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A brick

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ABSTRACT

A brick 10 including a generally planar front wall 11, a pair of generally parallel end walls 13, 14, a rear wall 12, and top and bottom faces 15. The brick 10 has general length, width and height dimensions of about 230mm by 110mm by 76 to 162mm. The rear wall 12 is defined by a pair of first portions 16, 17 that extend from the end walls 13, 14, a pair of inwardly extending portions 10, 19, each of which extends from a respective one of the first portions 16, 17, inwardly toward the front wall 11, and an intermediate portion 22 that extends generally parallel to the front wall 11 between the inwardly extending portions 18, 19. The width dimension between the front wall 11 and the intermediate portion 22 being in the range of between 80mm to 100mm.

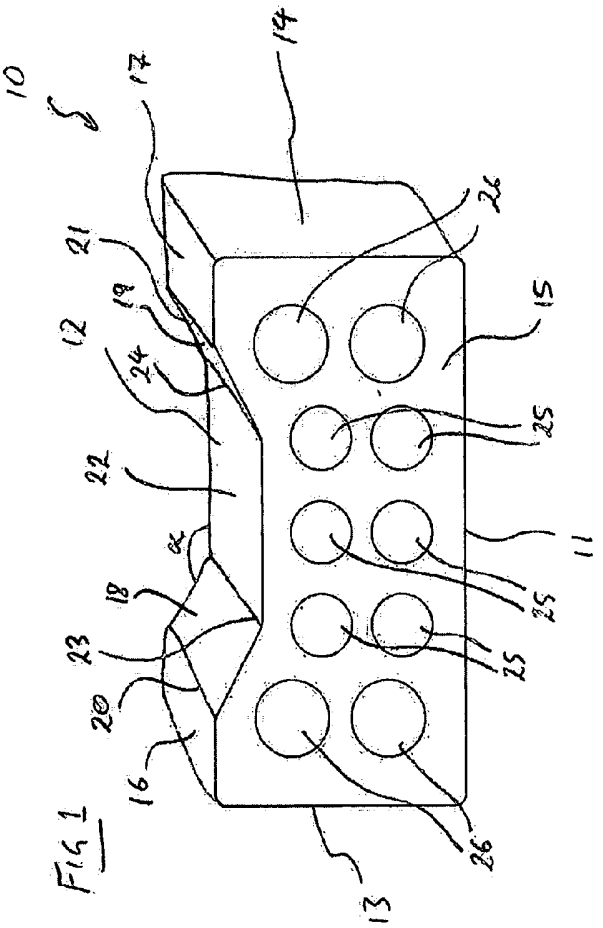

FIG 1

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Section 29

AUSTRALIA
Patents Act 1990

INNOVATION PATENT SPECIFICATION

Invention Title: **A BRICK**

Applicant: **Austral Bricks (QLD) Pty Ltd**

The invention is described in the following statement:

7019

A BRICK

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Field of the Invention

The present invention relates to a brick for use in the construction of walls, such as for buildings or fences. The present invention has been developed principally in relation to clay bricks for domestic houses and fences, and while it will be convenient to describe the invention in relation to that application, it should be appreciated that the invention could apply to bricks used for other purposes, such as for foundations formed from materials other than clay, for example from cement or calcium silicate.

Background of the Invention

A reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or matter was, in Australia, known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

Bricks for domestic walls and fences are predominantly manufactured having the dimensions 230mm by 110mm by 76mm. Bricks of this size are generally laid manually by bricklayers. The bricklayer lays bed of mortar on a previously laid course of bricks and lays each new brick individually to create a new brick course. Typically the bricklayer selects each new brick from a stack of bricks which has been placed nearby. Each brick typically has a weight of between 2.5 and 4 kilograms.

A typical wall or fence can comprise thousands of bricks. Accordingly, the number of bricks a bricklayer will handle to construct a wall or fence is significant and can contribute to fatigue or injury if incorrect handling techniques are adopted.

The dimensions of a brick can contribute to the ease or otherwise of handling the brick. Often a bricklayer will grip the brick across the width dimension of 110mm for moving the brick from the brick stack to the wall or fence being constructed. While this dimension is small enough to enable a bricklayer to pick up a brick, the dimension is nevertheless often too large for comfortable handling, particularly for bricklayers with smaller hands and particularly as a day of bricklaying wears on. Hand strain can be a significant problem for bricklayers and severe hand strain can require a bricklayer to take time off for recovery.

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German patent publication 102006028840 describes a brick that is used for creating a non-load bearing brick veneer. The brick is intended to be laid closely adjacent insulation located in the wall cavity of which the brick veneer is to cover. The brick includes a recess into which the fingers of a bricklayer can extend in order to protect the fingers and back of the hand during laying from engagement with the insulation of the wall cavity, or with the wall itself. Several different recess shapes are disclosed.

The manufacture of bricks is also an energy intensive process, principally during the firing part of the process. Temperatures for firing can be in the region of 1000°C. For some clay bricks a temperature in excess of 1000°C is required. When it is understood that the firing time can be up to 40 hours, the energy to produce the extreme temperatures required is significant. Energy is also required for drying the bricks, which occurs prior to firing. While the temperatures required for drying are less than those required for firing, drying temperatures in excess of 200°C are not uncommon.

Summary of the Invention

The present invention provides a brick including a generally planar front wall, a pair of generally parallel end walls which extend substantially perpendicular to the front wall, a rear wall, and top and bottom faces, the brick having general length, width and height dimensions of about 230mm by 110mm by 76mm to 162mm, the rear wall being defined by a pair of first portions that extend from the end walls, a pair of inwardly extending portions each of which extends from a respective one of the first portions, inwardly toward the front wall, and an intermediate portion that extends generally parallel to the front wall between the inwardly extending portions, the dimension between the front wall and the intermediate portion being in the range of between 70mm to 100mm.

The position of the intermediate portion being closer to the front wall than the first portions provides a number of advantages over bricks that have substantially parallel front and rear walls, ie that are substantially rectangular. A principle advantage resides in the dimensions of the brick that enable better handling of the brick by bricklayers. The reduced width of the brick between the intermediate portion and the front wall allows a bricklayer to more easily grip the brick, additionally with less

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likelihood of hand strain, so that there is less likelihood of fatigue or workplace injury. Also, the reduced width of the brick reduces the weight of the brick which again contributes to a potential reduction in fatigue or workplace injury. The quality of the bricklaying might also be improved as the bricklayer is subject to reduced fatigue. This has more of a consequence as the day goes on than at the start of the day. In addition, the advantages can contribute to faster construction.

In addition, while the above advantages are provided because the intermediate portion is closer to the front wall, the brick nevertheless has most of the characteristics of a standard sized brick having the dimensions 230mm by 110mm by 76mm, which is of benefit for other reasons. For example, corners of buildings and fences are easier to construct with bricks that have the 110mm width dimension as compared to bricks that have a smaller width dimension, to maintain a consistent bond pattern. Thus in a brick according to the present invention, the benefits of 110mm width bricks are largely maintained with the benefits of a 90mm width gripping portion introduced.

The dimension between the front wall and the intermediate portion can be anywhere in the range of between 80mm to 100mm, such as in the range of 85mm to 95mm. In one form of the invention which has been tested to date, it can be about 90mm ±2mm.

The inwardly extending portions can extend perpendicular to the front wall, or they can extend at an incline. Where they extend at an incline, they can extend in an inclined direction away from the end walls. The inwardly extending portions can each extend at the same angle or at differing angles.

In some arrangements, the inwardly extending portions extend at an angle of between 20° to 40° to horizontal, such as between 25°to 35°. In one form of the invention which has been tested to date, the inwardly extending portions extend at an angle of about 27°.

The intermediate portion can be of any suitable dimension between the end walls. The dimension between the end walls can be anywhere in the range of between

60mm to 100mm, such as in the range of 75mm to 90mm. In one form of the invention which has been tested to date, it can be about 83mm ±2mm.

While solid bricks can be provided, the brick can include one or more cores that extend through the brick from the top face through to the bottom face. The cores can be of any suitable shape. The cores can be of the same shape or they can be of different shapes. In some arrangements, a plurality of circular cores can be provided to extend through the brick. In that arrangement, the cores can be the same diameter or of different diameter. In some arrangements, a plurality of a first size of cores can be positioned approximately between the intermediate portion and the front wall and a plurality of a second size of cores can be positioned approximately between the first portions and the front wall. For each of the first and second size of cores, there can be an overlap with the inwardly extending portions, particularly when those portions are inclined rather than perpendicular to the front wall.

In some arrangements, the diameter of the cores can be approximately 28mm. In other arrangements, the diameter of the cores can be approximately 34mm. In some arrangements, the first size of cores which are positioned approximately between the intermediate portion and the front wall have a diameter of approximately 28mm, while second size of cores which are positioned approximately between the first portions and the front wall have a diameter of approximately 35mm.

In some arrangements, there are six of the first size of cores provided in two rows generally parallel to the front wall, and there are four of the second size of cores, two each of which are positioned adjacent each end wall, approximately parallel thereto.

While circular cores have been described above, it is to be appreciated that cores of different shapes can be employed. For example, the cores can have a shape which comprises a pair of parallel side walls and pair of curved end walls, or the cores can be oval or any other suitable shape. The cores can be elongate, and can be aligned to extend generally parallel to the length of the front wall or generally parallel to the length of the end wall. Alternatively, the cores can extend at transverse or perpendicular orientations to each other.

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In addition to the workplace benefits described for bricklayers, advantages provided by the invention can include a reduction in the weight of the brick by reduced material volume. In bricks which have been tested to date, a reduction of 37% has been made in the volume of brick material necessary to manufacture a brick when compared to a solid brick of the same external dimensions, while the weight of the brick has also been reduced. This latter consequence provides further workplace benefits in the manual handling of bricks by bricklayers as described above.

In addition, a reduction in the weight of a brick has benefits in relation to the transport of bricks from the manufacturing site to the construction site. In effect, the load to be carried is lighter and therefore there is a reduction in the energy for brick transport.

Further advantages provided by the invention reside in the reduction of the material required to manufacture the brick as well as a reduction in the drying and firing time required to manufacture the brick. By reducing the amount of material for the brick, various financial and environmental savings are made, while a reduction in drying and firing time reduces energy involved in producing the intense heat required for each activity. The benefits include:

- Less energy /per brick is required for the forming process of clay
- Less energy /per brick is required for the mining process of clay
- Less water /brick required for the brick forming process

For a better understanding of the invention and to show how it may be performed, embodiments thereof will now be described, by way of non-limiting example only, with reference to the accompanying drawing.

Brief Description of the Drawings

Figure 1 is a perspective view of a brick according to one embodiment of the invention.

Detailed Description of the Invention

Figure 1 illustrates a brick 10 which is of generally standard external dimensions of 230mm by 110mm by 76mm. The brick 10 has a front wall 11 (facing down in Figure 1), a rear wall 12, and end walls 13 and 14. The brick 10 has top and bottom faces, but only the top face 15 is visible in Figure 1. Each of the end walls 13 and 14, and

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the top and bottom faces are generally parallel. Each of the front wall 11, the end walls 13 and 14, and the top and bottom faces are generally planar.

The rear wall 12 is formed of by a pair of first rear wall portions 16, 17, that extend from the end walls 13, 14. The first portions 16, 17 extend substantially parallel to the front wall 11. The rear wall 12 further includes a pair of inwardly extending portions 18, 19, each of which extends from a respective edge 20, 21 of one of the first portions 16, 17, inwardly toward the front wall 11. The inwardly extending portions 16, 17 are inclined at an angle α of about 153°, so that the internal angle is about 27°. Each of the inwardly extending portions 16, 17 is inclined to the same amount.

An intermediate portion 22 extends generally parallel to the front wall 11 between the inwardly extending portions 18, 19 from respective edges 23, 24. The intermediate portion 22 is spaced from the front wall 11 about 90mm. The intermediate portion 22 has a dimension between the edges 23 and 24 of the end walls 13, 14 of about 83mm.

The brick 10 includes a plurality of circular cores that extend through the brick 10, from the top face 15 to the bottom face. In the arrangement illustrated, there are six cores 25 of a first size provided in two rows generally parallel to the front wall 11, and there are four of the second size of cores 26, two each of which are positioned adjacent each end wall 13,14, approximately parallel thereto. The cores 25 have a diameter of about 28mm, while the cores 26 have a diameter of about 35mm.

The core pattern is considered unique and has been found to be effective for compressive strength. That is, the compressive strength of the brick was maintained at required level although weight reduction and ease of handling was achieved.

It will be readily appreciated that a bricklayer could grip the brick 10 between the intermediate portion 22 and the front wall 11. By gripping the brick 10 at that position, the strain placed on the bricklayer's hand is reduced compared to a brick in which the width between the front wall and the rear wall is constant at 110mm. In addition, by arranging the rear wall 12 in the manner shown, or in the manner described earlier, a reduction in the weight of the brick 10 is realised, with resulting benefits being provided as discussed earlier in relation to injury and fatigue reduction for bricklayers,

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faster construction, as well as environmental benefits relating to reduction in materials and energy consumption.

The invention described herein is susceptible to variations, modifications and/or additions other than those specifically described and it is to be understood that the invention includes all such variations, modifications and/or additions which fall within the spirit and scope of the above description.

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CLAIMS:

1. A brick including a generally planar front wall, a pair of generally parallel end walls which extend substantially perpendicular to the front wall, a rear wall, and top and bottom faces, the brick having general length, width and height dimensions of about 230mm by 110mm by 76 to 162mm, the rear wall being defined by a pair of first portions that extend from the end walls, a pair of inwardly extending portions, each of which extends from a respective one of the first portions inwardly toward the front wall, and an intermediate portion that extends generally parallel to the front wall between the inwardly extending portions, the width dimension between the front wall and the intermediate portion being in the range of between 80mm to 100mm.

2. A brick according to claim 1, the width dimension between the front wall and the intermediate portion being 90mm ±2mm.

3. A brick according to claim 1 or 2, the intermediate portion being positioned substantially centrally of the rear wall and having a length dimension of about 83mm ±2mm.

4. A brick according to any one of claims 1 to 3, the inwardly extending portions being inclined to extend inwardly away from the end walls and extending at an angle to horizontal of about 27°.

5. A brick according to any one of claims 1 to 4, including a plurality of cores that extend through the brick from the top face through to the bottom face, the cores including a first size of cores positioned approximately between the intermediate portion of the rear wall and the front wall and a plurality of a second and larger size of cores positioned approximately between the first portions of the rear wall and the front wall.

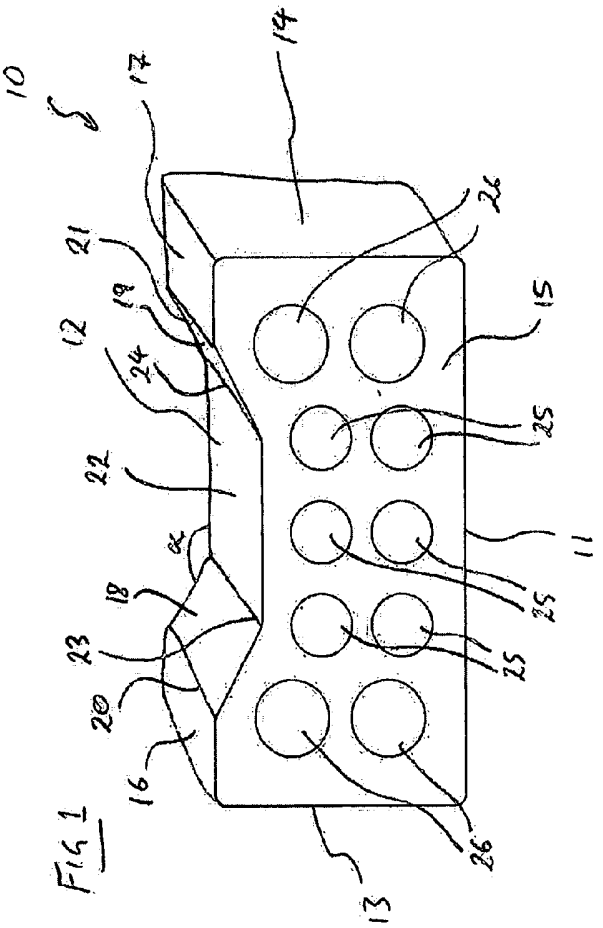

FIG 1