

SLIDING WALL PARTITION SYSTEM

Field of Invention

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This invention relates to a wall partition system for use in the interior of building. In particular, the invention relates to wall partition system that can slide and divide the space of a room.

10 Background of Invention

In recent times, there is a need to better use and management of space within a room – be it in the office or at home. Also, there has been proposals of a system that is capable of converting the use of a workspace of an office into a different use (for residential or leisure
15 purposes) or customising such a workspace to meet the need. There are on-site, erectable, partition walls are known in the prior art. Such partition walls employ panel members and modes of erection resulting in partitions of fire-resistive construction. Such wall partitions usually take the form of horizontally sliding panels, and are used for example to close or section off areas in rooms or buildings. These types of partition wall systems usually require
20 storage space beside the area being closed off, to accommodate the panels when not in use. Also, it is cumbersome to manage the plurality of panels.

In addition, there is increasing need to store a rapidly increasing number of cords, such as electric cords of electric office appliances and telephone wires, in order not to obstruct
25 usual lifestyle and to arrange them in harmony with the interior appearance of the room. For this purpose, movable partition walls which have wiring spaces in the inside are being developed. A movable partition wall is usually placed near an individual desk to store cords in its inside, so that it is possible to minimize the number of cords placed on the floor or wall. In the conventional type of movable partition wall, there is a problem that wiring work
30 is complicated. In particular, the cord has to be put into the wiring hole from its tip in wiring for it to work, and such work is complicated because the tip is usually connected to a connecting component such as a plug which is wider than the diameter of the cord.

As such, there exists a need for an improved wall partition system for dividing the space of the room and yet provide the required electrical cables to accommodate the users in the room and be in harmony with the interior appearance of the room space.

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Summary of Invention

In accordance with a preferred aspect, there is provided a sliding wall partition system for dividing the space of a room, the system comprising (a) a wall partition having a top portion adjacent the ceiling of the room, and a bottom portion adjacent the floor of the room; (b) a utility service rail for supplying at least one cable to the wall partition; and (c) a track assembly adapted to allow the wall partition to slide along a length of the room.

By “wall partition”, it is meant to include any structure that defines an area, carries a load, or provides shelter or security. It includes any structure that separates rooms, or dividing any space in a given room. This includes the management of space usage, and includes components that may be built into the wall, e.g. display or storage shelves and cabinets, tables that provide working space and the like. The wall partition may be made from any structural or non-structural material such as concrete, wood, metal, bricks, plasterboard, glass or the like. The wall partition may be any characteristic that is desired by the skilled person when building a wall partition for use in a building. For example, the wall partition may be resistant to fire or sound resistant. In a preferred embodiment of the present invention, the wall partition divides the space in an interior of a room.

Hence, by “sliding wall partition system”, it is meant to include any system having the necessary components that wall partition to move or cause it to move smoothly along the track assembly in a continuous motion. The track assembly allows the wall partition to slide along it by being in continual contact with the wall partition. The wall partition can slide manually by pushing the wall partition, or it may slide electrically using an electrical drive unit.

Preferably, the track assembly comprises (a) a first and second parallel floor runway tracks positioned on the floor of the room; and (b) a first and second rollers positioned on the bottom portion of the wall partition, wherein the first and second rollers engage first and second parallel floor runway tracks respectively to allow the wall partition to slide along the length of the runway tracks.

Advantageously, the rollers positioned at the base or bottom portion of the wall partition provides added stability when sliding the wall partition either by pushing or pulling at the wall partition.

By "runway track", it is meant to include any slot, slit or the like that is cut into the floor (or ceiling) of the room. The length of the runway track may be any length that is desired. Preferably, the length of the runway track will determine the length on which the sliding wall partition may slide along the room. Alternatively, or in addition to the above, these tracks may be any U-channel or channel bar that is cut into the floor (or ceiling) of the room.

More preferably, the track assembly further comprising a third and fourth rollers positioned on the bottom portion of the wall partition, wherein the first and third rollers engage the first parallel floor runway track, and the second and fourth rollers engage the second parallel floor runway track to allow the wall partition to slide along the length of the runway tracks. In the case where there are four rollers positioned on the bottom portion of the wall partition, each roller is positioned on each corner on the bottom portion of the wall partition.

Preferably, each roller has a groove for engaging a raised rib on each of the first and second parallel floor runway tracks.

By "groove", it is meant to include any indentation that runs the circumference of the rollers. Ideally, such "grooved rollers" include a groove or indentation positioned about the centre on the surface that rolls. By "raised rib", it is meant to include any projecting structure in the runway track that runs the length of the track, preferably, parallel to the track. Hence, the sizes of the groove on a roller and the raised rib are such that the groove

sits and engages the raised rib and rolls along the length of the runway track while in constant engagement and contact. Advantageously, this engagement allows for sturdy sliding of the wall partition along the runway track.

5 Preferably, the track assembly further comprises (a) a first and second parallel ceiling runway tracks positioned on the ceiling of the room; (b) a first and second fins positioned on the top portion of the wall partition, wherein first and second fins engage first and second parallel ceiling runway tracks respectively to guide the wall partition as it slides along the length of the runway tracks. More preferably, the track assembly further comprises a third
10 and fourth fins positioned on the top portion of the wall partition, wherein the first and third fins engage the first parallel ceiling runway track, and the second and fourth fins engage the second parallel ceiling runway track to guide the wall partition as it slides along the length of the runway tracks.

15 By “fin”, it is meant to include any projection that mates with or engages with the ceiling runway track.

Preferably, the first and second parallel ceiling runway tracks oppose the first and second parallel floor runway tracks respectively.

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Preferably, wherein the distance between the first and second parallel floor runway track spans the length of the wall partition.

Preferably, the utility service rail is positioned on the ceiling between the first and second
25 parallel ceiling runway tracks. More preferably, the utility service rail further comprises a plurality of hanging members that can slide relative to the rail along a horizontal direction, the hanging members for holding the at least one cable. The cable may be any one selected from the group consisting of or combination of: power cable, telephone wire, or coaxial cable for transmitting video, audio signals, or for broadband internet access.

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Preferably, the wall partition further comprises a work surface unit. The work surface unit may be foldable into the wall partition for storage when not in use.

Preferably, the wall partition further comprises a display or storage means. More preferably, the display or storage means further comprises a barrier to prevent items placed on the display or storage means from falling off the wall partition.

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Preferably, the wall partition further comprises a panel for mounting a home entertainment unit. More preferably, the home entertainment unit includes a television.

10 Preferably, the wall partition further comprises a sleeve connecting the utility service rail to the panel, the sleeve for supplying at least one cable from the utility service rail to the panel. Preferably, the panel includes a support structure to allow the panel to rotate about a vertical axis.

Preferably, the wall partition spans a width of the room.

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Advantageously, the present invention provides a sliding integrated multi-function wall system that can easily slide anywhere along the length of a room, thus allowing for better space management, and yet can provide functional features such as display or storage cabinets and work surface units (e.g. study tables) without a break in electrical power and
20 cable signals to a home entertainment unit. The present invention aims to provide the movable partition wall which is simple in structure and capable of utilizing space more flexibly to meet using requirements of different crowds.

Brief Description of Figures

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In order that the present invention may be fully understood and readily put into practical effect, there shall now be described by way of non-limitative examples only preferred embodiments of the present invention, the description being with reference to the accompanying illustrative figures.

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In the Figures:

Figure 1 is a perspective view of a sliding wall partition system according to an embodiment of the present invention;

Figure 2 is a perspective view of the sliding wall partition system of Figure 1 when moved to
5 another position;

Figure 3 is a partial simplified enlarged view of Figure 2;

Figure 3a is a perspective view of the sliding wall partition system according to an
10 embodiment of the present invention;

Figure 3b is an enlarged view of a portion of the sliding wall partition system shown in Figure 3a;

15 Figure 3c is an enlarged view of a portion of the sliding wall partition system shown in Figure 3a;

Figure 4 is a front view of the sliding wall partition system shown in Figure 1;

20 Figure 5A is a rear view of the sliding wall partition system shown in Figure 1;

Figure 5B is a side view of the sliding wall partition system shown in Figure 1;

Figure 6 is a plan view of a residence unit using a sliding wall partition system of Figure 1;
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Figure 7 is a side view of Figure 1 showing the sliding of the wall partition system from one position to another position;

Figure 8 is a partial enlarged view of Figure 7;
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Figure 9 is a rear view of Figure 1 showing engagement structure to a floor and a ceiling according to another embodiment of the present invention;

Figure 10 is a partial enlarged view of Figure 9;

Figure 11 is a perspective view of the sliding wall partition system according to an
5 embodiment of the present invention showing rotation of a panel of the sliding wall
partition system according to an embodiment of the present invention;

Figure 12 is a partial enlarged view of Figure 11; and

10 Figure 13 is a partial view of the sliding wall partition system according to an embodiment of
the present invention.

Detailed Description of The Preferred Embodiments

15 Embodiments of the present invention provide a sliding integrated multi-function wall
system, particularly a sliding wall partition system, for use in an indoor environment, e.g. a
living room to customize the room space functions and usages according to various actual
needs. The sliding wall partition system is movable in the room anywhere along the length
of the room. Alternatively, or in addition, the sliding wall partition system may be moved
20 between predetermined positions. The sliding wall partition system can also serve as a
functional cabinet e.g. a TV console and/or display panel. Electrical power supply and signal
cables are provided to and in the sliding wall partition system such that at any position the
sliding wall partition system is moved to and/or even during the movement of the wall
partition system, electrical power and signal transmission is continuously supplied to the
25 appliances that may be coupled to the wall partition e.g. a television without the need of
reconnecting the power and signal cables before and/or after the movement.

As shown in the drawings, Figures 1 to 3, the sliding wall partition system 100 includes a wall
partition 110 that can be used to divide the space of a room. The room having a floor, a
30 ceiling and walls. The wall partition 110, as can be seen in the Figures, is disposed between a
floor 20 and a ceiling 30 of a room, and has a top portion 2 that is adjacent the ceiling 30 of
the room and a bottom portion 4 that is adjacent the floor 20 of the room. The wall

partition 110 may be in the form of (or includes) a cabinet, made of wood or other suitable material with the necessary structural strength and dimension. In one embodiment, as shown in Figures 4, 5A and 5B, the wall partition 110 includes display or storage means, for example display panels 112, shelves 114 and a mounting panel 116 for a television 40. These will be described in greater detail later. In addition, these display or storage means further comprises a barrier to prevent items placed on the display or storage means from falling off the wall partition 110. In the embodiment of the present invention, such barriers may be in the form is a wire mesh S1.

Also, as seen in Figures 1 and 2, it can be seen that the wall partition 110 can slide along the length of the room in the direction shown by the arrows. The wall partition 110 can also slide in the direction opposite the arrows. As an example, Figures 1 and 2 show that the wall partition 110 can move between positions 101 and 102, and vice versa. A track assembly allows the wall partition 110 to slide along the length of the room. This track assembly comprises many parts and these parts will be described in detail.

In an embodiment of the present invention, the track assembly comprises a first floor runway track 6 and a second floor runway track 8 that are parallel to each other. A first roller 120a and a second roller 120b positioned on the bottom portion 4 of the wall partition 110 to support the wall partition 110 on floor 20, and to engage the first and second floor runway tracks 6, 8 respectively in order to allow the wall partition 110 to slide along the length of the runway tracks 6, 8, e.g. between a first position 101 and a second position 102. First roller 120a and second roller 120b can be seen in Figure 4 which shows the front view of the wall partition 110. First roller 120a and second roller 120b may be positioned on either bottom side of the wall partition 110 to support the entire weight of the wall partition 110. They may be positioned substantially center the width of the wall partition 110 so that the weight distribution on the two rollers are equal.

In addition to the above, and in another embodiment of the present invention, the track assembly further comprises a third roller 120c and fourth roller 120d position on the bottom portion 4 of the wall partition 110 such that the first roller 120a and third roller 120c engage the first parallel floor runway track 6, and the second roller 120b and fourth roller 120d

engage the second parallel floor runway track 8 to allow the wall partition 110 to slide along the length of the runway tracks 6, 8, e.g. between a first position 101 and a second position 102. In this embodiment, each roller 120a, 120b, 120c and 120d is positioned on each corner on the bottom portion 4 of the wall partition 110. Third roller 120c and fourth roller
5 120d can be seen in Figure 5A which shows the rear view of the wall partition 110.

In order to provide stability when sliding the wall partition 110 along the floor runway tracks 6, 8, each roller 120a, 120b, 120c and 120d has a groove 160 around the circumference of the rolling surface for engaging a raised rib 162 in or on the runway track 6, 8. This can be
10 seen in Figure 3B.

The track assembly further comprises a first ceiling runway track 10 and a second ceiling runway track 12 that are parallel to each other and position on the ceiling 30 of the room. In an embodiment of the present invention, first ceiling runway track 10 opposes first floor
15 runway track 6. Likewise, second ceiling runway track 12 opposes second floor runway track 8. As can be seen in Figure 3a, a first fin 14a and a second fin 14b positioned on the top portion 2 of the wall partition 110. First fin 14a and second fin 14b engage first and second parallel ceiling runway tracks 10, 12 respectively to guide the wall partition 110 as it slides along the length of the runway tracks 6, 8, 10, 12.

20 The distance between the first and second parallel floor runway tracks 6,8 may span the length of the wall partition 110.

In addition, and more preferably, there may be four fins positioned on each corner of the
25 wall partition 110 at the top portion 2. Advantageously, these fins allow the wall partition 110 to slide smoothly across the length of the room. In addition, these fins ensure that the wall partition 110 slides in a straight path and also acts as a safety restraint to prevent it from toppling whilst in motion.

30 In an example as shown in Figures 6 and 7, the wall partition 110 is installed in a living room 60. Wall partition 110 is slidable in the living room 60 along the sliding path 62. When a bigger room space is needed in the living room 60 e.g. for day time activities, wall partition

110 can be moved to position 101 adjacent to fixed wall 36. In the event that a separate space e.g. a study room or bed room is needed temporarily, the wall partition 110 can be pulled / pushed along the sliding path 62 to a second position 102. At position 102, wall partition 110 serves as a partition to divide living room 60 into two spaces 60a and 60b. Space 60a can remain as living room while space 60b can be used as a study room or a bed room. Wall partition 110 may be moved back to position 101 to resume the original space of living room 60, when the temporary study room or bed room is not required.

As shown in Figures 7 and 8, the sliding wall partition system 100 includes a utility service rail 152 mounted to ceiling 30 of the room. The utility service rail 152 supplies at least one cable to the wall partition 110. These cables may be power electrical cables, telephone wires, cables for providing cable television or broadband internet access, or the like. Hanging members 154 are attached to rail 152 and slidable relative to rail 152 along horizontal direction 32. Electrical cable 150 is held by the hanging members 152, in a loose manner e.g. with lobe portions 151 formed between the hanging members 154. One end of electrical cable 150 is connected to a power/signal point (not shown) on fixed wall 36. Another end of electrical cable 150 is connected to mainframe 110. During the sliding operation, mainframe 110 carries cable 150 to move together. The lobe portions 151 will be stretched when mainframe 110 moves away from fixed wall 36. The loosened status of the electrical cable 150 is resumed when mainframe 110 moves closer to fixed wall 36. In this way, electrical power connection and signal transmission remain continuously supplied without interruption during the movement of mainframe 110.

In an alternative embodiment, as shown in Figures 9 and 10, in addition (or as an alternative) to bottom rollers 120a, 120b, 120c, 120d, the sliding wall partition system 100 may also include top rollers 130 fixed to the wall partition 110 and disposed in a ceiling runway track 10, 12, e.g. a channel bar fixed to ceiling 30. During the movement of wall partition 110, top rollers 130 roll inside the runway tracks 10, 12 to improve the smoothness of movement and stability of mainframe 110. If the track assembly includes top rollers, then fins may be disposed at the bottom portion 4 of the wall partition 110 to provide guidance and stability when sliding the wall partition 110.

In another embodiment of the present invention, the wall partition 110 provides a work surface unit 118 that may be foldable into the wall partition 110 via any pivot or hinge arrangement known to the skilled person. A support structure may be used to extend the work surface unit 118 when it is required for use. Otherwise, the work surface unit 118 simply collapses back into the wall partition 110 and its surface may be flushed with the wall partition 110 surface. When extended, the work surface unit 118 may be used a study table, a dining table or the like. Electricity may be supplied to any appliance placed on the work surface unity 118 via the utility service rail 152.

In yet another embodiment as shown in Figures 11 and 12, the wall partition 110 includes a panel 116 for mounting a home entertainment unit. In the present case, the home entertainment unit may be a television. Alternatively, it may be a computer system, a video monitor or sound system or a combination thereof. The wall partition 110 further includes a sleeve 190 that may be vertically mounted thereto. The sleeve 190 may connect the utility service rail 152 to the panel 116 so that at least one cable from the utility service rail 152 may be supplied to the panel 116. Panel 116 may be attached to sleeve 190 and is rotatable about a vertical axis relative to wall partition 110 about sleeve 190. A support structure (for example any ball bearing swivel mount known to the skilled person) may be used to support the panel 116 and allow it to rotate about a vertical axis. In addition, or more preferably, a restrainer may be included in the support structure to limit the rotating angle of the panel 116. This feature allows a television mounted to panel 116 to become rotatable relative to wall partition 110 such that the television can face different directions. For example, when the wall partition 110 is moved to the middle part of the living room and serves as a partition, the television may be rotated to face either side of the wall partition 110 for watching. Disposed in sleeve 190, the major portion of the electrical cable 150 does not follow the rotation of panel 116. Only the portion adjacent to the connection point to the television follows the panel rotation, but within the allowable flexibility deformation range of the electrical cables. As such, electrical connection is not interrupted during rotation of the panel 116.

Openings 194, 196 are formed on sleeve 190 and panel 116. Electrical cable 150 from fixed power/signal point through the hanging members 154 are directed to pass through the

mainframe 110 and sleeve 190. Electrical cable 150 is connected to the television for power supply as well as signal transmission, through the openings 194 and/or 196. The bottom end opening 192 of sleeve 190 may be used for the audio/video cables connecting the television to e.g. a media player (not shown).

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In a further embodiment as shown in Figure 13, an outer sleeve 190a is fixed to the panel 116, and an inner sleeve 190b is mounted to the wall partition 110 and rotatably disposed in outer sleeve 190a. Rotation of the panel 116 is supported by the engagement of outer sleeve 190a and inner sleeve 190b. In this way, rotation of mounting panel can be smoother, easy operable and the mounting panel structure is more durable.

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Whilst there has been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology concerned that many variations or modifications in details of design or construction may be made without departing from the present invention.

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CLAIMS

- 5 1. A sliding wall partition system for dividing the space of a room, the system comprising:
- (a) a wall partition having a top portion adjacent the ceiling of the room, and a bottom portion adjacent the floor of the room;
 - (b) a utility service rail for supplying at least one cable to the wall partition; and
 - 10 (c) a track assembly adapted to allow the wall partition to slide along a length of the room.
2. The system according to claim 1, wherein the track assembly comprising:
- (a) a first and second parallel floor runway tracks positioned on the floor of the room; and
 - 15 (b) a first and second rollers positioned on the bottom portion of the wall partition,
- wherein the first and second rollers engage first and second parallel floor runway tracks respectively to allow the wall partition to slide along the length of the runway tracks.
- 20 3. The system according to claim 2, the track assembly further comprising a third and fourth rollers positioned on the bottom portion of the wall partition, wherein the first and third rollers engage the first parallel floor runway track, and the second and fourth rollers engage the second parallel floor runway track to allow the wall partition to slide along the length of the runway tracks.
- 25 4. The system according to claim 3, wherein each roller is positioned on each corner on the bottom portion of the wall partition.
- 30 5. The system according to any one of claims 2 to 4, wherein each roller has a groove for engaging a raised rib on each of the first and second parallel floor runway tracks.

6. The system according to any one of claims 2 to 5, wherein the track assembly further comprising:

(a) a first and second parallel ceiling runway tracks positioned on the ceiling of the room;

(b) a first and second fins positioned on the top portion of the wall partition, wherein first and second fins engage first and second parallel ceiling runway tracks respectively to guide the wall partition as it slides along the length of the runway tracks.

7. The system according to claim 6, wherein the track assembly further comprising a third and fourth fins positioned on the top portion of the wall partition, wherein the first and third fins engage the first parallel ceiling runway track, and the second and fourth fins engage the second parallel ceiling runway track to guide the wall partition as it slides along the length of the runway tracks.

8. The system according to any one of claims 6 or 7, wherein the first and second parallel ceiling runway tracks oppose the first and second parallel floor runway tracks respectively.

9. The system according to any one of claims 2 to 8, wherein the distance between the first and second parallel floor runway track spans the length of the wall partition.

10. The system according to any one of claims 6 to 9, wherein the utility service rail is positioned on the ceiling between the first and second parallel ceiling runway tracks.

11. The system according to any one of the preceding claims, wherein the utility service rail further comprises a plurality of hanging members that can slide relative to the rail along a horizontal direction, the hanging members for holding the at least one cable.

12. The system according to any one of the preceding claims, wherein the cable is any one selected from the group consisting of or combination of: power cable, telephone wire, or coaxial cable for transmitting video, audio signals, or for broadband internet access.

5 13. The system according to any one of the preceding claims, wherein the wall partition further comprises a work surface unit.

14. The system according to claim 13, wherein the work surface unit is foldable into the wall partition.

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15. The system according to any one of the preceding claims, wherein the wall partition further comprises a display or storage means.

15 16. The system according to claim 15, wherein the display or storage means further comprises a barrier to prevent items placed on the display or storage means from falling off the wall.

17. The system according to any one of the preceding claims, wherein the wall partition further comprises a panel for mounting a home entertainment unit.

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18. The system according to claim 17, wherein the wall partition further comprises a sleeve connecting the utility service rail to the panel, the sleeve for supplying at least one cable from the utility service rail to the panel.

25 19. The system according to any one of claims 17 or 18, wherein the panel includes a support structure to allow the panel to rotate about a vertical axis.

20. The system according to any one of claims 17 to 19, wherein the home entertainment unit includes a television.

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21. The system according to any one of the preceding claims, wherein the wall partition spans a width of the room.