(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 396 380 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90304706.6**

(51) Int. Cl.5: **E04D 1/16, E04D 1/18**

(22) Date of filing: **01.05.90**

(30) Priority: **02.05.89 NZ 228949**

(43) Date of publication of application:
07.11.90 Bulletin 90/45

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

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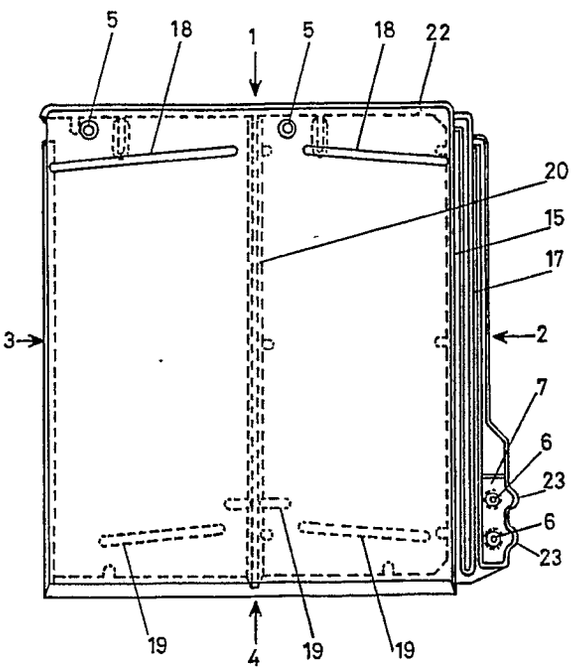
(54) Improvements in or relating to methods of fixing roof tiles and/or a roof tile.

(57) A method of fixing tiles to provide a roofing structure is provided. One or more tiles are positioned such that adjacent files overlap. At least some of the tiles are fixed to one or more underlying building members (9) such as a batten or continuous decking by a fixing means (8). The fixing means (8) such as a screw, nail or lug engages with apertures, slots or knockouts (5,6) in each of the overlapping tiles. Thus each tile has at least one fixing means (8) in common with an adjacent tile.

A form of roofing tile is also provided. The tile has at least one aperture, slot or knockout (5,6) at or adjacent a minimum of two edges of the tile. The apertures, slots or knockouts (5,6) are positioned so that the tiles can be overlapped and fixed to a building member (9) by inserting a suitable fixing means (8) through the apertures, slots or knockouts (5,6) provided on each of the overlapping tiles and anchoring the fixing means (8) to a building member (9).

FIG 1



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The invention relates to a method of fixing roof tiles and/or to a roof tile.

Traditional slate tiles are attached to a building member via two nails inserted in the top of a tile. The lower edge of the tile is then attached to a lower tile via a clip. Traditional slates provide inefficient coverage of a roof as each slate overlaps about 50% of the previous slate. Waterproofing relies merely on this large overlap. Also fixing the tiles is complicated as nails and clips need to be selected in order to fix the tiles.

It is an object of the invention to provide a method of fixing roof tiles and/or to provide a roof tile which will obviate or minimise the foregoing disadvantages in a simple yet effective manner or which will at least provide the public with a useful choice.

Accordingly, in a first aspect, the invention consists in a method of fixing tiles to provide a roofing structure, comprising the steps of positioning one or more tiles so as to overlap other adjacent tiles, and fixing at least some of said tiles to one or more underlying building members by fixing means engaged with fixing apertures, slots, or knockouts in said tiles, each said tile having at least one said fixing means in common with an adjacent tile.

In a further aspect the invention consists in a roofing tile having at least one fixing aperture, slot, or knockout at or adjacent each of two edges thereof, said fixing apertures, slots, or knockouts being so positioned that a pair of said tiles may be overlapped and fixed to a building member by engaging a fixing means with one of said apertures, slots, or knockouts on one said tile and a second of said apertures, slots, or knockouts on a second said tile and anchoring said fixing means to a building member.

To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

One preferred form of the invention will now be described with reference to the accompanying drawings, wherein

Figure 1 shows a plan view of a roof tile in accordance with the invention and suitable for use in a method in according with the invention;

Figures 2 and 3 show side view of roof tiles in accordance with the invention showing fixing means and alternative forms of means for compensating for overlap angle of the tiles as herein described;

Figure 4 shows a perspective view of a number of tiles arranged in accordance with the invention; and

Figure 5 shows an exploded detail of tiles from Figure 4.

Referring now to the Figures, these show a tile suitable for use in accordance with the invention, having in general four edges being an upper or rear edge 1 side edges 2 and 3 and a lower or front edge 4. The tile can be produced in a range of materials, such as concrete, terracotta and a variety of filled or unfilled polymers or other suitable materials. It may be produced by a variety of methods such as casting, pressing and moulding and may be shaped by pressure, heat, vibration, or other physical means and cured by a variety of chemical or physical means, as will be apparent to those skilled in the art.

Fixing for the tiles is provided in a minimum of two positions, at or adjacent to each of two edges respectively of the tile such as rear edge 1 and side edge 2.

The fixing positions may comprise apertures, slots, knockouts or the like suitable for engagement by tile fixing means.

If a knockout rather than a full aperture is provided the tile is thinned locally in the fixing area in such a way that the aperture can be readily produced by punching, drilling or other mechanical methods on site.

The fixing position on side edge 2 is preferably adjacent to the intersection of side edge 2 with front edge 4. The fixing positions suitably comprise fixing slots, apertures or knockouts 5 and 6. One or more fixing apertures 6 or knockouts are positioned on a side lug 7.

The rear fixing points 5 can be provided in multiple positions so as to give adequate security to the tile although it is envisaged that normally a total of three fixing positions per tile would be utilised. With reference to the embodiment shown in Figure 1, for example, the two rear fixing points 5 together with one of the side fixing points 6 may be utilised.

The fixing positions are so located on the tiles that when the tiles are positioned to form a roofing structure in overlapping courses, at least one fixing position on a first tile can be aligned with a fixing position on an adjacent tile so that the two tiles can be fixed by a common fixing means.

The fixing means 8 for the tiles can be provided in a variety of ways by proprietary or special purpose fixings, or for example can comprise nails, screws, lugs, rivets, fixing tabs as shown in Figure 3 or other suitable fixing means 8, which can be engaged with the tiles and anchored to a building member 9 such as a batten or continuous decking.

In at least one form envisaged within the scope of the invention, the fixing means can comprise

upstanding lugs or projections punched out from and integral with the batten or other building member, which may for example comprise a roll form metal batten. The tile or tiles is be positioned so as to drive the batten lug through the tile at the fixing position and the top of the lug is then bent over to secure the tile.

A further option is the use of a large headed nail or the like, driven into the building member closely alongside a tile at a fixing position. The head of the nail, overlapping the edge of the tile, serves to secure that tile.

Of course, in the presently preferred form illustrated, the fixing means 8 can readily comprise nails driven through the apertures or knock outs 5 and 6.

In at least the preferred form shown the tile will have a side drainage channel 15 overlapped by a lip or overhang 16 on the neighbouring tile. Additional side drainage channels 17 may be added to the first drainage channel 15 in order to carry away any water over-spill.

Adjacent the top or rear edge 1, water baffles 18 may be incorporated to break the up-flow of wind-driven rain between tiles. In order to achieve a labyrinth effect, a further baffle or baffles indicated by the dotted lines at 19 may be added to the underside of the tiles. The front edge 4 of the upper tile of an overlapped pair of tiles will act as the first baffle in a labyrinth. The baffles 18 and 19 are preferably angled at their top faces to provide water run off.

The underside of each tile is preferably strengthened by one or more ribs shown in dotted outline at 20 which may be relieved locally for example at 21 in Figure 2 to clear the weather baffle on an overlapped tile, or alternatively the baffles can be provided in sections so as to avoid the rib or ribs on the underside of the upper overlapped tile.

Clearly the exact arrangement of water baffles may be varied by one skilled in the art without departing from the scope of the invention.

In order to assist location of the tile while being fixed a rear rib shown in dotted outline at 22 of a local or continuous nature can be provided. This can be used to positively locate the tile on either battens or continuous decking.

In order to further enhance the weather tightness of the labyrinth, further projections such as lug extensions 23 can be added to the side edge of the front fixing lug 7 so as to provide a horizontal labyrinth path for water at this point.

A further preferred feature is a raised area 24 around the perimeter of the fixing apertures or knockouts so as to provide further resistance against water penetration.

In order to compensate for the difference in angle between the fall of each tile relative to the horizontal, when compared with that of the roof angle, due to the overlap of each tile from course to course, a series of fixing ramps 25 or alternatively localised pips or projections 26 can be provided on the underside of the tiles, so as to act as bearers on the batten or decking and make up for the discrepancy in height between each tile under surface and the batten or deck adjacent to the fixing points.

In use in the method according to the invention as shown in particular in Figures 4 and 5, the courses of tiles are positioned so that adjacent tiles are overlapped from top to bottom and laterally and the tiles are fixed to the building structure by way of fixing means 8 in a minimum of two positions for each tile. As shown in Figure 5, fixing means 8 passes through a side aperture 6 of an upper tile and then through a top edge aperture 5 of a tile in a lower course. Each tile has at least one fixing means 8 in common with another tile in the stack. The fixing means are positioned through the apertures, slots, knockouts or the like 5, 6 in the tiles, pairs of fixing apertures, slots, knockouts or the like 5 and 6 being aligned in overlapping tiles. The fixing means are anchored to building members 9 such as battens, decking or the like.

Thus it can be seen that at least in the preferred form of the invention a roofing tile and/or a method of fixing roofing tiles are provided, whereby the tiles are simple to fix and are very secure when fixed. The fastening of more than one tile together by common fixing means which have been anchored to the underlying building members is simple and economical and can provide substantially improved weather security against wind, rain, snow and ice, particularly when entering at angles to the horizontal ranging from about 20° to 90° ie. vertical. The weather security of the tiling system is additionally enhanced by the provision of a baffle labyrinth, and the tiles can be additionally strengthened by the provision of raised areas, lugs, and ribs as hereinbefore described.

Claims

1. A method of fixing tiles to provide a roofing structure comprising the steps of positioning:
one or more tiles so as to overlap other adjacent tiles,
and fixing at least some of said tiles to one or more underlying building members by fixing means engaged with fixing apertures, slots or knockouts in said tiles,
each said tile having at least one said fixing means in common with an adjacent tile.

2. A method of fixing tiles as claimed in Claim 1 wherein the fixing step includes anchoring said

fixing means to a said building member.

3. A method of fixing tiles as claimed in Claim 1 wherein the positioning step includes aligning at least one of said fixing apertures, slots, or knock-outs on one tile with a fixing aperture, slot, or knock-out in at least one adjacent tile whereby a common fixing means is engaged with both tiles so aligned.

4. A method of fixing tiles as claimed in any one of claims 1 to 3 wherein said fixing means is a nail, screw, lug, rivet or fixing tab.

5. A roofing tile having at least one fixing aperture, slot or knockout at or adjacent one edge thereof and a second fixing aperture, slot, or knock-out at or adjacent another edge thereof; said fixing apertures, slots, or knockouts being so positioned that a pair of said tiles may be overlapped and fixed to a building member by engaging a fixing means with one of said apertures, slots, or knock-outs on one said tile and a second of said apertures, slots, or knockouts on a second said tile and anchoring said fixing means to a building member.

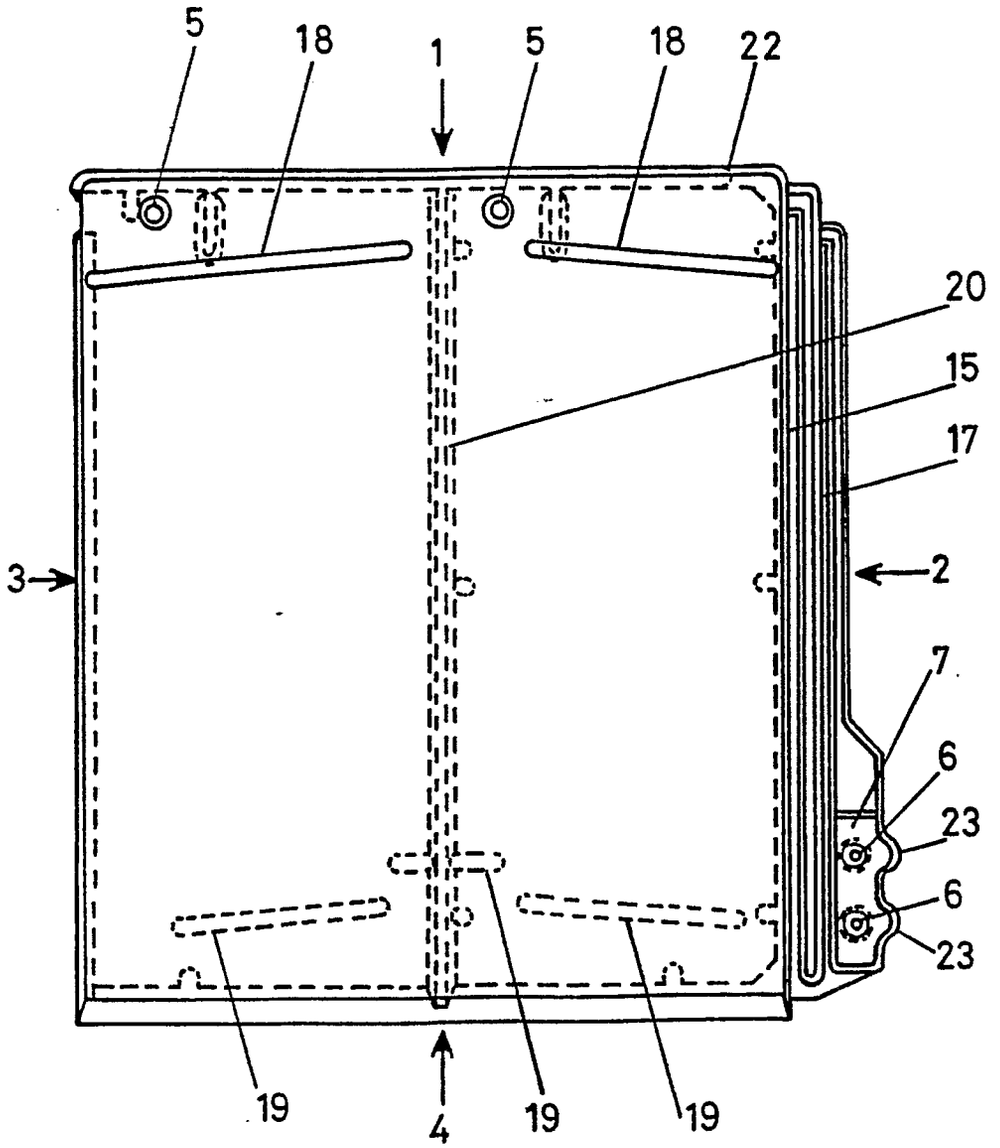
6. A roofing tile as claimed in Claim 5 wherein at least one of said fixing apertures, slots, or knock-outs is on a lug projecting from one edge of said tile.

7. A roofing tile as claimed in Claim 5 or Claim 6 wherein said fixing apertures, slots, or knockouts are positioned on a top or rear edge and a side edge of each said tile.

8. A roofing tile as claimed in Claim 6 wherein said lug projects from the side edge of said tile.

9. A roofing tile as claimed in Claim 6 or Claim 8 wherein said lug includes at least two of said fixing apertures, slots, or knockouts.

FIG 1



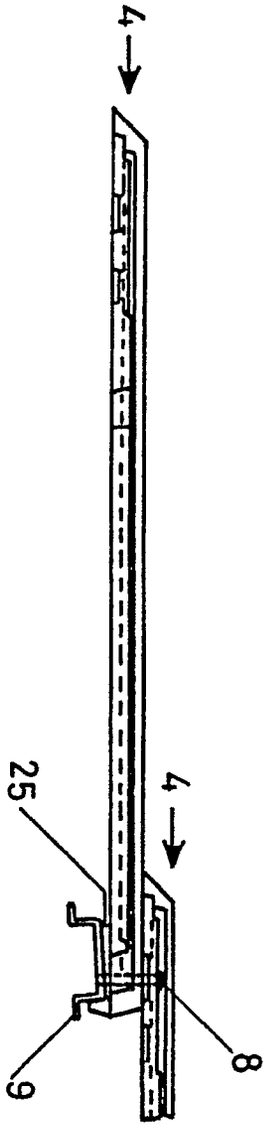


FIG 3

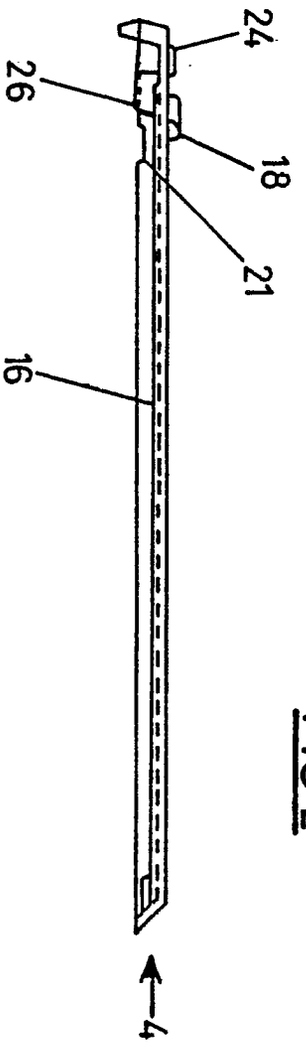


FIG 2

FIG 5

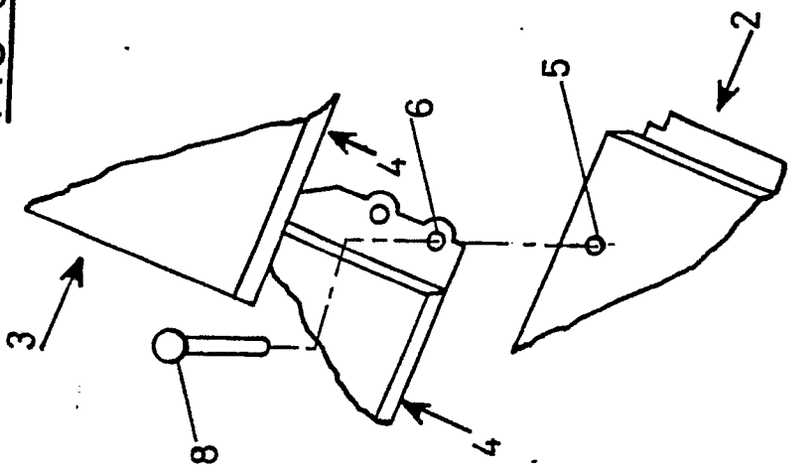
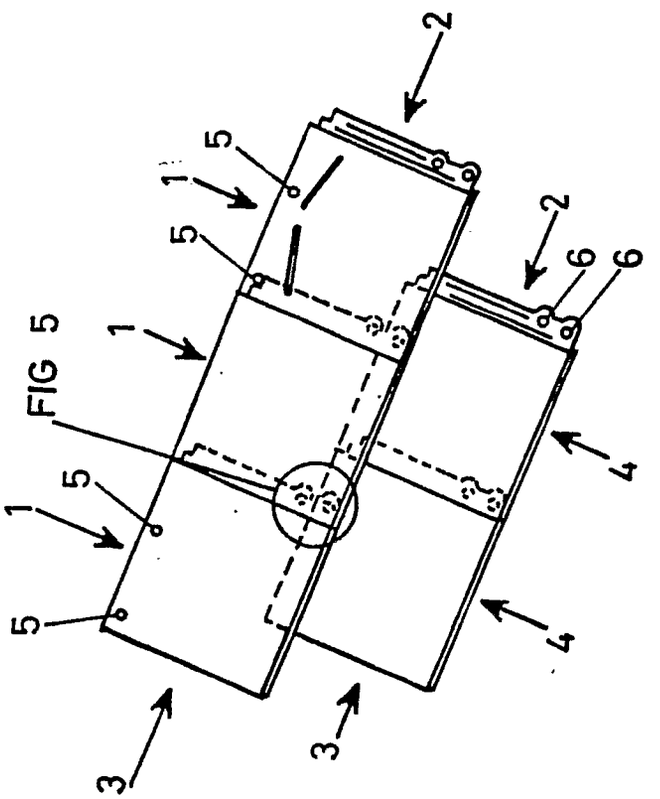


FIG 4



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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 4706

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-20103 (REDLAND) * page 3, line 10 - page 4, line 4 * * page 5, lines 7 - 23; figure 1 *	1-5, 7	E04D1/16 E04D1/18
A		6	
X	GB-A-2147021 (D. MORGAN) * page 2, lines 11 - 22; figures 5, 9, 10 *	1-5, 7	
Y		6, 8, 9	
Y	US-A-2482835 (W. BREMER) * column 3, lines 5 - 13; figure 1 *	6, 8	
Y	LU-A-84663 (DIASOL) * page 8, line 24 - page 9; figures 1, 2 *	6, 8	
Y	US-A-2034602 (A. ANDERSON) * page 1, lines 32 - 49; figure 2 *	6, 9	
A	GB-A-644099 (S. ROSENDO) * page 3, lines 3 - 14; figures 10-12 *	1-4	
A	US-A-1335756 (T. SCARFF) * page 2, lines 13 - 37; figures 1-4 *	1-4	TECHNICAL FIELDS SEARCHED (Int. Cl.5) E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	09 JULY 1990	KRIEKOUKIS S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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