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Insulating Wall Panel

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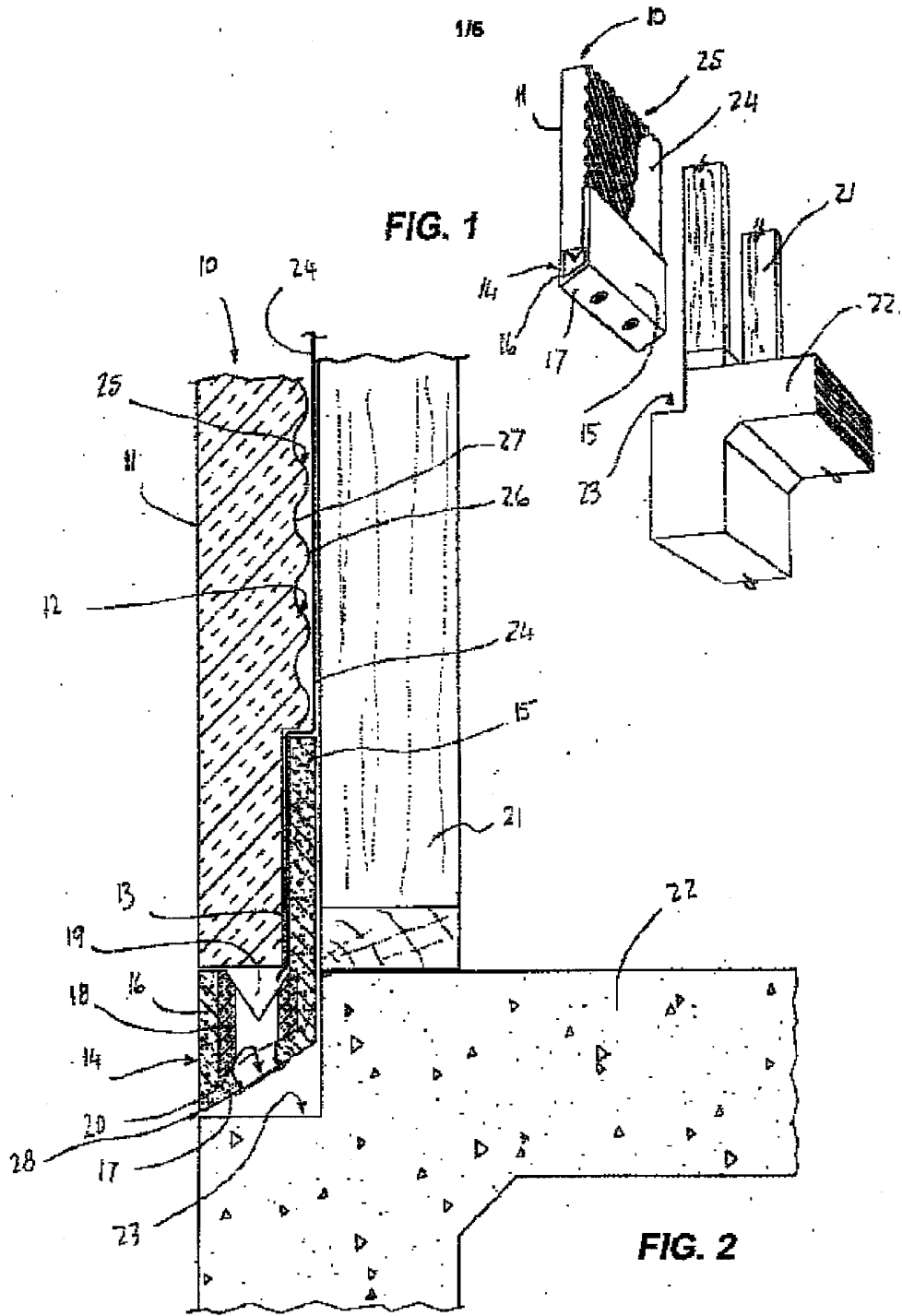
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## ABSTRACT

An insulating wall panel (10) comprises a rectangular sheet of EPS having a generally flat surface on one side (11) and a series of parallel corrugations (25) on the other side. The corrugations run diagonally on said other side whereby any moisture that penetrates or collects on the inside of the panel is able to drain to the bottom of the panel in the troughs of the corrugations. Either a base block (14) or a channel (31) collects any water which is exited to the front of the panel via apertures (20) or (35), respectively.



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Invention: INSULATING WALL PANEL

Details of Associated Provisional Patent Application: 2007902492

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

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## INSULATING WALL PANEL

### Field of the Invention

The present invention relates to an insulating wall panel and more particularly to an insulating wall panel constructed to facilitate moisture drainage and aeration in a wall structure.

### Background of the Invention

In more recent times the traditional double brick and brick veneer building construction has, in many instances, been replaced by lightweight external cladding systems. Such systems are particularly prevalent in second storey construction where legislation concerning safe working heights and scaffold load requirements for heavy bricks and concrete blocks has rendered the traditional systems inefficient.

Lightweight external cladding systems comprise reinforced expanded polystyrene sheets (EPS) which are fixed directly on to a building frame. The sheets are available in various thicknesses such as 50 mm, 75 mm and 100 mm for example, and are reinforced and pre-coated externally with AR/FG mesh and a polymer render coating, respectively. Unlike conventional brick veneer construction there is no air gap between the external wall (polystyrene sheets) and the building frame and therefore any moisture that penetrates to the inside of the sheets is unable to escape or evaporate and can cause problems such as rotting of timber frames, resulting of metal frames and deterioration of the sheets and/or internal wall surfaces. Water penetration can occur at poorly or unsealed wall openings such as window frames.

In view of the above it is an object of the present invention to provide an improved insulating wall panel and a lightweight wall construction that overcomes or reduces the aforementioned problems of moisture/water retention.

### Summary of the Invention

Accordingly the invention provides an insulating wall panel comprising a sheet of EPS or like insulating material having a generally flat surface on

one side and having parallel ridges and troughs extending across the surface of the other side to form a corrugated surface.

Preferably said sheet is rectangular and said ridges and troughs (corrugations) are disposed diagonally on said other side, said other side being the inside in use.

#### **Brief Description of the Drawings**

In order that the invention may be more readily understood particular embodiments will now be described with reference to the accompanying drawings wherein:

Fig. 1 is an exploded perspective view of part of a building wall incorporating a wall panel according to the invention;

Fig. 2 is an end view, on an enlarged scale, of the wall shown in Fig. 1;

Fig. 3a is an exploded perspective view, from the opposite side, of the wall panel and base block shown in Fig. 1;

Fig. 3b is an enlarged perspective view of the panel and base block of Figs. 1 and 3a;

Figs. 4 – 6b correspond with the respective figures 1 – 3b but show an alternative embodiment of the wall panel which eliminates the need for the base block of the first embodiment; and

Fig. 7 is a perspective rear view of a wall panel similar to that of Figs. 4 – 6b showing an alternative channel adjacent the bottom of the panel.

#### **Detailed Description of the Preferred Embodiments**

Referring now to the embodiments of Figs. 1 – 3b there is shown a wall panel 10 which is essentially a pre-coated and reinforced EPS sheet 1200 mm x 2400 mm and of a thickness which may be 50 mm, 75 mm or 100 mm. Clearly of course the sheet could be manufactured in other sizes. Although it is not evident in the drawings the outside 11 of the sheet, in use, is coated with a polymer render coating and reinforced AR/FG mesh. The inside 12 of the sheet, in use, has a corrugated surface comprising a series of parallel ridges 26 and troughs 27 which run diagonally down the sheet as is more clearly evident in Figs. 1 and 3b. Again, although it is not evident

from the drawings the inside surface 12 of the sheet or panel is coated with a waterproof coating. The bottom edge of the panel has a rebate 13 extending therealong.

5 The panel 10 according to the embodiment of Figs. 1- 3b is preferably used in conjunction with a base block 14 formed from cement render and adapted to provide a sealed and level edging so that the wall panel 10 is not exposed to the elements. The base block 14 also prevents moisture ingress near ground level. As is evident in the drawings the base block is essentially a U-shaped channel having one side 15 extending to a greater height than  
10 the opposite side 16. The bottom 17 is inclined and an EPS insert 18 is located in the base block 14 and has a V-shaped channel 19 with drainage holes 20 extending through the bottom 17. The insert 18 is coated to provide waterproofing.

Figs. 1 and 2 show a wall construction using the wall panel 10 and  
15 base block 14. A conventional timber frame 21 is fixed to a concrete floor slab 22 having a perimeter rebate 23. In order to construct an external wall on the timber frame, firstly insulating paper 24 is fixed to the outside of the timber frame. Lengths of base block 14 are fixed to the frame along the bottom of the wall to provide a level edging and the base block 14 is fixed by  
20 means of nails or screws (not shown) into the timber frame 21. The insulating paper 24 is folded to extend over the side 15 of the base block 14 and into the V-shaped channel 19. Once the base block 14 is attached along the wall and the paper 24 is in place wall panels 10 are fixed to the timber frame by screwed fasteners (not shown) in the manner shown. As is evident  
25 the rebate 13 on the panel 10 accommodates the side 15 of the base block 14 so that the outside 11 of the panel is flush with the outside of the side 16 of the base block. The corrugations of the wall panel 10 are arranged on the inside so that gaps exist when the ridges 26 contact the timber frame 21.

The base blocks 14 are attached to the timber frame in a manner  
30 ensuring a small gap 28 along the bottom edge of the base block 14 at the rebate 23 of the floor slab 22. As will be evident any moisture or water that reaches the inside of wall panel 10 due to leakage at window frames and the

like will run down the corrugations 25 and meet the paper 24 at the top edge of the side 15 of the base block 14. The water then runs down the paper and into the V-shaped channel 19 of the base block 14 where it exits through the drainage holes 20 onto the concrete slab and out via the gap 28. The corrugations also provide an air space behind the wall panel 10 to allow some air circulation between the panel and the paper 24. The drainage holes 20 preferably have vents 29 inserted in the bottom thereof for the purpose of preventing vermin from entering the space between the wall panel and the timber frame.

Whilst the corrugations 25 are shown to extend diagonally across the inside 12 of the wall panel 10 they could also extend vertically although the diagonal direction provides a more suitable interface between the panel and the timber frame.

Reference should now be made to Figs. 4 – 6b of the drawings wherein an alternative embodiment of the wall panel 10 is shown. The wall panel 30 of this embodiment is similar to the wall panel 10 of the first embodiment but differs only in that instead of a rebate 13 along the bottom edge a channel 31 extends across the bottom of the panel 30 a short distance above the bottom edge 32 of the panel. The channel 31 has upwardly inclined sides 33. The base 34 of the channel 31 (which extends vertically in use) is provided with space apertures 35 which extend through the panel to allow water collected in the channel 31 to exit to the outside of the building wall. The apertures 35 may be provided with inserts 36 which again serve to prevent vermin from entering the inside of the wall panel.

The panel 30 shown in Fig. 7 is very similar to that shown in Figs. 4 - 6b with the exception that the channel 31 is inclined downwardly from each end to the centre 37 so that moisture is collected at the point of exit via insert 36.

As is evident in Figs. 4 and 5 the paper 24 is arranged at its bottom edge to terminate in the channel 31 so that water that flows down the corrugations 25 is caused to flow into the channel 31 and thereafter through the apertures 35 to the outside of the wall.



As mentioned above, the corrugations 25 may extend vertically, near vertically or on an incline as shown in the above described embodiments. Whilst the corrugations are shown as uniform ridges 26 and troughs 27 other cross-sectional shapes may be used without departing from the spirit and scope of the invention.

Since modifications within the spirit and scope of the invention may be readily effected by persons skilled in the art, it is to be understood, that the invention, is not limited to the particular embodiments described by way of example, hereinabove.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An insulating wall panel comprising a sheet of EPS or like insulating material having a generally flat surface on one side and having parallel ridges and troughs extending across the surface of the other side to form a corrugated surface.

2. An insulating wall panel as defined in claim 1, wherein said sheet is rectangular and said ridges and troughs (corrugations) are disposed diagonally on said other side, said other side being the inside in use.

3. An insulating wall panel as defined in claim 2, wherein said one side has a polymer render coating and AR/FG mesh reinforcing.

4. An insulating wall panel as defined in claim 3, wherein said other side is coated with a moisture barrier preventing moisture from penetrating said EPS.

5. An insulating wall panel as defined in claim 4, wherein said corrugations are angled diagonally such that when said sheet is in use with opposed edges arranged vertically and horizontally, respectively, said corrugations are at an acute angle to the vertical sides, that is, more vertically oriented than horizontally oriented, so that water/ moisture will more easily run downwardly in the troughs.

6. An insulating wall panel as defined in any one of the preceding claims, wherein said panel has a groove on said other side extending across the panel adjacent to, and spaced from, the bottom edge, said groove having drainage holes allowing water to escape from the inside of said panel.

7. An insulating wall panel as defined in any one of claims 1 to 5, wherein said panel has a rebate on said other side extending along the bottom edge.

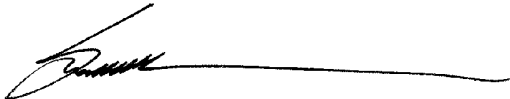
5 8. An insulating wall panel substantially as hereinbefore described with reference to any of the embodiments shown in the accompanying drawings.

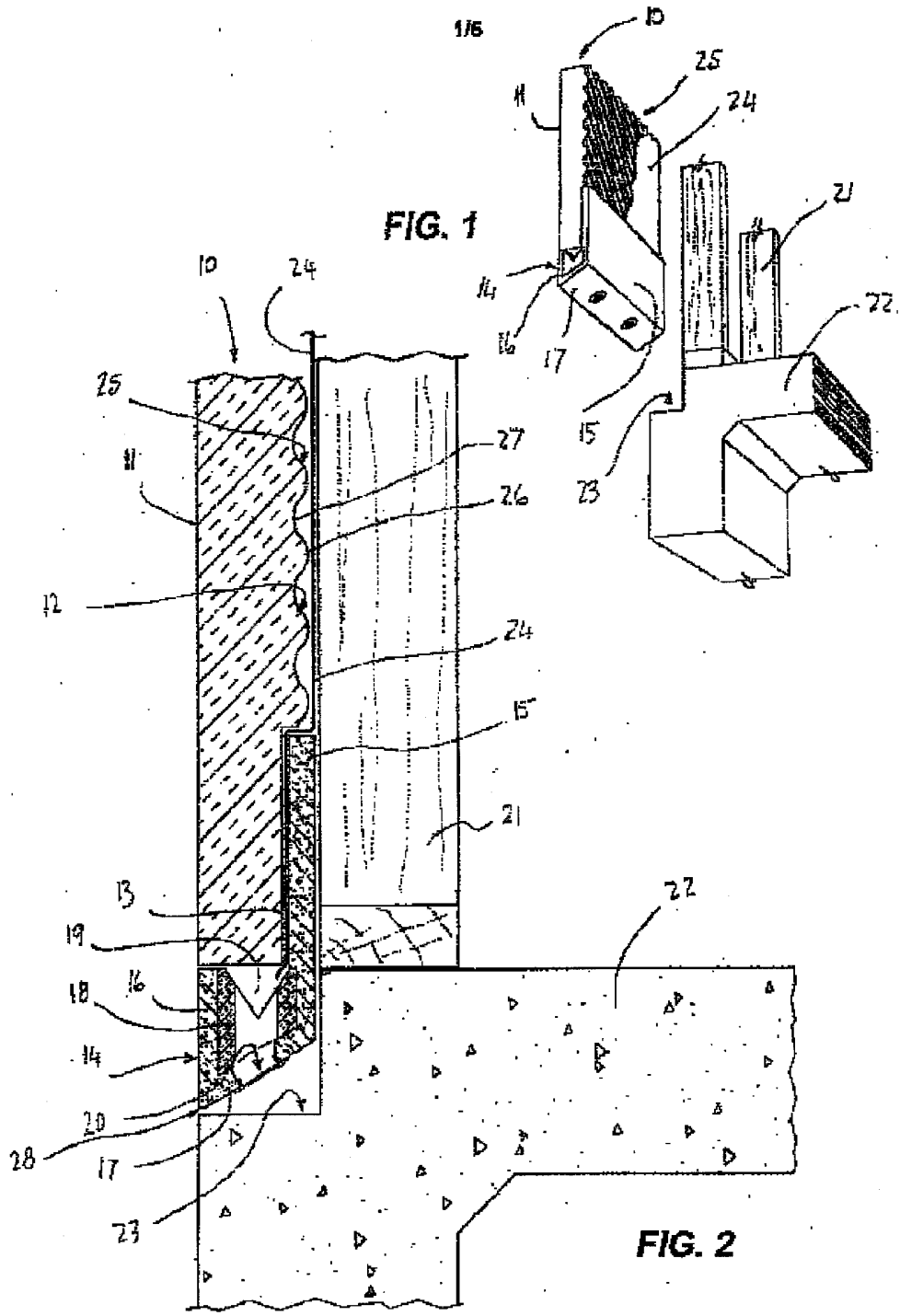
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By Their Patent Attorneys

**EKM patent**





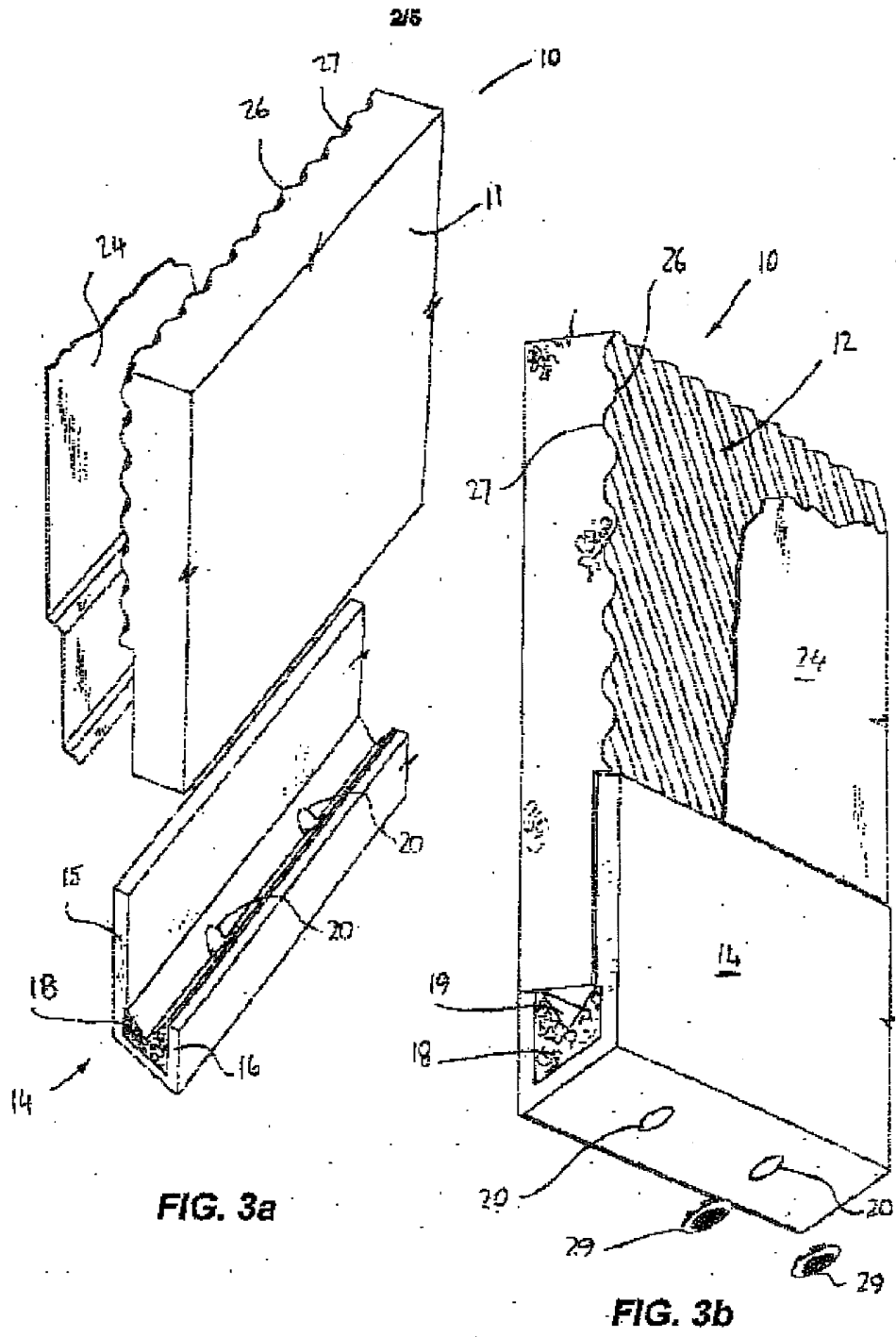


FIG. 3a

FIG. 3b

FIG. 4

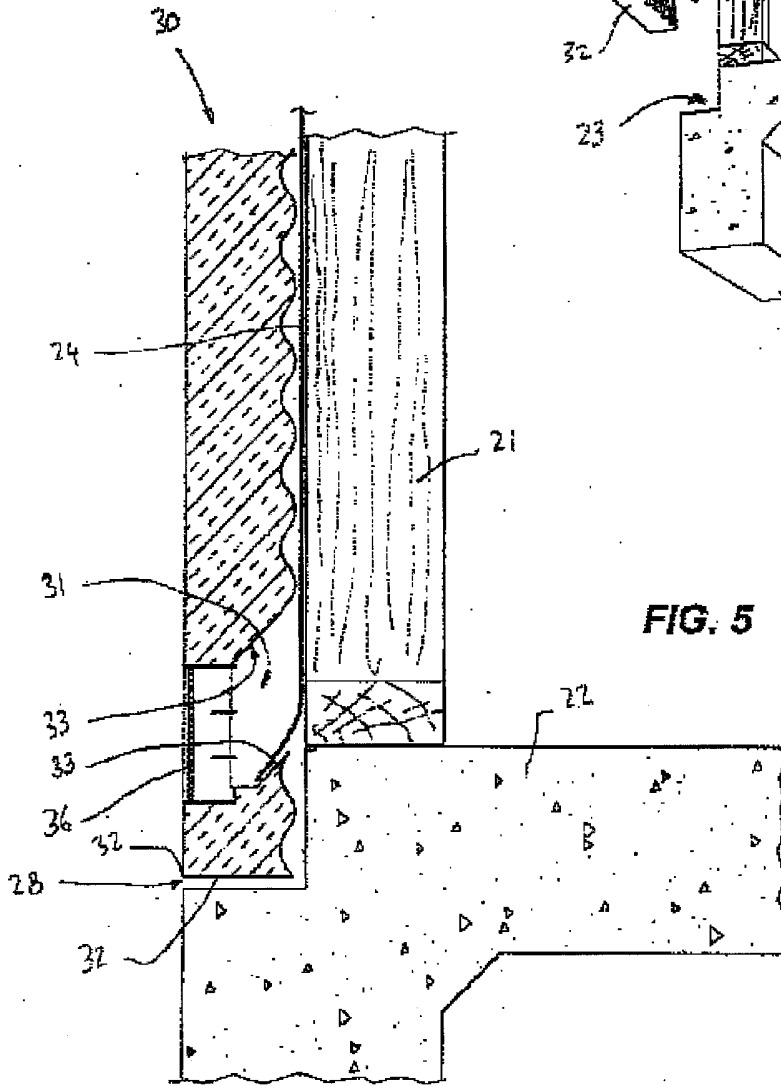
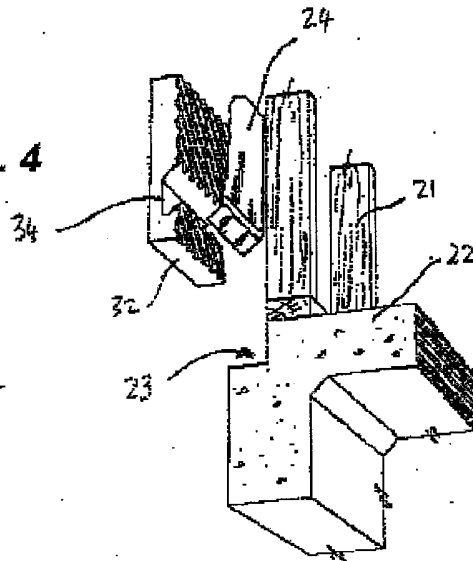


FIG. 5

FIG. 6a

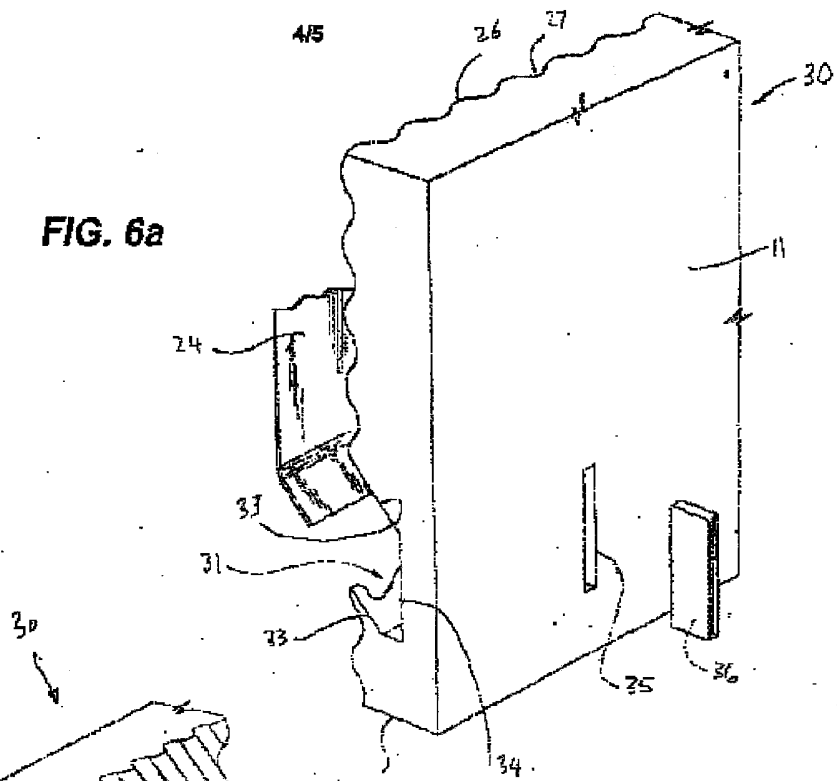
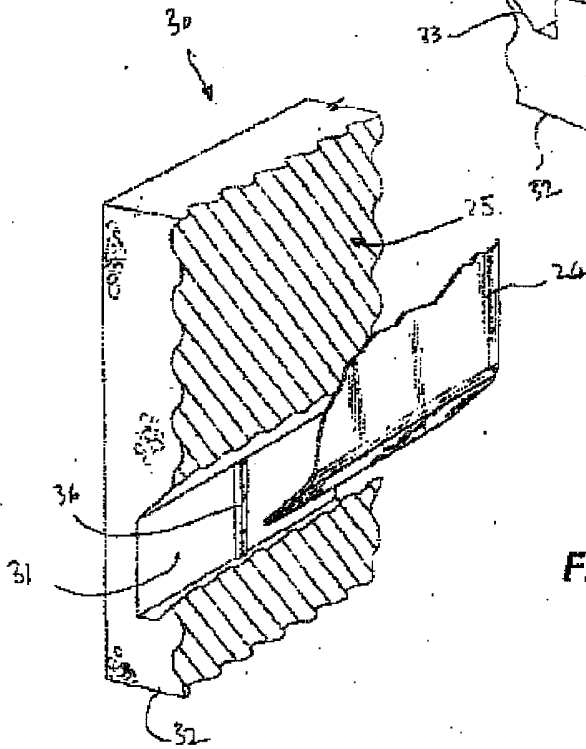


FIG. 6b



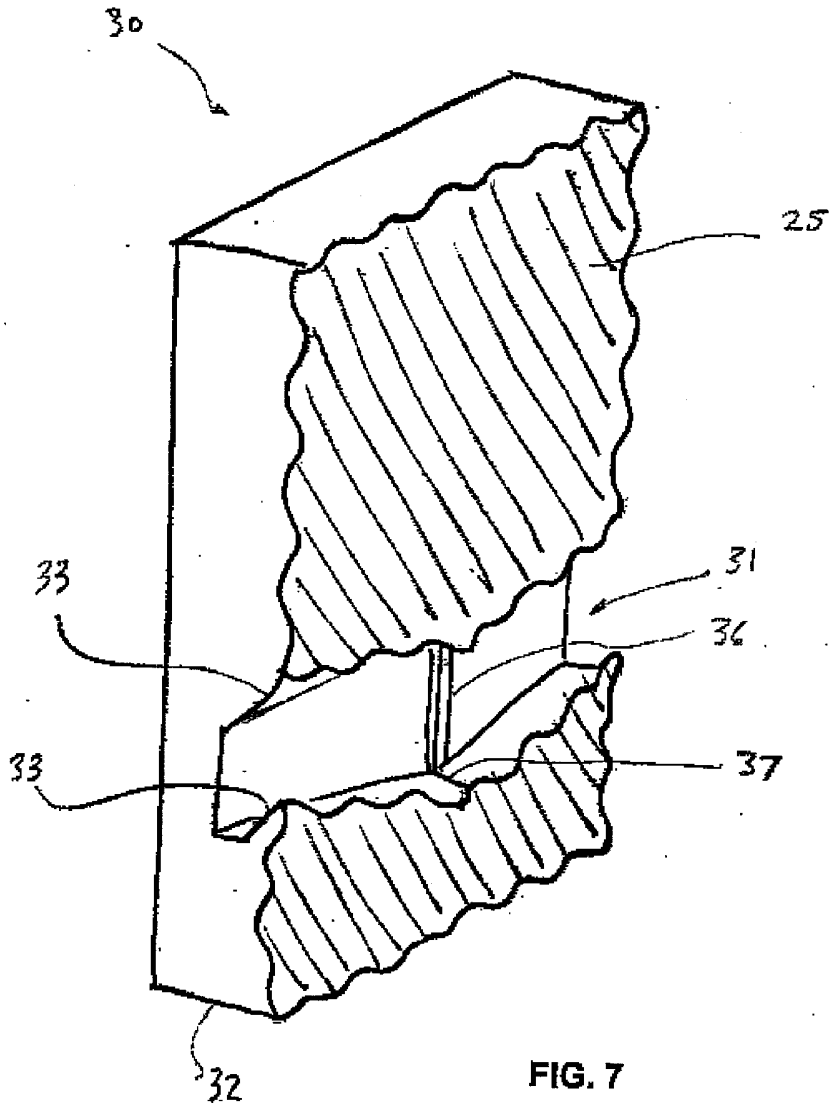


FIG. 7