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WO 1999/046458 A1 DE 002647769 B1
US 5852904 A1 US 3195698 A1

(58) Field of Search:
INT CL E04B, H02G

(54) Title of the Invention: **Non load-bearing wall design**
Abstract Title: **Non load bearing wall with wiring channels**

(57) A non load bearing wall assembly comprising a base support 10, a ceiling support 12, a set of uprights 14 containing a wiring channel which causes wires to extend from the top of the wall to the bottom and a set of cross pieces 18 which have a wiring channel that causes wiring to extend from one side to the other into the wiring channel of the uprights 14 and the channel has opening to enable wiring to pass out of the wiring channel. The base support 10 may comprise a base channel (30 fig 2) which may have at least one opening (32 fig 2) in the side wall and/or a flange (40 fig 3) at the base of the channel which extends beyond the channel on at least one side. The ceiling support 12 may comprise a ceiling channel (30 fig 2) which may have at least one opening (32 fig 2) in its side wall. There may be a set of angle cross pieces to use at a wall corner. Insulation panels may also be placed in the spaces between the uprights 14 and cross pieces 18. The openings in the cross pieces 18 may be able to receive a pattress box. A non load bearing wall may consist of two identical wall assemblies 20, 22 parallel and spaced apart with a layer of insulation 23 in the space between the wall assemblies 20, 22. This wall may include at least one angled section.

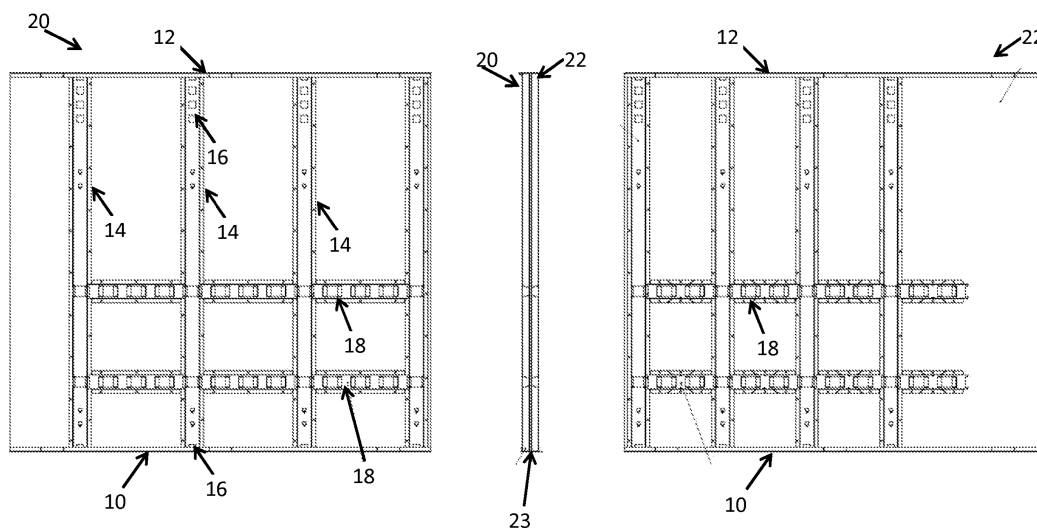


FIG. 1

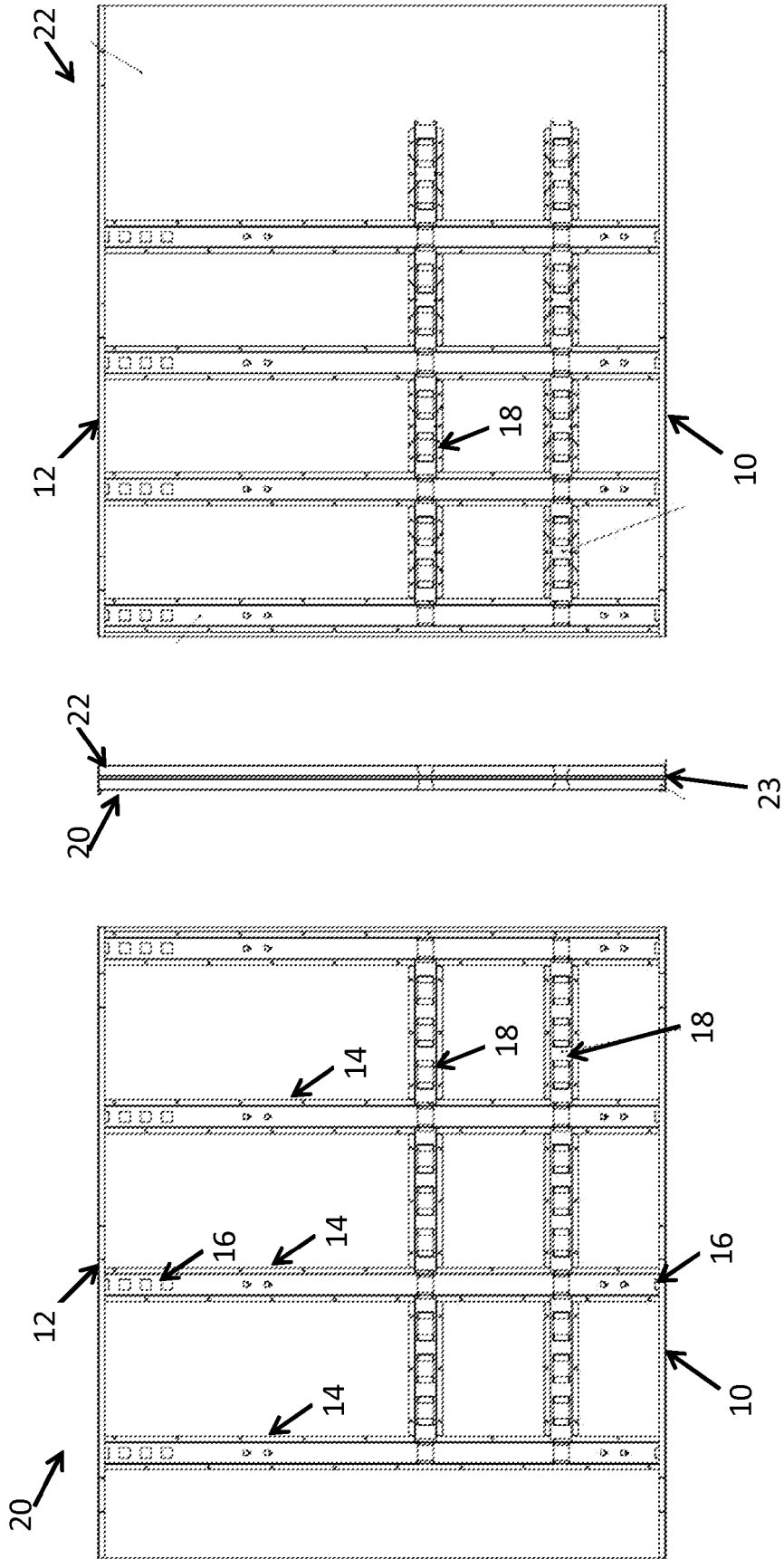


FIG. 1

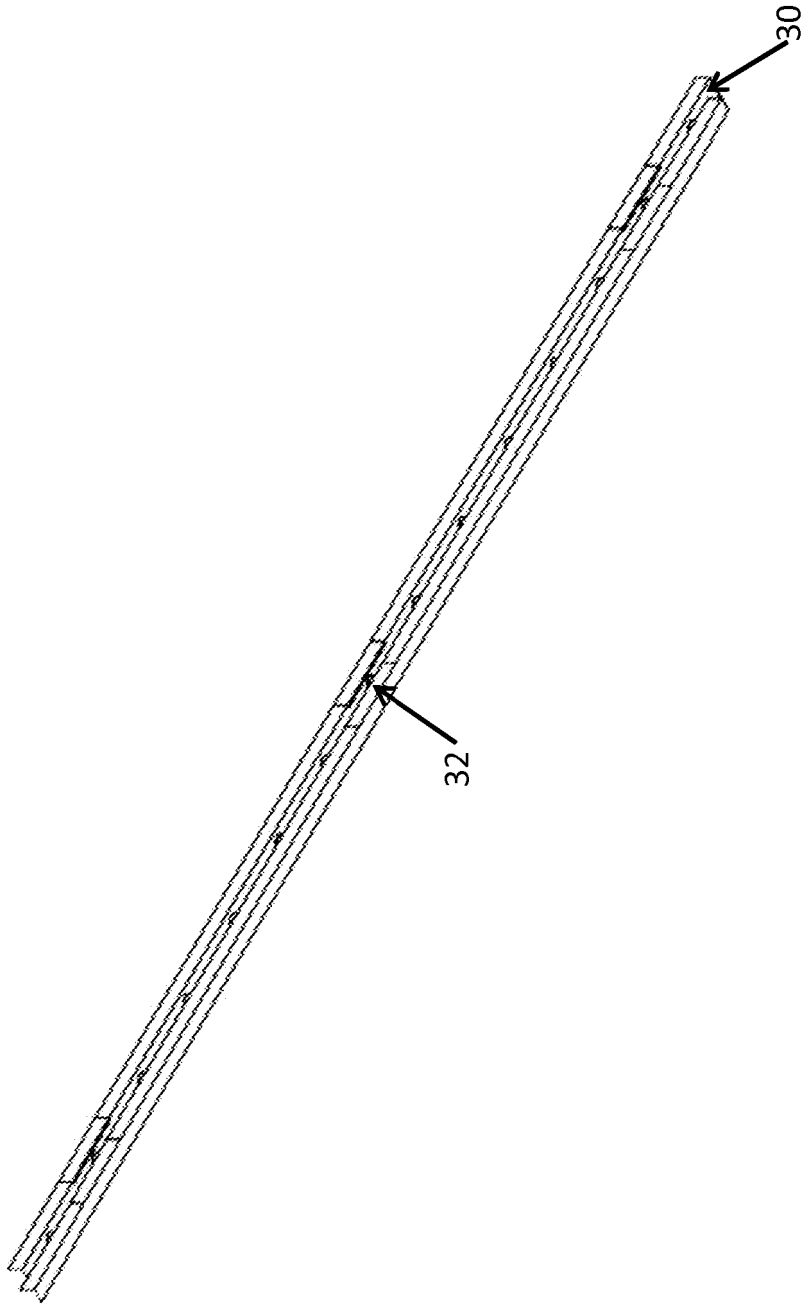


FIG. 2

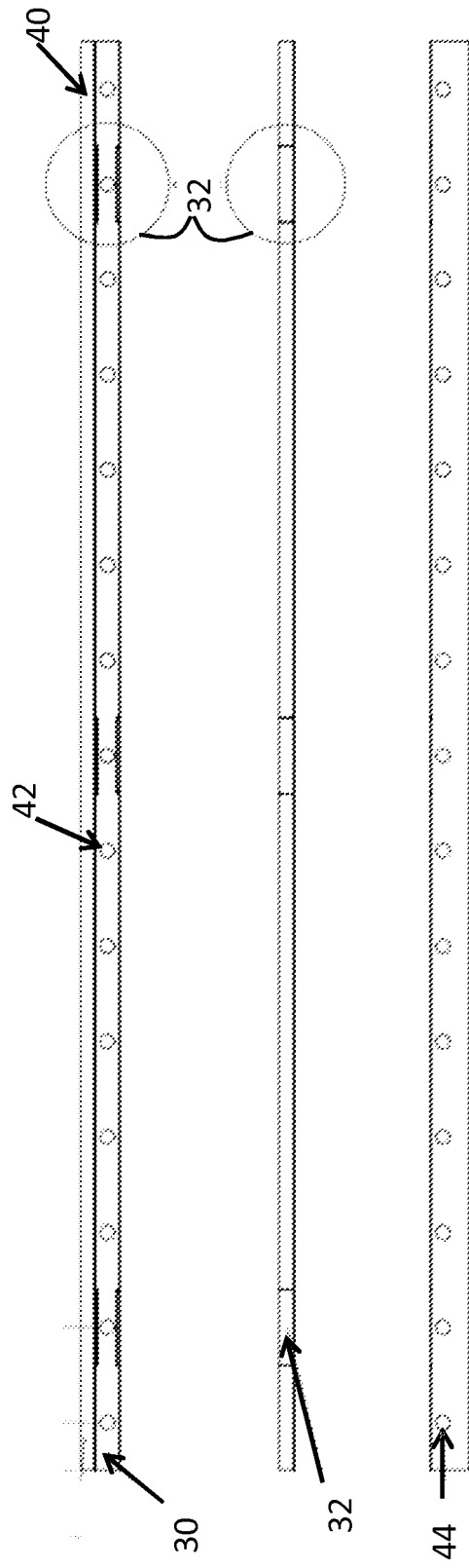


FIG. 3

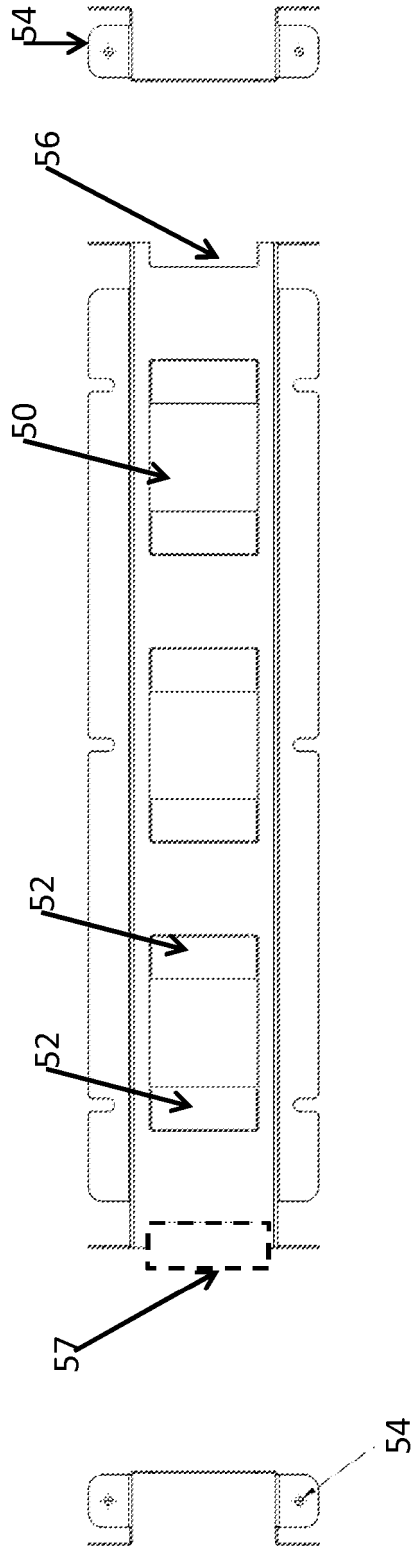


FIG. 4

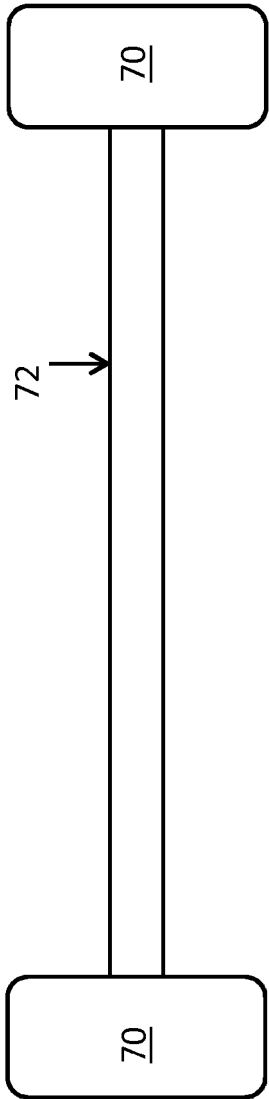


FIG. 5

NON LOAD-BEARING WALL DESIGN

This invention relates to non load-bearing wall designs, and in particular relates to internal partitions.

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It is well known to design the interior space of a building using partition walls which are non load-bearing. These walls can be fitted after the main building structure has been formed, and they can be positioned according to the needs of the end user. In many designs, they can also be moved should the desired use of the building space change. Such movable partitions are well known, for example to enable office space to be divided into sections.

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This invention relates generally to partition walls which are intended to remain in place for longer periods. For example, the invention relates to a wall design which incorporates wiring ducts for mains sockets and/or light switches.

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WO2012/175959 discloses a system for retro-fitting insulation to solid walls which uses studs for fixing insulation to the solid wall, the studs defining a channel between the front wall of the stud and underlying wall. This enables services to be routed in a well-defined location. Apertures in the front wall of the stud allows access to cables and pipes in the channel without causing deterioration in the acoustic or thermal performance of the insulation.

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The invention relates instead to self-standing walls, which are not fixed to an underlying substrate, but aims to provide the advantages of ease of routing wiring or other services within the wall structure.

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The invention provides an assembly as defined in the claims.

According to the invention, there is provided a non load-bearing wall assembly comprising:

a base support for fixing to a floor;

a ceiling support for fixing to a ceiling;

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a set of uprights for extending between the base support and the ceiling support, the uprights including a wiring channel enabling wiring to extend from top to bottom; and

a set of cross pieces for extending between an adjacent pair of uprights, the cross pieces including a wiring channel enabling wiring to extend from one side to the other into the wiring channel of the adjacent pair of uprights and having openings to enable wiring to pass out of the wiring channel.

5 This assembly enables a grid of supports to be formed. The grid comprises wiring channels, so that wiring can be routed around the grid. In this way, existing wiring in a room can access the grid at the top or bottom of any upright, and then be routed to any location within the grid. This enables the free selection of the location of access points, for example for sockets or
10 switches. The grid can be designed to make sure that cross pieces are provided at the location where sockets or switches are to be located.

The base support can comprise a base channel in which the uprights can sit, wherein the channel has at least one opening in its side wall to allow the upright to enter the channel. This makes the assembly easy in that the
15 uprights are simply slid along the top and bottom channels into position.

The base support can have a flange at its base which extends beyond the channel on at least one side. This provides extra support at the base of the wall for stability.

The ceiling support can be of the same design as the base support, and
20 thus can also comprise a ceiling channel in which the uprights can sit, wherein the ceiling channel has at least one opening in its side wall to allow the upright to enter the channel.

A set of angle cross pieces can be provided for use at a wall corner. This means the wall can have angles, and is not limited to a straight wall run.

25 Insulation panels are preferably provided for fitting in the spaces defined between the uprights and cross pieces. The spacing between uprights is preferably fixed and corresponds to a width of insulation panels, although larger insulation panels can of course be cut to size.

The openings in the cross pieces can be apertures adapted to receive a
30 pattress box.

The invention also provides a non load-bearing wall comprising:

a first wall assembly of the invention assembled to form a first wall extending between a floor and ceiling; and

a second wall assembly of the invention assembled to form a second first wall extending between the floor and ceiling.

5 The first and second walls are parallel and spaced apart, with a layer of insulation in the spacing. The insulation can be for sound insulation, thermal insulation and/or fire retardation. The two walls can be self-standing with no interconnection between them, so that no damage is caused to the insulation between the walls.

10 The wall can have at least one angled section. In this case, the wall assemblies can be formed from a set of identical uprights, a set of identical cross pieces, and a set of identical angle cross pieces. The base supports and ceiling supports can also all be identical.

15 An embodiment of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 shows a wall structure of the invention;

Figure 2 shows the base support in more detail in perspective view;

Figure 3 shows the base support in more detail in plan and side views;

20 Figure 4 shows a straight cross piece in more detail; and

Figure 5 shows a spacing tool.

The invention provides a non load-bearing wall assembly having uprights between a base support and a ceiling support, with wiring channels
25 enabling wiring to extend from top to bottom. Cross pieces extend between an adjacent pair of uprights, the cross pieces including a wiring channel enabling wiring to extend from one side to the other into the wiring channel of the adjacent pair of uprights. Openings in the cross pieces enable wiring to pass out of the wiring channel. This arrangement defines the wall structure as a grid
30 through which services can be routed.

The invention can be provided as a single skin wall (in which sockets can be provided on one side only). However, in a preferred implementation,

the invention is used to form two wall skins, each of which can be used to route wiring (or other services), and the two wall skins are back to back. The two wall skins can be configured independently in terms of the location of sockets and switches.

5 Figure 1 shows an example of a design using both wall skins.

The wall is formed as a modular arrangement. Each wall skin has a base support 10 for fixing to a floor and a ceiling support 12 for fixing to a ceiling. A set of uprights 14 extends between the base support and the ceiling support.

10 The uprights include a wiring channel enabling wiring to extend from top to bottom. Front openings 16 enable an installer to reach into the channel to feed wiring from the ceiling above or the floor below into the channel.

The uprights sit in channels of the base support and ceiling support. The base support and ceiling support are fixed to the floor or ceiling typically by vertical screws, and the uprights are also fixed to the base support and ceiling support, typically by lateral screws.

15 A set of cross pieces 18 extends between an adjacent pair of uprights 14. The cross pieces include a wiring channel enabling wiring to extend from one side to the other into the wiring channel of the adjacent pair of uprights 14.

20 The uprights are formed as a U-section channel (to provide resistance to bending) with a front face and side flanges perpendicular to the front face. They may also have back face flanges parallel the front face to define a more rigid structure. The side flanges have openings which enable connection between the wiring channel of the uprights and the wiring channel of the cross pieces.

25 The cross pieces have openings to enable wiring to pass out of the wiring channel. These openings are at locations where wiring sockets or electrical switches can be formed.

30 In this way, an interconnected grid of channels is formed. This enables wiring to be routed from the top or bottom of any upright to any cross piece. This in turn enables free choice of the location of sockets or switches.

It will be appreciated that other services can be routed in the wiring channels, such as gas and water, so that for example the position of a fridge (requiring a water supply) or a gas appliance can be freely selected.

5 The wall design of Figure 1 has two skins 20,22, both of which can be seen in Figure 1. The two skins can be designed independently, and Figure 1 shows different spacing of the uprights, by using different size cross pieces. The cross pieces can for example be designed to give a 600mm pitch between uprights or a 800mm pitch between uprights.

10 The height of the cross pieces is selectable, although with a discrete set of possible positions where the uprights provide lateral access into their wiring channel. Typically, three standard heights are enabled, which represent floor socket height, counter socket height and light switch height.

Although in Figure 1 both wall skins have the cross pieces at the same height, they can be selected independently.

15 Insulation is provided between the two wall skins. This can comprise thermal insulation, sound insulation or fire retardant insulation, or a combination of these.

20 The structure of Figure 1 is the wall support structure. To complete the wall, the spaces between uprights and cross pieces are filled with the insulation. Preferably, this is using solid insulation sheets which are sized to be a frictional fit in the spaces, i.e. they are pushed into place.

The wiring channels can also be partially filled with insulation, providing a gap is left to enable the passage of wiring. This partial filling is disclosed in WO WO2012/175959.

25 The space between the two walls is also provided with insulation 23, which can be thermal, acoustic and/or fire retardant.

30 The insulated wall skins are then covered with boarding such as plasterboard. The plasterboard can be bonded to the front faces of the uprights (and optionally also the cross pieces) or it can be fitted with screws. The use of fire retardant material between the wall skins can relax the constraints on the required boarding material on the outside faces of the wall.

The two wall skins are self supporting, and do not need to be interconnected (although this is possible). By avoiding the use of fixings between the wall skins, the need for any fixings passing through the wall insulation is avoided, which can deteriorate the desired thermal or sound
5 insulation properties.

Figure 1 shows the overall design. Some preferred detailed design aspects of some of the components used will now be discussed.

Figure 2 shows the design of the base or ceiling support in more detail. The base and ceiling supports can be identical (and they can be cut to length
10 for the particular application).

The support comprises a channel 30 in which the uprights can sit. The channel has a bottom wall and two side walls. The channel has at least one opening 32 in at least one of its side walls to allow the upright to enter the channel. The support can be provided with the openings patterned but not yet
15 removed (as shown in Figure 2) so that the installer can chose which opening to form. Once the opening has been made, the upright is slid into the channel in a forwards direction (i.e. towards the plane of the wall), then once in the channel, the upright can be slid left or right to the desired location.

The openings in the base and ceiling supports are aligned (as can be
20 seen in Figure 1) so that the upright is pushed into the pair of channels in a vertical orientation, then slid left or right to the desired location.

With openings on both sides, the installer can choose from which side to form the wall structure.

Figure 3 shows the support structure in more detail. The top image
25 shows a plan view. For the base support at least, in addition to the channel 30, there is a flange 40 which extends beyond the channel on at least one side. This provides additional stability for the wall assembly. The flange 40 can extend by an amount equal to the thickness of the wall board to be used so that it does not extend beyond the completed wall design, but it can extend
30 much further to provide additional stability, as it will be covered by a floor covering.

A flange can be provided on both lateral sides of the channel. The flange extending on the far side of the wall skin then extends to half way between the two skins, so that the two flanges meet in the middle. This can also enable accurate setting of the position of the two base supports and ceiling supports of the two wall skins.

The channel has a series of holes 42 in its base, where fixings are used to the floor beneath or the ceiling above.

The middle image shows the side view from the inside face of the wall.

The bottom image shows the side view from the outside face of the wall. It shows fixing holes 44 used to fix the support to the uprights. They are spaced by a factor of the desired upright spacing, for example 200mm (which is a factor of both 600mm and 800mm). An alternative upright pitch is 450mm, and fixing holes spaced by 150mm can of course be used for 450mm or 600mm upright spacing.

There may be two type of cross piece; one for flat walls and one for angles.

A cross piece for use in flat wall sections is shown in Figure 4.

The openings 50 have two possible sizes. An opening is provided with a size corresponding to a single pattress box, and removable pieces 52 are preformed to enable the opening to be enlarged to a double pattress box.

The ends of the cross piece have attachment tabs 54 which butt against the sides of the uprights. Screws can then be used to fix these tabs 54 to the uprights.

In the example shown in Figure 4, the ends of the cross piece have recesses 56. These can also have pre-cut removable portions 57 as shown dotted on one side. Thus, when in position, as shown in Figure 1, the upright can be provided with a single pattress box opening, and the removable portions of the cross pieces on each side can be used to convert this to a double pattress box opening.

A cross piece can also be used for angles to provide a continuous grid structure when the wall has angles. Typically, walls have 90 degree internal or

external angles. An angle cross piece can then be used to extend horizontally between two uprights but defining a desired internal or external angle.

The uprights are positioned with a predefined spacing corresponding to a particular design of solid insulation board. To fix the spacing of the uprights accurately, a tool can be used as shown in Figure 5. It comprises a head 70 at each end and a spacer 72 between the heads. The heads engage with the uprights in such a manner that the spacer 72 is forced to be perpendicular to the uprights. The heads have a shape which is complementary to the outer contour of the uprights, and they extend over a length of the upright such that rotation is prevented. With both heads engaged with adjacent uprights, the desired spacing is set.

In the assembly, the uprights can all be identical, the straight cross pieces can all be identical and the angle cross pieces can all be identical. The uprights can be cut to length or they can be made to a variety of lengths, with a set of the correct length being used for a particular installation.

The base supports and ceiling supports can also be identical. In this way, the whole assembly can use a minimum number of different components.

The uprights and cross pieces can be formed as stamped aluminium components.

The cross pieces and uprights may by approximately 80mm wide have a depth of 44mm.

Electrical and plumbing services can be easily fitted after installation of the wall assembly. The assembly can include a skirting moulding and crown moulding. These can be affixed to the bottom and top respectively of the uprights. They may be removable, for example by making use of clip fittings so that access to the openings beneath can easily be gained in the future if repairs or modifications to the electrical and/or plumbing services are required. Thus, the services can be easily located again in the future.

The design of the notches or openings at the top of the uprights can ensure that the upright can be cut to any exact room height whilst ensuring an access slot is available at ceiling level. Thus, the ceiling level access slots

may extend in series from the top end of the stud down to a minimum ceiling height.

The base and ceiling supports can be 3m in length, and can also be cut to size.

- 5 As mentioned above, the invention relates to partition walls which are intended to remain in place for prolonged periods. However, they can nevertheless be dismantled without requiring any complex structural support, so that the interior space of a building can be redesigned.

Various other modifications will be apparent to those skilled in the art.

CLAIMS

1. A non load-bearing wall assembly comprising:
a base support for fixing to a floor;
5 a ceiling support for fixing to a ceiling;
a set of uprights for extending between the base support and the ceiling support, the uprights including a wiring channel enabling wiring to extend from top to bottom; and
a set of cross pieces for extending between an adjacent pair of uprights,
10 the cross pieces including a wiring channel enabling wiring to extend from one side to the other into the wiring channel of the adjacent pair of uprights and having openings to enable wiring to pass out of the wiring channel.
2. An assembly as claimed in claim 1, wherein the base support
15 comprises a base channel in which the uprights can sit, wherein the channel has at least one opening in its side wall to allow the upright to enter the channel.
3. An assembly as claimed in any preceding claim, wherein the
20 base support has a flange at its base which extends beyond the channel on at least one side.
4. An assembly as claimed in any preceding claim, wherein the
25 ceiling support comprises a ceiling channel in which the uprights can sit, wherein the ceiling channel has at least one opening in its side wall to allow the upright to enter the channel.
5. An assembly as claimed in any preceding claim, further comprising a set of angle cross pieces for use at a wall corner.

6. An assembly as claimed in any preceding claim, comprising insulation panels for fitting in the spaces defined between the uprights and cross pieces.

5 7. An assembly as claimed in any preceding claim, wherein the openings cross pieces are apertures adapted to receive a patrix box.

8. A non load-bearing wall comprising:
a first wall assembly as claimed in any preceding claim and assembled
10 to form a first wall extending between a floor and ceiling;
a second wall assembly as claimed in any preceding claim and
assembled to form a second first wall extending between the floor and ceiling,
wherein the first and second walls are parallel and spaced apart, with a
layer of insulation in the spacing.

15 9. A wall as claimed in claim 8, having at least one angled section, wherein the wall assemblies are formed from a set of identical uprights, a set of identical cross pieces, and a set of identical angle cross pieces.

20 10. A wall as claimed in claim 9, wherein the wall assemblies are formed from base supports and ceiling supports which are all identical.

AMENDMENTS TO THE CLAIMS HAVE BEEN FILED AS FOLLOWS:

CLAIMS

1. A non load-bearing wall assembly comprising:
a first wall assembly forming a first wall extending between a floor and
5 ceiling;
a second wall assembly forming a second first wall extending between
the floor and ceiling,
wherein the first and second walls are parallel and spaced apart, with a
layer of insulation in the spacing, wherein the first and second wall assemblies
10 each comprise:
a base support for fixing to a floor;
a ceiling support for fixing to a ceiling;
a set of uprights for extending between the base support and the ceiling
support, the uprights including a wiring channel enabling wiring to extend from
15 top to bottom; and
a set of cross pieces for extending between an adjacent pair of uprights,
the cross pieces including a wiring channel enabling wiring to extend from one
side to the other into the wiring channel of the adjacent pair of uprights and
having openings to enable wiring to pass out of the wiring channel.
20
2. An assembly as claimed in claim 1, wherein the base support
comprises a base channel in which the uprights can sit, wherein the channel
has at least one opening in its side wall to allow the upright to enter the
channel.
25
3. An assembly as claimed in any preceding claim, wherein the
base support has a flange at its base which extends beyond the channel on at
least one side.
- 30 4. An assembly as claimed in any preceding claim, wherein the
ceiling support comprises a ceiling channel in which the uprights can sit,

19 06 14

wherein the ceiling channel has at least one opening in its side wall to allow the upright to enter the channel.

5 5. An assembly as claimed in any preceding claim, further comprising a set of angle cross pieces for use at a wall corner.

 6. An assembly as claimed in any preceding claim, comprising insulation panels for fitting in the spaces defined between the uprights and cross pieces.

10

 7. An assembly as claimed in any preceding claim, wherein the openings cross pieces are apertures adapted to receive a pattress box.

 8. An assembly as claimed in any preceding claim, having at least one angled section, wherein the wall assemblies are formed from a set of identical uprights, a set of identical cross pieces, and a set of identical angle cross pieces.

15 9. An assembly as claimed in claim 8, wherein the wall assemblies are formed from base supports and ceiling supports which are all identical.

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Examiner: Ms Alison Florance

Claims searched: 1-10

Date of search: 26 November 2013

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 3, 6	WO99/46458 A1 (STEELCASE INC) Base support 30, ceiling support 12, uprights 6, cross members 14-18. See figure 9 & 15 and lines 18-25 of page 9 and lines 18-20 of page 11
X	1, 6	US5852904 A1 (YU et al) Base support 17, uprights 19, cross pieces 18, 21, 22. See figure 5 and lines 60-65 of column 7
X	1, 6	US3195698 A1 (CODREA) Base support 30D, runner 94, uprights 32, cross pieces 42, 30E. See figure 1 & 4 and lines 74-75 of column 3 onto lines 1-2 of column 4 and lines 15-16 and 47-49 of column 5
X	1, 6, 7	DE2647769 B1 (LICENTIA) Base support 1, ceiling support 2, uprights 5, cross members 6. See WPI abstract.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

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Worldwide search of patent documents classified in the following areas of the IPC

E04B; H02G

The following online and other databases have been used in the preparation of this search report

WPI and EPODOC

International Classification:

Subclass	Subgroup	Valid From
E04B	0002/72	01/01/2006