US 20230228098A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0228098 A1**

COYLE et al. (43) **Pub. Date: Jul. 20, 2023**

(54) **CLADDING SYSTEM**

(71) Applicant: **MASONRY SUPPORT SYSTEMS LIMITED**, Derbyshire (GB)

(72) Inventors: **Sean COYLE**, Swadlincote (GB); **Owen COYLE**, Swadlincote (GB)

(21) Appl. No.: **18/064,550**

(22) Filed: **Dec. 12, 2022**

(30) **Foreign Application Priority Data**

Dec. 10, 2021 (GB) 2117894.2

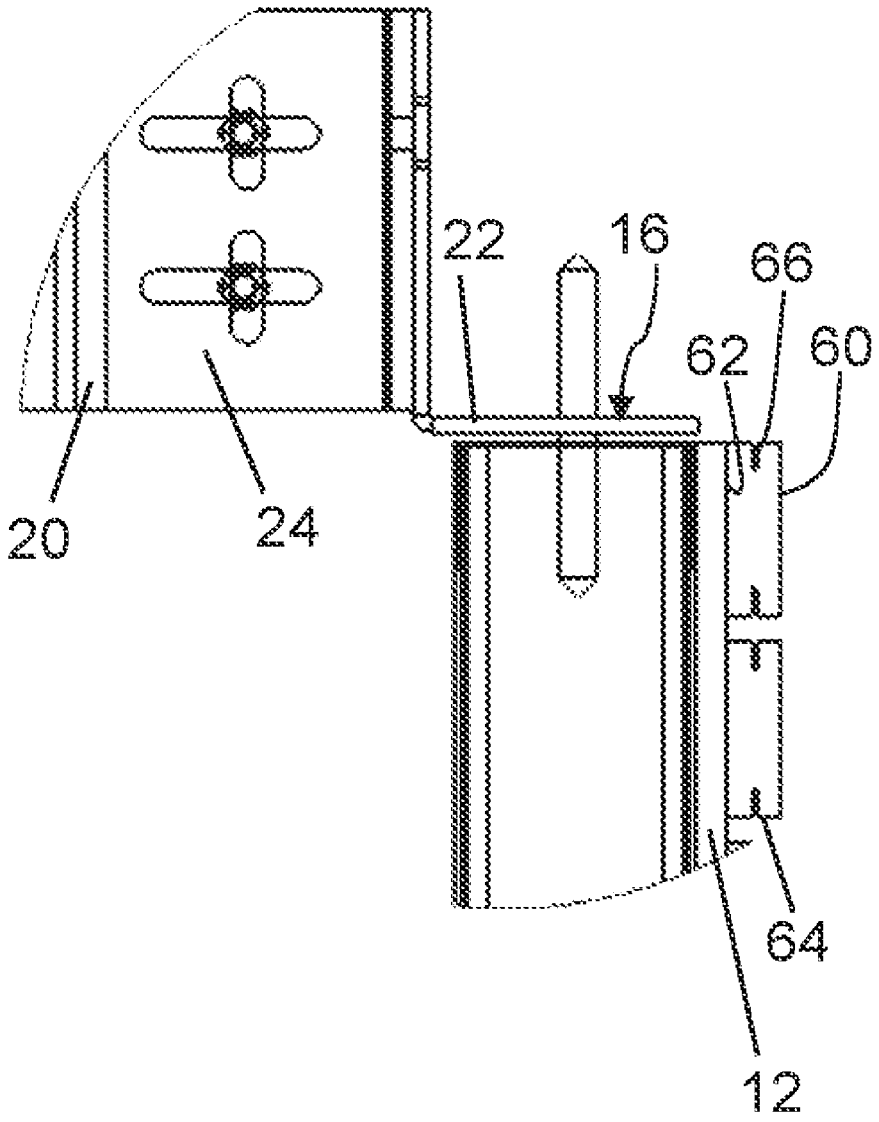
Publication Classification

(51) **Int. Cl.**
E04F 13/08 (2006.01)

(52) **U.S. Cl.**
CPC ***E04F 13/0855*** (2013.01); *E04F 13/0873* (2013.01)

(57) **ABSTRACT**

A cladding system **2** for a building comprises a cladding panel **4**, **6**, **8** and a mounting means **16** for mounting the cladding panel **4**, **6**, **8** to a building structure. The mounting means **16** provides adjustability of the cladding panel **4**, **6**, **8** relatively to the building structure towards or away from the building and/or upwards or downwards with respect to the building and/or laterally with respect to the building. The cladding panel comprises a frame **10** and a backing member **12** mounted on the frame **10** wherein the backing member **12** is suitable for receiving covering elements thereto. The mounting means **16** comprises a building mounting component **20** to be mounted to the building during installation. The mounting means **16** further comprises a cladding-panel mounting component **22**, **88** to be mounted to the cladding panel **4**, **6**, **8**.



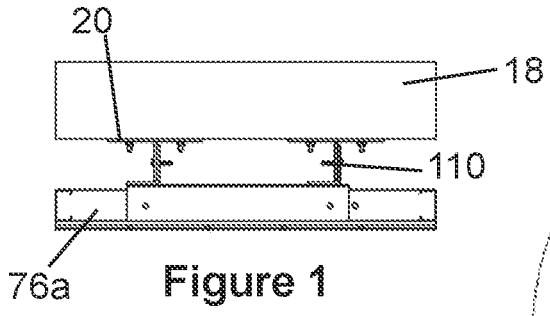


Figure 1

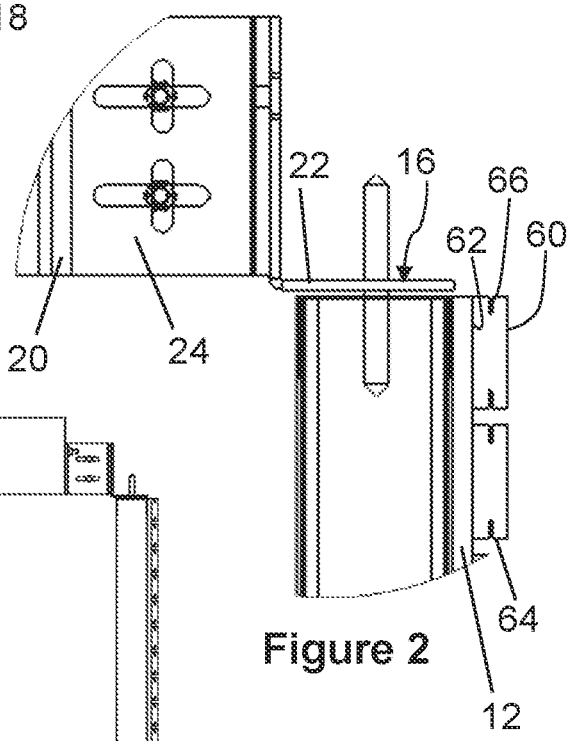


Figure 2

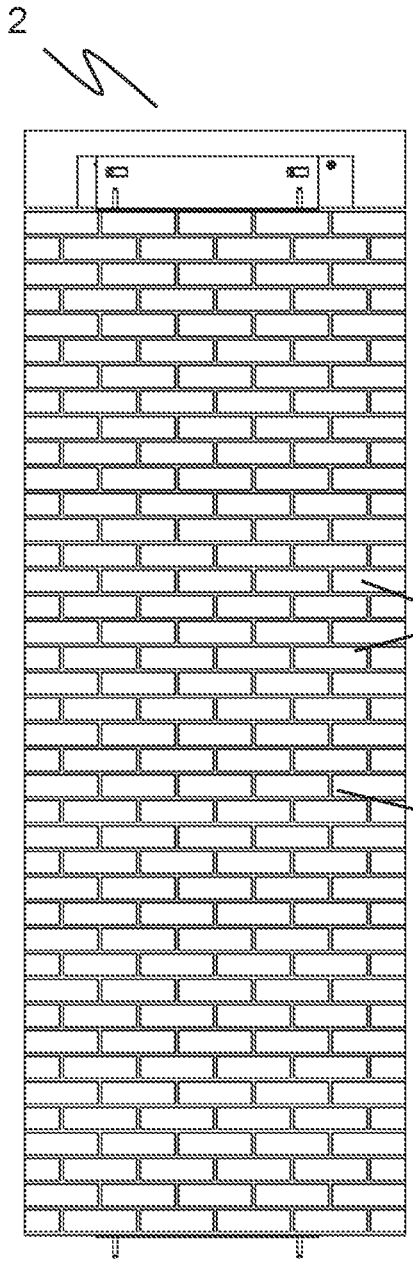


Figure 3

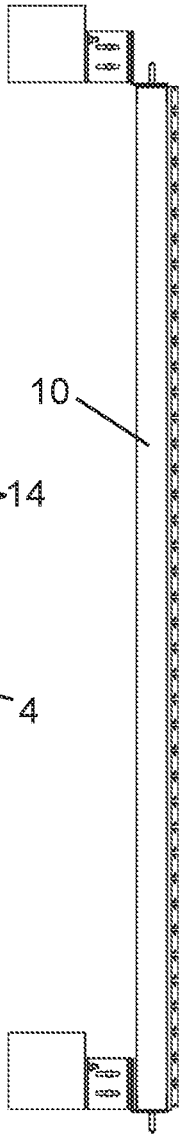


Figure 4

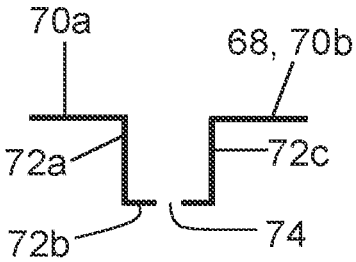


Figure 38

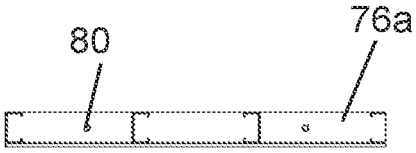


Figure 5

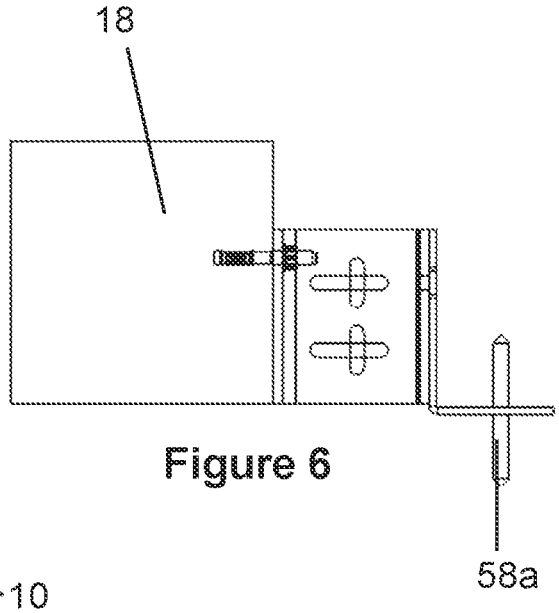


Figure 6

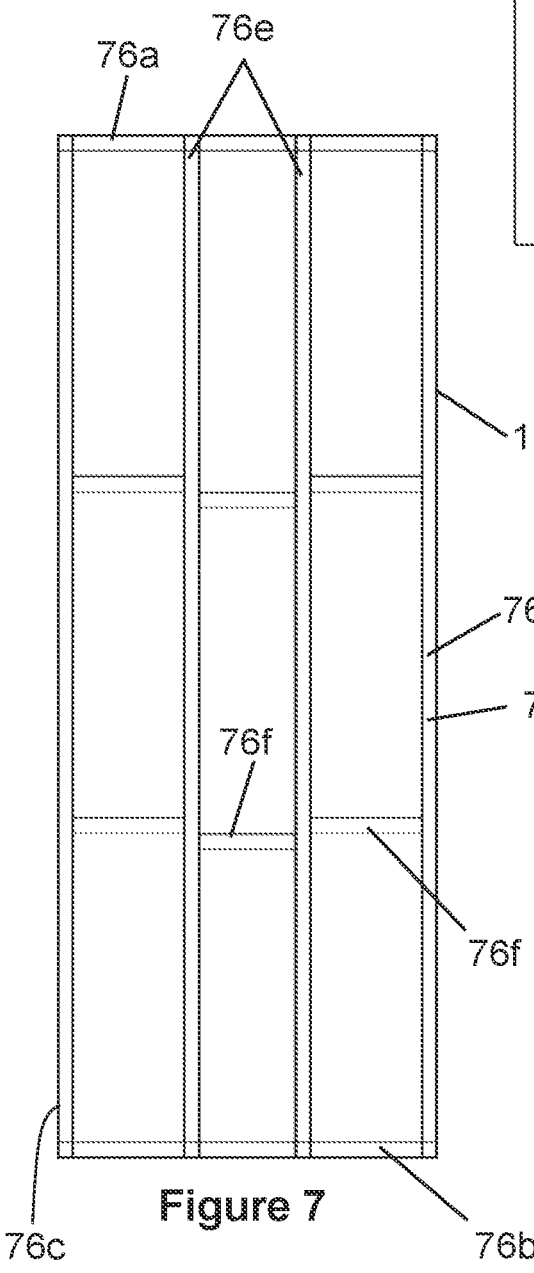


Figure 7

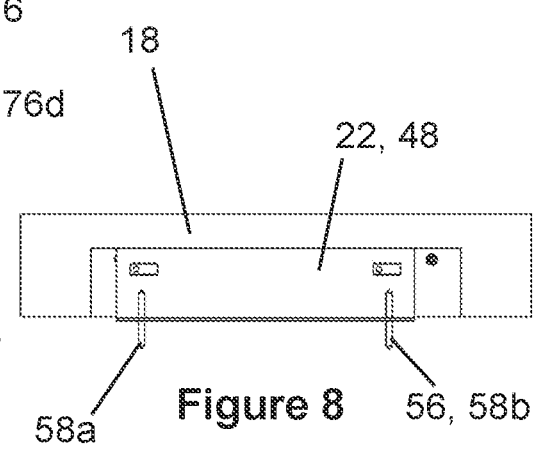


Figure 8

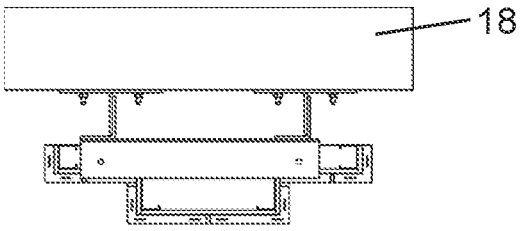


Figure 9

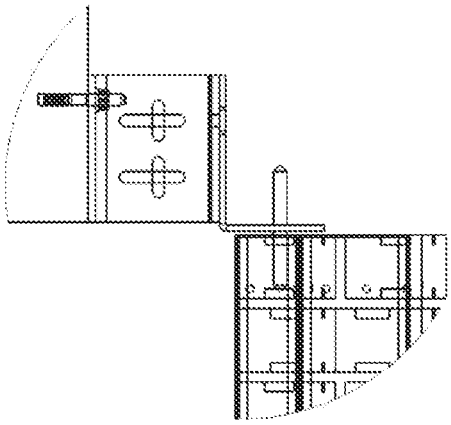


Figure 10

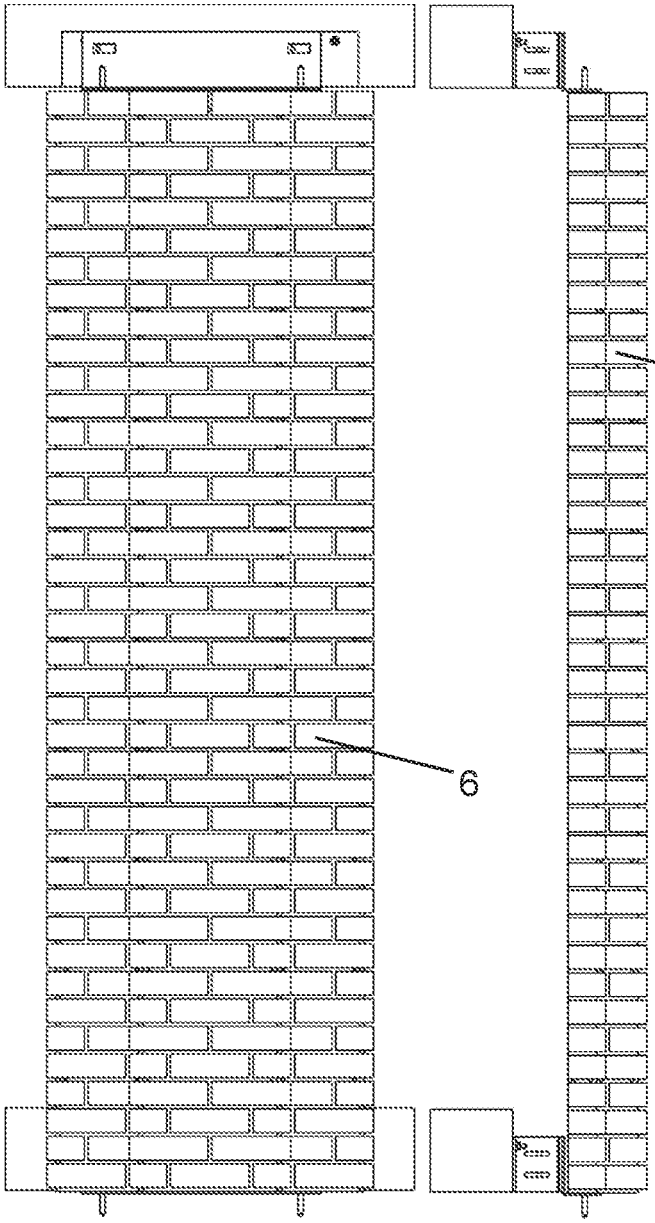


Figure 11

Figure 12

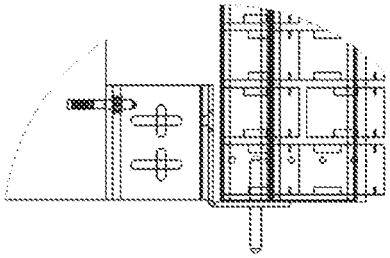


Figure 13

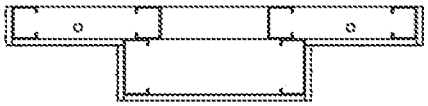


Figure 14

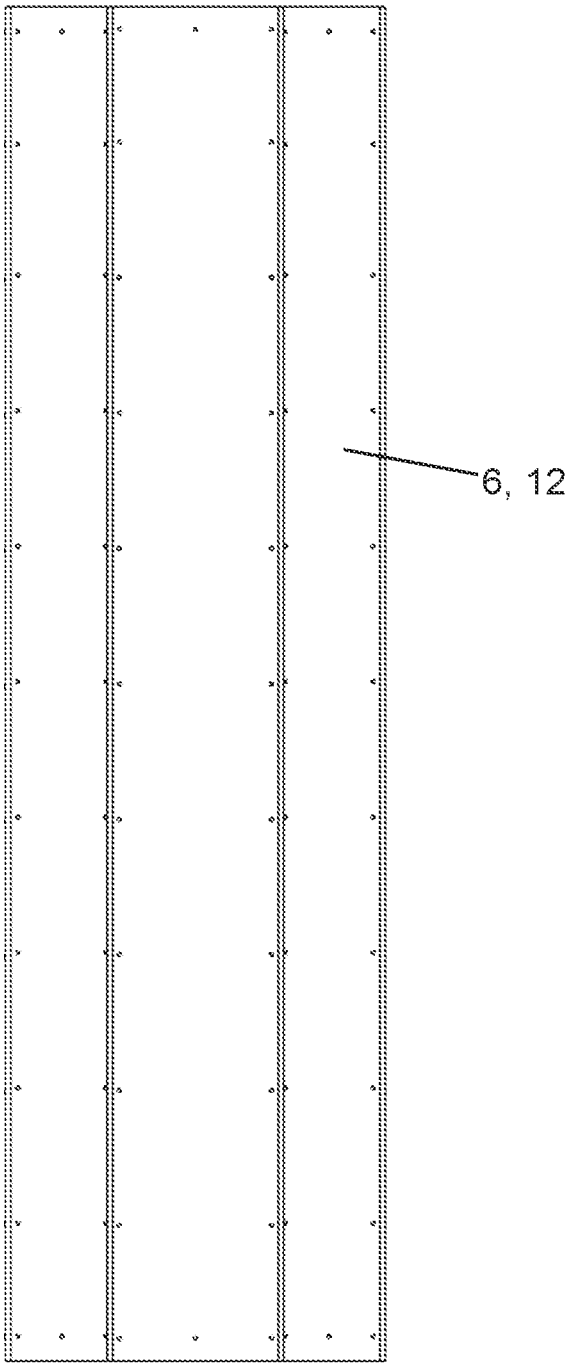


Figure 15

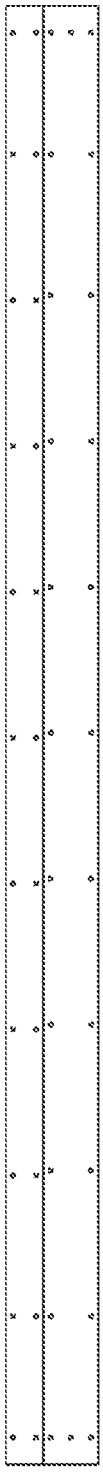


Figure 16

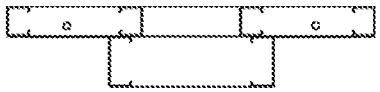


Figure 17

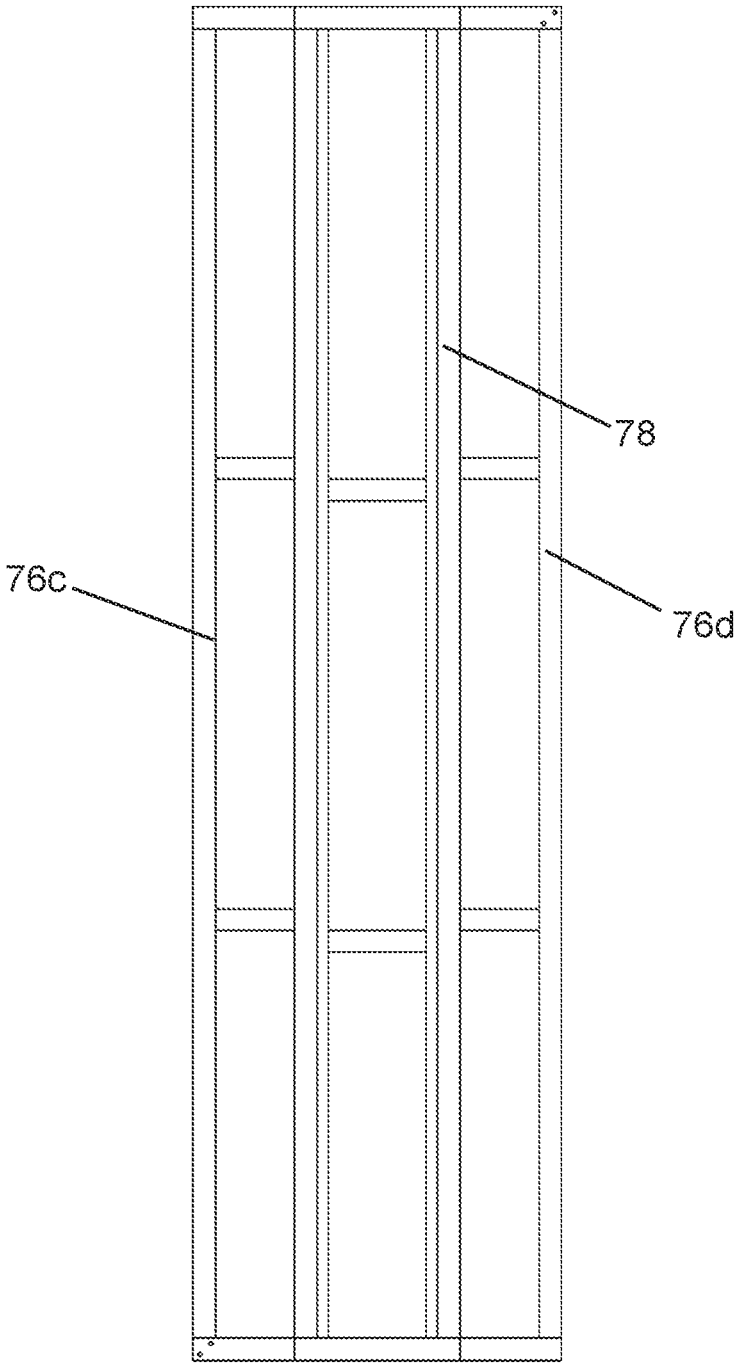


Figure 18

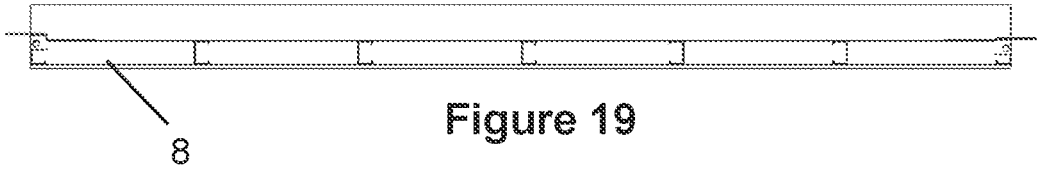


Figure 19

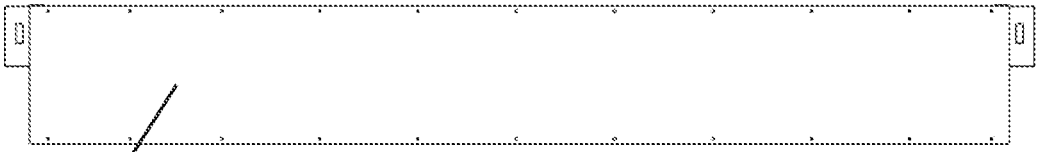


Figure 20

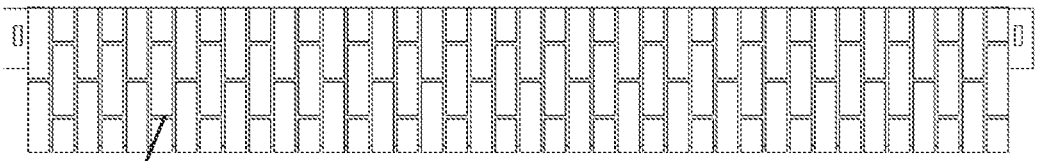


Figure 21

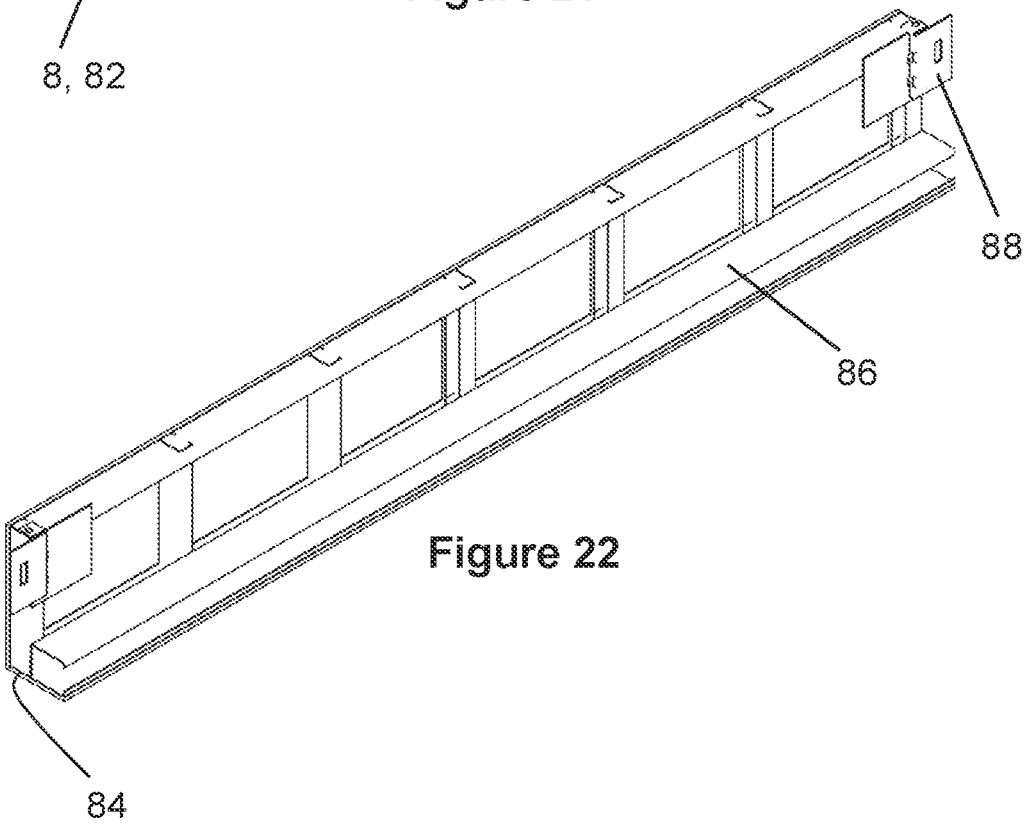


Figure 22

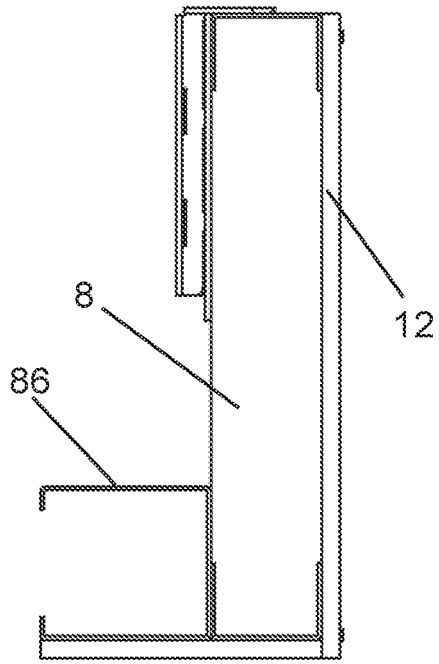


Figure 23

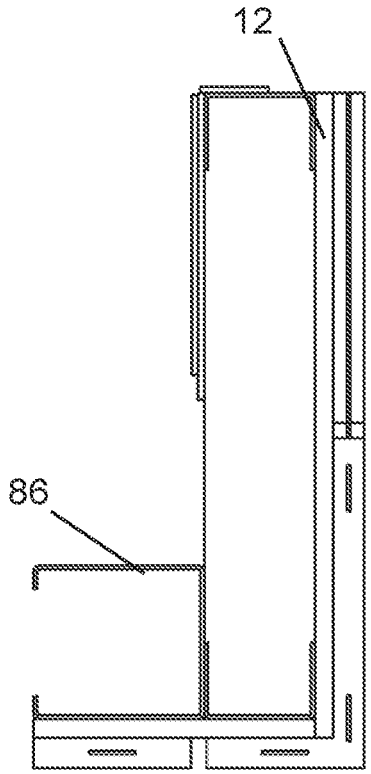


Figure 24

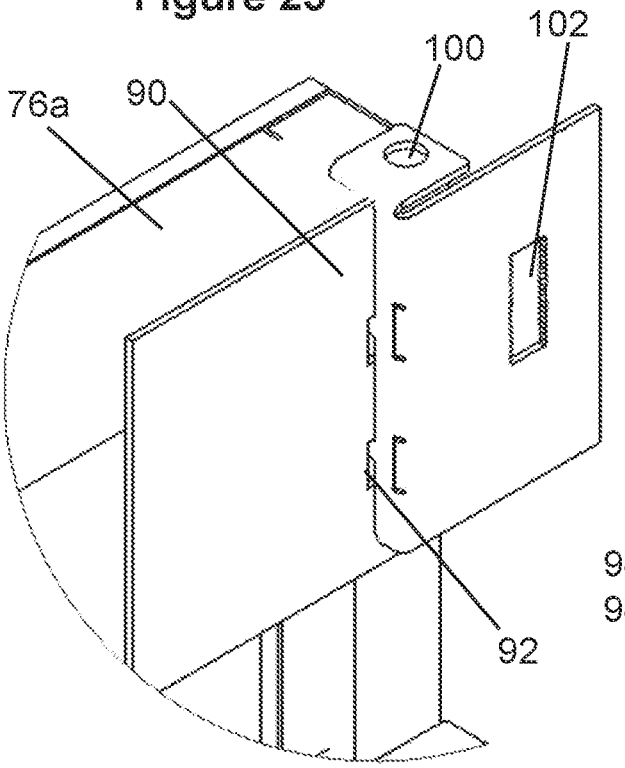


Figure 25

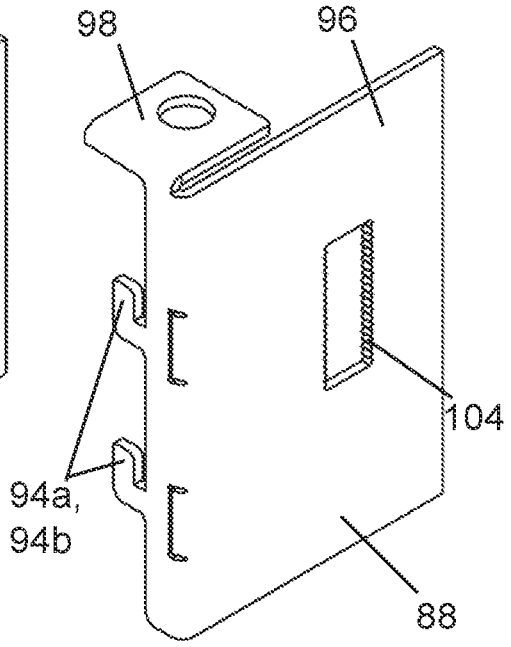


Figure 26

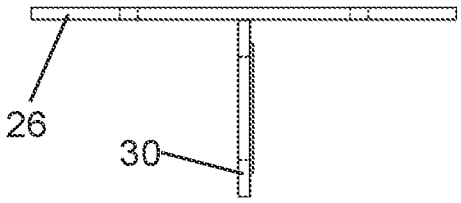


Figure 27

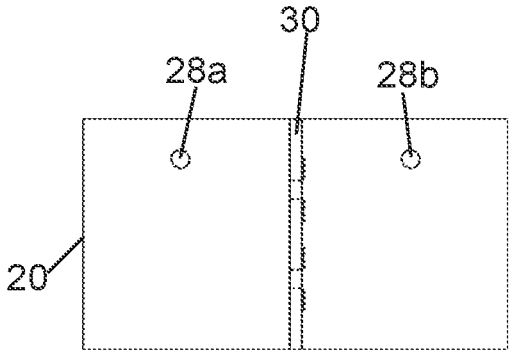


Figure 28

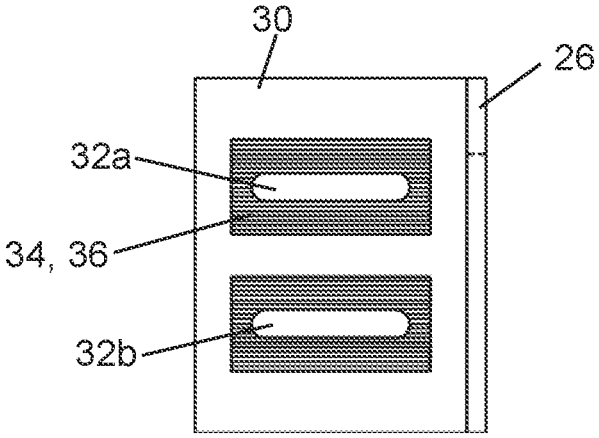


Figure 29

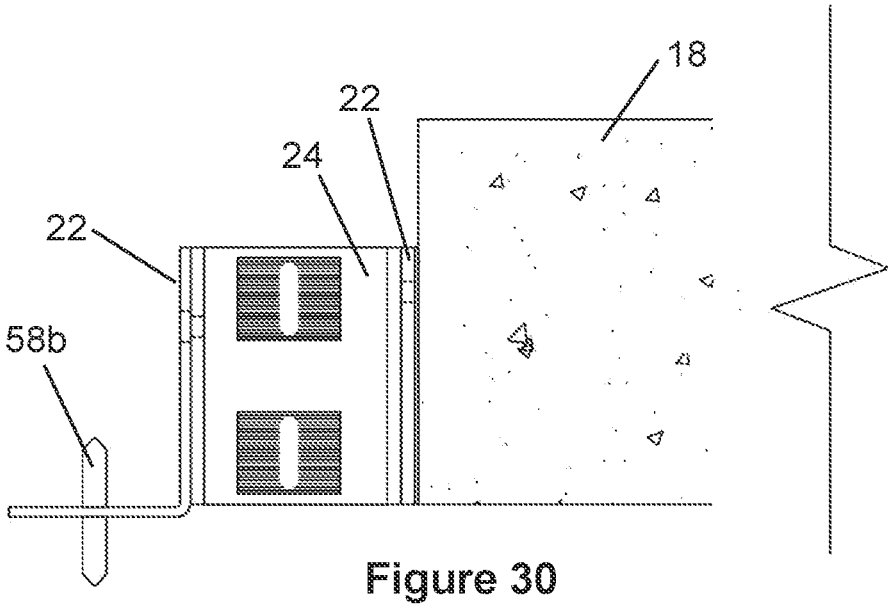


Figure 30

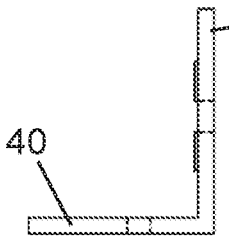


Figure 31

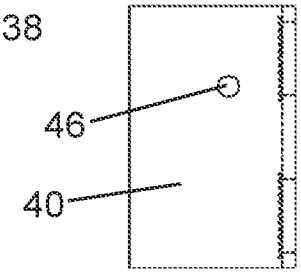


Figure 32

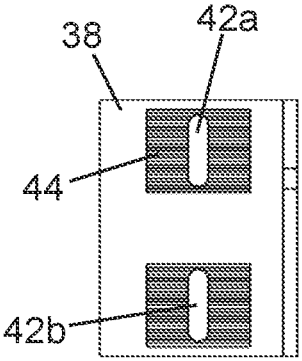


Figure 33

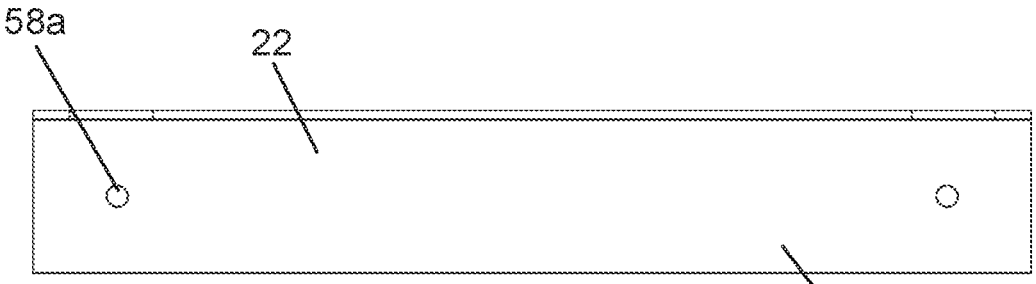


Figure 34

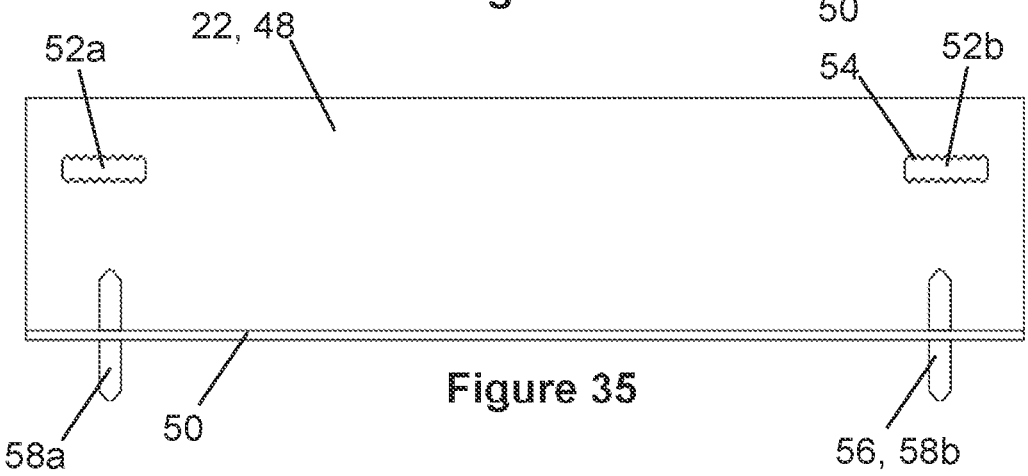


Figure 35

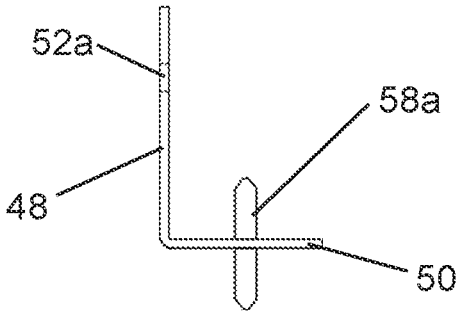


Figure 36

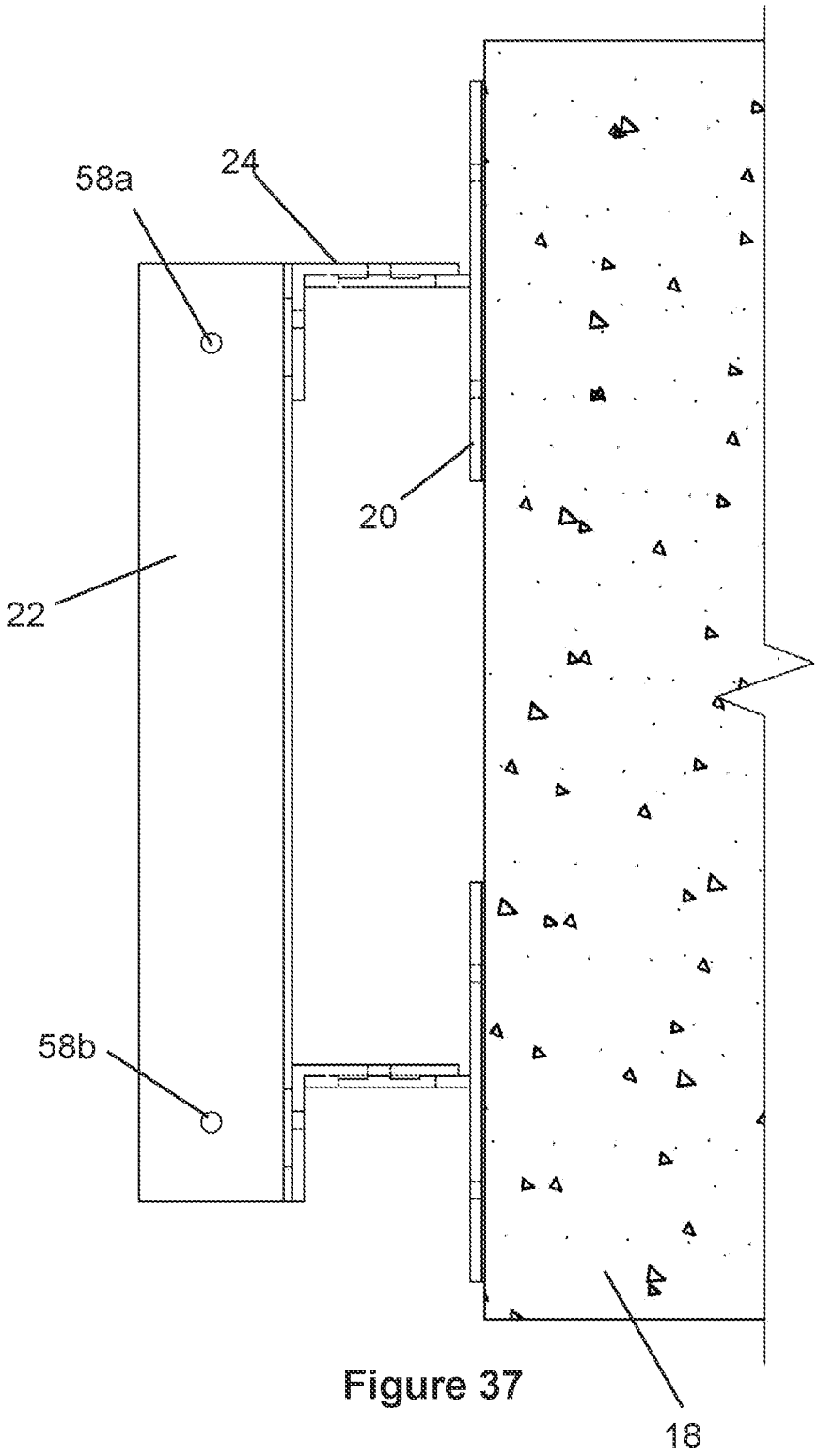


Figure 37

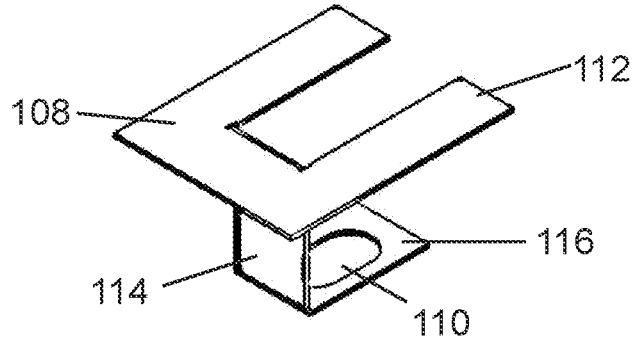


Figure 39

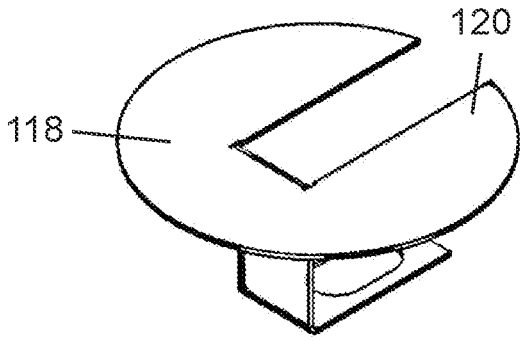


Figure 40

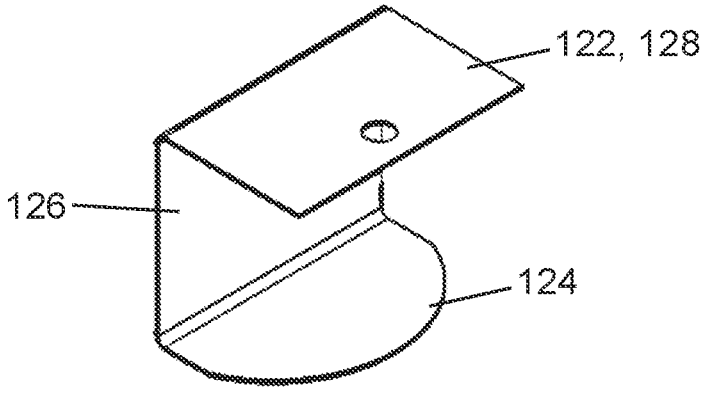


Figure 41

CLADDING SYSTEM

[0001] The present invention relates to a cladding system for buildings.

[0002] Cladding is an outer skin applied to a building with the purpose of providing weather protection, insulation, and/or desired aesthetics. There are many different known cladding systems, involving a range and combination of materials and styles. Some cladding systems use composite panels or glass to provide the cladding surface. However, it is often desirable for the cladding to provide the appearance of traditional brickwork. One reason for using cladding to provide the effect of traditional brickwork is that the number of skilled bricklayers is decreasing so it is becoming more difficult, and in some cases prohibitively expensive, to implement traditional bricklaying methods. However, the resulting cladding panels are heavy and unwieldy. Some panels are sized up to 6 metres tall and 3 metres wide and they are difficult to handle, expensive to transport and difficult to manage onsite, requiring a large workforce to oversee installation. In addition, due to the weight of the cladding panels, it is required to use many mounting points to ensure that the cladding panels are secured to the building, which again increases the installation time and materials required on site. One solution is to simply make the panels in smaller sizes, and it is known to provide 0.5 m^2 panels, however, the onsite assembly time is drastically increased with these panels as the workers are required to install significantly more panels to create the same finish as when using larger panels.

[0003] Brick-slip cladding systems are also known, wherein the outer surface is provided by thin sections of traditional brick (referred to as 'brick slips'). In some known systems, the brick slips are glued to a panel, which is then in turn fixed to the building to provide the cladding. The problem with using adhesives is that they will fail over time, and further, in the event of a fire, when burned, the adhesives can release toxins which can travel throughout the building and intoxicate inhabitants distal to the source of the fire. It is therefore desirable to use an alternative solution to adhesives.

[0004] In known brick-slip cladding systems, the supporting framework which supports the cladding panels is assembled onsite and the panels are then in turn installed on the framework. The gap between the panels where the brick slips from adjacent panels meet is then pointed. Again, with these systems, the panels are small (approximately 0.5 m^2), meaning that there is still a significant amount of pointing required onsite, and the onsite time is considerable due to the pointing requirements and the assembly of the framework.

[0005] In some known cladding systems, the arrangements used for mounting the cladding panels to the building structure often do not provide a sufficient cavity between the panel and the building structure. A minimum cavity of 50 mm is recommended, and this cannot be obtained by some known systems. There is also a problem with regards to adjustability of cladding panels during installation. Typically, installation involves fixing a bracket to the building and a further bracket to the panel which are configured to engage with one another. The panel is then installed such that the brackets engage. However, there are often fine margins of error because the panel must align with all adjacent panels, and the cavity spacing (between the cladding panel and the building structure) must be consistent across the panels. If the brackets are not fixed in the correct position, this can result in the panel not being correctly positioned when it is installed.

[0006] It is therefore an object of the invention to obviate or mitigate the problems outlined above in relation to cladding systems and particularly brick slip cladding systems.

[0007] According to an aspect of the invention there is provided a cladding system for a building, the cladding system comprising a cladding panel, the cladding panel comprising a frame and a backing member mounted on the frame, and wherein the backing member is suitable for receiving covering elements thereto, the cladding system further comprising a mounting means for mounting the cladding panel to a building structure.

[0008] Ideally, the cladding panel is formed mostly or entirely from non-combustible materials.

[0009] Preferably, during installation, the mounting means provides adjustability of the cladding panel relative to the building structure towards or away from the building and/or upwards or downwards with respect to the building and/or laterally with respect to the building.

[0010] Ideally, the mounting means comprises a building mounting component to be mounted to the building structure during installation, and a cladding-panel mounting component to be mounted to the cladding panel. Preferably, the building mounting component and the cladding-panel mounting component are separate components that are directly or indirectly fixable to one another.

[0011] Preferably, the mounting means comprises an intermediate mounting component that is fixable to the building mounting component and to the cladding-panel mounting component, wherein the intermediate mounting component is arranged extending between the building mounting component and the cladding-panel mounting component. Advantageously, use of an intermediate mounting component provides a greater degree of adjustability when installing the cladding panel because the position of the intermediate mounting component relative to the building mounting component and relative to the cladding-panel mounting component can be adjusted. Further, the intermediate mounting component spaces the cladding-panel mounting component from the building component and can therefore increase the size of the cavity between the panel and the building structure. Alternatively, the building mounting component could be directly fixed to the cladding-panel mounting component, but this provides less adjustability.

[0012] Ideally, the building mounting component comprises a building engagement portion configured to engage with the building structure when the building mounting component is fixed to a building structure. Preferably, the building engagement portion is adapted to engage with a flat surface of a building structure. Ideally, the building engagement portion can engage with a floor slab. Ideally, the building engagement portion is fixable to a building structure. Preferably, the building engagement portion comprises one or more apertures for receiving fixing elements such as bolts to fix the building engagement portion to a surface, such as the surface of a floor slab.

[0013] Ideally, the building mounting component comprises a projection that projects from the building engagement portion and which is configured to fix the building mounting component to the intermediate and/or cladding-panel mounting component(s). Ideally, there is a cavity located between the panel and the building structure when

the panel is installed. The size of the projection and/or the intermediate mounting component, and the connection between the two, defines the size of the cavity between the cladding panel and the building structure. Ideally, the cavity is 50 mm or greater, but variations in this will be apparent to the skilled person.

[0014] Preferably, the building engagement portion is planar. Ideally, the projection is a flange, most preferably a planar flange, arranged extending from the building engagement portion. Ideally, the projection is arranged at 90° or approximately 90° to the building engagement portion. Ideally, the projection is located centrally, or approximately centrally, along the length of the building engagement portion.

[0015] Ideally, the projection of the building mounting component comprises one or more apertures to receive fixing elements to fix, most preferably to releasably fix, the building mounting component to the intermediate mounting component and/or cladding-panel mounting component(s). Ideally, the one or more apertures are elongate slots. Ideally, there are two or more elongate slots which are most preferably arranged in parallel with respect to one another. Advantageously, use of an elongate slot provides adjustability along the length of the slot. Ideally, the longitudinal axis of the slot is arranged perpendicular to the building engagement portion. Advantageously, when installed, this means adjustability is provided towards and away from the building structure.

[0016] Preferably, the mounting means comprises a grip means to prevent relative movement between the different components of the mounting means such as the building mounting component, the cladding-panel mounting component and/or the intermediate mounting component, when the mounting means or component parts thereof is assembled.

[0017] Preferably, the grip means prevents relative movement between the building mounting component and the intermediate mounting component and/or relative movement between the intermediate mounting component and the cladding-panel mounting component, when the intermediate mounting component and cladding-panel mounting component are in engagement with one another.

[0018] Ideally, the grip means comprises all or part of a surface of the building mounting component, most preferably all or part of a surface of the projection of the building mounting component, having a topography that can engage with all or part of a surface of the intermediate mounting component having a corresponding topography, or with all or part of a surface of the cladding-system mounting component having a corresponding topography, in more than one configuration. Advantageously, if during installation it is desired to adjust the relative position of the building mounting component and the intermediate mounting component, for example, the component topographies can be disengaged and re-engaged in a different configuration.

[0019] Ideally, the surface topography is provided by indentations, ridges, grooves, bumps, teeth, crenelations or other suitable formation or any combination thereof.

[0020] Ideally, the indentations, ridges, grooves, bumps, teeth, crenelations or other suitable formation or any combination thereof are provided around the aperture or apertures of the projection of the building mounting component.

[0021] Ideally, the surface topography is provided by a series of ridges, most preferably arranged in parallel with respect to one another.

[0022] The indentations, ridges, grooves, bumps, teeth, crenelations or other suitable formation or any combination thereof may be integrally formed with the projection of the building mounting component, or may be provided by a separate piece fixed to the projection to provide the topography.

[0023] Ideally, the intermediate mounting component has a first part for engaging with the building mounting component and a second part for engaging with the cladding-panel mounting component.

[0024] Ideally, the first and/or second parts of the intermediate mounting component are planar parts.

[0025] Preferably, the first part is arranged at 90° or approximately 90° to the second part.

[0026] Ideally, the first and second parts are provided by an angle bracket.

[0027] Ideally, the first part comprises one or more apertures to receive fixing elements to releasably fix the intermediate mounting component to the building mounting component. Ideally, the one or more apertures are elongate slots. Ideally, there are two or more elongate slots which are most preferably longitudinally aligned with respect to one another such that they are arranged on the same longitudinal axis. Ideally, when installed, the longitudinal axis of the elongate slot of the intermediate mounting component is arranged at 90° or approximately 90° to the longitudinal axis of the elongate slot of the projection of the building mounting component. Advantageously, the orientation of the slot provides adjustability upwards or downwards with respect to the building structure.

[0028] Ideally, the grip means comprises all or part of a surface of the intermediate mounting component, most preferably all or part of a surface of the first part of the intermediate mounting component having a topography that can engage with all or part of a surface of the building mounting component having a corresponding topography, in more than one configuration. Advantageously, if during installation it is desired to adjust the relative position of the intermediate mounting component and the building mounting component, for example, the component topographies can be disengaged and re-engaged in a different configuration.

[0029] Ideally, the surface topography is provided by indentations, ridges, grooves, bumps, teeth, crenelations or other suitable formation or any combination thereof.

[0030] Ideally, the indentations, ridges, grooves, bumps, teeth, crenelations or other suitable formation or any combination thereof are provided around the aperture or apertures of the first part of the intermediate mounting component.

[0031] The indentations, ridges, grooves, bumps, teeth, crenelations or other suitable formation or combination thereof may be integrally formed with the first part of the intermediate mounting component, or may be provided by a separate piece fixed to the first part to provide the topography.

[0032] Ideally, the intermediate mounting component, most preferably the second part of the intermediate mounting component, comprises one or more apertures to receive fixing elements to releasably fix the intermediate mounting component to the cladding-panel mounting component.

[0033] Preferably, the cladding-panel mounting component comprises a first part for engaging with the intermediate mounting component and a second part for engaging with the cladding panel.

[0034] Ideally, the first and/or second parts of the cladding-panel mounting component are planar parts. Preferably, the first part is arranged at 90° or approximately 90° to the second part. Ideally, the first and second parts are provided by an angle bracket.

[0035] Ideally, the cladding-panel mounting component, most preferably the first part of the cladding-panel mounting component, comprises one or more apertures to receive fixing elements to releasably fix the cladding-panel mounting component to the intermediate mounting component. Ideally, the one or more apertures are elongate slots.

[0036] The cladding-panel mounting component may be operable to provide a shelf on which a cladding panel can be mounted, and/or the cladding-panel mounting component may be operable to suspend a panel from the cladding-panel mounting component and therefore from the mounting means and the building structure. Ideally, the cladding system comprises a first cladding-panel mounting component operable as a shelf for cladding panels, and a second cladding-panel mounting component operable to suspend a panel from the mounting means.

[0037] Ideally, at least in the cladding-panel mounting component that is operable as a shelf for cladding panels, there are two or more elongate slots which are most preferably longitudinally aligned with respect to one another such that they are arranged on the same longitudinal axis. Ideally, when installed, the first part of the cladding-panel mounting component is parallel or substantially parallel with the building engagement portion of the building mounting component. Ideally, the longitudinal axis of the elongate slot in the first part of the cladding-panel mounting component is aligned with the longitudinal axis of the first part. Advantageously, this provides lateral adjustability of the cladding panel during installation. Alternatively, the elongate slot could be provided on the second part of the intermediate mounting component to provide lateral adjustability.

[0038] Ideally, the perimeter of the elongate slot or slots of the cladding-panel mounting component comprises a series of teeth adapted to engage with a corresponding series of teeth on the outer boundary of a washer. Advantageously, a washer may be inserted into the elongate slot such that the teeth of the washer and the teeth of the perimeter of the elongate slot engage one another, and this prevents movement of the washer along the length of the slot. A bolt or other suitable fixing element can then be inserted through the washer and through the aperture on the second part of the intermediate mounting component to fix the intermediate mounting component to the cladding-panel mounting component. To adjust the lateral position of the cladding panel with respect to the building structure, the washer can be removed from the elongate slot, repositioned, and reinserted as desired.

[0039] Preferably, the cladding-panel mounting component can be used to mount an upper part of a first panel and a lower part of a second panel directly above the first panel. Advantageously, a single cladding-panel mounting component can be used for two panels, and the height of two floors may be cladded by using just two panels, and three sets of mounting means.

[0040] Ideally, the cladding-panel mounting component, most preferably the second part of the cladding-panel mounting component, comprises fixing means for fixing the cladding-panel mounting component to the cladding panel. Ideally, the fixing means are fixing elements that extend from the second part and that can engage with an opening or aperture on the cladding panel to enable fixing thereto. Ideally, the fixing elements are spaced apart and extend from either or, most preferably, both planar sides of the second part of the cladding-panel mounting component. Advantageously, the second part provides a shelf to which the cladding panel can be fixed. The fixing elements extending below the second part of the cladding-panel mounting component can engage with a panel below the cladding-panel mounting component, whereas the fixing elements extending above the second part of the cladding-panel mounting component can engage with a panel that is above and preferably sitting on the second part of the cladding-panel mounting component. The same cladding-panel mounting component can be used on the lower surface of the cladding panel, wherein the second part of the cladding-panel mounting component extends below the cladding panel, as well as on the upper surface of the cladding panel wherein the second part extends above the cladding panel.

[0041] The cladding-panel mounting component may be mounted via two intermediate mounting components to two building mounting components. Two cladding-panel mounting components may be used per each cladding panel.

[0042] The fixing elements used to fix the building mounting component to the intermediate mounting component, and to fix the intermediate mounting component to the cladding-panel mounting component may be a nut-and-bolt or other suitable fixing elements.

[0043] Ideally, a lower cladding-panel mounting component can be mounted on a floor slab of a building, and an upper cladding-panel mounting component can be mounted on the floor slab immediately above the floor slab to which the lower cladding-panel mounting component is mounted, with the cladding panel mounted extending therebetween. Advantageously, one cladding panel can be used extending the entire height between the two floor slabs.

[0044] Ideally, the backing member is formed from a non-combustible material. Preferably, the backing member is formed from cementitious material such as calcium silicate fibre cement or magnesium oxide board. Ideally, in one embodiment the panel does not use a cement particle board. Advantageously, the backing member can readily receive mechanical fixings, such as screws or bolts, to mechanically fix a covering element thereto. Further advantageously, the backing member is relatively light in weight compared to other backing members, such as steel or concrete. The combination of a frame and lightweight backing member, rather than a concrete panel, means the cladding panel overall is much lighter and therefore easier to transport and install than known cladding panels. Ideally, the backing member is fitted to the frame before transportation. Advantageously, it is not required to assemble the frame onsite, and onsite installation times are reduced.

[0045] Preferably, one or more covering elements are fixed to the backing member.

[0046] Ideally, the one or more covering elements are mechanically fixed to the backing member.

[0047] Ideally, the one or more covering elements are fixed to the backing member via one or more horizontal rails.

[0048] Ideally, the one or more covering elements are fixed to the frame via one or more horizontal rails.

[0049] Ideally, the one or more covering elements are fixed to the frame via one or more horizontal rails and clips which are configured to support the covering elements on the rails.

[0050] Ideally, the one or more covering elements are masonry slips such as brick slips, block slips or stone slips, or composite slips such as glass-reinforced plastic (GRP) slips, or a combination thereof.

[0051] Ideally, the covering elements have a front face, a rear face, and side faces extending between the front face and the rear face. In use, the rear face engages with the backing member.

[0052] Ideally, there is a slot in one or more side faces, ideally in at least two side faces, of the covering elements, the slot being configured to receive a fixing element. Ideally, the slot is located at a position in the side face between the rear face and the front face.

[0053] Ideally, the covering elements are fixed to the backing member by a covering-element fixing element that is disposed in the slot of the covering element, and which is in turn fixed to the backing member.

[0054] Ideally, the covering-element fixing element is a bracket which has a flange that engages the slot in the covering element, a first portion that extends from the flange towards the backing member and then a second portion that extends from the first portion and is fixed or fixable to the backing member. Ideally, the second portion comprises an aperture for receiving a screw. The aperture may be elongate, thereby providing adjustability of the bracket relative to the screw during installation.

[0055] The bracket may comprise a third portion that extends from the second portion to a second flange engaged in the slot of an adjacent covering element. The bracket is therefore substantially U-shaped.

[0056] Alternatively, the flange may be sized to extend from a slot in one covering element to a slot in an adjacent covering element. Advantageously with this fixing element there is no requirement for the third portion and second flange. The flange may be planar and it may be substantially U-shaped. The flange may have a polygonal perimeter, ideally having three sides, or it may be rounded.

[0057] A further fixing element is provided which is ideally used to mechanically attach covering elements located at the side of the backing member. In this fixing element, the flange and the second portion are mutually opposed. The first portion is sized such that the flange engages a slot in one covering element and the second portion is disposed to the rear of the backing member, where it can then be fixed with a screw. The length of the first portion is therefore equal to or greater than the width of the backing member and the width of the covering element from the rear of the covering element to the slot.

[0058] Adhesives may also be used with the mechanical fix to enhance the connection between the covering elements and the backing member.

[0059] Preferably, the frame comprises a plurality of structural frame elements that are connected to one another and/or integrally formed with one another to define a frame.

[0060] Ideally, the cladding panel is arranged with the frame defining the rear of the cladding panel, with the backing member having a front surface for receiving covering elements. Ideally, no part of the frame is visible on the front surface. Preferably, no part of the frame extends to the front surface.

[0061] Ideally, the panels are designed such that the covering elements dovetail along the panel joint.

[0062] Ideally, the covering elements dovetail the panel at corner joints.

[0063] Ideally, the covering elements dovetail the panel at planar joints.

[0064] Preferably, the covering elements and the panel interlock to each other via corresponding recesses and projecting covering elements provided in adjacent panels in such a manner that no part of the panel is visible on the front surface of the building.

[0065] Ideally, the frame is mountable to the cladding-panel mounting component. The cladding-panel mounting component may be pre-mounted on the cladding panel before transport to the building site.

[0066] Ideally, the frame comprises one or more structural frame elements extending longitudinally in a first direction, and one or more structural frame elements extending longitudinally in a second direction. Ideally, the second direction is perpendicular or substantially perpendicular to the first direction.

[0067] Ideally, the frame comprises an upper frame element, arranged at or close to the upper edge of the backing member.

[0068] Ideally, the frame comprises a lower frame element, arranged at or close to the lower edge of the backing member.

[0069] Ideally, the upper and/or lower frame elements have apertures or openings that are configured to receive the fixing elements of the cladding-panel mounting component.

[0070] The cladding panel may be mounted on the cladding-panel mounting component without having to secure the cladding panel thereto. Advantageously, this reduces complexity of the installation. The cladding panel can be installed by simply setting it onto a cladding-panel mounting component which is mounted on the building structure, such that the fixing elements of the cladding-panel mounting component extend through the apertures on the lower frame element. A cladding-panel mounting component can then be set on the upper frame element such that the fixing elements of the cladding-panel mounting component extend through apertures on the upper frame element. The upper cladding-panel mounting component can then be secured to the building.

[0071] Preferably, the frame comprises a side frame element, arranged at or close to the side of the backing member. Preferably, the frame comprises two side frame elements, one arranged at each side of the backing member.

[0072] Ideally, the side frame element extends between the upper and lower frame elements.

[0073] Ideally, the frame comprises one or more intermediate frame elements located extending partially or entirely between the upper and lower frame elements, and/or located extending partially or entirely between the two side frame elements. Advantageously, this strengthens the frame and the cladding panel.

[0074] Ideally, the frame is formed from a metal. Preferably, a majority of the frame is formed from steel and most

preferably from light gauge steel. Ideally, at least 50%, 60%, 70%, 80%, 90%, 95%, 96%, 97%, 98% or 99% of the frame is formed from steel, most preferably light gauge steel. The entirety of the frame may be formed from steel, most preferably light gauge steel (with the possible exception of fixing elements or materials used to fix the structural frame elements together to form the frame, which may be formed from different materials to the frame elements). Light gauge steel is also known as cold-formed steel or cold-rolled steel. Use of light gauge steel ensures that the cladding panel is light in weight, and it can therefore be made to a larger size than known brick-slip cladding panels without becoming unwieldy and difficult to transport. Advantageously, a panel spanning an entire floor may be made in this way.

[0075] The backing member may be provided by a single sheet of material, or it may be multiple sheets fixed to the frame and/or joined together.

[0076] Ideally, the panels are arrangeable extending between two floor slabs on a building, such that the panel extends from floor-to-floor.

[0077] Ideally, one panel is shaped to provide a flat outer surface of covering elements.

[0078] Ideally, a further panel is shaped to provide the appearance of a stepped column. In this panel, the frame is arranged to provide the frame of a stepped column, with the backing member fixed thereto.

[0079] Ideally, yet a further panel is arranged having both a fascia surface and a soffit surface. Advantageously, said panel can be used extending across openings such as windows, with the soffit surface extending in towards the building opening.

[0080] Combinations of the features of the stepped column and/or soffit surface may be integrated into a single panel and panels may be made with openings to accommodate windows, for example.

[0081] Ideally, the panel with the soffit surface has part of the backing member fixed to one part of the frame defining a fascia surface, and a further part of the backing member fixed to a further part of the frame defining a soffit surface, wherein the soffit surface is perpendicular or substantially perpendicular to the fascia surface.

[0082] Ideally, the frame of the panel with the soffit surface comprises a soffit frame element that extends along the rear of the backing member that defines the soffit surface. Ideally, the soffit frame element is a C-shaped beam. Ideally, one side of the C-shape beam extends along the rear of the soffit surface.

[0083] Ideally, the panel with the soffit surface is mountable to the intermediate mounting component. Ideally, the panel with the soffit surface is mounted by a cladding-panel mounting component for suspending the panel from the mounting means. Ideally, the cladding-panel mounting component for suspending the panel is mounted in turn on the frame of the panel with the soffit surface. Ideally, the frame of the panel with the soffit surface is configured to receive the cladding-panel mounting component. Ideally, the frame comprises a surface, most preferably a planar surface, for receiving the cladding-panel mounting component. Ideally, the surface for receiving the cladding-panel mounting component comprises one or more apertures to receive the cladding-panel mounting component. Ideally, the surface for receiving the cladding-panel mounting component is located proximal to the side of the panel and preferably proximal to the upper part of the panel.

[0084] Ideally, the cladding-panel mounting component for suspending a panel comprises an engagement means to engage with the aperture of the surface on the panel. Ideally the engagement means is a hook or hooks. Most preferably, the cladding-panel mounting component comprises two spaced apart hooks that engage with two spaced apart apertures on the panel. Preferably, a portion of the cladding-panel mounting component for suspending a panel, most preferably a planar portion, extends from at or about the engagement means, most preferably perpendicularly to the engagement means. Ideally, the cladding-panel mounting component for suspending a panel comprises a tab that is arranged perpendicularly to the engagement means and/or perpendicularly to the portion that extends from at or about the engagement means. The tab abuts an upper surface of the upper frame element of the panel with the soffit surface when the cladding-panel mounting component is fitted to the panel. The tab can be fixed to the frame of the panel with the soffit surface to secure the cladding-panel mounting component to the panel. Ideally, the tab has an aperture for receiving a fixing element.

[0085] Preferably, the portion of the cladding-panel mounting component for suspending a panel that extends from at or about the engagement means comprises an aperture, most preferably an elongate slot, to receive fixing elements to fix the mounting component to the intermediate mounting component or building mounting component. Ideally, the perimeter of the elongate slot comprises a series of teeth adapted to engage with a corresponding series of teeth on the outer boundary of a washer. Ideally, the longitudinal axis of the slot extends from the upper to lower part of the portion that extends from at or about the engagement means, thereby providing adjustability upwards or downwards of the panel with the soffit surface.

[0086] It should be noted that the flat panel or stepped-column panel could be configured to be mounted via the cladding-panel mounting component for suspending a panel, and the panel with a soffit surface could be configured to be mounted via the cladding-panel mounting component that is operable as a shelf.

[0087] The cladding panel may extend for at least 1 m, at least 2 m, at least 3 m, at least 4 m, at least 5 m or at least 6 m in one direction. The cladding panel may have a surface area of at least 1 m^2, at least 4 m^2, at least 9 m^2, at least 16 m^2, or at least 25 m^2. Advantageously, despite large sizes, the cladding panel is not unwieldy due to being formed from lightweight materials.

[0088] According to a further aspect of the invention there is provided a cladding panel for a building, the cladding panel comprising a frame, and a backing member mounted on the frame, the backing member being suitable for receiving brick slips or other covering elements thereto.

[0089] The cladding panel may comprise any features in any combination of any cladding panel described above in relation to the cladding system.

[0090] According to a further aspect of the invention there is provided a mounting means for mounting cladding panels to a building structure.

[0091] The mounting means may comprise any features in any combination of the mounting means described above in relation to the cladding system.

[0092] According to a further aspect of the invention there is provided a building, wherein the building is cladded with a cladding system.

[0093] The cladding system may comprise any features in any combination of the cladding system described above.

[0094] Ideally, the building comprises a flat surface provided by a cladding panel mounted extending between two spaced apart floor slabs. Ideally, wherein one floor slab is located above the other floor slab.

[0095] Ideally, the building comprises a stepped column provided by a cladding panel mounted extending between two spaced apart floor slabs. Ideally, wherein one floor slab is located above the other floor slab.

[0096] Ideally, the building comprises a soffit surface and fascia surface provided by a cladding panel.

[0097] Ideally, the majority of the building is cladded in the cladding system. Most preferably, at least 80%, 85%, 90% or 95% of the building is cladded in the cladding system.

[0098] According to a further aspect of the invention there is provided a method for cladding a building with a cladding system as described above.

[0099] Ideally, the method comprises fixing the building mounting component to a building structure, such as a floor slab.

[0100] Preferably, the method comprises fixing an intermediate mounting component to the building mounting component. The method may comprise a readjustment step wherein the alignment between the intermediate mounting component and the building mounting component is checked after engagement between the surface topographies of the components, and wherein the components are disengaged, adjusted and re-engaged.

[0101] Ideally, the method comprises fixing a cladding-panel mounting component on the intermediate mounting component. The method may comprise a readjustment step wherein the alignment between the cladding-panel mounting component and the intermediate mounting component is checked after the washer is inserted into the elongate slot of the cladding-panel mounting component, and wherein the washer is removed, the alignment between the cladding-panel mounting component and intermediate mounting component is adjusted, and wherein the washer is reinserted.

[0102] Ideally, the method comprises using fixing elements such as a nut-and-bolt to fix the building mounting component to the intermediate component and/or to fix the intermediate component to the cladding-panel mounting component.

[0103] The method may then comprise the step of fixing a panel on a cladding-panel mounting component. The panel may be fixed by fixing elements such as nuts and bolts or another suitable fixing element.

[0104] The method may comprise mounting the cladding panel on the cladding-panel mounting component without securing the cladding panel thereto with a nut or other fixing element. The method may comprise installing the cladding panel by simply setting it onto a cladding-panel mounting component which is mounted on the building structure, such that cladding-panel mounting component supports the cladding panel. Ideally, the method comprises installing the cladding panel such that the fixing elements of the cladding-panel mounting component extend through the apertures on the lower frame element. The method may then comprise setting a cladding-panel mounting component on the upper frame element such that the fixing elements of the cladding-panel mounting component extend through apertures on the upper frame element. The method may comprise then securing the upper cladding-panel mounting component to the building. The method may comprise setting a second panel on the upper cladding-panel mounting component directly above the panel. The method may involve stacking subsequent panels in this manner to clad the building.

[0105] The panel may be a flat panel, stepped-column panel or panel with a soffit surface. The method may comprise pre-fitting the cladding-panel mounting component or mounting component for a panel with a soffit surface to the panel, then raising the panel and fixing the cladding-panel mounting component or mounting component for a panel with a soffit surface to the intermediate mounting component or building mounting component. Alternatively, the method may comprise first fixing the cladding-panel mounting component to the intermediate component or building mounting component, then raising the panel and fixing the panel to the cladding-panel mounting component. Ideally, the panels are prefabricated before transport to a site for installation. Ideally, the backing member is secured to the frame with screws or other suitable fixing means before transport to a site for installation. Ideally, the covering elements are fitted to the backing member, and spacing between the covering elements filled with mortar before transport to a site for installation.

[0106] Ideally, the method comprises the step of installing a single panel extending from one floor to the floor directly above or below said floor. The method may comprise installing a plurality of panels adjacent to each other to clad the majority or entirety of a building. Ideally, the method comprises the step of installing a panel suspended from the mounting means.

[0107] The method may comprise the step of fitting waterproof membranes and/or insulation between and/or around the panels.

[0108] The invention will now be described, by way of example only, with reference to the accompanying drawings in which:

[0109] FIG. **1** is a plan view of a flat panel according to the invention mounted to a floor slab.

[0110] FIG. **2** is a detailed view of the upper mounting means for the flat panel and floor slab of FIG. **1**.

[0111] FIG. **3** is a front elevation view of the flat panel of FIG. **1**.

[0112] FIG. **4** is a side view of the flat panel of FIG. **1**.

[0113] FIG. **5** is a plan view of the frame and backing member of the flat panel of FIG. **1**.

[0114] FIG. **6** is a section view of the lower mounting means for the flat panel and floor slab of FIG. **1**.

[0115] FIG. **7** is a front elevation view of the frame of the flat panel of FIG. **1**.

[0116] FIG. **8** is a front elevation view of the lower mounting means for the flat panel and floor slab of FIG. **1**.

[0117] FIG. **9** is a plan view of a stepped-column panel according to the invention.

[0118] FIG. **10** is a detailed section view of the upper mounting means for the stepped-column panel and floor slab of FIG. **9**.

[0119] FIG. **11** is a front elevation view of the stepped-column panel of FIG. **9**

[0120] FIG. **12** is a side view of the stepped-column panel of FIG. **9**.

[0121] FIG. **13** is a detailed section view of the lower mounting means for the stepped-column panel and floor slab of FIG. **9**.

[0122] FIG. **14** is a plan view of the frame and backing member of the stepped-column panel of FIG. **9**.

[0123] FIG. **15** is a front elevation view of the backing member of the stepped-column panel of FIG. **9**.

[0124] FIG. **16** is a side elevation view of the backing member of the stepped-column panel of FIG. **9**

[0125] FIG. **17** is a plan view of the steel frame of stepped-column panel of FIG. **9**.

[0126] FIG. **18** is a front elevation view of the frame of the stepped-column panel of FIG. **9**.

[0127] FIG. **19** is a plan view of the frame and backing member of a panel with a soffit surface according to the invention.

[0128] FIG. **20** is a front elevation view of the frame and backing member of the panel with a soffit surface of FIG. **19**.

[0129] FIG. **21** is a front elevation view of the panel with a soffit surface of FIG. **19**.

[0130] FIG. **22** is a rear perspective view of the panel with a soffit surface of FIG. **19**.

[0131] FIG. **23** is a side view of the frame and backing member of the panel with a soffit surface of FIG. **19**.

[0132] FIG. **24** is a side view of the panel with a soffit surface of FIG. **19**.

[0133] FIG. **25** is a detailed view of the mounting component for suspending a panel such as the panel of FIG. **19** when it is mounted to the panel.

[0134] FIG. **26** is an isometric view of the mounting component for suspending a panel such as the panel of FIG. **19** when it is mounted to the panel.

[0135] FIG. **27** is a plan view of the building mounting component.

[0136] FIG. **28** is a front elevation view of the building mounting component of FIG. **27**.

[0137] FIG. **29** is a section view of the building mounting component of FIG. **27**.

[0138] FIG. **30** is a section view of a mounting means according to the invention when mounted on a floor slab.

[0139] FIG. **31** is a plan view of the intermediate mounting component.

[0140] FIG. **32** is a front elevation view of the intermediate mounting component of FIG. **31**.

[0141] FIG. **33** is a section view of the intermediate mounting component of FIG. **31**.

[0142] FIG. **34** is a plan view of the cladding-panel mounting component.

[0143] FIG. **35** is a front view of the cladding-panel mounting component of FIG. **34**.

[0144] FIG. **36** is a section view of the cladding-panel mounting component of FIG. **34**.

[0145] FIG. **37** is a plan view of the mounting means of FIG. **30**.

[0146] FIG. **38** is a schematic cross-sectional, front elevation view of a fixing element used to fix the covering elements to the backing member.

[0147] FIG. **39** is an isometric view of a further fixing element that may be used to fix the covering elements to the backing member.

[0148] FIG. **40** is an isometric view of yet a further fixing element that may be used to fix the covering elements to the backing member.

[0149] FIG. **41** is an isometric view of yet a further fixing element that may be used to fix the covering elements to the backing member.

[0150] In the drawings there is shown a cladding system for a building, the cladding system being indicated generally by reference numeral **2**. The cladding system **2** comprises a cladding panel which is mountable to a building structure. In the illustrated embodiment, the cladding system **2** comprises three cladding panels of different shapes. FIGS. **1** to **8** illustrate a flat panel indicated by reference numeral **4**, FIGS. **9** to **18** illustrate a stepped column panel indicated by reference numeral **6**, and FIGS. **19** to **26** illustrate a panel with a soffit surface, the panel being indicated by reference numeral **8**. The cladding panels **4**, **6**, **8** have a frame **10** and a backing member **12** mounted on the frame **10**. The backing member **12** is suitable for receiving covering elements **14**. In the illustrated embodiment, there are brick slips **14** fixed to the backing member **10**.

[0151] The cladding system **2** further comprises a mounting means **16** for mounting the cladding panels **4**, **6**, **8** to a building structure. In the illustrated embodiment, the flat panel **4** and stepped column panel **6** are each shown mounted to a floor slab **18**. The cladding panels **4**, **6**, **8** are formed from non-combustible materials and are therefore suitable for use in high-rise buildings (i.e., over 18 metres tall) in the UK, where regulations currently prohibit use of flammable materials on the exterior of buildings. The mounting means **16** provides adjustability of the cladding panels **4**, **6**, **8** relative the building structure towards and away from the building and upwards and downwards with respect to the building. The mounting means **16** can also provide adjustability of the flat and stepped-column panels **4**, **6** laterally with respect to the building structure.

[0152] The mounting means **16** comprises a building mounting component **20** to be mounted to the building during installation. The mounting means **16** further comprises a cladding-panel mounting component **22** to be mounted to the cladding panel **4**, **6**. The cladding-panel mounting component **22** is operable as a shelf on which the cladding panels **4**, **6** can be mounted. The mounting means **16** involves a cladding-panel mounting component **88** which is operable to suspend a panel from the mounting means **16** and is used with the panel **8** as will be described in further detail below. The building mounting component **20** and the cladding-panel mounting components **22**, **88** are separate components that are directly or indirectly fixable to one another. The mounting means **16** further comprises an intermediate mounting component **24** that is fixable to the building mounting component **20** and to the cladding-panel mounting components **22**, **88**. The intermediate mounting component **24** is arranged extending between the building mounting component **20** and the cladding-panel mounting component **22**, **88**. Use of the intermediate mounting component **24** provides a greater degree of adjustability when installing the cladding panel **4**, **6** because the position of the intermediate mounting component **24** relative to the building mounting component **20** and relative to the cladding-panel mounting component **22**, **88** can be adjusted. Alternatively, the building mounting component **20** could be directly fixed to the cladding-panel mounting component **22**, **88**, but this provides less adjustability.

[0153] The building mounting component **20** is illustrated in isolation in FIGS. **27** to **29**. The building mounting component **20** is formed from steel although other metals or materials may be suitable, provided they are sufficiently strong to withstand the weight of the cladding panels **4**, **6**, **8**. The building mounting component **20** comprises a building-

engagement portion **26** configured to engage with the building structure when the building mounting component **20** is fixed to a building structure. The building engagement portion **26** is adapted to engage with a flat surface of a building structure. Ideally, the building engagement portion **26** can engage with a floor slab, as shown in FIG. **1**. In the illustrated embodiment, the building engagement portion **26** is a flat, rectangular plate, although the skilled person will understand that other shapes may be suitable for the same purpose. The building engagement portion **26** comprises two apertures **28***a*, **28***b* in the illustrated embodiment for receiving fixing elements such as bolts to fix the building engagement portion **26** to a surface, such as the surface of a floor slab. The building engagement portion **26** may have more or less than two apertures if desired.

[0154] The building mounting component **20** further comprises a projection **30** that projects from the building engagement portion **26** and which is configured to fix the building mounting component **20** to the intermediate and/or cladding-panel mounting component(s) **22**, **24**, **88**. The size of the projection **30** and/or the intermediate mounting component **24** defines the size of the cavity between the cladding panel **4**, **6**, **8** and the building structure.

[0155] The projection **30** is a rectangular, planar flange, arranged extending from the building engagement portion **26**. The skilled person will understand that other shapes may be suitable for the same purpose. The projection is arranged at 90° to the building engagement portion **26**. The projection **30** is located centrally along the length of the building engagement portion **26**.

[0156] The projection **30** of the building mounting component **20** comprises two apertures **32***a*, **32***b* to receive fixing elements to releasably fix the building mounting component **20** to the intermediate and/or cladding-panel mounting component(s) **22**, **24**, **88**. The projection **30** may have more or less than two apertures for this purpose if desired. The apertures **32***a*, **32***b* are elongate slots. The elongate slots **32***a*, **32***b* are arranged in parallel with respect to one another. Use of an elongate slot provides adjustability along the length of the slot. The longitudinal axis of each slot **32***a*, **32***b* is arranged perpendicular to the building engagement portion **26**. Advantageously, when installed, this means adjustability is provided towards and away from the building structure.

[0157] The mounting means **16** further comprises a grip means **34** to prevent relative movement between the building mounting component **20**, the cladding-panel mounting component **22**, **88** and/or the intermediate mounting component **24**, when the cladding system **2** is assembled. The grip means **34** comprises a surface of the projection **30** of the building mounting component **20** having a topography that can engage with the all or part of a surface of the intermediate mounting component **24** having a corresponding topography, or with the all or part of a surface of the cladding-system mounting component **22**, **88** having a corresponding topography, in more than one configuration. Therefore, if during installation it is desired to adjust the relative position of the building mounting component **20** and the intermediate mounting component **24**, for example, the component topographies can be disengaged and re-engaged in a different configuration. The surface topography is provided by a series of ridges **36** arranged in parallel. Any suitable formation, such as indentations, grooves, bumps, teeth, crenelations or other suitable formation or combination thereof could be used provided it functions to engage with a corresponding topography on another component. The ridges **36** are provided located around the apertures **32***a*, **32***b*. The ridges **36** may be integrally formed with the projection **30** of the building mounting component **20**, or may be provided by a separate piece fixed to the projection **30** to provide the topography. The longitudinal axis of the ridges **36** is parallel with the longitudinal axis of the elongate slot **32***a*, **32***b* around which it is located. The ridges **36** are arranged defining a rectangular outline.

[0158] The intermediate mounting component **24** has a first part **38** for engaging with the building mounting component **20** and a second part **40** for engaging with the cladding-panel mounting component **22**, **88**. The first and second parts **38**, **40** of the intermediate mounting component **24** are planar parts. In the illustrated embodiment, both the first and second parts **38**, **40** are rectangular, but variations in shape will be apparent to the skilled person. The intermediate mounting component **24** is formed from steel although other metals or materials may be suitable, provided they are sufficiently strong to withstand the weight of the cladding panels **4**, **6**, **8**. The first part **38** is arranged at 90° to the second part **40**. The first and second parts **38**, **40** are provided by an angle bracket.

[0159] The first part **38** comprises two apertures **42***a*, **42***b* to receive fixing elements to releasably fix the intermediate mounting component **24** to the building mounting component **20**. It should be noted that, in the drawings, the fixing elements are not illustrated in every drawing for the purposes of clarity, as illustrating the fixing elements would obscure the other important features of the drawings. In FIG. **1**, fixing elements **106** are illustrated between the building mounting component **20** and the intermediate mounting component **22**, and between the building mounting component **20** and the floor slab **18**. More or less than two apertures may be present as desired. The apertures **42***a*, **42***b* are elongate slots. The elongate slots longitudinally aligned with respect to one another such that they are arranged on the same longitudinal axis. When installed, the longitudinal axis of the elongate slots of the intermediate mounting component **24** is arranged at 90° to the longitudinal axis of the elongate slot of the projection **30** of the building mounting component **20**. The orientation of the slot therefore provides adjustability upwards or downwards with respect to the building structure.

[0160] The grip means **34** comprises all or part of a surface of the first part **38** of the intermediate mounting component **24** having a topography that can engage with all or part of a surface of the building mounting component **20** having a corresponding topography, in more than one configuration. If, during installation, it is desired to adjust the relative position of the intermediate mounting component **24** and the building mounting component **20**, for example, the component topographies can be disengaged and re-engaged in a different configuration. The surface topography is provided by a series of ridges **44** arranged in parallel. Any suitable formation, such as indentations, grooves, bumps, teeth, crenelations or other suitable formation or combination thereof could be used provided it functions to engage with a corresponding topography on another component. The ridges **44** are provided located around the apertures **42***a*, **42***b*. The ridges **44** may be integrally formed with the first part **38** of the intermediate mounting component **24**, or may be provided by a separate piece fixed to the first part **38** to provide the topography. The longitudinal axis of the ridges

44 is perpendicular with the longitudinal axis of the elongate slot **42***a*, **42***b* around which it is located. The ridges **44** are arranged defining a rectangular outline. When assembled, the ridges **44** of the first part **38** of the intermediate mounting component **24**, and the ridges **36** of the projection **30** of the building mounting component **20** extend longitudinally in the same direction, with the ridges **44** of the first part **38** of the intermediate mounting component **24** fitting between the ridges **36** of the projection **30** of the building mounting component **20**.

[0161] The second part **40** of the intermediate mounting component **24** comprises an aperture **46** to receive fixing elements to releasably fix the intermediate mounting component **24** to the cladding-panel mounting component **22**. The second part **40** may have more than one aperture for additional fixing elements if desired.

[0162] The cladding-panel mounting component **22**, which is operable as a shelf for the flat panel **4** and stepped-column panel **6**, has a first part **48** for engaging with the intermediate mounting component **24** and a second part **50** for engaging with the cladding panel **4**, **6**. The first and second parts **48**, **50** of the cladding-panel mounting component **22** are planar, rectangular parts. The cladding-panel mounting component **22** is formed from a steel angle bracket, although alternative materials or shapes may be used if desired. The first part **48** is arranged at 90° to the second part **50**. The first part **48** has two apertures **52***a*, **52***b* to receive fixing elements to releasably fix the cladding-panel mounting component **22** to the intermediate mounting component **24**. More or less than two apertures could potentially be used if desired. The apertures **52***a*, **52***b* are elongate slots. The elongate slots are longitudinally aligned with respect to one another such that they are arranged on the same longitudinal axis. When installed, the first part **48** of the cladding-panel mounting component **22** is parallel or substantially parallel with the building-engagement portion **26** of the building mounting component **20**. The longitudinal axis of the elongate slots **52***a*, **52***b* is aligned with the longitudinal axis of the first part **48** of the cladding-panel mounting component **22**. This provides lateral adjustability of the cladding panel **4**, **6** during installation.

[0163] The perimeter of the elongate slots **52***a*, **52***b* of the cladding-panel mounting component **22** comprises a series of teeth **54** adapted to engage with a corresponding series of teeth (not shown) on the outer boundary of a washer (not shown). Advantageously, a washer may be inserted into the elongate slot **52***a*, **52***b* such that the teeth of the washer and the teeth of the perimeter of the elongate slot **52***a*, **52***b* engage one another and this prevents movement of the washer along the length of the slot **52***a*, **52***b*. A bolt or other suitable fixing element can then be inserted through the washer and through the aperture **46** on the second part **40** of the intermediate mounting component **24** to fix the intermediate mounting component **24** to the cladding-panel mounting component **22**. To adjust the lateral position of the cladding panel **4**, **6** with respect to the building structure, the washer can be removed from the elongate slot **54***a*, **54***b*, repositioned, and reinserted as desired.

[0164] The second part **50** of the cladding-panel mounting component **22** has fixing means **56** for fixing the cladding-panel mounting component **22** to the cladding panel **4**, **6**. The fixing means **56** are fixing elements **58***a*, **58***b* that extend from the second part **50** and that can engage with an opening or aperture on the cladding panel **4**, **6** to enable fixing thereto. The fixing elements **58***a*, **58***b* are spaced apart and extend from both planar sides of the second part **50** of the cladding-panel mounting component **22**. The second part **50** provides a shelf to which the cladding panel **4**, **6** can be fixed. The same cladding-panel mounting component **22** can be used on the lower surface of the cladding panel **4**, **6**, wherein the second part **50** of the cladding-panel mounting component **22** extends below the cladding panel **4**, **6**, as well as on the upper surface of the cladding panel **4**, **6** wherein the second part **50** extends above the cladding panel **4**, **6**. Ideally, each cladding-panel mounting component **22** is mounted via two intermediate mounting components **24** to two building mounting components **20**. Two cladding-panel mounting components **22** may be used per each cladding panel **4**, **6**. Two panels may be mounted on one cladding-panel mounting component **22**, wherein one panel is located above the second part **50**, and one panel is located below the second part **50**.

[0165] The fixing elements are used to fix the building mounting component **20** to the intermediate mounting component **24** and to fix the intermediate mounting component **24** to the cladding-panel mounting component **22** may be a nut-and-bolt or other suitable fixing elements.

[0166] A lower cladding-panel mounting component **22** can be mounted on a floor slab **18** of a building, and an upper cladding-panel mounting component **22** can be mounted on the another floor slab **18** immediately above the floor slab **18** to which the lower cladding-panel mounting component **22** is mounted, with the cladding panel **4**, **6** mounted extending therebetween. Advantageously, one cladding panel **4**, **6** can be used extending the entire height between the two floor slabs **18**. This arrangement is illustrated in FIGS. **3**, **4**, **11** and **12**.

[0167] The backing member **12** is formed from calcium silicate fibre cement but other non-combustible material, preferably cementitious materials may be used if desired. The backing member **12** can readily receive mechanical fixings, such as screws or bolts, to mechanically fix a covering element thereto. In the illustrated embodiment a plurality of covering elements **14**, which are brick slips, are mechanically fixed to the backing member **12**. Other masonry slips such as block, or stone slips, or composite slips such as GRP slips, or combinations thereof could be used. Slips or sheets of any other desirable material could be fixed to the backing member **14** if desired.

[0168] The covering elements **14** have a front face **60**, a rear face **62**, and side faces **64** extending between the front face **60** and the rear face **62**. The rear face **62** abuts the backing member **12**. There is a slot **66** that extends along the side faces **64**, the slot **66** being configured to receive a fixing element. The slot **66** is located at a position in the side face **64** between the rear face **62** and the front face **60**. The covering elements **14** are fixed to the backing member **12** by a fixing element **68** that is disposed in the slot **66** of the covering element, and which is in turn fixed to the backing member **12**.

[0169] The fixing element **68** is a bracket which has a flange **70***a* that engages the slot **66** in the covering element **14**, a first portion **72***a* that extends from the flange **70***a* towards the backing member **12** when in use and then a second portion **72***b* that extends from the first portion **72***a* and abuts and is fixed to the backing member **12**. The second portion **72***b* comprises an aperture **74** for receiving a screw. The fixing element **68** comprises a third portion **72***c* that

extends from the second portion **72***b* to a second flange **70***b* engaged in the slot **66** of an adjacent covering element **14**. The bracket is therefore substantially U-shaped.

[0170] In FIG. **39** there is a further fixing element for covering elements indicated by reference numeral **108**. The fixing element **108** has first and second portions **114**, **116**. There is an elongate aperture **110** in the second portion for receiving a screw. The elongate aperture **110** provides adjustability of the bracket relative to the screw during installation. The fixing element **108** has a flange **112**, similar to the flange **70***a* of the fixing element **68**, for engaging a slot **66** in the side of a covering element **14**. The flange **112** extends from the first portion **114**, and the second portion **116** extends from an opposing end of the first portion **114**. The flange **112** is sized to extend from a slot in one covering element to a slot in an adjacent covering element **14**. Advantageously with this fixing element there is no requirement for the third portion **72***b* and second flange **70***b*. The flange **112** is planar and is substantially U-shaped. The flange **112** has three outer sides, but may have more sides if desired. The flange **108**, first portion **114** and second portion **116** are formed by initially providing a planar piece, the perimeter of which forms the flange **108**, then cutting and bending the piece to provide the first and second portions **114**, **116**.

[0171] FIG. **40** shows a further fixing element **118**. The fixing element **118** is similar to the fixing element **108**, with the exception that it has a rounded flange **120**.

[0172] FIG. **41** shows a further fixing element **122** which is used to mechanically attach covering elements **14** located at the side of the backing member **12**. The fixing element has a flange **124** for engaging a slot in a covering element, a first portion **126** extending from the flange, and a second portion **128** extending from the first portion that is fixable to the backing member **12**. The flange **124** mutually opposes the second portion **128**. The flange **124** has a rounded edge. The first portion **126** is sized such that the flange **124** engages a slot in one covering element and the second portion **128** is disposed to the rear of the backing member **12**, where it can then be fixed with a screw thereby securing the covering element on the backing member **12**. The length of the first portion **126** is therefore equal to or greater than the width of the backing member **12** and the width of the covering element **14** from the rear of the covering element to the slot **66**.

[0173] Alternative shapes of fixing elements are within the scope of the invention provided they engage with the slot **66** and can be fixed to the backing member **12** to secure the covering element **14** mechanically to the backing member **12**. Adhesives may also be used with the mechanical fix to enhance the connection between the covering elements **14** and the backing member **12**.

[0174] After the covering elements **14** are fixed to the backing member **12** during manufacture, the space between the covering elements **14** are filled with mortar. The covering elements **14** are arranged creating the appearance of traditional brickwork and in particular a stretcher bond pattern. Other patterns, such as Flemish bond or common bond may be used as desired.

[0175] The frame **10** has a plurality of structural frame members **76** that are connected to one another to define a frame. The cladding panels **4**, **6**, **8** are arranged with the frame **10** defining the rear of the cladding panel **4**, **6**, **8**, with the backing member **12** having a front surface for receiving covering elements **14**. No part of the frame **10** is visible on the front surface and no part of the frame **10** extends to the front surface.

[0176] The frame **10** is mountable to the cladding-panel mounting component **22**. The cladding-panel mounting component **22** may be pre-mounted on the cladding panel **4**, **6** before transport to the building site, or this may be conducted on site.

[0177] The frame **10** has a plurality of structural frame elements **76** extending longitudinally in a first direction, and a plurality of structural frame elements **76** extending longitudinally in a second direction, wherein the second direction is perpendicular to the first direction. The frame **10** has an upper frame element **76***a*, arranged at or close to the upper edge of the backing member **12**. The frame **10** comprises a lower frame element **76***b*, arranged at or close to the lower edge of the backing member **12**. The upper and lower frame elements **76***a*, **76***b* have apertures **80** that are configured to receive the fixing elements **58***a*, **58***b* of the cladding-panel mounting component **22**. The frame **10** further comprises two side frame elements **76***c*, **76***d*, arranged at or close to the side of the backing member **12**. The side frame element **76***c*, **76***d* extends between the upper and lower frame elements **76***a*, **76***b*.

[0178] Referring now specifically to the flat panel **4**, the frame **10** has two intermediate frame elements **76***e* located between the two side frame elements **76***c*, **76***d* and which are spaced apart from one another. The intermediate frame elements **76***e* extend between the upper and lower frame elements **76***a*, **76***b* and they are parallel with the side elements **76***c*, **76***d*. The frame **10** further comprises six intermediate frame elements **76***f* which are parallel to the top and bottom frame members **76***a*, **76***b* and which are arranged extending from the side frame elements **76***c*, **76***d* or from the intermediate frame elements **76***e* to provide structural support. The stepped panel **6** has a similar configuration but a step **78** is built into the frame **10**. The step is located centrally between the frame side elements **76***c*, **76***d*. The step **78** extends across the entire height of the panel **6**. The backing member **12** is formed from a plurality of separate pieces fitted to the frame **10** to provide the stepped column. The panel **8** with a soffit surface is described in more detail below.

[0179] The frame **10** is formed from light gauge steel, but the fixing elements or materials used to fix the frame elements **76** together may be formed from different materials. Some of the frame elements may be formed from other materials, such as traditional steel, but it is preferable that the majority of the frame **10** is formed from light gauge steel, as this lowers the weight of the panels **4**, **6**, **8**. Advantageously, a panel spanning an entire floor may be made in this way.

[0180] Referring now to the panel **8** with a soffit surface, the panel **8** has a fascia surface **82** and a soffit surface **84**. The panel **8** can therefore be used extending across openings such as windows, with the soffit surface **84** extending in towards the building opening. The panel **8** has part of the backing member **12** fixed to one part of the frame **10** defining a fascia surface **82**, and a further part of the backing member **10** fixed to a further part of the frame **10** defining a soffit surface **84**, wherein the soffit surface **84** is perpendicular to the fascia surface **82**. The frame **10** of the panel **8** with the soffit surface has a soffit frame element **86** that

extends along the rear of the backing member **12** that defines the soffit surface **84**. The soffit frame element **86** is a C-shaped beam.

[0181] The panel **8** with the soffit surface **84** is mountable to the intermediate mounting component **24**. The mounting means **16** comprises a cladding-panel mounting component **88** for use in suspending a panels from the mounting means **16**. The cladding-panel mounting component **88** is mounted on the frame **10** of the panel **8** with the soffit surface **84**. The frame **10** of the panel **8** with the soffit surface **84** is configured to receive the cladding-panel mounting component **88**. The frame **10** comprises a planar surface **90** for receiving the cladding-panel mounting component **88**. The surface **90** for receiving the cladding-panel mounting component **88** comprises two apertures **92**. The surface **90** for receiving the cladding-panel mounting component **88** is located at the upper side of the panel **8**.

[0182] The cladding-panel mounting component **88** for suspending the panel **8** has an engagement means for engaging with the apertures **92**. The engagement means is provided by two hooks **94***a*, **94***b* that engage with the apertures **92** of the surface **90** on the panel **8**. Specifically, the cladding-panel mounting component **88** for suspending the panel **8** comprises two spaced apart hooks **94***a*, **94***b* that engage with two spaced apart apertures **92** on the panel **90**. A planar portion **96** extends perpendicularly from the hooks **94***a*, **94***b* and it therefore extends beyond the side perimeter of the panel **8**. The cladding-panel mounting component **88** further has a tab **98**, arranged perpendicularly to the hooks **94***a*, **94***b* and also perpendicularly to the planar portion **96**. The tab **98** abuts an upper surface of the upper frame element **76***a* of the panel **8** with the soffit surface **84** when the cladding-panel mounting component **88** is fitted to the panel **8**. The tab **98** can be fixed to the frame **10** of the panel **8** to secure the cladding-panel mounting component **88** to the panel. The tab **98** has an aperture **100** for receiving a fixing element (not shown). The cladding-panel mounting component **88** is formed from a single piece of folded metal.

[0183] The planar portion **96** of the cladding-panel mounting component **88** further comprises an aperture **102**, arranged as an elongate slot, to receive fixing elements (not shown) to fix the cladding-panel mounting component **88** to the intermediate mounting component **24** or building mounting component **20**. The perimeter of the elongate slot **102** comprises a series of teeth **104** adapted to engage with a corresponding series of teeth (not shown) on the outer boundary of a washer (not shown). The longitudinal axis of the slot **102** extends from the upper to lower part of the planar portion **96**, thereby providing adjustability upwards or downwards of the panel **8** with the soffit surface **84** during installation. Because the planar portion **96** extends beyond the perimeter of the panel **8**, this provides visibility of the aperture **102** during installation of the panel **8**.

[0184] In use, the building mounting component **20** is first mounted to a building structure such as a floor slab **18**. Next, an intermediate mounting component **24** is fixed to the building component. A readjustment step may be required wherein the alignment between the intermediate mounting component **24** and the building mounting component **20** is checked after engagement between the surface topographies of the components **20**, **24**, and wherein the components **20**, **24** are disengaged, adjusted and re-engaged.

[0185] Next a cladding-panel mounting component **22**, **88** is mounted on the intermediate component **24**. Again, a readjustment step may be required wherein the alignment between the cladding-panel mounting component **22**, **88** and the intermediate mounting component **24** is checked after the washer is inserted into the elongate slot **52***a* or **52***b* of the cladding-panel mounting component **22**, and wherein the washer is removed, the alignment between the cladding-panel mounting component **22**, **88** and intermediate mounting component **24** is adjusted, and wherein the washer is reinserted. Fixing elements such as a nut-and-bolt are used to fix the building mounting component **20** to the intermediate component **24** and to fix the intermediate component **24** to the cladding-panel mounting component **22**, **88**.

[0186] The panel **8** with a soffit surface **84** may be mounted by mounting the cladding-panel mounting component **88** for suspending a panel from the mounting means **16** initially on the surface **90** of the panel **8** and then mounting the cladding-panel mounting component **88** on the intermediate component **24**. A readjustment step may be required wherein the alignment between the cladding-panel mounting component **88** and the intermediate mounting component **24** is checked after the washer is inserted into the elongate slot **102** of the mounting component **88** of the panel **8** with a soffit surface **84**, and wherein the washer is removed, the alignment between the cladding-panel mounting component **88** of the panel **8** with a soffit surface **84** and the intermediate mounting component **24** is adjusted, and wherein the washer is reinserted.

[0187] Referring to the flat panel **4** and stepped-column panel **6**, the panels **4**, **6** can be installed by simply setting the panel **4**, **6** onto a cladding-panel mounting component **22** which is mounted on the building structure, such that the fixing elements **56***a*, **56***b* extend through the apertures **80** of the lower frame element **76***b*. It is not necessary to then use a nut on the fixing element **56***a*, **56***b* because the weight of the panel **4**, **6** secures the panel to the cladding-panel mounting component **22**. The upper end of the panel **4**, **6** can be mounted by either mounting a cladding-panel mounting component **22** on the upper frame element **76***b*, and then securing the cladding-panel mounting component **22** to a mounted intermediate mounting component **24**. Alternatively, the panel **4**, **6** could be secured initially at its upper end and then at its lower end if desired. As the panels **4**, **6** extend the entire height of a floor between two floor slabs **18**, a single panel can be installed extending the height of the floor. Adjacent panels can be sequentially installed to clad the building. The panel **8** with the soffit surface **84** can be installed over openings such as windows. An entire building can therefore be clad using the cladding system **2**, thereby providing the appearance of traditional brick work on the exterior of the building. Ideally, the panels are prefabricated in a factory before transport to a site for installation, with the covering elements **14** ideally being fitted to the backing members **12**, and spacing between the covering elements **14** filled with mortar before transportation. The installation may also comprise fitting waterproof membranes and/or insulation (not shown) between and/or around the panels **4**, **6**, **8**.

[0188] The skilled person will appreciate that all preferred or optional features of the invention described with reference to only some aspects or embodiments of the invention may be applied to all aspects of the invention.

[0189] It will be appreciated that optional features applicable to one aspect of the invention can be used in any combination, and in any number. Moreover, they can also be used with any of the other aspects of the invention in any

combination and in any number. This includes, but is not limited to, the dependent claims from any claim being used as dependent claims for any other claim in the claims of this application.

[0190] In relation to the detailed description of the different embodiments of the invention, it will be understood that one or more technical features of one embodiment can be used in combination with one or more technical features of any other embodiment where the transferred use of the one or more technical features would be immediately apparent to a person of ordinary skill in the art to carry out a similar function in a similar way on the other embodiment.

[0191] The features disclosed in the foregoing description or the following drawings, expressed in their specific forms or in terms of a means for performing a disclosed function, or a method or a process of attaining the disclosed result, as appropriate, may separately, or in any combination of such features be utilised for realising the invention in diverse forms thereof.

1. A cladding system (**2**) for a building, wherein the cladding system (**2**) comprising a cladding panel (**4**, **6**, **8**) the cladding panel (**4**, **6**, **8**) comprising a frame (**10**) and a backing member (**12**) mounted on the frame (**10**), wherein the backing member (**12**) is suitable for receiving covering elements (**14**) thereto, the cladding system further comprising at least one mounting means (**16**) for mounting the cladding panel to a building structure, and wherein the mounting means (**16**) provides adjustability of the cladding panel (**4**, **6**, **8**) relative to the building structure towards or away from the building and/or upwards or downwards with respect to the building and/or laterally with respect to the building.

2. The cladding system (**2**) for a building according to claim **1**, wherein the mounting means (**16**) comprises a building mounting component (**20**) to be mounted to the building structure during installation, and a cladding-panel mounting component (**22**, **88**) to be mounted to the cladding panel; and wherein the building mounting component (**20**) and the cladding-panel mounting component (**22**, **88**) are separate components that are directly or indirectly fixable to one another.

3. The cladding system (**2**) for a building according to claim **2**, wherein the mounting means (**16**) further comprises an intermediate mounting component (**24**) that is fixable to the building mounting component (**20**) and to the cladding-panel mounting component (**22**, **88**).

4. The cladding system (**2**) for a building according to the claim **3**, wherein the intermediate mounting component (**24**) is arranged extending between the building mounting component (**20**) and the cladding-panel mounting component (**22**, **88**) in such a manner that allows a greater degree of adjustability when installing the cladding panel (**4**, **6**, **8**) because the position of the intermediate mounting component (**24**) relative to the building mounting component and relative to the cladding-panel mounting component (**22**, **88**) is adjustable.

5. The cladding system (**2**) for a building according to claim **3**, wherein the intermediate mounting component (**24**) spaces the cladding-panel mounting component (**22**, **88**) from the building mounting component (**20**) and can therefore adjust the size of the cavity between the panel (**4**, **6**, **8**) and the building structure.

6. The cladding system (**2**) for a building according to claim **2**, wherein the building mounting component (**20**) comprises a building engagement portion (**26**) adapted to engage with a surface of a building structure and a projection (**30**) projecting from the building engagement portion (**26**); wherein the building engagement portion (**26**) comprises one or more apertures (**28***a*, **28***b*) for receiving fixing elements; and the projection (**30**) comprises one or more apertures (**32***a*, **32***b*) to receive fixing elements to releasably fix the building mounting component (**20**) to the intermediate mounting component (**24**) and/or cladding-panel mounting component (**22**).

7. The cladding system (**2**) for a building according to claim **6**, wherein the building engagement portion (**26**) is planar; and wherein the projection (**30**) is a flange arranged at 90° or approximately 90° to the building engagement portion (**26**).

8. The cladding system (**2**) for a building according to claim **6**, wherein two or more apertures (**32***a*, **32***b*) of the projection (**30**) are elongate slots (**32***a*, **32***b*) arranged in parallel with respect to one another which further provides adjustability along the length of the slot.

9. The cladding system (**2**) for a building according to claim **2**, wherein the mounting means **16** comprises a grip means (**34**) to prevent relative movement between the different components of the mounting means **16** such as the building mounting component (**20**), the cladding-panel mounting component (**22**, **88**) and/or the intermediate mounting component (**24**), when the mounting means (**16**) or component parts thereof are assembled.

10. The cladding system (**2**) for a building according to claim **9**, wherein the grip means (**34**) comprises all or part of a surface of the projection (**30**) of the building mounting component (**20**) having a topography that can engage with all or part of a surface of the intermediate component (**24**) having a corresponding topography, or with all or part of a surface of the cladding-system mounting component (**22**) having a corresponding topography.

11. The cladding system (**2**) for a building according to claim **3**, wherein the intermediate mounting component (**24**) has a first part (**38**) for engaging with the building mounting component (**20**) and a second part **40** for engaging with the cladding-panel mounting component (**22**), wherein the first part (**38**) is arranged at 90° or approximately 90° to the second part, wherein the first part (**38**) comprises one or more apertures (**42***a*, **42***b*) to receive fixing elements (**106**) to releasably fix the intermediate mounting component (**24**) to the building mounting component (**22**) and wherein the second part (**40**) comprises one or more apertures (**46**) to receive fixing elements to releasably fix the intermediate mounting component (**24**) to the cladding-panel mounting component (**22**).

12. The cladding system (**2**) for a building according to claim **11**, wherein the two or more apertures (**42***a*, **42***b*) of the first part (**38**) are elongate slots longitudinally aligned with respect to one another such that they are arranged on the same longitudinal axis, and wherein the longitudinal axis of the elongate slots (**42***a*, **42***b*) of the first part (**38**) is arranged at 90° or approximately 90° to the longitudinal axis of the elongate slots (**32***a*, **32***b*) of the projection (**30**) of the building mounting component (**20**) in such a way that the slot's orientation provides adjustability upwards or downwards with respect to the building structure.

13. The cladding system (**2**) for a building according to claim **2**, wherein the cladding-panel mounting component (**22**, **88**) comprises a first part (**48**) comprising two or more

apertures (**52***a*, **52***b*) to receive fixing elements to releasably fix the cladding-panel mounting component (**22**, **88**) to the intermediate mounting component (**24**) and a second part (**50**) comprising a fixing means (**56**) for fixing the cladding-panel mounting component (**22**) to the cladding panel (**4**, **6**) wherein the first part (**48**) is arranged at 90° or approximately 90° to the second part, and wherein the two or more apertures (**52***a*, **52***b*) of the first part (**48**) of the cladding-panel mounting component (**22**) are elongate slots longitudinally aligned with respect to one another such that they are arranged on the same longitudinal axis.

14. The cladding system (**2**) for a building according to claim **13**, wherein when installed, the first part (**48**) of the cladding-panel mounting component (**22**) is parallel or substantially parallel with the building-engagement portion (**26**) of the building mounting component (**20**) and the longitudinal axis of the elongate slots (**52***a*, **52***b*) formed in the first part (**48**) of the cladding-panel mounting component (**22**) is aligned with the longitudinal axis of the first part (**48**) of the cladding-panel mounting component (**22**) which further provides a lateral adjustability of the cladding panel (**4**, **6**) during installation.

15. A method for cladding a building with a cladding system (**2**), wherein the method comprises:

fixing at least a mounting means (**16**) to a building structure;

installing a cladding panel (**4**, **6**, **8**) comprising a frame (**10**) and a backing member (**12**) mounted on the frame to the building structure via the mounting means (**16**); and

further providing the adjustability to the cladding panel (**4**, **6**, **8**) relative to the building structure towards or away from the building and/or upwards or downwards with respect to the building and/or laterally with respect to the building via the mounting means (**16**).

* * * * *