Figure 24 shows a perspective view of the wall panel D according to one embodiment of the present invention;

Figure 25A shows a perspective view of the floor slab panel prior to bolting according to one embodiment of the present invention;

Figure 25B shows a perspective view of the wall panel A bolted to the floor slab panel according to one embodiment of the present invention;

Figure 25C shows a perspective view of the wall panel C bolted to the floor slab panel according to one embodiment of the present invention;

Figure 25D shows a perspective view of the wall panel B bolted to the floor slab panel according to one embodiment of the present invention;

Figure 25E shows a perspective view of the wall panel D bolted to the floor slab panel according to one embodiment of the present invention;

Figure 25F shows a perspective view of the roof slab bolted to the module according to one embodiment of the present invention;

Figure 26 shows a perspective view of various modules of varied sizes that can be adjoined to one another according to one embodiment of the present invention;

Figure 27 shows a perspective view of a complete apartment made up of varied sized Solibox modules adjoined to one another according to one embodiment of the present invention;

Figures 28A and 28B are various views of a partial side cross-sectional view of two pairs of corner castings according to a further embodiment of the invention, and;

Figure 29 is an elevation cross-sectional view of two pairs of corner castings according to a further embodiment of the invention.

Detailed Description of Embodiments of the Invention

In the following description, numerous specific details are set forth in order to provide a thorough understanding of various illustrative embodiments of the invention. It will be understood, however, to one skilled in the art, that embodiments of the invention may be practiced without some or all of these specific details. It is understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to limit the scope of the invention. In the drawings, like reference numerals refer to same or similar functionalities or features throughout the several views.

It should be understood that the terms "comprising", "including", "includes" and "having" are intended to be open-ended and mean that there may be additional elements other than the listed elements. Use of identifiers such as first, second, third and fourth should not be

23 is of similar construction to the end wall panel A of Figure 21 having lower connecting portions 306C, upper connecting portions 306B, For instance, said connecting portions may be casters for engaging the adjacent panels, and/o receiving a binding member for later assembly to form a building structure. The end wall panels C of Figure 23 further include horizontal connecting edges 306D and vertical connecting edges 306A. Finally, a further longitudinal wall panel D as shown in Figure 24 includes the panel 307 with stepped peripheral edges 307A to receive connectors from corresponding panels. The final panel being the roof panel 303 includes corresponding peripheral edge 303A for connection with the various horizontal connecting edges of the wall panels.

Figures 25A to 25F show a sequential arrangement for the construction of the module according to one embodiment. Firstly, the floor panel 302 is placed followed by end walls 304 and 306. These are held in place by connecting to the roof panel 303 with all four panels now joined along the dowelled stack peripheral edges of the panels. As shown in Figure 25E and 25F, the longitudinal panels 305 and 307 are then connected to the structure to form the finished module. As the respective panels are placed, the automated bolting device may include an alignment arrangement to hold the panels in place, as the bolts are placed in the recesses located along the peripheral edges of each panel. It will be appreciated that, for bolts rather than dowels, the recesses may be threaded metal sections embedded in the precast concrete panel.

It will be appreciated that the construction of such a module may take a number of different forms in order to create modules of different size, shape and functionality.

Figures 26 and 27, for instance, show an array of modules 311 to 314 which are placed adjacent to each other and aligned through aligning connectors to form a building structure 315. To complete the construction process, a binding member is then placed at critical locations around the structure to bind the modules together to form the unitary building structure. As previously outlined, this arrangement allows for the modular formation of larger building structures. Whilst the module, according to the embodiment shown in Figures 1A and 1B, can potentially form building structures as shown in Figures 4A to 4H and 5A to 5E, equally the building module according to the embodiment shown in Figure 18 can equally form such building structures when placed accordingly and turn into a unitary building structure on coupling with a binding member.

One such binding member that can be used according to the module embodiment of Figure 18 is the connection rod as shown in Figures 8A to 8C.

As an alternative arrangement the binding member may comprise a series of anchor blocks and post-stressing cables locating at the peripheral edges of the panels of the placed modules, with anchor blocks positioned at the connections portions of the panels. For instance the corner castings may comprise end anchors arranged to resist a post-stressed cable connecting adjacent modules and binding said modules into the unitary structure. Such an arrangement is shown in Figure 29, which is alternative to the use of connecting rods as the binding member, as shown in Figure 13. For this alternative embodiment, the end connections 322 are modified to receive an anchor 321, which act to resist the post-stressing of the cable 320. Thus when the various modules have been placed and aligned, the cable is stressed so as to couple the placed discrete modules to form a unitary building structure.

Claims

1. A unitary structure defining a plurality of internal occupiable spaces, the unitary structure comprising:

a plurality of modules arranged to be adjacent to each other, each of the plurality of modules having at least one occupiable space; and

at least one binding member arranged to span across and couple adjacent modules,

wherein each of the plurality of modules further comprises a plurality of structural panels, each of the plurality of structural panels are assembled with adjacent structural panels by a plurality of mechanical connectors, and

wherein at least one edge of one module is aligned with a corresponding edge of the adjacent modules, and peripheral connection edges of said structural panels are shaped to allow a single positional engagement.

2. The unitary structure according to claim 1, wherein the plurality of structural panels comprises at least a roof panel and a floor panel.

3. The unitary structure according to claim 2, wherein the floor panel of an upper-level module is positioned on the roof panel of a lower-level module.

4. The unitary structure according to claim 2 or claim 3, wherein the binding member is arranged to couple adjacent modules on the roof panel of the module.

5. The unitary structure according to claim 3 or claim 4, wherein the binding member comprises a first rod arranged to be inserted through at least one edge of the lower-level module, and a second rod arranged to be inserted through at least one edge of the upper-level module, the first and second rods comprise an internally threaded end and an externally threaded end, the internally threaded end and the externally threaded end are arranged to be complementary with each other,

wherein the externally threaded end of the second rod is arranged to be inserted into the internally threaded end of the first rod.

6. The unitary structure according to any one of claims 1 to 5, wherein the binding member comprises an assembly of at least one tension cable and at least a pair of end anchors.

7. The unitary structure according to any one of claims 1 to 6, wherein the plurality of mechanical connectors comprises a bolt and ferrule system.

8. The unitary structure according to any one of claims 1 to 7, further comprising an interlocking plate arranged to span across and couple adjacent modules.

9. The unitary structure according to any one of claims 1 to 8, wherein peripheral edges of said panels include recesses to receive connectors along the peripheral edge.

10. The unitary structure according to any one of claims 1 to 9, wherein peripheral edges of said structural panels are stepped to receive flush edges.

11. The unitary structure according to any one of claims 1 to 10, wherein the connecting portions include casters for engaging adjacent panels and/or receiving a binding member for assembly into a building structure.

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