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54 **Improved roof ventilation tile and method of ventilating a roof space.**

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## Description

This invention relates to a roof ventilation tile which can be mounted in a tiled roof in place of one or more tiles (or part tiles) to improve the ventilation of the roof space. The invention also relates to an improved method of achieving such ventilation. The invention has particular application to fibre-cement roofs and particular value for ventilating regions of the roof space adjacent to the apex of the roof.

It is known to fabricate a special "tile" for a roof which can be used at intervals over the array of tiles laid down during a roofing operation (or used as a replacement for selected tiles removed from an existing roof) and which provides air inlets for ventilation purposes. Some prior art roof ventilation tiles have been secured in place in precisely the same way as the tiles they replace and it has thus been proposed to provide the upper edge of the tile with a downwardly depending lip and to provide one side edge with an overlying lip and the opposite side edge with an underlying lip. An alternative range of prior art roof ventilation tiles has comprised an air inlet cowl extending upwardly from a substantially flat plate of piercable material, the flat plate being nailed in place with adjacent tiles at the upper end and on two sides overlying the plate (GB—A—2027469).

The present invention relates to an improved roof ventilation tile and to an improved method of ventilating a roof space which uses a simpler method for securing the roof ventilation tile in place.

According to one aspect of the invention, a roof ventilation tile comprising a base plate, a cowl extending upwardly from the base plate to provide an air vent and fixing means for securing the ventilation tile in place with the cowl over an air opening in a roof is characterised in that the fixing means comprises a resilient clip below the cowl with at least one part which in the normal position of the clip extends downwardly below the base plate but which can be flexed upwardly into the cowl to facilitate fixing of the ventilation tile in place on a roof.

Preferably the base plate is of generally rectangular shape in plan and may be fabricated from metallic sheet (e.g. an aluminium alloy sheet) or plastics material. When used with flat tiles, the base plate is desirably planar.

The cowl can be integrally formed from the base plate by a stamping or moulding operation and desirably the inlet to the cowl is of generally rectangular shape. A grille can (and normally would) be provided over the inlet of the cowl to define the air vent and to reduce the risk of rain or snow being driven into the roof space and such a grille can incorporate or augment an insect screen.

The resilient clip can be a length of spring steel strip bent into an "L" shape and mounted under the cowl with one arm of the "L" generally in the plane of the base plate and the other arm of the

"L" extending downwardly away from the cowl. The clearance in the air vent above the clip provided by the cowl should be sufficient to permit the clip to be lifted above the plane of the base plate during a fixing operation. The clip is desirably designed to lie partly behind a horizontally extending roof timber when the ventilation tile is in position on the roof and thereby prevent the ventilation tile slipping down the roof.

According to a further aspect of the invention, a method of ventilating a tiled roof space which comprises removing at least a part of one existing tile of the roof and a part of at least one tile underlying said one existing tile, forming an opening into the roof space below said removed tile parts, slipping a roof ventilation tile, having an air vent defined by a cowl at least partly surrounded by a base plate, over the opening so that the cowl overlies the opening and the base plate underlies adjacent tiles and fixing the ventilation tile in place, is characterised in that the ventilation tile is fixed in place by means of a resilient clip projecting downwardly below the base plate and passing through the said opening to engage a component of a roof, the clip being urged up towards the cowl by a member acting on it from below when the roof ventilation tile is slipped into place, the member being withdrawn in the direction opposite to the direction of slipping the ventilation tile into place, to allow the clip to engage behind a transverse batten of the roof.

GB—A—197584 describes a method of clipping non-ventilating replacement slates or tiles to roof battens using a pair of spring clips. GB—A—2027469 describes a ventilating device for a roof which replaces an existing tile, is clipped in place using a tingle in the usual manner for replacement slates and is then stabilised in place with a coating of a bituminous composition to waterproof the device and the surrounding tiles.

One embodiment of roof ventilation tile in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of the ventilation tile seen from the front,

Figure 2 is an underside perspective view of the tile of Figure 1,

Figure 3 is a side sectional view of the tile of Figures 1 and 2 with the resilient fixing clip shown in its normal position and, in dashed lines, in its raised position employed during fixing, and

Figures 4, 5 and 6 show the method of securing the tile in place on an existing roof to ventilate the roof space.

The ventilation tile shown in the drawings comprises a base plate 1 of generally rectangular shape with an upstanding wedge shaped cowl 2 which leaves flat perimeter regions 1a, 1b and 1c along the two side edges and the upper edge of the base plate. The cowl 2 provides an air vent, the opening of which is partially obturated by a grille 3.

The grille 3 is integrally formed with a strut 4 extending between and secured to the regions 1a

and 1b and also with a lip 5 which sandwiches the upper front edge of the cowl 2.

An "L"-shaped spring clip 6 is secured to the strut 4 centrally thereof and has one limb 6a disposed generally in the plane of the perimeter regions 1a and 1b, its other limb 6b being disposed substantially normal thereto. The distal end of the limb 6b can be bent forwardly as shown at 6c.

To fit the ventilation tile in place, the lower half of one existing roof tile is removed and the two underlying roof tiles (A and B) are cut away to leave a triangular opening 7 in the roof tiles and expose the felt lining 8 of the roof as shown in Figure 4. The felt lining 8 of the roof is next cut with an inverted "T" cut and the triangular flaps 9 of the lining 8 so formed are taped back as shown in Figure 5 to provide an air opening 7a. This opens the roof space to ventilation and exposes the upper edge of a transverse batten (shown dotted at 10) of the roof structure to which the adjacent roof tiles have been secured.

The ventilation tile is now slipped upwardly into the space left by the removal of the half roof tile (see Figure 6), the perimeter regions 1a and 1b underlying the adjacent roof tiles C and D and the perimeter region 1c underlying the upper half of the initially cut roof tile. During this operation the spring clip 6 is urged upwardly into the cowl 2 (e.g. using the blade of a bricklayer's trowel) as shown in dashed lines in Figure 3, so that the distal edge of the clip 6 is in the plane of the perimeter regions 1a and 1b. When the clip 6 overlies the opening 7, the clip 6 can be released to spring down naturally into the opening 7. The ventilation tile can now be moved down the roof slightly to cause the limb 6b of the clip 6 to bear against the upper edge of the batten 10 exposed by the opening 7 (also as shown in Figure 3). If the position 6c is provided, this moves below the batten to improve the security of fixing.

With a rectangular air opening as shown in the drawings, the volume of air flow per unit time into the roof space can be three times that of prior art ventilation tiles which employed an arcuate cowl.

The reference to "roof tiles" in this specification should be taken to include slates or other roof materials with which the ventilation tiles could be used.

Although the embodiment described shows the perimeter regions 1a, 1b and 1c of the base plate as lying in one plane (a design suitable for use with flat fibrecement slates) the invention also relates to a ventilation tile in which the perimeter regions are profiled. Such a modified design permits the ventilation tile to be used as a replacement for part of a profiled tile in ventilating a roof constructed of such profiled tiles.

### Claims

1. A roof ventilation tile comprising a base plate (1), a cowl (2) extending upwardly from the base plate (1) to provide an air vent and fixing means for securing the ventilation tile in place with the

cowl over an air opening (7a) in a roof characterised in that the fixing means comprises a resilient clip (6) below the cowl (2) with at least one part (6b, 6c) which in the normal position of the clip (6) extends downwardly below the base plate (1) but which can be flexed upwardly into the cowl to facilitate fixing of the ventilation tile in place on a roof.

2. A roof ventilation tile as claimed in claim 1, characterised in that the base plate (1) is of substantially rectangular shape in plan and the inlet to the cowl (2) is also substantially rectangular.

3. A roof ventilation tile as claimed in claim 1 or claim 2, characterised in that the base plate (1) is fabricated from metallic sheet, the cowl (2) being integrally formed from the base plate (1) by a stamping operation.

4. A roof ventilation tile as claimed in any preceding claim, characterised in that the air vent comprises a grille (3) which is secured (at 5) to the cowl (2) and to opposite perimeter regions (1a, 1b) of the base plate (1), a part of the grille (3) thereby forming an extension of the base plate (1) under the cowl (2).

5. A roof ventilation tile as claimed in any preceding claim, characterised in that the resilient clip (6) is a length of a spring strip bent into an "L"-shape, one arm (6b) of the "L" extending, in the normal position of the clip (6), downwardly below the plane of perimeter regions (1a, 1b, 1c) of the base plate (1).

6. A roof ventilation tile as claimed in claim 5, characterised in that a portion (6c) at the distal end of said one arm (6b) is bent forwardly of the rest of said one arm.

7. A roof ventilation tile as claimed in any preceding claim, characterised in that an insect screen is provided in the air vent.

8. A method of ventilating a tiled roof space which comprises removing at least a part of one existing tile of the roof and a part of at least one tile (A, B) underlying said one existing tile, forming an opening (7a) into the roof space below said removed tile parts, slipping a roof ventilation tile, having an air vent defined by a cowl (2) at least partly surrounded by a base plate (1), over the opening (7a) so that the cowl (2) overlies the opening (7a) and the base plate (1) underlies adjacent tiles (C, D) and fixing the ventilation tile in place, characterised in that the ventilation tile is fixed in place by means of a resilient clip (6) projecting downwardly below the base plate (1) and passing through the said opening (7a) to engage a component (10) of the roof, the clip (6) being urged up towards the cowl (2) by a member acting on it from below when the roof ventilation tile is slipped into place, the member being withdrawn in the direction opposite to the direction of slipping the ventilation tile into place, to allow the clip to engage behind a transverse batten (10) of the roof.

9. A method as claimed in claim 8, characterised in that the clip (6) includes a distal end

portion (6c) which locates below the said component (10) of the roof.

#### Patentansprüche

1. Ein Dachbelüftungsziegel, umfassend eine Grundplatte (1), eine von der Grundplatte (1) aus nach oben verlaufende Haube (2) zur Schaffung einer Belüftungsöffnung sowie eine Befestigungsvorrichtung zur Sicherung des Belüftungsziegels mit der Haube oberhalb einer Luftdurchlaßöffnung (7a) in einem Dach, dadurch gekennzeichnet, daß die Befestigungsvorrichtung eine elastische Klammer (6) unterhalb der Haube (2) umfaßt, wobei sich zumindest ein Teil (6b, 6c) in der normalen Position der Klammer (6) nach unten unter die Grundplatte (1) erstreckt, jedoch nach oben elastisch in die Haube eingreifen kann, um so die Befestigung des Belüftungsziegels auf einem Dach zu erleichtern.

2. Ein Dachbelüftungsziegel gemäß Anspruch 1, dadurch gekennzeichnet, daß die Grundplatte (1) einen im wesentlichen rechtwinkligen Grundriß aufweist und der Einlaß zur Haube (2) ebenfalls im wesentlichen rechtwinklig ist.

3. Ein Dachbelüftungsziegel gemäß Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß die Grundplatte (1) aus Metallblech besteht, wobei die Haube (2) durch einen Stanzvorgang als fester Bestandteil aus der Grundplatte (1) geformt ist.

4. Ein Dachbelüftungsziegel gemäß irgendeinem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die Belüftungsöffnung ein Gitter (3) umfaßt, das (bei 5) an der Haube (2) und den gegenüberliegenden Flächenbereichen (1a, 1b) der Grundplatte (1) befestigt ist, wobei ein Teil des Gitters (3) eine Verlängerung der Grundplatte (1) unterhalb der Haube (2) bildet.

5. Ein Dachbelüftungsziegel gemäß irgendeinem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die elastische Klammer (6) mit einer bestimmten Länge aus einem Federstahlstreifen besteht, der in eine "L"-Form gebogen ist, wobei sich ein Schenkel (6b) des "L" in der normalen Position der Klammer (6) nach unten unter die Ebene der Flächenbereiche (1a, 1b, 1c) der Grundplatte (1) erstreckt.

6. Ein Dachbelüftungsziegel gemäß Anspruch 5, dadurch gekennzeichnet, daß ein Abschnitt (6c) des entferntesten Endes des genannten einen Schenkels (6b) gegenüber dem Rest des genannten einen Schenkels nach vorne gebogen ist.

7. Ein Dachbelüftungsziegel gemäß irgendeinem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß in der Belüftungsöffnung ein Insektenschutzgitter vorgesehen ist.

8. Eine Methode zur Belüftung eines Ziegeldachraums, die das Herausnehmen von zumindest einem Teil eines vorhandenen Dachziegels und einem Teil von zumindest einem Ziegel (A, B), der sich unterhalb des genannten einen vorhandenen Ziegels befindet, die Schaffung einer Öffnung (7a) im Dachraum unter-

halb der genannten entnommenen Ziegelteile, den oberhalb der Öffnung (7a) vorgenommenen Einbau eines Dachbelüftungsziegels, der eine von einer Haube (2) festgelegte Belüftungsöffnung aufweist, die zumindest teilweise von einer Grundplatte (1) umgeben ist, so daß die Haube (2) über der Öffnung (7a) und die Grundplatte (1) unter den angrenzenden Ziegeln (C, D) liegt, sowie die Befestigung des Belüftungsziegels umfaßt, dadurch gekennzeichnet, daß die Befestigung des Belüftungsziegels mit Hilfe einer elastischen Klammer (6) erfolgt, die sich nach unten unter die Grundplatte (1) und durch die genannte Öffnung (7a) erstreckt, um in ein Bauteil (10) des Dachs einzugreifen, wobei ein auf die Klammer (6) von unten einwirkendes Element diese nach oben in Richtung auf die Haube (2) drückt, wenn der Dachbelüftungsziegel eingefügt wird, und wobei das Element in eine der Einbaurichtung des Belüftungsziegels entgegengesetzte Richtung zurückgezogen wird, damit die Klammer hinter einen Querriegel (10) des Dachs eingreifen kann.

9. Eine Methode gemäß Anspruch 8, dadurch gekennzeichnet, daß die Klammer (6) einen entfernten Endabschnitt (6c) umfaßt, der unterhalb des genannten Bauteils (10) des Dachs eingreift.

#### Revendications

1. Tuile de ventilation comprenant une plaque de base (1), un capuchon (2) s'étendant vers le haut à partir de la plaque de base (1) pour former une bouche d'aération, ainsi que des moyens de fixation pour fixer la tuile de ventilation en place avec le capuchon disposé au-dessus d'une ouverture d'aération (7a) ménagée dans une toiture, caractérisée en ce que les moyens de fixation comprennent une languette élastique (6) située sous le capuchon (2) et comportant au moins une partie (6b, 6c) qui, en position normale de la languette (6), s'étend vers le bas sous la plaque de base (1) mais qui peut être infléchiée vers la haut à l'intérieur du capuchon pour faciliter la fixation de la tuile de ventilation en place sur un toit.

2. Tuile de ventilation suivant la revendication 1, caractérisé en ce que la plaque de base (1) présente en plan une forme substantiellement rectangulaire et en ce que l'accès au capuchon (2) est également substantiellement rectangulaire.

3. Tuile de ventilation suivant la revendication 1 ou la revendication 2, caractérisée en ce que la plaque de base (1) est réalisée à partir d'une tôle métallique, le capuchon (2) étant formé d'une pièce avec la plaque de base (1) par une opération d'estampage.

4. Tuile de ventilation suivant l'une ou l'autre des revendications précédentes, caractérisée en ce que la bouche d'aération comporte une grille (3) qui est fixée (en 5) au capuchon (2) et aux plages opposées (1a, 1b) du périmètre de la plaque de base (1), une partie de la grille (3) formant ainsi un prolongement de la plaque de base (1) sous le capuchon (2).

5. Tuile de ventilation suivant l'une ou l'autre des revendications précédentes, caractérisée en

ce que la languette élastique (6) est une portion de ressort à lame plié en "L", un bras (6b) de cet "L" s'étendant, dans la position normale de la languette (6) vers le bas sous le plan des plages périmétriques (1a, 1b, 1c) de la plaque de base (1).

6. Tuile de ventilation suivant la revendication 5, caractérisée en ce qu'une portion (6c), à l'extrémité distale dudit bras (6b), est pliée vers l'avant par rapport au reste dudit bras.

7. Tuile de ventilation suivant l'une ou l'autre des revendications précédentes, caractérisée en ce qu'un écran anti-insectes est disposé dans la bouche d'aération.

8. Procédé pour ventiler un comble, dans lequel on enlève une partie d'une tuile existante du toit et une partie d'au moins une tuile (A, B) placée sous ladite tuile existante, on forme une ouverture (7a) dans le comble sous lesdites parties enlevées de tuiles, on glisse une tuile de ventilation présentant une bouche d'aération définie par un capuchon (2) au moins partiellement entouré par une plaque de base (1) au-dessus de

l'ouverture (7a) en sorte que le capuchon (2) soit situé au-dessus de l'ouverture (7a) et que la plaque de base (1) soit située sous les tuiles adjacentes (C, D), et on fixe la tuile de ventilation en place, caractérisé en ce que l'on fixe la tuile de ventilation en place au moyen d'une languette élastique (6) saillant vers le bas sous la plaque de base (1) et passant à travers ladite ouverture (7a) pour s'accrocher à une composant (10) de la toiture, la languette (6) étant poussée vers le haut en direction du capuchon (2) par un élément agissant sur elle par le bas lorsque la tuile de ventilation est glissée en place, l'élément étant retiré dans la direction opposée à la direction du glissement de la tuile de ventilation en place, afin de permettre à la languette de s'accrocher derrière une volige transversale (10) de la toiture.

9. Procédé suivant la revendication 8, caractérisé en ce que la languette (6) comporte une portion (6c) à son extrémité distale, qui se positionne sous ledit composant (10) de la toiture.

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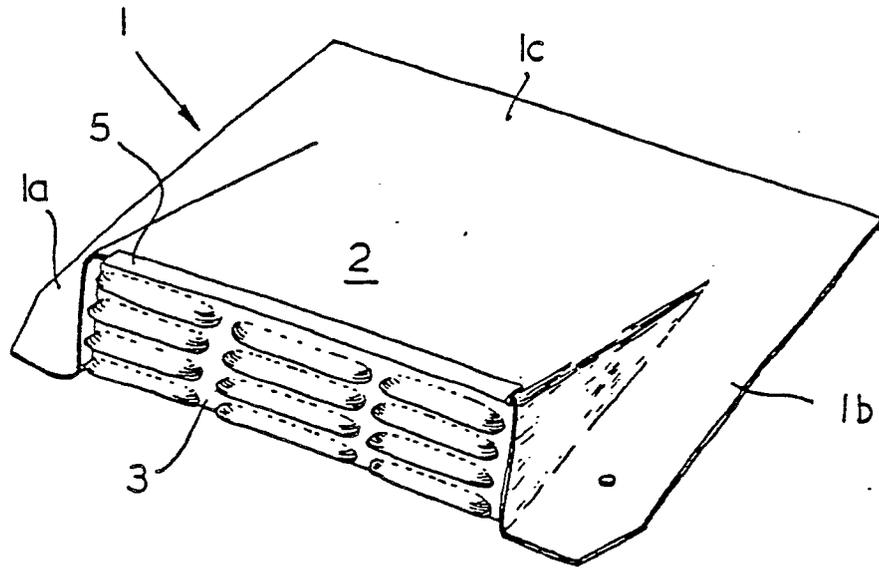


FIG. 1

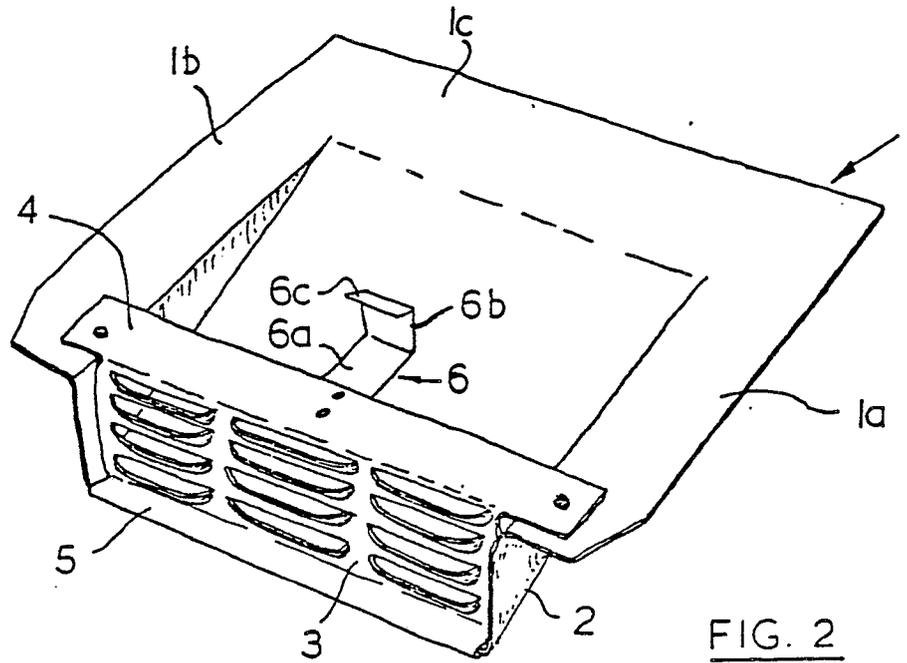


FIG. 2

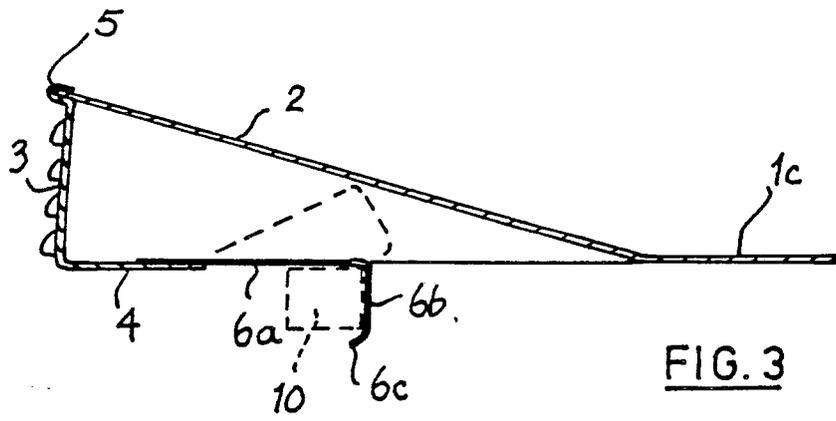


FIG. 3

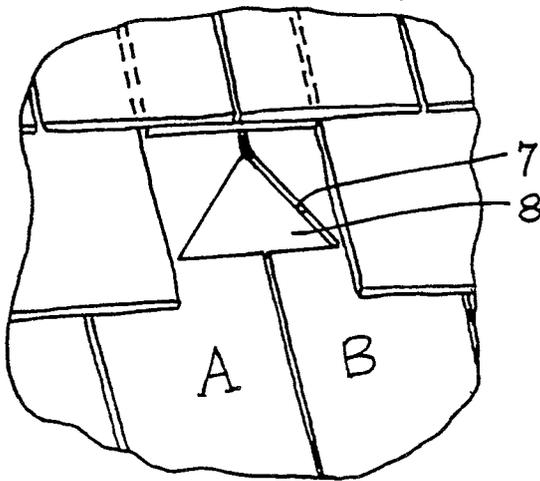


FIG. 4

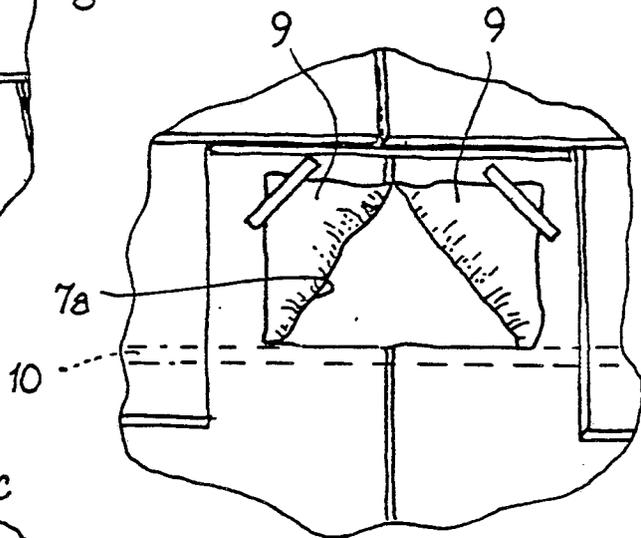


FIG. 5

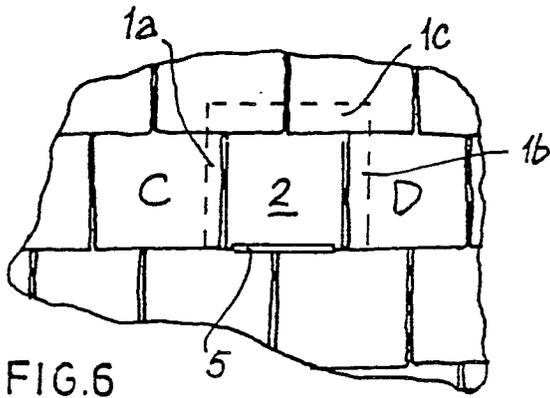


FIG. 6