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PATENT REQUEST: STANDARD PATENT

We, being the persons identified below as the applicants, request the grant of a Patent to the persons identified below as the Nominated Persons, for an invention described in the standard complete specification.

Full application details follow.

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(54) Invention Title: PREFABRICATED BRICK WALLS

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ASSOCIATED PROVISIONAL APPLICATION(S) DETAILS
(60) Application No. and Date: PN0661 20 January 1995

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(62) Original application number:
    Person by whom made:

I am an opponent eligible person described in Section 33-36 of the Act.

(Complete if the specification relates to a microorganism)
For the purposes of Section 40, the specification relies on Section 6 of the Act.

JOHN REIDY MINTO and REIDY JOHN MINTO
by their Patent Attorneys
Barker Blankinship & Associates:

Julian Blankinship
Dated: 18 January 1996
A method of construction for a brick panel comprising the steps of:

a) Laying an arrangement of bricks onto a substantially planar template in the orientation required for the finished wall;

b) Placement of top and bottom plates at the top and bottom of the brickwork so arranged;

c) Introduction of a plurality of tensioning means extending from the bottom plate to the top plate through the bricks;

d) Introduction of mortar into the spaces between the bricks;

e) Cleaning of excess mortar from the brickwork structure;

f) Allowing the mortar between the bricks to set;

g) Tensioning the tensioning means so as to urge the brick courses between the top and bottom plates together;

h) Removing the finished panel from the planar surface.
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COMPLETE SPECIFICATION
FOR A STANDARD PATENT
ORIGINAL

TO BE COMPLETED BY APPLICANT

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Invention Title: PREFABRICATED BRICK WALLS

Details of Associated Provisional Application Nos: PN0661 20 January 1995

The following statement is a full description of this invention, including the best method of performing it known to me:-

PREFABRICATED BRICK WALLS

The present invention relates to prefabricated brick walls and in particular to steel reinforced brick panels and a method of construction of same.

For many years the construction of buildings utilising bricks has been extremely labour intensive and relatively expensive with constant quality control difficulties. Brickwork must first be laid with careful attention to maintenance of level and straight courses and then the mortar utilised must be either raked out or scraped off level with the brick on the face side as well as substantially cleared from the non-face side of the brickwork. Excess mortar remnants must then be cleaned from the face side of the brickwork by use of acid washing or blasting apparatus.

It is accordingly an object of the present invention to ameliorate one or more of the abovementioned disadvantages with existing bricklaying techniques or at least to provide the market with an alternative method of construction for brick structures.

According to the present invention there is disclosed a prefabricated brick panel having rigid top and bottom plates; brick courses and mortar joints interposed between such plates; multiple tensioning means extending through the bricks from the bottom plate to the top plate in order to maintain the mortar between the bricks in compression and avoid the joints between the bricks being subjected to tensional
forces; the tensioning means being anchored to each of the top and bottom plates and
having adjustment means in order to achieve the desired tension in the tensioning
means such that the top and bottom plates are urged towards each other with a pre-
determined tension.

The present invention additionally discloses a method of construction for a brick
panel in accordance with the present invention comprising the steps of:

a) Laying an arrangement of bricks onto a substantially planer template in the
orientation required for the finished wall;
b) Placement of top and bottom plates at the top and bottom of the brickwork
so arranged;
c) Introduction of a plurality of tensioning means extending from the bottom
plate to the top plate through the bricks;
d) Introduction of mortar into the spaces between the bricks;
e) Cleaning of excess mortar from the brickwork structure;
f) Allowing the mortar between the bricks to set;
g) Tensioning the tensioning means so as to urge the brick courses between the
top and bottom plates together;
h) Removing the finished panel from the planer surface.

One embodiment of the present invention will now be described with reference to the
accompanying drawings in which:
Figure I is a perspective view of a partially complete brickwork panel in accordance with the present invention in place upon a planer template and;

Figure II is a section through a finished wall of a residential dwelling utilising the prefabricated brickwork panel in accordance with figure I hereof and;

Figure III is a perspective view of an extrusion appropriate for use as a lining mount within the brickwork panel of figures I and II and;

Figure IV is a perspective view of a bottom plate suitable for use in accordance with the brickwork panel of figures I and II hereof.

Figure V is a partial section through a bottom corner of a brick panel in accordance with the present invention.

Figure I depicts a resiliently deformable rubberised template 1 laid out in a planer orientation. It will be noted that the resiliently deformable rubberised template includes raised lines 2 thereon arranged in a block pattern corresponding to that of the mortar joints in the prefabricated brick panel to be constructed.

Raised lines 2 are intended to prevent mortar introduced from above the brickwork in a “grouting” type procedure from extending all the way to the “face” side of the
brickwork adjacent the rubberised template 1 in order that the “face” side of the brickwork may have the appearance of a brick wall in which the joints have been “raked out”.

Bricks 3 are arranged on template 1 within lines 2 in a conventional pattern leaving a “toothed out” section alongside 4 in order to facilitate tying-in of the finished panel to an adjacent co-planer or angled wall in the building (not shown) to be constructed. It will be observed that the opposing side 5 of the panel depicted in this drawing not so toothed out is consequently adapted to abut a doorway or window.

The embodiment of figure 1 additionally discloses a reinforced concrete top plate 6 and an angle section extruded steel bottom plate 7. It will be observed that steel tensioning rods 8 embedded within top plate 6 extend down through the brickwork to and through the bottom plate 7. The tensioning rods 8 are threaded at their lower extremities 9 in order that nuts 10 may be run up onto same and tensioned against the bottom plate 7 in order to compress the mortar joints and brickwork of the prefabricated wall once the mortar (not shown) has set. It will be appreciated that the template 1 maintains the bricks 3 in an ordered arrangement such that the introduction of the mortar between the bricks may be done from above in much the same manner as one would “grout” a tiled floor. It should not be necessary to effect a substantial cleaning of the face surface (the underside) of the finished panel as the rubberised template 1 should prevent mortar extending onto the face side of the brickwork.
The panel of figure I additionally includes three sheet metal extrusions 11 sandwiched between the brick courses such extrusions being provided with apertures 12 in order that the tensioning rods 8 may pass there through. These extrusions 11 are intended to facilitate the fixing of internal linings to the non-face side of the brickwork whilst maintaining a cavity between the brick panel and internal lining and space for utilities such as water and power between the internal lining and the brickwork. This configuration may best be viewed from figure II. The panel of figure I is additionally provided with a secondary timber top plate 13 fixed to reinforced concrete top plate 6 in order to facilitate the nailing of trusses or other roofing structures thereto.

It will be appreciated that after construction the finished prefabricated brick panel may be lifted from template 1 and template 1 peeled away from the face of the panel to leave the finished product. The tensioning rods extending between the top and bottom plate ensure that the mortar joints and brickwork are maintained in compression in order to facilitate transport of the finished panel without the mortar joints being subject to tensional loadings which are not readily resisted by masonry structures.

With reference to figure II hereof it will be observed that the prefabricated brickwork panel 14 is erected in a vertical orientation sitting upon an appropriate recess 15 in a concrete footing 16. The prefabricated panel 14 of figure II utilises a box section
steel top plate 17 rather than the reinforced concrete top plate of figure I although presently it is considered that the concrete top plate has certain cost advantages. It will be appreciated that structural top plates of box section steel or reinforced concrete facilitate the placement of windows or doors at any point along the panel as these plates ensure that roof loadings span such windows or doors (not shown).

It will be appreciated that a concrete panel fabricated in accordance with figures I and II enables the construction of a dwelling without the necessity for an internal timber frame or second masonry wall as the internal lining 18 of plasterboard may be affixed directly to extrusions 11 and top and bottom plates 7 and 17 whilst maintaining a cavity there between. Although it is not contemplated that the present invention be restricted to single skinned brick structures with internal linings it will be appreciated that such method of construction utilising the external prefabricated brick panel 14 as part of the roof supporting structure is far more effective than the usual "brick veneer" construction wherein the internal timber frame is utilised for such purpose and the external brickwork is largely decorative rather than structural.

The rolled metal extrusions of figures III and IV are well adapted to space the internal lining 18 from the main body of the masonry panel 14 and the plasterboard lining 18 may be glued and/or screwed to the internal flanges 19 of such extrusions.

Buildings constructed utilising brick panels in accordance with the present invention have enhanced cyclone resistant characteristics as the tensioning means enable roof
structures to be readily tied into wall structures adjacent the top plate whilst ensuring that upward roof loadings such as may be experienced under cyclone conditions are distributed over the entire height of the wall whilst avoiding any tensional loadings on mortar joints.

Figure V discloses in partial section a brick panel 14 erected upon a concrete footing 16. It will be noted that the bottom course of bricks include hollow cavities 20 through which a height adjustable foot 21 passes. The foot comprises internally threaded fixed portion 22 sandwiched between the bottom two courses 23 and 24 of brickwork in the panel and a movable slab contacting bolt portion 25. It will be appreciated that after the panel is erected it will need to be aligned with adjacent panels and if the concrete footing 16 is not perfectly level bolt portion 25 may be unscrewed or screwed into internally threaded fixed portion 22 in order to achieve a perfect match of panels. It should be appreciated that adjacent panels will have toothed out sections which will need to mate with each other.

The panel described herein with reference to figures I, II, III, IV and V is intended for use in single masonry skinned structures where the external appearance required is that of raked brickwork. Raised lines 2 in the template may however be omitted where flush mortar joints are required although it is then necessary to provide alternate means for accurately locating the bricks in an ordered fashion on the template in order to achieve consistent joint spacings. The template which achieves
uniform spacing of the bricks may however be incorporated in the mechanical equipment which places the bricks on the planer surface prior to grouting.

Prefabricated panels in accordance with the present invention may also be utilised in relation to conventional brick veneer or double brick structures although the cost advantages in such instances may be less than when the system facilitates direct affixation of linings as described with reference to figure II hereof.
The claims defining the invention are as follows:

1. A method of construction for a brick panel comprising the steps of:
   a) Laying an arrangement of bricks onto a substantially planar template in the orientation required for the finished wall;
   b) Placement of top and bottom plates at the top and bottom of the brickwork so arranged;
   c) Introduction of a plurality of tensioning means extending from the bottom plate to the top plate through the bricks;
   d) Introduction of mortar into the spaces between the bricks;
   e) Cleaning of excess mortar from the brickwork structure;
   f) Allowing the mortar between the bricks to set;
   g) Tensioning the tensioning means so as to urge the brick courses between the top and bottom plates together;
   h) Removing the finished panel from the planar surface.

2. A method of construction for a brick panel in accordance with the steps listed in claim 1 wherein the template includes raised sections corresponding to the brick joints in order to impart a raked out appearance to the external face of the resulting brick panel.

3. A method of construction in accordance with claim 1 hereof wherein the template is fabricated from resiliently deformable thermoplastic material.
4. A method of construction for a brick panel in accordance with claim 1 hereof wherein the bottom plate is provided with height adjustable feet in order to facilitate levelling of the panel in its installed position.

5. A method of construction for a brick panel in accordance with claim 1 hereof wherein the height adjustable feet comprise a fixed internally threaded portion built into the bottom course of brickwork comprising the panel and an externally threaded ground contacting bolt portion adapted to be received in the said fixed portion and to protrude an adjustable distance beneath the bottom course of brickwork for supporting same.

6. A method of construction for a brick panel comprising the steps of:

   a) Laying an arrangement of bricks onto a planer surface in the orientation required for the finished wall;

   b) Placement of top and bottom plates at the top and bottom of the brickwork so arranged;

   c) Introduction of a plurality of tensioning means extending from the bottom plate to the top plate through the bricks;

   d) Introduction of internal lining locating and fixing surfaces at least partially into the selected joints between the brickwork;
e) Introduction of mortar into the spaces between the bricks in such a manner as to permanently locate the internal lining locating and fixing surfaces to the panel;

f) Cleaning of excess mortar from the brickwork structure;

g) Allowing the mortar between the bricks to set;

h) Tensioning the tensioning means so as to urge the brick courses between the top and bottom plates together;

i) Removing the finished panel from the planar surface.

7. A method of construction for a brick panel in accordance with claim 5 hereof wherein the internal lining locating and fixing surfaces are of a length such that they may extend horizontally across at least a substantial percentage of the total width of the panel and have a profile including a planar internal lining fixing surface parallel to the plane of the intended internal lining.

8. A method of constructing a panel in accordance with any one of claims 5 or 6 hereof wherein the internal lining locating and fixing surfaces have a profile such that the portion thereof which spans the cavity slopes downwardly from the internal lining fixing position to the brickwork to facilitate drainage.
9. A method of constructing a panel in accordance with any one of claims 5 or 6 hereof wherein one internal lining locating and fixing surface is provided adjacent the bottom course of brickwork comprising the panel and is integral with the bottom plate of the panel which also serves as a damp course.

10. A method of constructing a panel in accordance with any one of claims 5 to 7 hereof wherein there are apertures in the internal lining locating and fixing surfaces so as to facilitate passing of services down the cavity.

11. A method of construction of a brick panel in accordance with any one of the preceding claims wherein mortar is introduced into the internal cavities of the bricks through which the tensioning means pass.

12. A method of construction of a brick panel in accordance with claim 3 wherein spacing means are included between the tensioning means and the internal surfaces of the brickwork in order to ensure at least ten millimetres of mortar coverage between the tensioning means and the internal surfaces of the brickwork.

13. A method of construction of a brick panel in accordance with any one of the preceding claims wherein the tensioning means comprise mild steel rods.
14. A method of construction of a brick panel in accordance with claim 5 wherein the top plate comprises a steel reinforced concrete beam with the tensioning means extending into the concrete beam and the concrete beam being poured after placement of the tensioning means therein.

15. A method of construction of a brick panel in accordance with claim 6 wherein the tensioning means are steel rods and the steel rods are locked against reinforcing rods comprising the reinforcement for the top plate.

16. A brick panel when constructed in accordance with any one of the preceding claims.

DATED this 18 January 1996.

JOHN RENDYL MINTO and
RENDYL JOHN MINTO
by their Patent Attorneys
Barker, Blenkinship & Associates
A pretensioned brick panel construction method comprising the steps of:

a) Laying an arrangement of bricks onto a substantially planer template in the orientation required for the finished wall;

b) Placement of top and bottom plates at the top and bottom of the brickwork so arranged;

c) Introduction of a plurality of tensioning means extending from the bottom plate to the top plate through the bricks;

d) Introduction of mortar into the spaces between the bricks;

e) Cleaning of excess mortar from the brickwork structure;

f) Allowing the mortar between the bricks to set;

g) Tensioning the tensioning means so as to urge the brick courses between the top and bottom plates together;

h) Removing the finished panel from the planer surface.