

## **“WALL SYSTEM”**

### **Field of the Invention**

[001] The present invention relates to a system for creating a wall within a building.

### **Background to the Invention**

[002] Conventional residential building design comprises generally forming external and internal walls constructed in fixed positions relative to a floor slab. The walls may comprise brick and mortar or frame walls but these walls are fixed in place during construction of the building. The occupants of most buildings however often have changing needs over time. For example, as families grow, additional bedrooms may be required. Eventually as the children become adults and move out, less bedrooms may be required and the space may be better used for other activities. It would therefore be advantageous to utilise a construction in which the internal walls may be fixed in place to form rooms suitable for present needs but where the walls may be later moved to reconstruct the layout of rooms.

[003] The present invention relates to a wall system which may be used to address the above issue. The wall system is aimed at being simple to construct in the desired location, easily disassembled for moving if required and able to accommodate variations and movement in the building.

### **Summary of the Invention**

[004] According to one aspect of the present invention there is provided a wall system comprising:

a wall panel connected to one or more adjacent wall panels;

one or more legs extending from a lower edge of the wall panel on which the wall panel is supported, each of the legs comprising a shaft having a foot on a lower end thereof; and

a lower track secured to a floor, the lower track having a lower channel into which the feet are received;

wherein an inner surface of the lower channel is arcuate in cross section taken transversely to a longitudinal axis thereof and a lower surface each of the feet has a corresponding arcuate cross sectional shape such that the angle of the wall panel can be varied relative to the lower track.

[005] Preferably each of the feet is mounted for sliding vertical movement in a foot slot.

[006] Preferably the leg comprises a plurality of shafts and a single elongate foot extending throughout the lower channel from adjacent a first side of the panel to adjacent a second side of the panel.

[007] Preferably an adjustment block is provided at an upper end of the foot slot to receive the upper end of the shaft, the adjustment block including a first gear to engage with the thread on the shaft such that the rotation of the gear rotates the shaft and thereby moves the foot upwardly or downwardly.

[008] Preferably the adjustment block includes a first tool opening in a side wall thereof to allow a tool to be inserted into the adjustment block to engage with the gear for adjusting the height of the leg.

[009] Preferably the panel includes also includes upper legs having feet received in an upper foot slot to engage into an arcuate upper channel in an upper track located above the panel.

[010] Preferably the upper legs include springs around the shafts thereof to push the foot of each of the upper legs upwardly into the upper channel.

[011] Preferably the upper and lower tracks are connectable together by connector inserts comprising elongate members slidable into connector channels extending into the ends of the upper and lower tracks.

[012] Preferably an inner surface of the lower channel is provided with one or more longitudinal ribs to be received within corresponding grooves provided on the lower surface of the feet.

[013] Preferably the grooves are wider than the ribs to allow movement of the ribs within the grooves.

[014] Preferably there are provided a pair of ribs extending longitudinally along the lower channel positioned one either side of a longitudinal centre line of the lower channel.

[015] Preferably an upper end of the wall panel is provided with a compressible engagement member to be received into an upper channel on an upper track, the upper track to be fixed above the upper edge of the wall panel.

[016] Preferably the engagement member is connected to the wall panel by one or more threaded shafts to allow the height of the engagement member above the wall panel to be varied.

[017] Preferably the engagement member comprises an upper portion and a lower portion, the upper and lower portions being moveable away or toward each other, and a compressible member provided between the upper and lower portions.

[018] Preferably each of the upper and lower portions is U-shaped in transverse cross section and the compressible member comprises an elongate member of compressible material.

[019] Preferably each of the upper and lower portions comprises a first side wall, a second side wall and a connecting wall extending between the first and second side walls.

[020] Preferably the first side wall of each of the lower and upper portions comprises a solid wall and the second side wall includes a recess in an end thereof such that the recesses in the second side walls of the lower and upper portions receive ends of the first side walls of the upper and lower portions.

[021] Preferably an upper surface of the connecting wall of the upper portion is arcuate in transverse cross-section and the upper channel in the upper track has a corresponding cross sectional shape.

[022] Preferably skirtings are provided to extend between the ends of the panel and an adjacent floor or ceiling, each of the skirtings comprising:  
a skirting panel having a flange extending outwardly from along the length thereof on an inner side;  
a circular rib along the distal edge of the flange;  
first and second side channels on opposed vertical sides of the upper or lower track;  
wherein the rib may be received in one of the side channels in a snap fit manner such that the skirting panel may rotate about the upper or lower track.

[023] Preferably an upper inner edge of the skirting panel is provided with a magnetic strip to engage with a portion of the panel and hold the upper edge of the skirting panel in place.

[024] In accordance with a second aspect of the present invention, there is provided a wall system comprising:  
one or more wall panels; and  
one or more skin panels connectable to outer surfaces of the wall panels;  
a plurality of connectors for connecting the skin panels to the wall panels, each of the connectors comprises a connection rail having a pair of connector clips rotatably secured to opposite ends thereof;  
wherein an inner surface of the skin panel includes a plurality of vertical ribs such that the connection clips may be attached to the ribs by receiving connector clips between adjacent ribs and rotating and wherein the connection rail of the connector is attracted magnetically into a horizontal channel on a surface of the wall panel.

[025] Preferably each of the connector clips comprises a base which is located on a side of the connector adjacent the skin panel in use and a body which passes through a hole in an end of the connection rail.

[026] Preferably the base of each of the connector clips includes opposed flat and arcuate edge portions between the flat sides such that the flat sides may be aligned with the ribs to allow the base to be received between a pair of ribs.

[027] Preferably the body of each of the connector clips is provided with a tool slot such that a suitable tool may engage with the tool slot to rotate the connector clip.

[028] In accordance with a third aspect of the present invention, there is provided wall system comprising:

a wall panel having a latch channel in a vertical edge thereof;

an elongate latch member received into the latch channel;

wherein an inner side of the latch member includes one or more latch magnets and an inner surface of the latch channel includes one or more channel magnets such that the latch member may slide longitudinally in the channel between a position in which the latch magnets attract the channel magnets to retract the latch member into the channel and a position in which the latch magnets repel the channel magnets to extend the latch member from the channel.

[029] Preferably poles of the latch magnets are aligned with opposed poles of the channel magnets when the latch member is in the retracted position and are aligned with like poles of the channel magnets when the latch member is in the extended position.

[030] Preferably the latch member comprises an elongate body mounted at a lower end thereof to a lower member and at an upper end thereof to an upper member such that the lower and upper members are mounted for sliding motion longitudinally within the latch channel and the elongate body can slide longitudinally within the latch channel but can also move laterally relative to the lower and upper members to allow the elongate body of the latch member to move between the extended and retracted positions.

[031] Preferably the upper and lower ends of the elongate body of the latch member are provided with rails received in corresponding grooves in the upper surface of the lower member and the lower surface of the upper member.

[032] Preferably an adjustment block is provided adjacent the lower member such that a threaded rod extending upwardly from the adjustment block engages with the lower member to move the lower member upwardly or downwardly.

[033] Preferably the adjustment block is provided with a second tool opening to allow engagement with a second gear such that rotating the second gear rotates the rod and causes the lower member to move upwardly or downwardly within the latch channel.

[034] Preferably end posts are provided to connect between an end of a panel and an adjacent wall.

[035] Preferably the end posts comprise first and second elongate members, wherein first compressible buffers are provided on a first side of the first elongate member, second compressible members are provided between a second side of the first elongate member and a first side of the second elongate member and a latch channel is provided in a second side of the second elongate member.

[036] Preferably the second side of the first elongate member includes engagement ribs located to be received in engagement channels provided on the first side of the second elongate member and wherein the second buffer members are provided in the engagement channels.

[037] Preferably each of the first and second elongate members comprises a plurality of telescoping sections such that the lengths of the first and second elongate members is variable.

**Brief Description of the Drawings**

[038] The invention will now be described, by way of example, with reference to the following drawings, in which:

[039] Figure 1a is an upper perspective view of a wall panel of a wall system in accordance with the present invention;

[040] Figure 1b is a front view of the wall panel of Figure 1a;

[041] Figure 1c is a top view of the wall panel of Figure 1a;

[042] Figure 1d is a side view of the wall panel of Figure 1a;

[043] Figure 2 is an exploded view of the wall panel of Figure 1;

[044] Figure 3a is an upper perspective view of the wall panel of Figure 1 including skin panels;

[045] Figure 3b is an exploded view of the wall panel of Figure 3a;

[046] Figure 4a is an upper perspective view of one of the side members of the wall panel of Figure 1;

[047] Figure 4b is a top view of the side member of Figure 4a;

[048] Figure 4c is a side view of the side member of Figure 4a;

[049] Figure 4d is an exploded view of the side member of Figure 4a;

[050] Figure 5a is an upper perspective view of a leg of the wall panel of Figure 1;

[051] Figure 5b is a side view of the leg of Figure 5a;

[052] Figure 5c is a front view of the leg of Figure 5a;

[053] Figure 5d is a top view of the leg of Figure 5a;

[054] Figure 6a is an upper perspective view of a lower track of the wall panel of Figure 1;

[055] Figure 6b is an exploded view of the lower track;

[056] Figure 6c is a top view of the lower track;

[057] Figure 6d is an end view of the lower track;

[058] Figure 6e is a side view of the lower track;

[059] Figure 7a is front view of the wall panel of Figure 1;

[060] Figure 7b is a cross-sectional view of the wall panel of Figure 7a through the line F-F;

- [061] Figure 7c is a cross-sectional view of the wall panel of Figure 7a through the line B-B;
- [062] Figure 7d is a close-up view of Detail G of Figure 7b;
- [063] Figure 7e is a close up view of Detail Z of Figure 7c;
- [064] Figure 7f is a close-up view of Detail A of Figure 7c;
- [065] Figure 8a is an upper perspective view of a skirting of the wall panel of Figure 1;
- [066] Figure 8b is an exploded view of the skirting;
- [067] Figure 8c is an end view of the skirting;
- [068] Figure 8d is a side view of the skirting;
- [069] Figure 9a is an upper perspective view of an upper engagement member for connecting between an upper end of the wall panel and the upper track;
- [070] Figure 9b is a side view of the engagement member of Figure 9a;
- [071] Figure 9c is an end view of the engagement member of Figure 9a;
- [072] Figure 9d is an exploded view of the engagement member of Figure 9a;
- [073] Figure 10a is a side view of the engagement member of Figure 9 in a first compressed configuration;
- [074] Figure 10b is an end view of the engagement member of Figure 10a;
- [075] Figure 10c is a side view of the engagement member of Figure 9 in a second compressed configuration;
- [076] Figure 10d is an end view of the engagement member of Figure 10c;
- [077] Figure 11a is a side view of the engagement member of Figure 9 in a third compressed configuration;
- [078] Figure 11b is an end view of the engagement member of Figure 11a;
- [079] Figure 11c is a side view of the engagement member of Figure 9 in a fourth compressed configuration;
- [080] Figure 11d is an end view of the engagement member of Figure 11c;
- [081] Figure 12a is an upper perspective view of the upper track of the wall panel of Figure 1;
- [082] Figure 12b is an exploded view of the upper track;
- [083] Figure 12c is an end view of the upper track;
- [084] Figure 12d is a side view of the upper track;
- [085] Figure 13a is an upper perspective view of the wall panel showing the upper track prior to engagement with the engagement member;

- [086] Figure 13b is a front view of the wall panel of Figure 13a;
- [087] Figure 13c is a top view of the wall panel of Figure 13a;
- [088] Figure 13d is an end view of the wall panel of Figure 13a;
- [089] Figure 13e is a close up view of Detail A of Figure 13d;
- [090] Figure 14a is an upper perspective view of the wall panel showing the upper track engaged with the engagement member;
- [091] Figure 14b is a front view of the wall panel of Figure 14a;
- [092] Figure 14c is a top view of the wall panel of Figure 14a;
- [093] Figure 14d is an end view of the wall panel of Figure 14a;
- [094] Figure 14e is a close up view of Detail B of Figure 14d;
- [095] Figure 15a is an upper perspective view of the wall panel showing the upper track engaged with the engagement member and the engagement member in a first compressed state;
- [096] Figure 15b is a front view of the wall panel of Figure 15a;
- [097] Figure 15c is a top view of the wall panel of Figure 15a;
- [098] Figure 15d is an end view of the wall panel of Figure 15a;
- [099] Figure 15e is a close up view of Detail B of Figure 15d;
- [100] Figure 16a is an upper perspective view of the wall panel showing the upper track engaged with the engagement member and the engagement member in a second compressed state;
- [101] Figure 16b is a front view of the wall panel of Figure 16a;
- [102] Figure 16c is a top view of the wall panel of Figure 16a;
- [103] Figure 16d is an end view of the wall panel of Figure 16a;
- [104] Figure 16e is a close up view of Detail B of Figure 16d;
- [105] Figure 17 is an upper perspective view of the upper track including fasteners;
- [106] Figure 18a is a lower view of the upper track of Figure 17;
- [107] Figure 18b is an end view of the upper track of Figure 17;
- [108] Figure 19a is a side view of an alternative embodiment of a leg of the wall panel;
- [109] Figure 19b is an end view of the leg of Figure 19a;
- [110] Figure 19c is a cross sectional view of the leg of Figure 19b through the line Y-Y;

- [111] Figure 20a is an upper perspective view of a further alternative embodiment of a leg of the wall panel;
- [112] Figure 20b is an exploded view of the leg of Figure 20a;
- [113] Figure 21a is a side cross sectional view of the leg of Figure 20 in a first tilted position;
- [114] Figure 21b is a side cross sectional view of the leg of Figure 20 in a second tilted position;
- [115] Figure 22a is an upper perspective view of an alternative embodiment of an upper engagement member of the wall panel
- [116] Figure 22b is an exploded view of the engagement member of Figure 22a;
- [117] Figure 23a is an end view of the engagement member of Figure 22;
- [118] Figure 23b is a cross sectional view of the engagement member of Figure 23a through the line Y-Y;
- [119] Figure 24a is an end view of the engagement member of Figure 22 in a compressed state;
- [120] Figure 24b is a cross sectional view of the engagement member of Figure 24a through the line AD-AD;
- [121] Figure 25a is an end view of an alternative embodiment of an engagement member of the wall panel;
- [122] Figure 25b is a top view of the engagement member of Figure 25a;
- [123]
- [124] Figure 26 is a perspective view of a lower end of a further embodiment of a panel of a wall system in accordance with the present invention;
- [125] Figure 27 is a second perspective view of the lower end of the panel of Figure 26;
- [126] Figure 28 is a perspective view of an upper end of the panel of Figure 26;
- [127] Figure 29 is a lower perspective view of the panel of Figure 26 with the lower track removed;
- [128] Figure 30 is a perspective view of the panel of Figure 26 showing the latch member in the extended position;
- [129] Figure 31 is a perspective view of the upper end of the panel of Figure 29;

- [130] Figure 32a is a view perspective of the side member of the panel of Figure 26 with the latch member removed;
- [131] Figure 32b is a perspective view of the latch member of the panel of Figure 26;
- [132] Figure 33 is a view showing one of the skin panels removed from the panel;
- [133] Figure 34 is a close up view of the upper half of the skin panel of Figure 32;
- [134] Figure 35 is a close up view of the connectors of the skin panel;
- [135] Figure 36a is a perspective of one of the connectors removed from the skin panel; and
- [136] Figure 36b is a top view of the skin panel;
- [137] Figure 37 is a perspective view of a connecting post for connecting together multiple panels of the wall system;
- [138] Figure 38 is a view of a cross section of the connecting post of Figure 37
- [139] Figure 39 is a first upper perspective view of an end post for use with the wall system of the present invention;
- [140] Figure 40 is a second upper perspective view of the end post of Figure 39;
- [141] Figure 41 is a close up view of an end of the end post of Figure 39

### **Detailed Description of Preferred Embodiments**

[142] Referring to the Figures, there is shown a wall system 10 comprising one or more wall panels 12. The wall panels 12 may be positioned adjacent further wall panels 12 and connected in place to form a wall structure. One or more connecting members may be placed between adjacent wall panels 12 to either allow connection of more than two wall panels 12 at corners, or to allow wall panels 12 to be connected at an angle to each other.

[143] Each of the wall panels 12 comprises in the embodiment shown first and second side members 16 and 17 located along vertical edges of the wall panel 12. First and second side sheets 20 and 21 extend between the first and second side members 16 and 17 to define the wall panel 12 which may be used to form

a wall structure comprising one or more of the wall panels 12. An insulating filler 74 may be provided between the first and second side sheets 20 and 21 in use.

[144] Each of the first and second side members 16 and 17 includes a central latch channel 22 defining an opening facing outwardly away from the vertical edge of the wall panel 12. The latch channel 22 is provided for receiving a latch member 18 such that the latch member 18 may extend outwardly through the opening, or retract inwardly into the latch channel 22. The outer end of the latch member 18 may be engaged into the opening of an adjacent wall panel 12 in the extended position in order to connect adjacent wall panels 12 together.

[145] The first and second side members 16 and 17 may also include a plurality of magnets 14 along the length to engage with an adjacent wall panel 12, or a connecting member. The first and second side sheets 20 and 21 are also securable to the first and second members 16 and 17 as can be seen in the Figures.

[146] Each of the first and second side members 16 and 17 includes a leg bracket 24 for supporting a leg 26 on which the wall panel 12 may rest in use. The leg 26 comprises a threaded shaft 28 having a foot 30 on a lower end thereof. The leg bracket 24 comprises a cylinder having an internal thread to receive the threaded shaft 28. The shaft 28 may therefore be rotated to adjust the length of the leg 26 and therefore the height of the wall panel 12.

[147] A lower track 32 is provided to be secured to the floor on which the wall panel 12 is to be placed. The lower track 32 comprises an elongate member having a lower channel 34 in an upper surface thereof. A lower surface of the feet 30 are to be received in the lower channel 34 to locate the wall panel 12.

[148] The feet 30 each include a first end 36 and a second end 37. A lower surface of each of the feet 30 is arcuate in cross sections taken transversely to an axis extending between the first and second ends 36 and 37 (as can be seen for example in Figure 5c). The lower channel 34 is also arcuate in cross sections taken transversely to the length of the lower track 32, with the curvature corresponding to that of the lower surface of the foot 30.

[149] The angle of the wall panel 12 can therefore be slightly adjusted relative to the lower track 32 by rotation of the lower surface of the feet 30 within the lower channel 34. This thereby allows the wall panel 12 to be positioned vertically regardless of slight imperfections in the floor on which the lower track 32 is placed.

[150] An inner surface of the lower channel 34 is also provided with one or more longitudinal ribs 38. In the embodiment shown, there are provided a pair of ribs 38 extending longitudinally along the lower channel 34 positioned one either side of a longitudinal centre line of the lower channel 34. The lower surface of the feet 30 includes one or more slots 40 extending between the first and second ends 36 and 37 thereof. The slots 40 correspond to the ribs 38 such that the ribs 38 in the lower channel 34 may be received within a corresponding one of the slots 40. The slots 40 are wider than the width of the ribs 38 such that the ribs 38 may move slightly laterally within the slots 40 to allow the above-mentioned variation in angle between the wall panel 12 and the lower track 32. The ribs 38 however will limit rotational movement between the wall panels 12 and the lower channel 34, thereby providing some limited movement which may be useful in conditions where the wall panels 12 may move, such as earthquakes or general building movement.

[151] The wall system 10 is provided also with an upper track 42 to be fixed above the wall panels 12 to a ceiling or roof structure. The upper track 42 includes an upper channel 44 to receive an engagement member 46 secured above an upper edge of the wall panel 12. In the embodiment shown, the engagement member 46 comprises an elongate member having threaded shafts 48 extending downwardly into upper ends of the side members 16 and 17 to allow adjustment of the vertical position of the engagement member 46 above the wall panel 12.

[152] The engagement member 46 comprises a lower portion 50 and an upper portion 51. The lower portion 50 engages with the upper portion 51 such that the upper and lower portions 50 and 51 may move toward or away from each other in use. One or more compressible members 52 is provided between the upper and lower portions 50 and 51 of the engagement member 46. The

compressible members 52 in the embodiment shown comprise elongate members of a suitable compressible resilient material, such as a foam or rubber based material. The compressible members 52 engage against the upper and lower portions 50 and 51 to allow the upper and lower portions 50 and 51 to be moved towards each other, compressing the compressible member 52. The upper and lower portions 50 and 51 may also be moved away from each other and the compressible members 52 will expand to their original uncompressed configuration.

[153] In the embodiment shown, each of the upper and lower portions 50 and 51 comprises a first side wall 54, a second side wall 55 and a connecting wall 56 extending between the first and second side walls 54 and 55. Each of the upper and lower portions 50 and 51 is therefore generally U-shaped in transverse cross-section. The connecting wall 56 of the lower portion 50 is located below the first and second side walls 54 and 55 and the connecting wall 56 of the upper portion 51 is located in use above the first and second side walls 54 and 55 such that a space is defined between the first and second side walls 54 and 55 of the lower and upper portions 50 and 51 into which the compressible members 52 are received.

[154] The first side wall 54 of each of the lower and upper portions 50 and 51 comprises a solid wall and the second side wall 56 includes a recess 58 in an end thereof such that the recesses 58 in the second side walls 55 of the lower and upper portions 50 and 51 may receive ends of the first side walls 54 of the upper and lower portions 51 and 50. The engagement of the first side walls 54 into the recesses 58 of the second side walls 55 allows the lower and upper portions 50 and 51 of the engagement member 46 to slide towards or away from each other, thereby compressing or expanding the compressible members 52.

[155] As can be seen in Figures 16 to 19, the wall panel 12 may be moved upwardly to engage an upper end of the engagement member 46 in the upper channel 44 and compress the compressible members 52 sufficiently to provide sufficient force on the upper end of the wall panel 12 to secure the wall panel 12 in place.

[156] An upper surface of the connecting wall 56 of the upper portion 51 is arcuate in transverse cross-section, as is the upper channel 44, to allow slight angular adjustments in position of the engagement member, and thereby the wall panel 12, relative to the upper track 42 and the roof structure to which it is secured. An inner surface of the upper channel 44 includes one or more ribs 38 and the upper surface of the connecting wall 56 of the upper portion 51 of the engagement member 46 includes corresponding slots 40 of similar configuration to those provided in the feet 30 and the lower channel 34. This allows slight rotational movement between the engagement member 46 and the upper track 42 which, along with the compressible nature of the engagement member 46, provides flexibility between the wall panel 12 and the structure to which it is connected. Such flexibility and movement allows for variations in the structures to be accommodated and also movement in the event of an earthquake or general building movement.

[157] Each of the lower and upper tracks 32 and 42 are securable in place by a plurality of fasteners 100. The fasteners 100 may comprise standard threaded fasteners such as screws. The fasteners 100 are passed through holes 104 provided along the centre of the lower and upper channels 34 and 44. The fasteners 100 are provided with fixing plates 102 through which the fasteners 100 are passed and which engage with inner surfaces of the channels 34 and 44. Each of the lower and upper channels 34 and 44 is provided with recessed portions 60 extending outwardly away from a centre of the channel 34 or 44 (as can be seen for example in Figure 21). The recessed portions 60 are provided to allow movement of the wall panel 12 by sliding of the fixing plates 102 into the recessed portions 60. This also provides for movement caused by earthquakes or general building movement.

[158] The wall panel 12 is provided with skirtings 62 provided to extend between a lower edge of the wall panel 12 and the floor. The skirtings 62 each comprise a skirting panel 64 connectable relative to a lower end of the wall panel 12. The skirting panels 64 are provided with a flexible arm member 66 extending out from an inner surface thereof. The arm member 66 extends upwardly and away from the inner surface of the skirting panel 64 and includes

an end portion 68 provided to engage with an inner surface of the adjacent side sheet 20 or 21 adjacent a lower edge thereof. The lower edge of the side sheet 20 and 21 is thereby engaged between the inner surface of the skirting panel 64 and the distal end portion 68 of the arm member 66 (as can be seen in Figure 7f).

[159] A lower end of the inner surface of the skirting panel 64 engages with an adjacent side of the lower track 32. The inner surface of the skirting panel 64 is provided with a downwardly extending flange 70 which is received into an upwardly facing groove 72 on an outer side of the lower track 32. This engages the lower end of the skirting 62 with the adjacent lower track 32 in a way where the height of the skirting 62 relative to the lower track 32 may be adjusted to account for flooring materials of different thicknesses.

[160] Figure 19 shows an alternative embodiment of a leg 26 in accordance with the present invention. In the embodiment of Figure 19, the lower surface of the foot 30 is arcuate between the first and second sides of the foot 30 to correspond with the inner shape of the lower track 32 but the lower surface of the foot 30 is also arcuate between first and second ends 36 and 37 (as can be seen in Figure 19c). This curvature between the first and second ends allows the shaft 28 of the leg 26 to tilt slightly in directions both parallel and perpendicular to the longitudinal axis of the lower track 32.

[161] Figure 20 shows a further alternative embodiment of a leg 26 provided to allow tilting of the shaft 28 relative to the lower track 32 in a plane parallel to the lower track 32. In this embodiment, a lower end of the shaft 28 is received in an aperture 106 in an upper side of the foot 30. The lower end of the shaft 28 includes a sleeve 108 and the length of the aperture 106 in a direction parallel to the longitudinal axis of the lower track 32 in use is slightly longer than the width of the sleeve 108. A pin 110 is received through a raised collar 112 around the aperture 106 and also through a corresponding hole in the sleeve 108. The pin 110 is oriented perpendicular to the longitudinal axis of the lower track 32 such that the shaft 28 can pivot slightly relative to the foot 30 (as can be seen in Figure 24).

[162] Figures 22 to 24 show a further embodiment of an engagement member 46 for engaging between an upper end of the panel 12 and the upper track 42. The engagement member 46 of Figures 22 to 24 also includes upper and lower portions 50 and 51, however a plurality of springs 114 are provided between the upper and lower portions 50 and 51 to also control movement of the upper and lower portions 50 and 51 relative to each other.

[163] Figure 25 shows a further alternative embodiment of an engagement member 46 for engaging between the upper end of the panel 12 and the upper track 42. The engagement member 46 comprises an elongate member 116 of compressible material, such as rubber or foam. The elongate member 116 includes an upper part 118 to engage into the upper track 42 and a lower part 119 to engage with the upper end of the panel 12. The upper part 118 includes a curved upper surface to engage into the upper channel 44. An upper side of the lower part 119 and a lower surface of the upper part 118 both include corrugations 120 which interlock to engage the upper and lower parts 118 and 119 together.

[164] Figures 25 to 28 show a further embodiment of legs 26 of the wall system 10 in accordance with the present invention. The legs 26 of Figures 25 to 28 are similar to the previous embodiment and like reference numerals are used to denote like parts.

[165] The legs 26 comprise a foot 30 having an arcuate lower surface to be received the lower channel 34 of the lower track 32. The foot 30 in the embodiment shown is mounted for sliding vertical movement in a foot slot 122 in a lower end of the panel 12. There is provided in this embodiment a single leg 26 comprising a plurality of shafts 28 but a single foot 30. The foot 30 comprises an elongate foot 30 extending throughout the lower channel 34 from adjacent a first side of the panel 12 to adjacent a second side of the panel 12.

[166] An adjustment block 124 is provided at an upper end of the foot slot 122 to receive the upper end of the shaft 28. The adjustment block 124 includes a gear to engage with the thread on the shaft 28 such that the rotation of the gear

rotates the shaft 28 and thereby moves the foot upwardly or downwardly to adjust the position of the foot 30 below the panel 12.

[167] The adjustment block 124 includes a first tool opening 126 in a side wall thereof to allow an appropriate tool to be inserted into the adjustment block 124 to engage with the gear for adjusting the height of the leg 26.

[168] The panel 12 of Figures 25 to 28 also includes upper legs 26a. The upper legs 26a are of the same configuration as the legs 26 at the lower end of the panel 12 and are provided to extend between the upper end of the panel 12 and into the upper channel 44 of the upper track 42. The upper end of the panel 12 is provided with an upper foot slot 122a to receive the foot 30 of the upper leg 26a. The upper legs 26a include springs 27 around the shafts 28 thereof to push the foot 30 of each of the legs 26a upwardly into the upper channel 44.

[169] The upper and lower tracks 32 and 34 are connectable together by connector inserts 154, as can be seen in Figure 27. The connector inserts 154 comprise elongate members slidable into connector channels 156 extending into the ends of the tracks 32 and 42. The connector inserts 154 may be received in the connector channels 156 in an adjacent pair of tracks 32 or 42 to connect the tracks 32 or 42 together.

[170] The embodiment shown in Figures 26 to 28 also shows an alternative arrangement for the skirting panels 64 of the wall panels 12. The skirting panels 64 in this embodiment are connectable to the lower and upper tracks 32 and 42. The skirting panels 64 include a flange 82 extending outwardly from along the length thereof on an inner side. The flange 82 includes a circular rib 84 along the distal edge thereof. The lower and upper tracks 32 and 42 each include first and second side channels 86 and 87 on opposed vertical sides thereof. Each of the side channels 86 and 87 is arcuate in transverse cross section such that the rib 84 may be received in one of the side channels 86 or 87 in a snap fit manner.

[171] When the rib 84 of the flange 82 is received in one of the side channels 86 or 87, the skirting panel 64 extends generally between the end of the panel 12 and the adjacent floor or ceiling. The rib 84 however may rotate to a limited

degree within the side channel 86 or 87 to allow for some minor adjustment of the angle of the skirting body 64 relative to the lower or upper track 32 or 42. This allows for some compensation for uneven floors causing an angle between the lower and upper tracks 32 and 42 and the panel 12.

[172] An upper inner edge of the skirting panel 64 is provided with a magnetic strip 88. The magnetic strip 88 is provided to engage with a portion of the panel 12 and hold the upper edge of the skirting panel 64 in place. In the embodiment shown, the upper and lower ends of the panel 12 are provided with ducting covers 90 extending between the ends of the panel 12 and the lower and upper tracks 32 and 42 to provide a space where cabling and other services may extend. The magnetic strip 88 in this embodiment engages with the outer surface of the ducting covers 90.

[173] Figures 29 to 31 show details of a latch member 18 in accordance with the second aspect of the invention. The latch member 18 comprises an elongate member received within the latch channel 22 such that the latch member 18 can be moved between an extended position, in which an outer edge of the latch member 18 protrudes outwardly from the latch channel 22 to be received in a latch channel 22 of an adjacent panel 12, and a retracted position, in which the latch member 18 is contained within the latch channel 22 to allow disconnection of the adjacent panels 12.

[174] The latch member 18 in the embodiment shown comprises an elongate body 94 mounted at a lower end thereof to a lower member 92 and at an upper end thereof to an upper member 93. The lower and upper members 92 and 93 are mounted for sliding motion longitudinally within the latch channel 22. The elongate body 94 can slide longitudinally within the latch channel 22 but can also move laterally relative to the lower and upper members 92 and 93 to allow the elongate body of the latch member 18 to move between the extended and retracted positions.

[175] In the embodiment shown, the upper and lower ends of the elongate body 94 of the latch member 18 are provided with rails 96 received in corresponding grooves 98 in the upper surface of the lower member 92 and the

lower surface of the upper member 93. The rails 96 may slide in the grooves 98 in order to guide movement of the elongate body 94 between the extended and retracted positions. In the embodiment shown, the rails 96 and grooves 98 are angled such that the elongate body 94 of the latch member 18 moves upwardly as it moves towards the extended position.

[176] In the embodiment shown, the adjustment block 124 includes a threaded rod 128 extending upwardly from the adjustment block 124 to engage with the lower member 92 of the latch member 18. The adjustment block 124 is provided with a second tool opening 130 to allow engagement with a second gear such that rotating the second gear rotates the rod 128 and causes the lower member 92 to move upwardly or downwardly within the latch channel 22.

[177] A rear side of the elongate body 94 of the latch member 18 includes a plurality of latch magnets thereon. The latch magnets may be provided in magnet slots 152 extending outwardly from the rear of the latch member 18 as can be seen in Figure 31b. An inner surface of the latch channel 22 includes a plurality of channel magnets 150 mounted at intervals along the length thereof (as can be seen in Figure 31a). The channel magnets 150 and the latch magnets are arranged such that, as the latch member 18 is moved upwardly, the latch magnets move from a position in which they attract to the channel magnets to a position in which they repel the channel magnets 150. The latch magnets on the elongate body 92 of the latch member 18 may initially be aligned such that poles thereof are adjacent opposed poles of the channel magnets 150 to attract the elongate body 92 into the latch channel 22. As the elongate body 94 moves upwardly, the poles of the latch magnets on the elongate body 94 are moved adjacent opposed poles of the channel magnets 150, thereby causing repulsion of the elongate body 92 such that it moves to the extended position (as can be seen in Figure 29).

[178] Figure 37 shows an embodiment of a connector post 160 for use with the panels 12 of the wall system of Figures 26 to 32. The connector post 160 comprises an elongate member having a rectangular cross section to define four perpendicular sides. Each of the sides of the connector post 160 includes a latch channel 22 provided to receive the latch member 18 of an adjacent panel

12. Each of the latch channels 22 engages with the latch member 18 in the same manner as latch channels 22 in the panels 12 engage with the latch members 18.

[179] The connector post 160 therefore provides for connection of four adjacent panels 12, each being at right angles to each other. It will be appreciated however that other configurations of the connector post 160 may be provided wherein the sides thereof, and the associated latch channels 22 are oriented in other configurations.

[180] In the embodiment shown, the connector post 160 includes a plurality of corner ducts 162 at upper and/or lower ends thereof. Each corner duct 162 is located at a connection between an adjacent pair of sides of the corner post to connect to the spaces defined by the ducting covers 90 on the panels 12.

[181] The corner post 160 comprises generally a central core 180 and a plurality of face plates 182 connected to the core 180. In the embodiment shown, each of the face plates 182 includes a latch channel 22 to allow the corner post 160 to engage with four connected panels 12. However, face plates 182 without latch channels 22 may be used to simply cover the side of the corner post 160 to provide configurations for connecting two or three panels 12.

[182] Figures 38 to 40 show an end post 164 for use with the panels 12. The end post 164 is provided to extend between a side of a panel 12 of the wall system 10 and an adjacent wall of the building in which the wall system 10 is installed. The end post 164 is provided to fill space that might exist between the end of the panel 12 and the adjacent wall.

[183] The end post 164 comprises a first elongate member 166 to be positioned adjacent the wall in use. A second elongate member 168 is to be located between the first elongate member 166 and the adjacent end of the panel 12. The second elongate member 168 included a latch channel 22 to receive the latch member 18 of the adjacent panel 12 in the same manner as the panels 12 engage with each other and connector posts 160. The first and second elongate member 166 and 168 can move toward or away from each other to thereby fill the space between the panel 12 and the wall.

[184] In the embodiment shown, the first elongate member 166 includes a plurality of compressible first buffer members 170. The first buffer members 170 comprise elongate members of a suitable compressible and resilient material, such as a suitable foam material. The first buffer members 170 extend along a first side of the first elongate member 166 such that the first buffer members 170 engage with the wall in use.

[185] The first elongate member 166 includes a plurality of engagement ribs 174 on a second side thereof. In the embodiment shown, there are provided a pair of such engagement ribs 174 located adjacent first buffer members 170. The engagement ribs 174 are received in use in corresponding engagement channels 176 provided on a first side of the second elongate member 168. The latch channel 22 is provided in an opposite second side of the second elongate member 168.

[186] The engagement channels 176 in the second elongate member 168 are each provided with a second buffer member 172. The second buffer member 172 also comprises an elongate strip of a suitable compressible resilient material such that an outer surface of the engagement rib 174 presses against the second buffer member 172. The width of the end post 164 between the wall and the panel 12 can therefore be adjusted by the degree to which the first and second buffer members 170 and 172 are compressed.

[187] Ends of the end post 164 may also be provided with cover strips 178 to engage with the first and/or second elongate members 166 and 168 in order to improve the appearance of the visible ends of the end post 164. As can be seen in Figures 38 and 39, each of the first and second elongate members comprises a plurality of telescoping sections such that the lengths of the first and second elongate members is variable.

[188] The wall panel 10 is provided with skin panels 80 which are connectable to the outer surfaces of the first and second side sheets 20 and 21. The skin panels 80 may be provided in a range of appearances such that the skin panels

80 may be removed and replaced in order to alter the appearance of the wall structure.

[189] The skin panels 80 (as can be seen in Figures 32 to 35) are provided with a plurality of connectors 132 to connect inner surfaces of the skin panels 80 to the outer surface of the panel 12. In the embodiment shown, the inner surface of the skin panels 80 are each provided with a plurality of ribs 146 extending vertically along the length thereof. The connectors 132 each comprise a pair of connector clips 134 and a connection rail 136. Ends of the connection rails 136 are provided with holes 138 through which the connector clips 134 are passed.

[190] Each of the connector clips 134 comprises a base 140 which is located on a side of the connector 132 adjacent the skin panel 80 in use and a body 142 which passes through the hole 138. The base 140 of each of the connector clips 134 is generally circular but with flat opposed sides (as can be seen in Figure 35a). By aligning the opposed flat sides of the base 140 to be parallel to the ribs 146, the base 140 may be received between an adjacent pair of ribs 146. The ribs 146 are shaped such that rotating the connector clips 134 causes arcuate portions of the edge of the base 140 to engage with the adjacent ribs to secure the connector clip 134 to the ribs 146.

[191] The body 142 of the connector clip 134 is provided with a tool slot 158 such that a suitable tool, such as a screwdriver may engage with the connector clip 134 to rotate the connector clip 134. The connectors 132 may therefore be positioned in place on the inner surface of the skin panel 80 in the required position to engage with the panel 12.

[192] The panel 12 is provided with a plurality of horizontal channels 148 at intervals along the length thereof. The horizontal channels 148 are provided to receive the connection rails 136 such that the connection rails 136 are magnetically held within the horizontal channels 148. The connection rails 136 may include one or more magnets along the length thereof and the horizontal channels 148 may be provided with metallic or magnetic strips to engage with the connection rails 136.

[193] It will be readily apparent to persons skilled in the relevant arts that various modifications and improvements may be made to the foregoing embodiments, in addition to those already described, without departing from the basic inventive concepts of the present invention.

## Claims

- 5     1.     A wall system comprising:  
a wall panel connected to one or more adjacent wall panels;  
one or more legs extending from a lower edge of the wall panel on which the  
wall panel is supported, each of the legs comprising a shaft having a foot on a  
lower end thereof; and
- 10   a lower track secured to a floor, the lower track having a lower channel into  
which the feet are received;  
wherein an inner surface of the lower channel is arcuate in cross section taken  
transversely to a longitudinal axis thereof and a lower surface each of the feet  
has a corresponding arcuate cross sectional shape such that the angle of the  
15   wall panel can be varied relative to the lower track.
2.     A wall system in accordance with claim 1, wherein each of the feet is  
mounted for sliding vertical movement in a foot slot.
3.     A wall system in accordance with claim 2, wherein the leg comprises a  
plurality of shafts and a single elongate foot extending throughout the lower  
20   channel from adjacent a first side of the panel to adjacent a second side of the  
panel.
4.     A wall system in accordance with claim 3, wherein an adjustment block  
is provided at an upper end of the foot slot to receive the upper end of the shaft,  
the adjustment block including a first gear to engage with the thread on the shaft  
25   such that the rotation of the gear rotates the shaft and thereby moves the foot  
upwardly or downwardly.
5.     A wall system in accordance with claim 4, wherein the adjustment block  
includes a first tool opening in a side wall thereof to allow a tool to be inserted  
into the adjustment block to engage with the gear for adjusting the height of the  
30   leg.

6. A wall system in accordance with any one of the preceding claims, wherein the panel includes also includes upper legs having feet received in an upper foot slot to engage into an arcuate upper channel in an upper track located above the panel.
- 5 7. A wall system in accordance with claim 6, wherein the upper legs include springs around the shafts thereof to push the foot of each of the upper legs upwardly into the upper channel.
8. A wall system in accordance with claim 6 or 7, wherein the upper and lower tracks are connectable together by connector inserts comprising elongate  
10 members slidable into connector channels extending into the ends of the upper and lower tracks.
9. A wall system in accordance with any one of the preceding claims, wherein an inner surface of the lower channel is provided with one or more longitudinal ribs to be received within corresponding grooves provided on the  
15 lower surface of the feet.
10. A wall system in accordance with claim 9, wherein the grooves are wider than the ribs to allow movement of the ribs within the grooves.
11. A wall system in accordance with claim 9 or 10, wherein there are provided a pair of ribs extending longitudinally along the lower channel  
20 positioned one either side of a longitudinal centre line of the lower channel.
12. A wall system in accordance with any one of claims 1 to 5, wherein an upper end of the wall panel is provided with a compressible engagement member to be received into an upper channel on an upper track, the upper track to be fixed above the upper edge of the wall panel.
- 25 13. A wall system in accordance with claim 6, wherein the engagement member is connected to the wall panel by one or more threaded shafts to allow the height of the engagement member above the wall panel to be varied.

14. A wall system in accordance with claim 13, wherein the engagement member comprises an upper portion and a lower portion, the upper and lower portions being moveable away or toward each other, and a compressible member provided between the upper and lower portions.
- 5 15. A wall system in accordance with claim 1314, wherein each of the upper and lower portions is U-shaped in transverse cross section and the compressible member comprises an elongate member of compressible material.
- 10 16. A wall system in accordance with claim 15, wherein each of the upper and lower portions comprises a first side wall, a second side wall and a connecting wall extending between the first and second side walls.
- 15 17. A wall system in accordance with claim 16, wherein the first side wall of each of the lower and upper portions comprises a solid wall and the second side wall includes a recess in an end thereof such that the recesses in the second side walls of the lower and upper portions receive ends of the first side walls of the upper and lower portions.
- 20 18. A wall system in accordance with claim 15 or 16, wherein an upper surface of the connecting wall of the upper portion is arcuate in transverse cross-section and the upper channel in the upper track has a corresponding cross sectional shape.
19. A wall system in accordance with any one of the preceding claims, wherein skirtings are provided to extend between the ends of the panel and an adjacent floor or ceiling, each of the skirtings comprising:  
a skirting panel having a flange extending outwardly from along the length thereof on an inner side;  
a circular rib along the distal edge of the flange;  
first and second side channels on opposed vertical sides of the upper or lower track;
- 25

wherein the rib may be received in one of the side channels in a snap fit manner such that the skirting panel may rotate about the upper or lower track.

20. A wall system in accordance with claim 19, wherein an upper inner edge of the skirting panel is provided with a magnetic strip to engage with a portion  
5 of the panel and hold the upper edge of the skirting panel in place.

21. A wall system comprising:  
one or more wall panels; and  
one or more skin panels connectable to outer surfaces of the wall panels;  
a plurality of connectors for connecting the skin panels to the wall panels, each  
10 of the connectors comprises a connection rail having a pair of connector clips  
rotatably secured to opposite ends thereof;  
wherein an inner surface of the skin panel includes a plurality of vertical ribs  
such that the connection clips may be attached to the ribs by receiving  
connector clips between adjacent ribs and rotating and wherein the connection  
15 rail of the connector is attracted magnetically into a horizontal channel on a  
surface of the wall panel.

22. A wall system in accordance with claim 21, wherein each of the  
connector clips comprises a base which is located on a side of the connector  
adjacent the skin panel in use and a body which passes through a hole in an  
20 end of the connection rail.

23. A wall system in accordance with claim 22, wherein the base of each of  
the connector clips includes opposed flat and arcuate edge portions between  
the flat sides such that the flat sides may be aligned with the ribs to allow the  
base to be received between a pair of ribs.

25 24. A wall system in accordance with claim 23, wherein the body of each of  
the connector clips is provided with a tool slot such that a suitable tool may  
engage with the tool slot to rotate the connector clip.

25. A wall system comprising:  
a wall panel having a latch channel in a vertical edge thereof;  
an elongate latch member received into the latch channel;  
wherein an inner side of the latch member includes one or more latch magnets  
5 and an inner surface of the latch channel includes one or more channel  
magnets such that the latch member may slide longitudinally in the channel  
between a position in which the latch magnets attract the channel magnets to  
retract the latch member into the channel and a position in which the latch  
magnets repel the channel magnets to extend the latch member from the  
10 channel.

26. A wall system in accordance with claim 25, wherein poles of the latch  
magnets are aligned with opposed poles of the channel magnets when the latch  
member is in the retracted position and are aligned with like poles of the channel  
magnets when the latch member is in the extended position.

15 27. A wall system in accordance with claim 25 or 26, wherein the latch  
member comprises an elongate body mounted at a lower end thereof to a lower  
member and at an upper end thereof to an upper member such that the lower  
and upper members are mounted for sliding motion longitudinally within the  
latch channel and the elongate body can slide longitudinally within the latch  
20 channel but can also move laterally relative to the lower and upper members to  
allow the elongate body of the latch member to move between the extended  
and retracted positions.

28. A wall system in accordance with claim 27, wherein the upper and lower  
ends of the elongate body of the latch member are provided with rails received  
25 in corresponding grooves in the upper surface of the lower member and the  
lower surface of the upper member.

29. A wall system in accordance with any one of claims 25 to 28, wherein an  
adjustment block is provided adjacent the lower member such that a threaded  
rod extending upwardly from the adjustment block engages with the lower  
30 member to move the lower member upwardly or downwardly.

30. A wall system in accordance with claim 29, wherein the adjustment block is provided with a second tool opening to allow engagement with a second gear such that rotating the second gear rotates the rod and causes the lower member to move upwardly or downwardly within the latch channel.

5 31. A wall system in accordance with any one of claims 25 to 30, wherein end posts are provided to connect between an end of a panel and an adjacent wall.

32. A wall system in accordance with claim 31, wherein the end posts comprise first and second elongate members, wherein first compressible  
10 buffers are provided on a first side of the first elongate member, second compressible members are provided between a second side of the first elongate member and a first side of the second elongate member and a latch channel is provided in a second side of the second elongate member.

33. A wall system in accordance with claim 32, wherein the second side of  
15 the first elongate member includes engagement ribs located to be received in engagement channels provided on the first side of the second elongate member and wherein the second buffer members are provided in the engagement channels.

34. A wall system in accordance with any one of the preceding claims,  
20 wherein each of the first and second elongate members comprises a plurality of telescoping sections such that the lengths of the first and second elongate members is variable.