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

(11) Publication number: **0 350 587 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **89108429.5**

(51) Int. Cl.4: **E04D 1/18**

(22) Date of filing: **10.05.89**

(30) Priority: **15.07.88 IT 6194288 U**

(43) Date of publication of application:
17.01.90 Bulletin 90/03

(84) Designated Contracting States:
ES GR

(71) Applicant: **Scarpa, Tobia**
Via Fabio Filzi, 16
I-31040 Trevignano (Treviso)(IT)

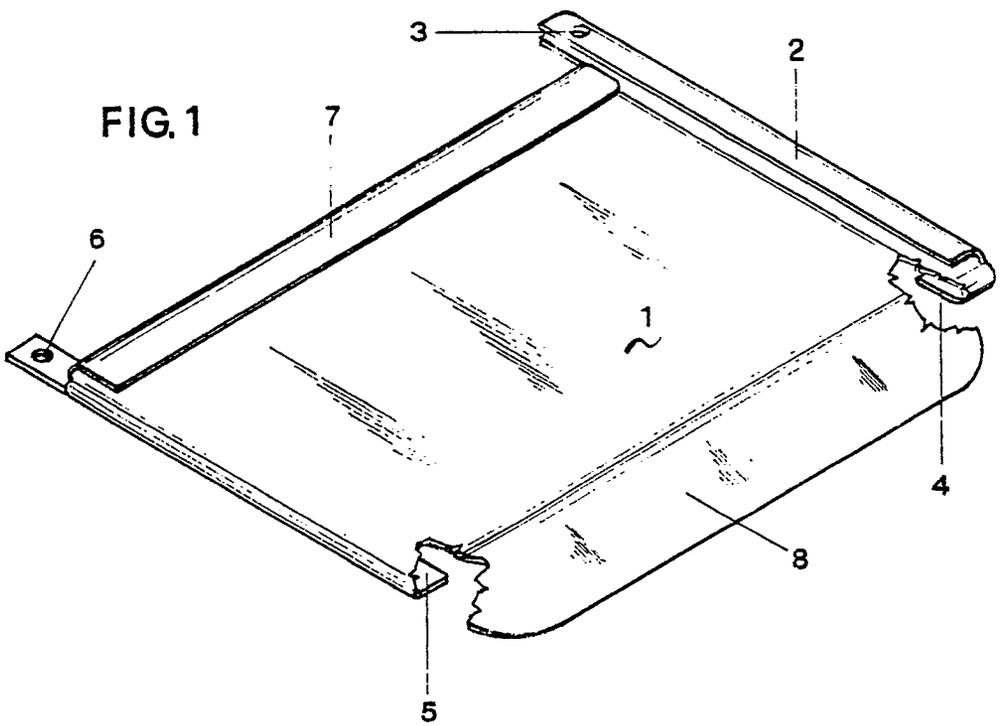
(72) Inventor: **Scarpa, Tobia**
Via Fabio Filzi, 16
I-31040 Trevignano (Treviso)(IT)

(74) Representative: **Piovesana, Paolo**
Corso del Popolo, 70
I-30172 Venezia-Mestre(IT)

(54) Modular roofing element.

(57) A modular roofing element (1) consisting of a plate-like element of substantially rectangular shape in which one side edge (2) is bent frontwards to U-shape and is provided with a lower appendix (4) bent rearwards to U-shape, the other side edge (5) is bent rearwards to U-shape, and the upper transverse edge (7) is bent frontwards to U-shape.

FIG. 1



EP 0 350 587 A1

This invention relates to a modular roofing element.

An object of the invention is to provide a metal modular roofing element which is extremely easy to mount.

A further object of the invention is to provide a modular element which gives high stability to the constructed roof.

A further object of the invention is to provide a modular element which offers a practically total seal against water, wind and atmospheric agents in general.

A further object of the invention is to provide a modular element which gives a resultant pleasant appearance.

A further object of the invention is to provide a modular element which allows the roof to adapt to thermal expansion of the individual elements.

A further object of the invention in to provide an element which allows effective natural roof ventilation to be obtained.

These and further objects which will be apparent from the description given fereinafter are attained according to the invention by a modular roofing element characterised by consisting of a plate-like element of substantially rectangular shape in which:

- one side edge is bent frontwards to U-shape and is provided with a lower appendix bent rearwards to U-shape,
- the other side edge is bent rearwards to U-shape, and
- the upper transverse edge is bent frontwards to U-shape.

The present invention is described in detail hereinafter with reference to the accompanying drawings in which:

figure 1 is an interrupted partly perspective view of a modular element according to the invention;

figure 2 is a plan view thereof;

figure 3 is a perspective view of a roof portion obtained using the elements according to the invention;

figure 4 is a detailed view of the connection between adjacent elements, taken in horizontal section on the line IV-IV of figure 3;

figure 5 is a detailed view of the connection between adjacent elements, taken in vertical section on the line V-V of figure 3;

figure 6 is a detailed cross-sectional view showing the engagement between two horizontal element bands at the ridge of a two-pitch roof, in a first embodiment;

figure 7 is the same detailed view as figure 6, but in a second embodiment.

As can be seen from the figures, the modular element according to the invention, indicated overall by 1, consists of a sheet portion of electrolytically treated normal or stainless steel, copper, coloured or non-coloured aluminium, or another metal prepainted or pretreated for the particular use.

The element 1 is of overall rectangular shape, of which:

- the right hand edge 2 (with reference to figure 2) is bent frontwards to U-shape, ie towards the outer surface of the element 1, and comprises at its upper end a through hole 3. The lower portion of the outer flange of said lateral edge 2 is removed, whereas the inner flange is bent rearwards to U-shape to form a hooking appendix 4. The frontward bending of the right hand edge 2 is preceded by its bending in two opposing directions so that the two flanges of said edge 2 lie symmetrically about the general plane of the element 1;
- the left hand lateral edge 5 is bent rearwards to U-shape and is provided with a hole 6 corresponding to the hole 3 of the right hand lateral edge;
- the upper transverse edge 7 is bent frontwards to U-shape; although it is not strictly necessary to provide a continuous bend along the upper edge 7, it is preferable because as will be apparent hereinafter this ensures a good seal against water and against the force of the wind, and also gives greater freedom in the relative positioning of the various elements. However, the bending of the edge 7 does not include the right hand lateral edge 2 or the outer flange of the left hand lateral edge 5;
- the lower edge 8 has its ends slightly rounded and is given a slight rearward bend. As will be apparent hereinafter, this slight bend is provided both for aesthetic reasons and for functional reasons in that it contributes to the water and wind seal.

The element according to the invention is constructed from sheet metal strip, from which a portion corresponding to the developed element is punched out without the parts which are not present in the finished element, ie the lower portion of the outer flange of the left hand edge 2 and the ends of the lower edge 8.

The punched piece is then subjected to conventional bending operations to produce the element 1. This can then be surface-treated if the initial sheet metal strip had not been subjected to such treatment.

For mounting purposes a support lattice advantageously of wood or possibly metal is required comprising a plurality of longitudinal members 9 disposed parallel to each other at a distance apart substantially equal to the distance between those lines on the elements 1 about which the upper edge 7 and lower edge 8 are bent.

The lower left hand roofing element is then applied to this lattice and fixed to the corresponding longitudinal member 9 with screws screwed

through the holes 3 and 6 provided in the two lateral edges 2 and 5. The horizontally adjacent element is then fitted to this element so that its rearwardly bent left hand lateral edge 5 engages in the frontwardly bent right hand edge 2 of this already fitted element, and is then fixed to the same longitudinal member 9 with further screws through the holes 3 and 6. When the horizontal row of elements is complete the overlying row is commenced. The first element is applied in imbricate arrangement between the two adjacent elements 1 positioned at the left hand end of the lower row, so that the hooking appendix 4 of the right hand edge 2 of the new element engages in the frontwardly bent upper transverse edge 7 of one of said elements of the first row. This procedure is then repeated for the adjacent element until the second row is complete, after which the third row is applied and so on until that roof pitch is complete.

If the roof has two pitches, the two upper rows of elements 1 are connected together by ridge elements 10 and 11 which engage in the two bent upper edges 7 of the elements of these two rows, the ridge elements 10, 11 then being joined together either directly (see figure 6) or by U-section elements 12 (see figure 7).

From the aforegoing it is apparent that the modular elements according to the invention are extremely advantageous in that:

- they are extremely easy to mount,
- they enable roofs of high mechanical stability to be constructed,
- they offer an excellent seal against water and wind,
- they have a resultant pleasant appearance,
- they render the roof virtually insensitive to thermal expansion by completely absorbing it,
- they enable roofs to be constructed having excellent natural ventilation.

Claims

1. A modular roofing element characterised by consisting of a plate-like element of substantially rectangular shape in which:
- one side edge (2) is bent frontwards to U-shape and is provided with a lower appendix (4) bent rearwards to U-shape,
- the other side edge (5) is bent rearwards to U-shape, and
- the upper transverse edge (7) is bent frontwards to U-shape.

2. An element as claimed in claim 1, characterised in that the two side edges (2,5) extend upperly beyond the bent tansverse edge (7) to form two appendices for fixing the element to an underlying support lattice (9).

3. An element as claimed in claim 2, characterised in that the upper appendices of the lateral edges (2,5) comprise a hole (3,6) through which members are passed for fixing the element to the lattice (9).

4. An element as claimed in claim 1, characterised in that the lower transverse edge (8) is slightly bent rearwards.

5. An element as claimed in claim 1, characterised by comprising, in proximity to the frontwardly bent lateral edge (2), two bends in opposing directions such that the two flanges of said bent edge (2) become disposed symmetrically about the general plane of the element.

6. An element as claimed in claim 1, characterised by being of sheet metal construction.

7. An element as claimed in claim 6, characterised by being of copper construction.

8. An element as claimed in claim 6, characterised by being of aluminium construction.

9. An element as claimed in claim 8, characterised by being of coloured aluminium construction.

10. An element as claimed in claim 1, characterised by being of prepainted sheet metal construction.

FIG. 1

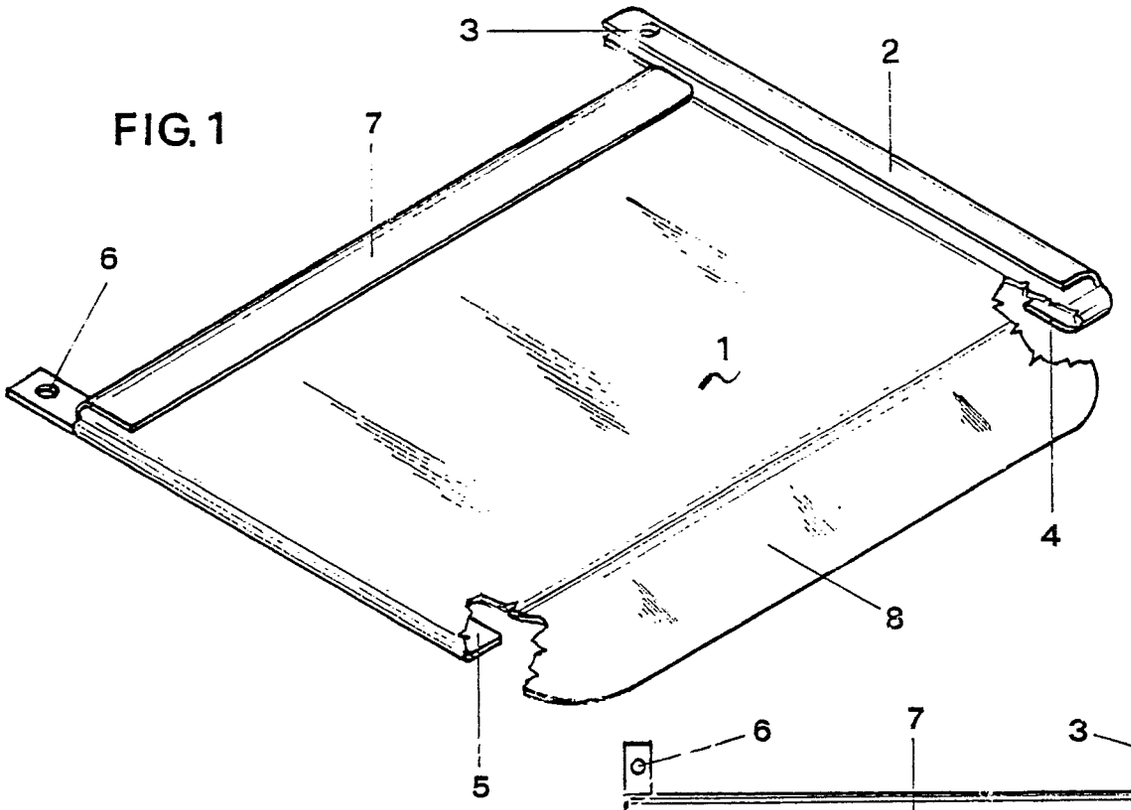
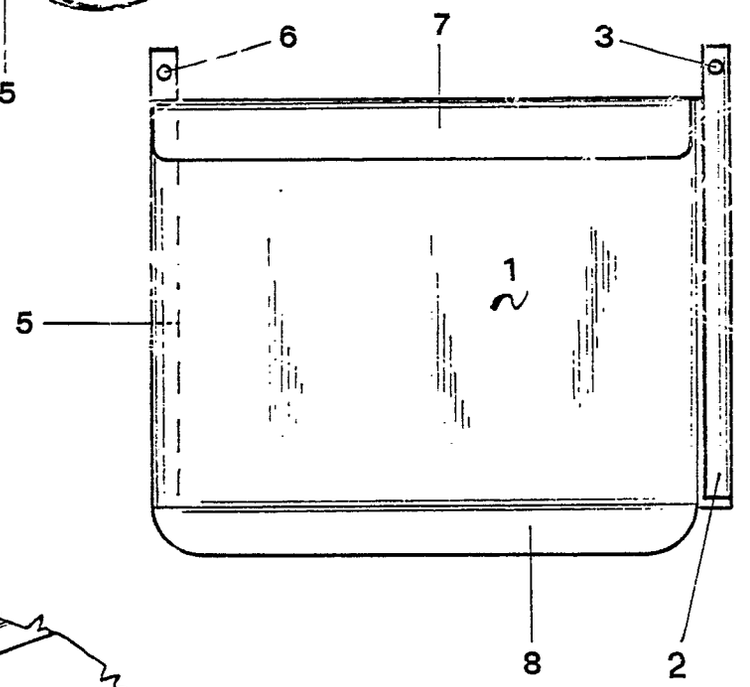


FIG. 2



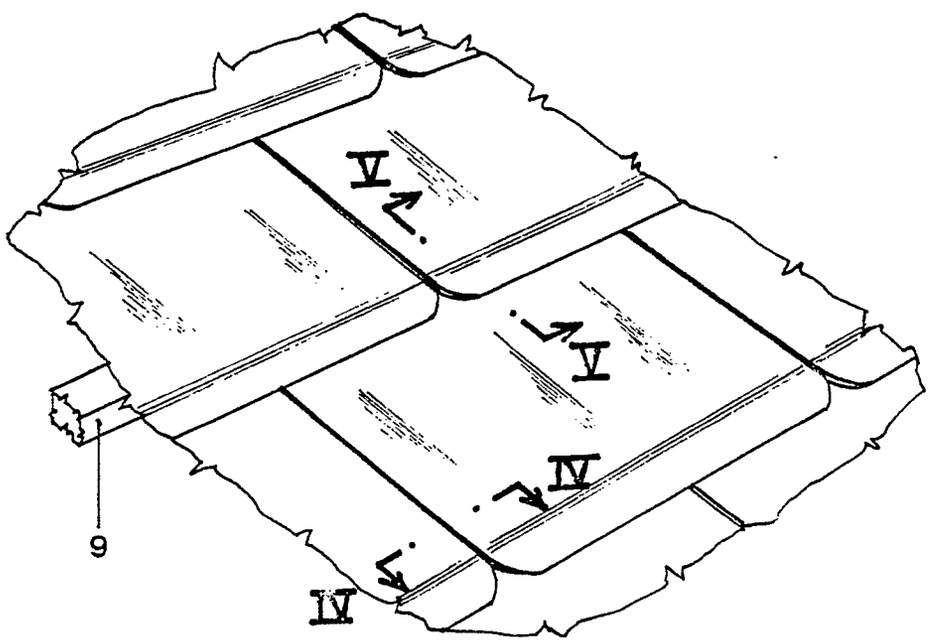


FIG. 3

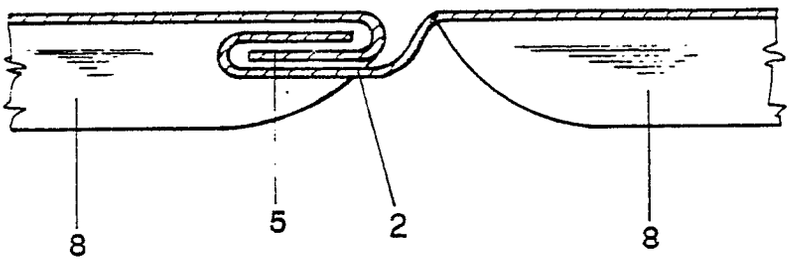


FIG.4

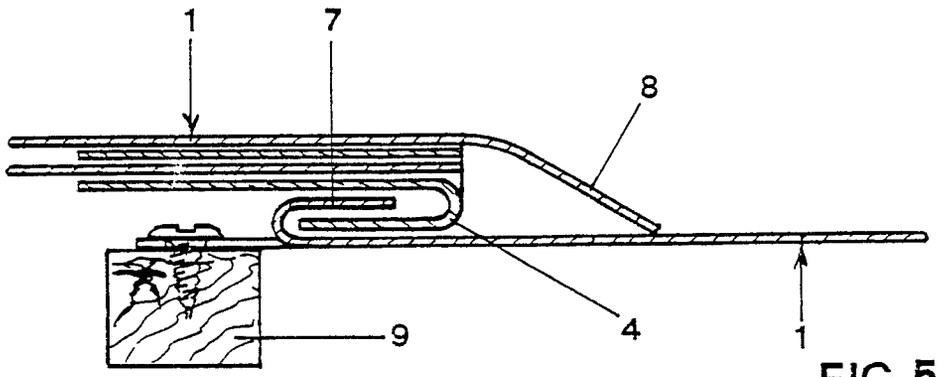


FIG.5

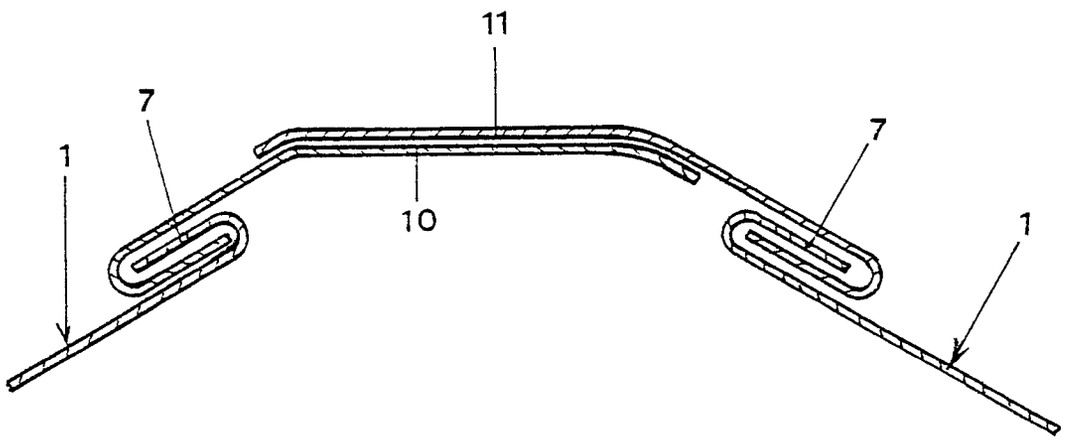


FIG.6

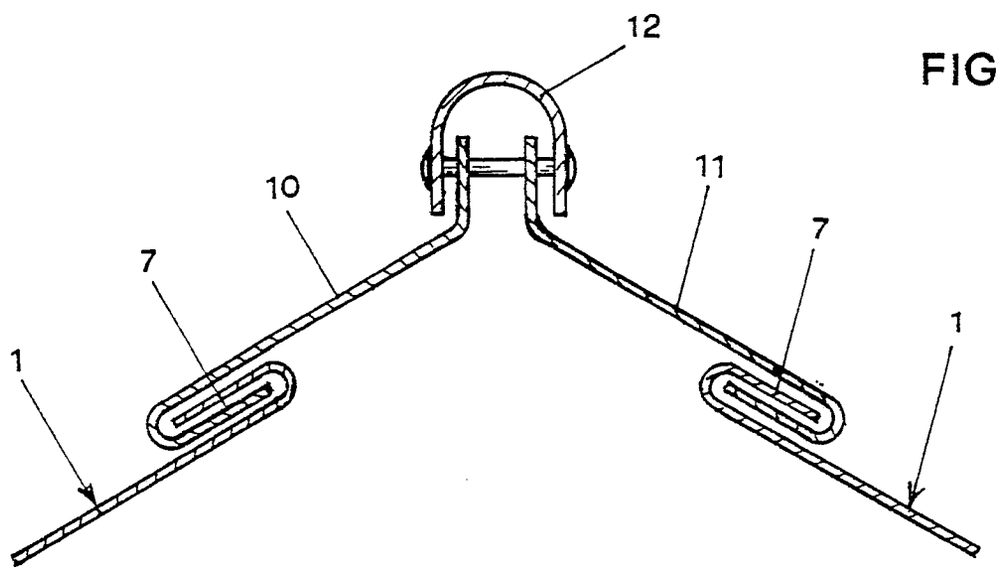


FIG.7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 10 8429

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)
A	DE-C- 879 762 (F. MEINZER) * Page 2, column 1, lines 1-12,54-57; page 2, column 2, lines 86-92; figures 1-3 *	1-3,6,8	E 04 D 1/18
A	US-A-2 830 546 (D. RIPPE) * Column 1, lines 55-58; claim 1; figures 5,8,9 *	1,3,6,8	
A	DE-A-1 708 975 (N. MARTINEZ) * Page 6, lines 10-19; page 7, lines 1-8; figures 1,2,4,7,10 *	1-3,5-6	
A	US-A-2 882 840 (G. WASKE) * Column 2, lines 6-18,25-39; claim 1; figures 1,3,4 *	1-3	
A	FR-A- 509 081 (R. DUGUET) * Page 1, column 2, line 43 - page 2, column 1, line 8; figures 1,4 *	1,3,6	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E 04 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11-10-1989	KRIEKOUKIS S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)