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(54) **A walling unit and method of forming a wall**

(57) A walling unit for forming a wall, comprising: a support member having a front surface and plurality of side surfaces for abutting, in use, adjacent walling units; and a plurality of frontal pieces, mounted on or attached to the front surface, so as to give a predetermined visual appearance from the front of the walling unit. A method

of fabricating a walling unit, comprising: providing a support member having a front surface and plurality of side surfaces for abutting, in use, adjacent walling units; and mounting on or attaching to the front surface a plurality of frontal pieces, so as to give a predetermined visual appearance from the front of the walling unit. A method of forming a wall, and a wall so formed, is also disclosed.

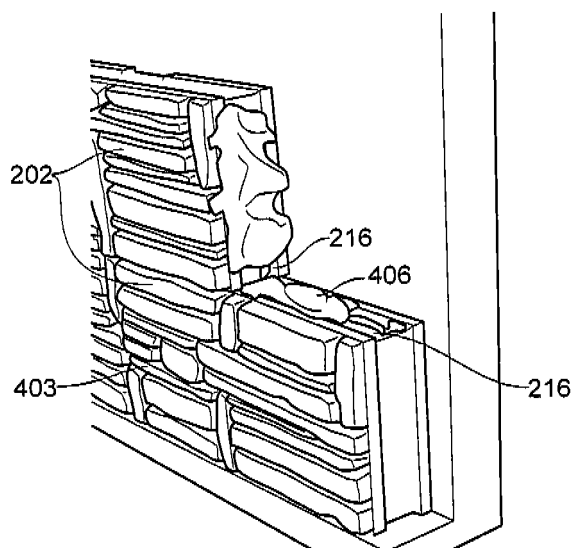


FIG. 4(e)

Description

[0001] The present invention relates to construction technologies, and more particularly to a walling unit and method of forming a wall.

[0002] It is known to construct walls using numerous methods, e.g. casting of concrete in situ, or by building up from foundations with numerous construction units (e.g. bricks or blocks) formed side-by-side and one on top of the other.

[0003] Where a wall is to be formed that is to have a particular coating or external appearance, a problem with walls constructed by bricks or blocks is that a two stage process is required - building up with wall with bricks or blocks, and then (after time to dry/cure mortar) applying the facing layer or coating to the wall. Further, existing techniques for constructing walls from units that already have a coating or pattern applied to them require that each unit is identical or, in the end result, there is a lack of matching appearance or a visible discontinuity between adjacent units.

[0004] A further problem is that in the two stage process, installation of the coated/patterned wall is time-consuming, and creation of a coated/facing layer with the appearance of a repeating pattern can be difficult or complex to accomplish.

[0005] The present invention seeks to address the aforementioned and other issues.

[0006] According to one aspect of the present invention there is provided a walling unit for forming a wall, comprising: a support member having a front surface an plurality of side surfaces for abutting, in use, adjacent walling units; and a plurality of frontal pieces, mounted on or attached to the front surface, so as to give a predetermined visual appearance from the front of the walling unit.

[0007] Preferably, the thickness of the frontal pieces is substantially less than that of the support member.

[0008] Preferably, frontal pieces nearest to said side surfaces have predetermined shapes and orientations whereby, in use when mounted in abutment, at least some of the frontal pieces have the appearance of extending continuously over adjacent walling units.

[0009] Preferably, one or more of the side surfaces have a groove therein for receiving a binder, when, in use, two walling units are placed in abutment.

[0010] Preferably, the walling unit is made of cast cement or concrete.

[0011] According to another aspect of the present invention there is provided a method of fabricating a walling unit, comprising: providing a support member having a front surface an plurality of side surfaces for abutting, in use, adjacent walling units; and mounting on or attaching to the front surface a plurality of frontal pieces, so as to give a predetermined visual appearance from the front of the walling unit.

[0012] Preferably, the thickness of the frontal pieces is substantially less than that of the support member.

[0013] Preferably, frontal pieces nearest to said side surfaces have predetermined shapes and orientations whereby, in use when mounted in abutment, at least some of the frontal pieces have the appearance of extending continuously over adjacent walling units.

[0014] Preferably, the method includes forming in one or more of the side surfaces a groove for receiving a binder when, in use, two walling units are placed in abutment.

[0015] Preferably, the walling unit is made of cast cement or concrete.

[0016] According to another aspect of the present invention there is provided a method of forming a wall, comprising: providing a plurality of walling units, the walling units being according to any of claims 1 to 6 of the appended claims; positioning a first walling unit on a base surface; applying a binder to one or more side surfaces of the first walling unit; placing a further walling units into abutment with each of the side surfaces to which the binder is applied; repeating the foregoing two steps with respect to one or more of the further walling units.

[0017] Preferably, the method comprises mounting a plurality of walling units on the base surface to form a first row, and mounting further units to form one or more successive further rows, thereby forming the wall.

[0018] According to another aspect of the present invention there is provided a wall formed by the method of claim 13 or 14 of the appended claims.

[0019] An advantage of the invention is that a wall can be built up from units such that the finished wall has its own visual appearance and the joints between units are diminished or imperceptible.

[0020] A further advantage of the invention arises from the use of abutting surfaces that provide stability of the wall while it is built up - only curing of the mortar in the joints is necessary, avoiding the additional step and time required for applying a surface pattern or relief.

[0021] Embodiments of the invention will now be described in detail, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of several stacked masters used in the process of forming walling units according to an embodiment of the invention;

Figure 2 shows views of walling units according to an embodiment of the invention, (a) perspective frontal view of an open joint between walling units, (b) two units joined and (c) three units joined side by side;

Figure 3 shows (a) a side view at the corner of one of the walling units of Fig. 2, and (b) a close up view of the side surface of the walling unit of Fig. 2, showing in more detail a grooved side surface; and

Figure 4 shows the process for forming a wall according to an embodiment of the invention (a) a perspective view of the first row of walling units, (b) and (c) illustrations of the application of mortar to horizontal and vertical side surfaces, (d) the positioning

of units, (e) the quantity of mortar used, and (f) and (g) views of a completed wall.

[0022] In the following, like references will be used to describe like elements. Unless indicated otherwise, and design feature disclosed or illustrated herein may be used in conjunction with any other design feature disclosed or illustrated herein.

[0023] Figure 1 is a perspective view of several stacked masters used in the process of forming walling units according to an embodiment of the invention. Each master 102 comprises a master support member 104 and a master frontal layer 106 of master frontal or facing elements 108.

[0024] In this embodiment, the masters 102 are rectangular, but it will be appreciated that square or elongated units may also be used. In one embodiment, the walling units have dimensions of 225x450 mm; however, it will be appreciated by persons skilled in the art that any suitable dimensions may be employed.

[0025] In each master 102, the master support member 104 is made of wood. In this embodiment, the master support member 104 is formed by bonding together three separate wood panels 103, 105, 107, as will be described in further detail hereinafter, for example using conventional wood adhesive. However, the master support members 104 may be made of unitary pieces, either of wood or any other materials suitable in construction of masters. Each master 102 has horizontal side surfaces 110 and vertical side surfaces 112. At 114 is indicated the front surface of the master support member 104, from which a master frontal element 108 is missing.

[0026] To form the master frontal layer 106 in a predetermined pattern (as viewed from the front), a number of master frontal elements (e.g. formed of stone, cast cement, clay or the like) are fixed to master support member 106, for example using adhesive suitable for masonry/wood bonding.

[0027] The master support members 104 comprise a front wood panel 103, an intermediate wood panel 105 and a rear wood panel 107. The dimensions of the front and rear wood panels 103, 107 are slightly larger (e.g. of the order 5-10mm) greater than those of the intermediate wood panel 105, so as to define an master elongate groove 116 running the length of the side surfaces 110, 112. Also provided is a master rear groove 118 in the rear panel 107, which has use, in the resulting walling unit, during wall formation.

[0028] Preferably, the masters 102 in Fig. 1 are formed as a set, so that, when assembled, they provide a predetermined, somewhat patterned, appearance when the resulting wall is viewed from the front.

[0029] As will be appreciated by persons skilled in the art, the masters 102 are used to form moulds (not shown); according to the invention, the walling units are then formed by pouring cement or concrete, or any other materials suitable in construction of structural walling, into the moulds (not shown), and allowing to mature.

[0030] Examples of the resulting walling units 202 are shown in Fig. 2.

[0031] Figure 2(a) shows a perspective frontal view of an open joint between walling units. Each walling unit 202 comprises a support member 204 and a frontal layer 206 of frontal or facing elements 208.

[0032] In this embodiment, the walling units 202 are rectangular, but it will be appreciated that square or elongated units may also be used. In one embodiment, the walling units have dimensions of 225x450 mm; however, it will be appreciated by persons skilled in the art that any suitable dimensions may be employed.

[0033] In this embodiment, the support member 204 has three different sections, corresponding to the different dimensioned wood panels 103, 105, 107 of Fig. 1, as will be described in further detail hereinafter. However, the support members 204 may be made of unitary pieces with the same outer dimension. Each walling unit 202 has horizontal side surfaces 210 and vertical side surfaces 212. An open joint 220 can be seen - the two walling units 202 are in position prior to butt jointing, as described further hereinafter.

[0034] Figure 2(b) shows two units joined at joint 220, with surfaces of the two outer sections of the support member 204 in abutment. As can be seen, due to the close abutment upon closure of the joint 220, a number of pairs (208 and 208', and 208" and 208''') have a shape and position so as to appear horizontally continuous, and the joint 220 is barely visible, as discussed further hereinafter. Figure 2(c) shows three units joined side by side, including two barely visible joints 220, 220'.

[0035] Figure 3(a) is a side view at the corner of one of the walling units 202 of Fig. 1. The support member 204 comprises a front section 203, an intermediate section 205 and a rear section 207. The dimensions of the front and rear sections 203, 207 are slightly larger (e.g. of the order 5-10mm) greater than those of the intermediate panel 205, so as to define an elongate groove 216 running the length of the side surfaces 110, 112. Also provided is a rear groove 218 in the rear panel 207, permitting the escape, during wall formation, of excess binder (mortar).

[0036] Figure 3(b) is a close up view of the side surface of the walling unit of Fig. 3(a), showing in more detail a grooved side surface 212. Also illustrated are flat or substantially flat horizontal abutment surfaces 302, 304, and vertical abutment surfaces 306, 308 of the front and rear sections 203, 207, respectively. As discussed hereinafter, these surfaces 302-308 on adjacent walling units 202 are brought into abutment during the formation of a wall.

[0037] Figure 4 shows the process for forming a wall according to an embodiment of the invention (a) a perspective view of the first row of walling units, (b) and (c) illustrations of the application of mortar to horizontal and vertical side surfaces, (d) the positioning of units, (e) the quantity of mortar used, and (f) and (g) views of a completed wall.

[0038] Referring to Fig. 4(a), a first row 402 of the wall 403, comprising three walling units 202, have been mounted on a foundation (substantially flat surface) 404. The wall 403 may be formed, as here, immediately in front of an existing wall 405 (e.g. shell of a building), or may be formed as a freestanding structural wall. As can be seen, in the grooves 216 in the walling units 202 in the first row 402, a quantity of mortar 406 is placed. This is illustrated in close up in Fig. 4(b).

[0039] The wall 403 is built up, continuing with the next row 408 of walling units 202, with mortar 406 also being placed in the grooves 226 of the vertical side surfaces 212, for binding the walling unit 202 to the next walling unit (not shown) immediately to the right in Fig. 4(c). As seen, the horizontal abutment surfaces 302, 304 of the lower walling unit abut those of the walling unit 202 immediately above. Thus, the walling units 202 are built up on top of each other, with the horizontal abutment surfaces 302, 304 providing a significant degree of stability, at least until the mortar 406 has cured.

[0040] As illustrated in Fig. 4(d), the horizontal abutment surfaces 302, 304 also permit fine correction and positioning of walling units 202 - tapping with a tool 410 enables walling units 202 to be slid into exactly the right position to achieve correct relative positions of frontal elements 208 of adjacent walling units 202.

[0041] Figure 4(e) shows the quantity of mortar used in the grooves 216, so as to be sufficient to achieve bonding of the walling units 202 and obtain a rigid, stable wall 403.

[0042] The effect of the invention may be seen in views of a completed wall in Figure 4 (f) and (g). For example, although walling units 202, 202' are separated by a join (abutting surfaces) 412, the frontal elements 208, 208' have the appearance of being continuous across the join 412. The design allows the disguising of the mortar joints vertically & horizontally. This is also illustrated by frontal elements (stones) 208" and 208"', on each side of joint 412'. The vertical placement of stones (bridging stone courses or mini jumper blocks) is more random again to help disguise where the joint is.

[0043] Horizontally, the small stone (frontal) element appears to run from one block into the other across the joint line. The effect is to "throw the eye". This is illustrated by frontal elements (stones) 208^{IV} and 208^V, on each side of joint 412".

Claims

1. A walling unit for forming a wall, comprising:

a support member having a front surface an plurality of side surfaces for abutting, in use, adjacent walling units; and
a plurality of frontal pieces, mounted on or attached to the front surface, so as to give a predetermined visual appearance from the front of

the walling unit.

2. The walling unit of claim 1, wherein the thickness of the frontal pieces is substantially less than that of the support member.

3. The walling unit of claim 1 or 2, wherein frontal pieces nearest to said side surfaces have predetermined shapes and orientations whereby, in use when mounted in abutment, at least some of the frontal pieces have the appearance of extending continuously over adjacent walling units.

4. The walling unit of any of the preceding claims, wherein one or more of the side surfaces have a groove therein for receiving a binder, when, in use, two walling units are placed in abutment.

5. The walling unit of any of the preceding claims, formed of cast cement.

6. The walling unit of any of the preceding claims, formed of cast concrete.

7. A method of fabricating a walling unit, comprising, comprising:

providing a support member having a front surface an plurality of side surfaces for abutting, in use, adjacent walling units; and
mounting on or attaching to the front surface a plurality of frontal pieces, so as to give a predetermined visual appearance from the front of the walling unit.

8. The method of claim 7, wherein the thickness of the frontal pieces is substantially less than that of the support member.

9. The method of claim 7 or 8, wherein frontal pieces nearest to said side surfaces have predetermined shapes and orientations whereby, in use when mounted in abutment, at least some of the frontal pieces have the appearance of extending continuously over adjacent walling units.

10. The method of claim 7, 8 or 9, including forming in one or more of the side surfaces a groove for receiving a binder when, in use, two walling units are placed in abutment.

11. The method of any of claims 7 to 10, wherein the support member is made of formed of cast cement or concrete.

12. The method of any of claims 7 to 11, wherein the frontal pieces are made of cast cement or concrete.

13. A method of forming a wall, comprising:

providing a plurality of walling units, the walling units being according to any of claims 1 to 6;
positioning a first walling unit on a base surface; 5
applying a binder to one or more side surfaces of the first walling unit;
placing a further walling units into abutment with each of the side surfaces to which the binder is applied; 10
repeating the forgoing two steps with respect to one or more of the further walling units.

14. The method of claim 13, comprising mounting a plurality of walling units on the base surface to form a first row, and mounting further units to form one or more successive further rows, thereby forming the wall. 15**15.** A wall formed by the method of claim 13 or 14. 20

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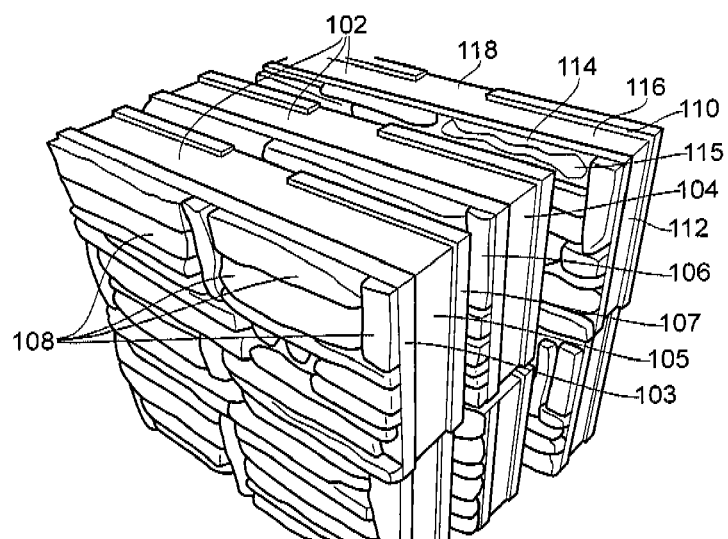


FIG. 1

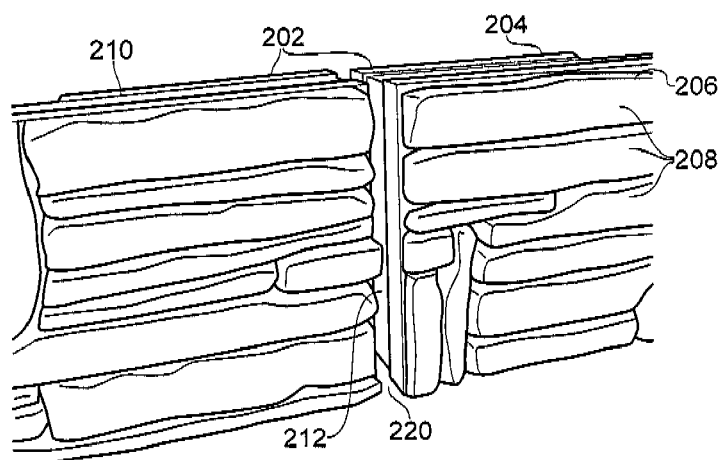


FIG. 2(a)

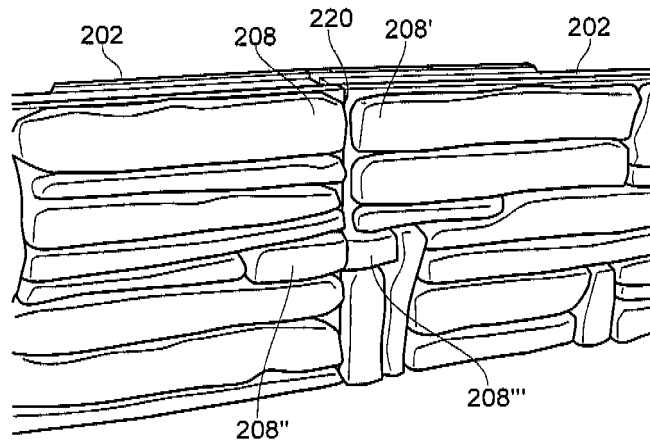


FIG. 2(b)

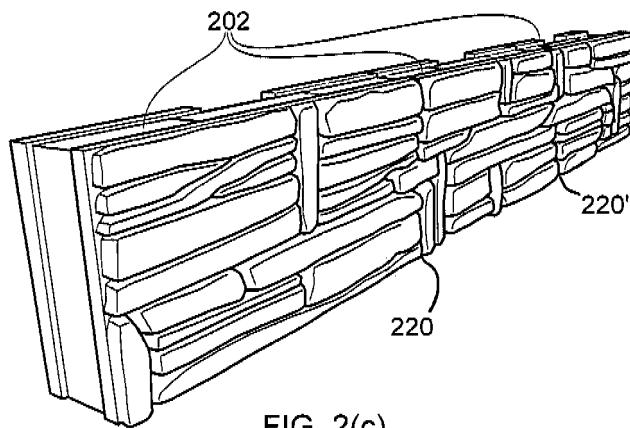


FIG. 2(c)

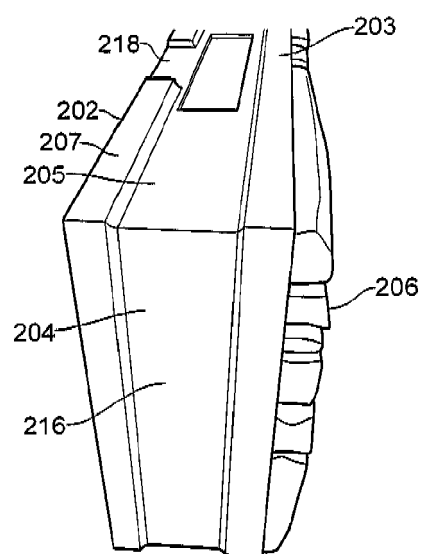


FIG. 3(a)

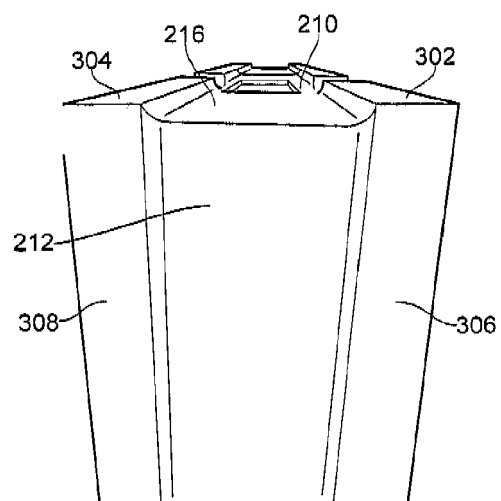


FIG. 3(b)

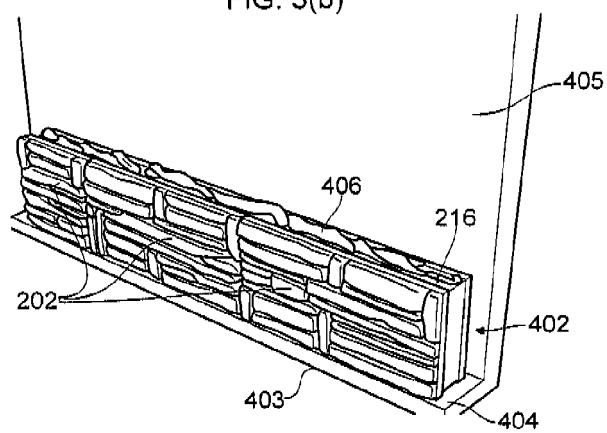


FIG. 4(a)

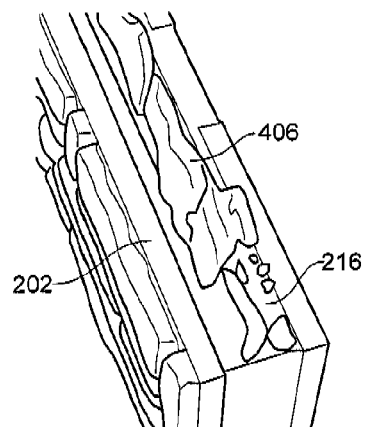


FIG. 4(b)

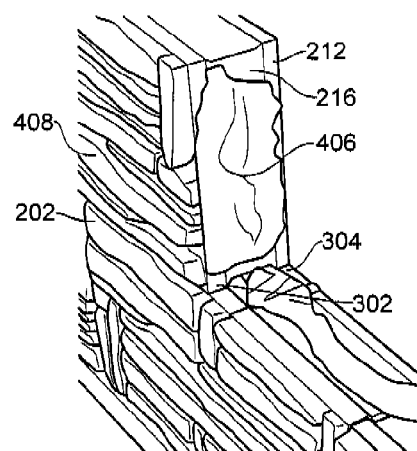


FIG. 4(c)

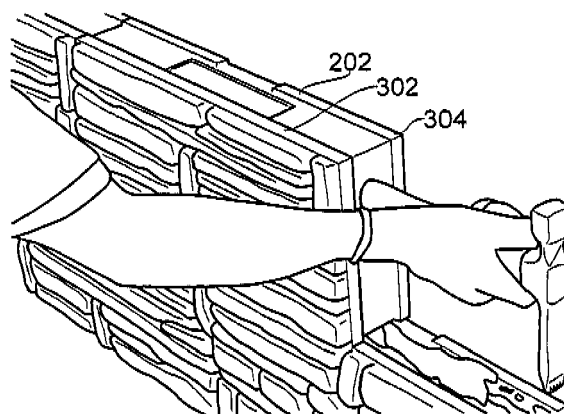


FIG. 4(d)

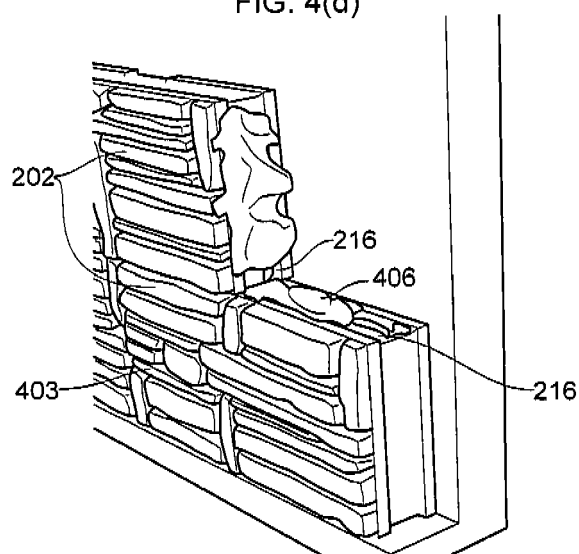


FIG. 4(e)

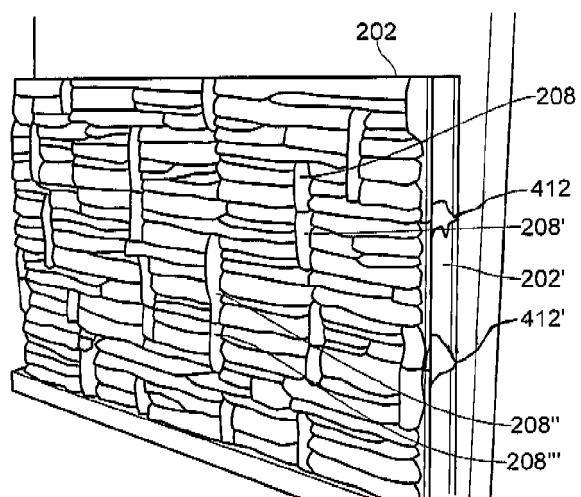


FIG. 4(f)

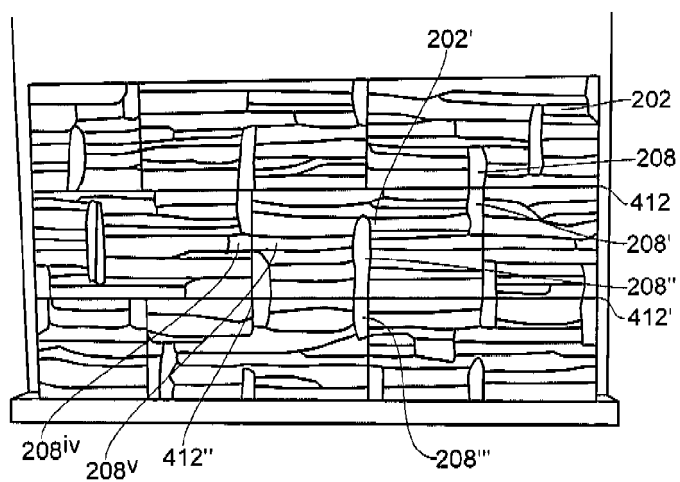


FIG. 4(g)