

[72] Inventors **Ronald John Roach**  
**Blair Athol;**  
**John Frederick Spencer, Hackney, both of,**  
**Australia**  
[21] Appl. No. **768,004**  
[22] Filed **Oct. 16, 1968**  
[45] Patented **June 8, 1971**  
[73] Assignees **Gramall Industries Proprietary Limited**  
**Blair Athol;**  
**Malcolm John Australia Pty. Ltd.**  
**Hackney, both of, Australia**  
[32] Priority **July 26, 1968**  
[33] **Australia**  
[31] **41301**

[50] Field of Search..... 52/519,  
542, 309, 530, 531, 521, 522, 520, 538, 540, 554

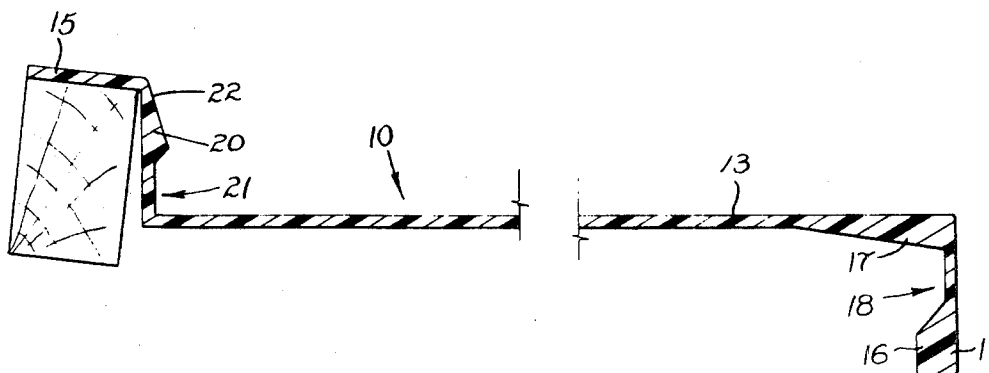
[56] **References Cited**  
**UNITED STATES PATENTS**  
973,946 10/1910 Lindau ..... 52/538  
1,030,590 6/1912 Latulip ..... 52/536X  
2,766,861 10/1956 Abramson ..... 52/530  
3,214,876 11/1965 Mattes ..... 52/522X  
3,394,520 7/1968 Skelton ..... 52/531X  
3,458,962 8/1969 Kendall ..... 52/309  
**FOREIGN PATENTS**  
1,031,354 1953 France ..... 52/531  
1,042,993 1966 Great Britain ..... 52/309

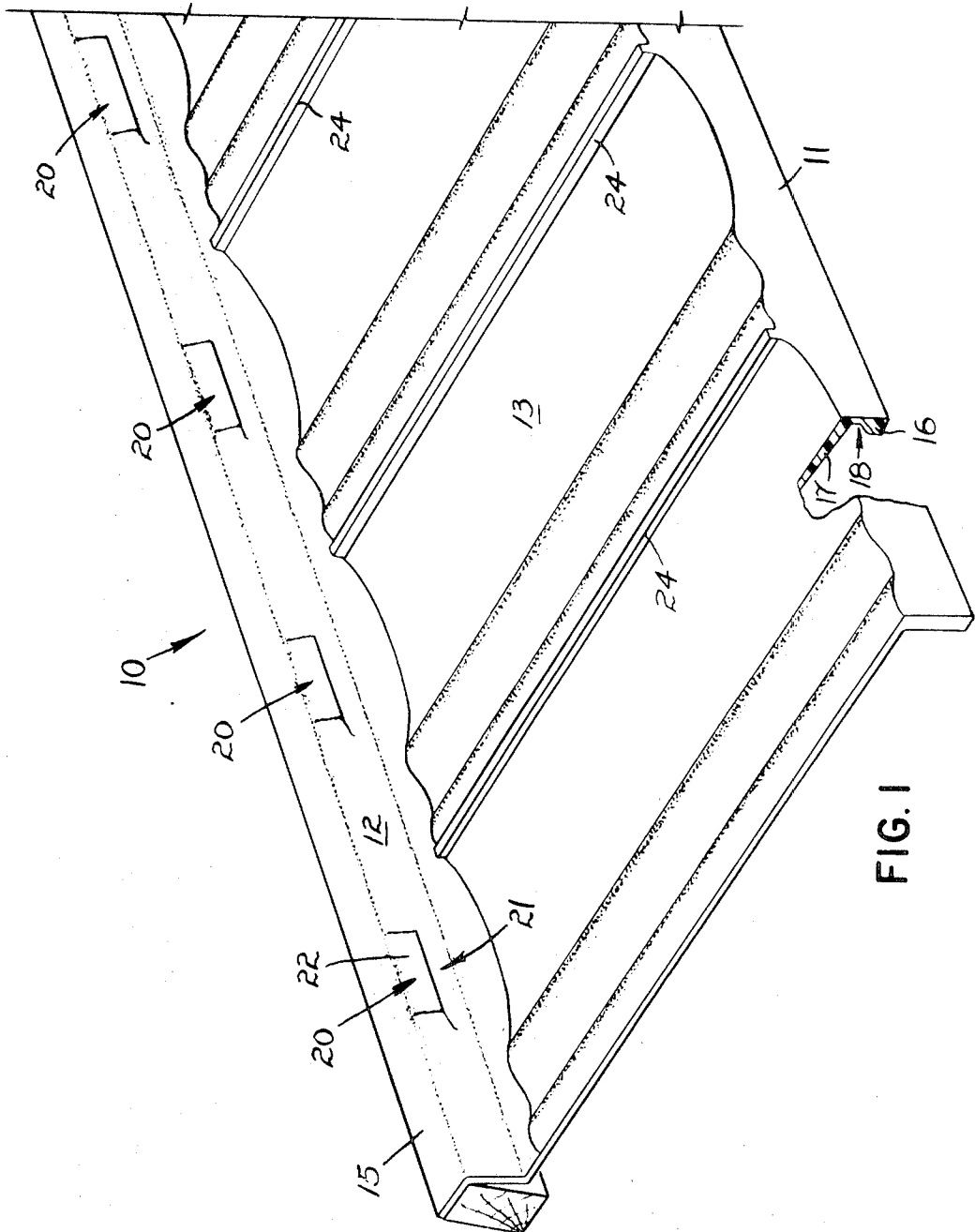
*Primary Examiner*—John E. Murtagh  
*Attorney*—Oldham & Oldham

[54] **A PLASTIC TILE WITH INTERLOCKING PROJECTIONS**  
4 Claims, 5 Drawing Figs.

[52] U.S. Cl. .... 52/309,  
52/542, 52/554  
[51] Int. Cl. .... E04d 1/08,  
E04d 3/362

**ABSTRACT:** A tile formed from resin-based plastics material which has an upstanding rear wall and a depending front wall each having projections thereon which interengage so that the fixing means for the tile can be positioned adjacent the rear wall and will thereby be protected by the overlapping front end of an adjacent tile.





INVENTORS

RONALD JOHN ROACH  
JOHN FREDERICK SPENCER

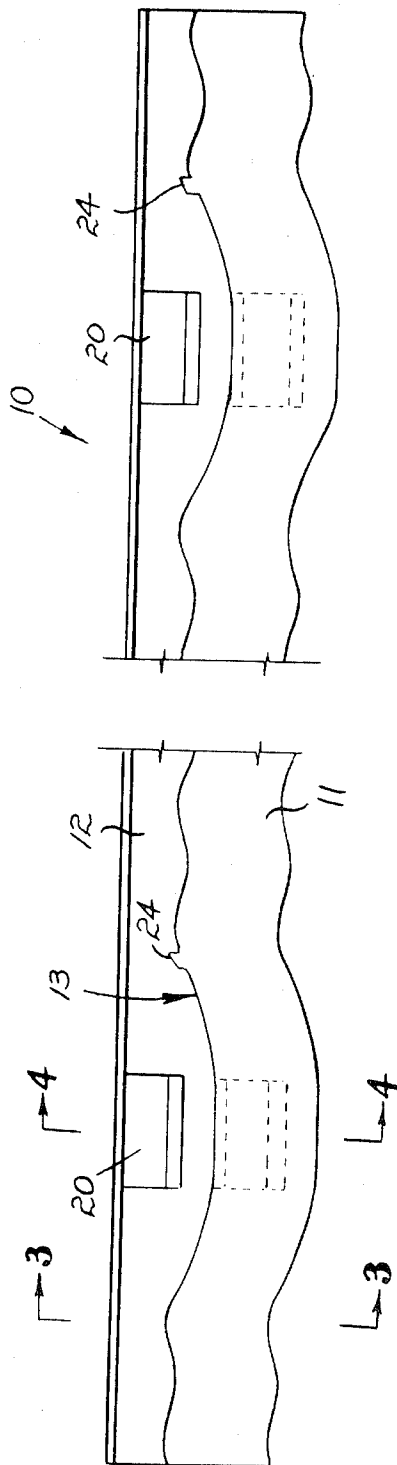
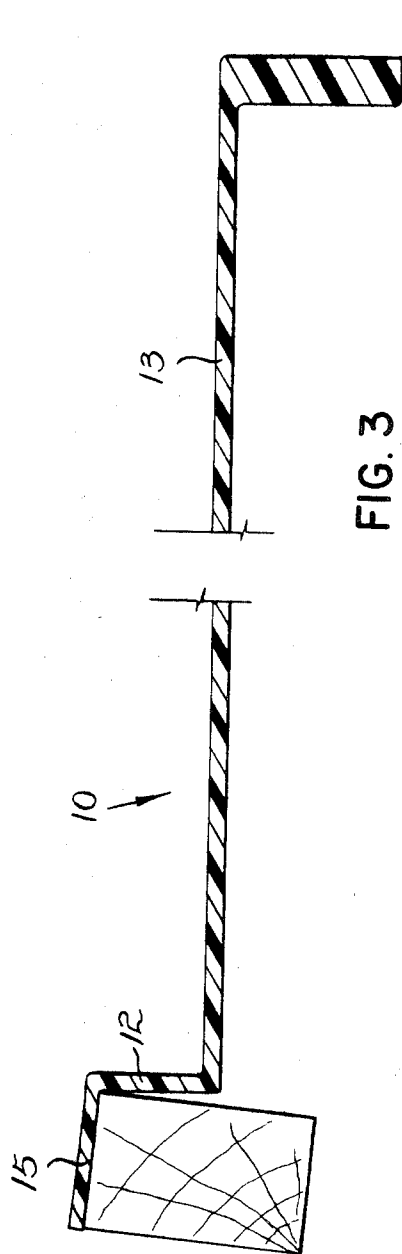
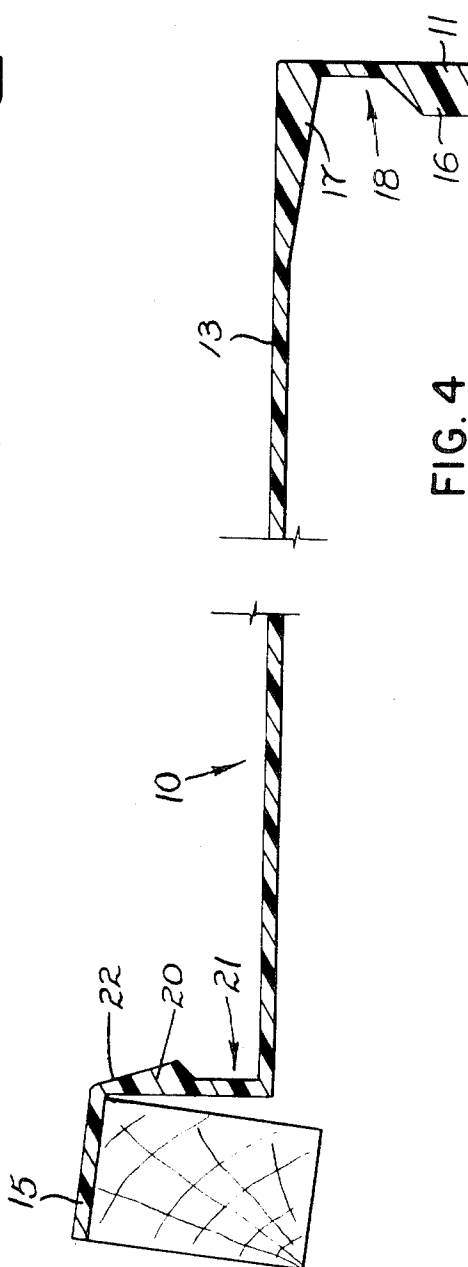


FIG. 2

INVENTORS  
RONALD JOHN ROACH  
JOHN FREDERICK SPENCER



INVENTORS  
RONALD JOHN ROACH  
JOHN FREDERICK SPENCER

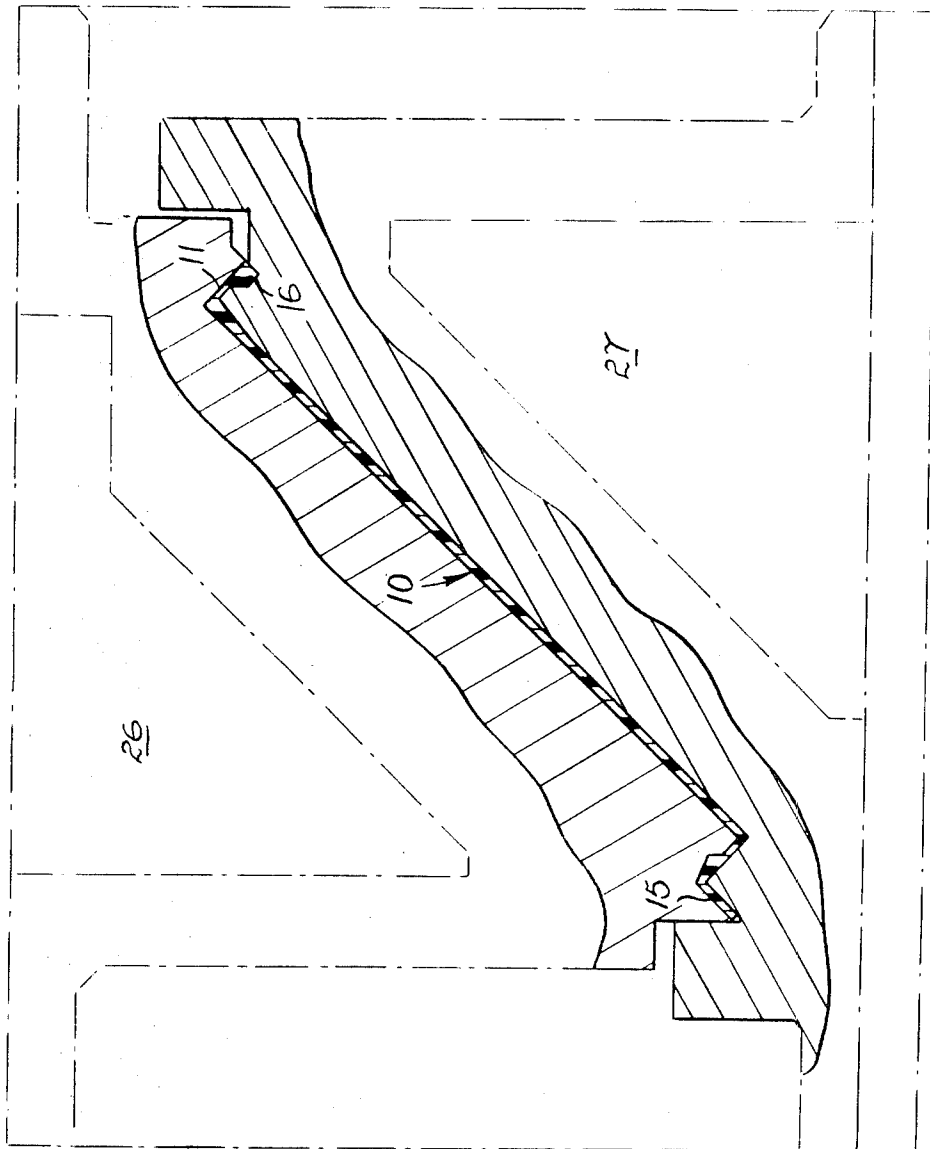


FIG. 5

INVENTORS  
RONALD JOHN ROACH  
JOHN FREDERICK SPENCER

## A PLASTIC TILE WITH INTERLOCKING PROJECTIONS

This invention relates to a tile which can be used for example as a roofing tile, and further relates to a method of production of such a tile.

Roofing tiles are in common use and the average roofing tile is limited in dimension to something less than 2 feet by 1 foot in most instances because of the difficulty of maintaining accuracy if larger tiles are used, since in the firing of clay there is a tendency for the product to distort from its intended shape, and one of the objects of this invention is to provide an improved roofing tile which can be of larger dimension than heretofore, so that in turn the cost of fixing will be reduced. This object may be achieved in this invention by forming a tile from resin-based plastics material containing both filler materials and reinforcing fibers, since such material can be pressed from a "dough" and is dimensionally stable.

A second problem which is encountered with the average tile is its high weight, and because of this heavy roof supports are needed, and to obviate this problem an object of this invention is to provide a tile which will be of small weight. This object may also be achieved by use of reinforced filled resin-based plastics material.

A still further difficulty which is encountered is that the average roofing tile does not readily interlock with a similar tile, firstly because of the large dimensional tolerance required and secondly because of the low strength of masonry articles, and a still further object of this invention is to provide a tile which will have improved interlocking means.

This object may be achieved in this invention by providing a tile having an upstanding rear wall containing a recess and a depending front wall having a projection complementary to the recess, thereby forming interlocking means between similarly shaped tiles.

Roofing tiles are frequently secured to their supporting battens by means of wire ties, but these are slow and tedious to install, and are not physically strong, and one of the objects of this invention is to provide a superior fixing means. This is achieved in this invention by providing a flange extending rearwardly from the upwardly extending rear wall. Such a flange can lie on a batten and be simply secured thereto by nails, and the interlocking means between the tiles will secure both front and rear walls.

If a tile is to be formed by a pressing process, then the formation of a recess and complementary projection in the rear and front walls presents difficulty in die construction. This invention may overcome this difficulty by forming a forwardly extending projection on the rear wall spaced from the watershed portion of the tile to form a recess, the face of the projection forming the recess being inclined relative to the plane of the watershed portion, and the complementary face of the projection on the front wall being similarly inclined and being substantially parallel to the first sloping face. The tile can then be formed between dies, with the watershed portion sloping and the normally inclined surfaces of the projections substantially vertical, this allowing the dies to open with little or no undercut condition existing.

In one of its forms the invention may consist of a tile formed from resin-based plastics material containing both filler materials and reinforcing fibers, the configuration of the tile including a depending front wall, an upstanding rear wall, and a watershed portion joining the walls, a projection extending forwardly on the upstanding rear wall spaced upwardly from the watershed portion to define a recess, and a projection extending rearwardly from the depending front wall complementary in shape to the recess thereby forming interlocking means between similarly shaped tiles.

An embodiment of the invention is described hereunder in some detail with reference to and is illustrated in the accompanying drawings, in which:

- FIG. 1 is a fragmentary perspective view of a tile,
- FIG. 2 is a fragmentary front elevation,
- FIG. 3 is a section taken on line 3-3 of FIG. 2,
- FIG. 4 is a section taken on line 4-4 of FIG. 2, and

FIG. 5 is a section through a die showing the pressing operation.

According to this embodiment a tile 10 is provided with a depending front wall 11, an upstanding rear wall 12, and a corrugated watershed portion 13 joins the two walls. The upstanding rear wall is provided with a rearwardly extending flange 15 and this is arranged to be nailed to a supporting batten carried on the rafters of the roof (not shown).

The front wall depending from the front edge of the watershed portion of the tile is corrugated when viewed in front elevation (FIG. 2), the corrugations following the corrugations of the watershed portion, whereas the rearwardly extending flange is substantially flat so that it is supported over the whole of its length by the batten. The front wall is provided at spaced intervals with retention projections 16 extending rearwardly from the rear face of the front wall (FIG. 4). Above each projection and on the underside of the watershed portion is disposed a sloping gusset 17 between the watershed portion and the front wall, each liner projection 16 defining with a respective sloping gusset a recess 18, the gusset recesses strengthening the tile at its interlock localities. The rear wall 12 is similarly provided with a series of retention projections 20 which extend forwardly from the front face of the upwardly extending rear wall 12, these complementary retention projections engaging within the recesses 18 in similar tiles to retain the depending front walls thereof against upward displacement. Similarly the retention projections 20, in being spaced upwardly from the watershed portion 13, form recesses which receive the front wall retention projections 16, so that an interlock exists when the tiles interengage. The upper surfaces 22 of the rear retention projections 20 slope for easy assembly of tiles to one another.

Extending between the front and rear walls but not for the entire length are a series of upstanding ribs 24, the end ribs being near but not at one of the side edges, and each rib cooperates with the opposite side edge of a similar tile to prevent ingress of water in the event that wind tends to blow rain between the tiles where they overlap one another. In any case the upstanding rib is positioned on a downwardly sloping portion of the upper surface of the tile when the tile is used as a roofing tile, so that this tendency exists only under conditions of high wind pressure. The overlap portion is also of shallow gutter form so that the rain which penetrates between the tiles will tend to run downwardly down the slope of the roof rather than work its way by capillary action between the two tiles to discharge beneath them.

The retention projections 16 and 20 are all provided with surfaces inclined to the general plane of the watershed portion, and the angle is such that a tile may be pressed from a "dough" with its watershed portion at an angle of, say, 45° to the direction of die movement, and have no reentrant angles between its surfaces so as to be free to come away from both dies 26 and 27. This is illustrated in FIG. 5.

The material used for the tiles in this embodiment is a polyester "dough" containing a large proportion of filler material and also containing some fibrous material for reinforcing, in this embodiment glass fibers, and the "dough" is pressed between the dies 26 and 27 which are spaced when fully closed to provide a die cavity of fixed shape, the dies being provided with a heating cycle so that the initial curing of the polyester can take place as the dough is pressed. The dough also includes a release agent.

A brief consideration of the above embodiment will indicate that the invention is very simple but nevertheless results in a tile which can be of very low cost but high strength, which is light in weight and which is quickly and easily secured to a roof. It will be seen that the rear flange of the tile being secured to a batten firmly secures the rear end of the tile to the batten, while the complementary retention projections ensure that the front end of the tile is also prevented from lifting upwardly by its interlocking with a similar tile. Furthermore it will be seen that none of the fixing means is exposed to the weather, but in each instance fixing means is protected by the

overlapping front edge of a tile. It will of course be seen that resins other than polyester resin can be used.

We claim:

1. A tile formed from resin-based plastics material containing both filler materials and reinforcing fibers, the configuration of the tile including a depending front wall, an upstanding rear wall, and a watershed portion joining the walls, a projection extending forwardly on the upstanding rear wall spaced upwardly from the watershed portion to define a recess, and a projection extending rearwardly from the depending front wall complementary in shape to the recess thereby forming interlocking means between similarly shaped tiles, the said projections having their interengaging surfaces inclined to the general plane of the watershed, so constructed and arranged that no reentrant angles exist between surfaces thereof, the said projections being further characterized in that the front wall projection defines with the front wall and the watershed portion a further recess which is complementary in shape to the rear wall projection, the projections thereby interlocking in respective recesses when two similar tiles interengage, and the upper surface of the rear wall projection slopes relative to the watershed portion of the tile.

2. A tile according to claim 1 further including a flange extending rearwardly of the rear wall from a portion thereof above the watershed portion of the tile.

3. A tile according to claim 1 further including a plurality of

upstanding ribs extending along the upper surface of the watershed portion between the front and rear walls, one end rib being near but not at one of the side edges and cooperating with an overlapping side edge of an adjacent tile.

4. A tile formed from resin-based plastics material containing both filler materials and reinforcing fibers, the configuration of the tile including a depending front wall, an upstanding rear wall, and a watershed portion joining the walls, a rear wall projection extending forwardly of the upstanding rear wall provided with an interlocking surface disposed upwardly from the watershed portion and defining therewith a recess, a front wall projection extending rearwardly from the rear face of the front wall being provided with an interlocking surface spaced downwardly from the watershed portion and defining therewith a further recess, the front wall projection being complementary in shape to the recess beneath the rear wall projection and the rear wall projection being complementary in shape to the recess above the front wall projection, said interlocking surfaces being inclined relative to the watershed portion and being substantially parallel to one another, the said projections having their interengaging surfaces inclined to the general plane of the watershed, so constructed and arranged that no reentrant angles exist between surfaces thereof, and further comprising a flange extending rearwardly from the upper edge of the rear wall.

30

35

40

45

50

55

60

65

70

75