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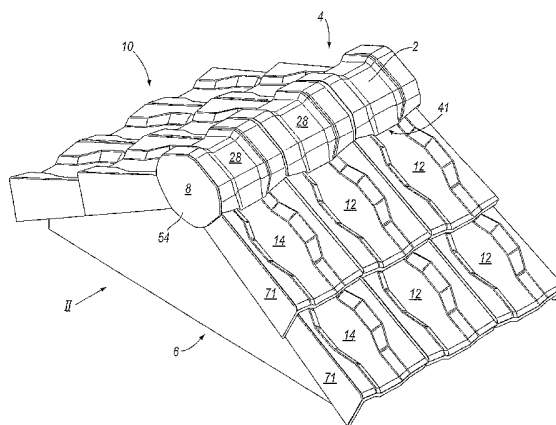
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ROOF TILES



(57) Abstract: An integrated set of roof tiles comprises a main roof tile (12) of rectangular shape in plan, which is provided with interlocking side-lock portions (58, 60) at opposite side edges thereof. The roof tile (12) also has a flat, bottomed channel (62) with sloping side walls (68, 70), the channel (62) extending from a toe to head end of the main roof tile (12). The channel (62) has a widening towards the middle of its length. The set of roof tiles also comprises a ridge tile (2), which is substantially of half round configuration and is provided with a channel (24) having sloping side walls (30, 32), the channel (24) extending over the ridge tile to continue the configuration of the main roof tiles (12). The ridge tiles (2) are also provided with protuberances (42) at lower edges that engage in use with upper faces of the topmost roof tiles (12) on either side of an apex (4) of a roof (6), which protuberances (42) define a ventilation opening (41) between the ridge tiles (2) and the topmost roof tiles (12). Pervious sealing members, provided by grills, strips of foam or a combination thereof are attached to the ridge tiles (2) to bridge the ventilation openings (41) and facilitate the fast assembly of the ridge of a roof. The set of tiles, which also includes ridge end caps (8) and verge tiles (14), are moulded from concrete and have a density of between 2.11 to 2.16 g/cm³ and a durability of over 400DIN freeze/thaw cycles.



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ROOF TILES

FIELD OF THE INVENTION

5 This invention is concerned with improvements in concrete roof tiles and is particularly concerned with sets of concrete roof tiles including a novel roof ridge tile intended to complement the shape and configuration of main roof tiles of a set thereof.

10

BACKGROUND TO THE INVENTION

Concrete roof tiles have been traditionally made for almost one hundred years by an evolving roller and slipper extrusion
15 process as disclosed, for example, in GB 1357627, so that upper surfaces of the roof tiles are linear along their lengths from toe portions to head portions thereof.

It will be readily understood, therefore, that roof tiles
20 formed by the conventional extrusion process cannot be provided with upper surfaces having configurations other than those that may be formed by said extrusion processes.

Nevertheless, extruded roof tiles are applied to the pitched
25 roof of a building, whether a domestic or commercial building, the tiles being configured so that they match the remainder of the roof tiles, viz. the verge tiles, on a completed roof.

Ridge tiles, on the other hand, which may be made by an
30 extrusion or moulding process, have generally been of a half-round, delta or of tapered half-round configuration and are usually of simple design for the purpose of sealing the ridge of a roof.

In the past, where a roof is to be ventilated at the ridge thereof, provision has been made for this purpose by providing ventilation elements that are affixed to a ridge batten of a roof structure with ridge tiles being assembled on the roof
5 overlying the ventilation elements. The inclusion of the ventilation elements has often called for the addition of intermediate tiles and/or other closing elements between the ridge tiles and the uppermost ones of the main roof tiles on the roof.

10

Thus, the extra components required for assembling the completed roof ridge structure, together with the attendant labour, adds to the overall cost of the roof.

15 Therefore, it is one of the objects of the present invention to provide an improved roof ridge tile that overcomes, or at least mitigates the disadvantages of the prior arrangements, which roof ridge tile is provided as a prefabricated unit incorporating ventilation means.

20

It is another object of the present invention to provide a set of tiles that overcomes, or at least mitigates the disadvantages of the prior arrangements.

25 It is a further object of the present invention to provide a roof ridge tile of novel configuration that is complementary to the shape and configuration of the main roof tiles and thereby comprising an integrated set of roof tiles.

30

SUMMARY OF THE INVENTION

Thus, the present invention conveniently provides a roof ridge tile, which is generally half round in shape and is provided with a flat bottomed central channel portion, adapted in use, to complement the shape and configuration of a flat bottomed channel provided in an adjacent roof tile on a roof, said adjacent roof tile comprising an upper surface that includes a flat bottomed channel extending lengthwise thereof, the central channel portion of said roof ridge tile, when in use on a roof, being juxtaposed and upwardly extending from the channel of the adjacent roof tile.

By the term "central channel portion" is meant a portion of the ridge tile configured as a channel, a centre line of the tile, when viewed in use on the roof, lying in the channel. Preferably, the ridge tile, when viewed on the roof, appears symmetrical about that centre line.

The term "central channel" when used in connection with a roof tile, is to be similarly construed.

In a preferred embodiment of the invention, lower edge portions of the roof ridge tile are provided with protuberances adapted, in use, to rest on an upper surface of an adjacent roof tile to define a ventilation opening between the roof ridge tile and the adjacent roof tile.

Preferably, the ventilation opening is bridged by a pervious sealing member, which may conveniently be provided by a grill, a strip of foam material or a combination of a grill and a strip of foam.

In one convenient embodiment provided by the invention, the

pervious sealing member may be co-joined with the ridge tile to form a prefabricated unit.

Conveniently, the channel of the ridge tile is bounded by
5 sloping side walls, which also complement, in use on a roof, sloping side walls of the channel formed in the upper surface of the adjacent roof tile.

Preferably, the roof ridge tile comprises means for
10 interlocking with adjacent roof ridge tiles along a ridge of a roof when in use, said interlocking means comprising a downwardly facing lock portion at one end of the roof ridge tile and an upwardly facing lock portion at an opposite end thereof.

15 Conveniently, the roof ridge tile has a length that is equal, or substantially equal to the width of the adjacent roof tile.

The present invention also provides a set of tiles for use on
20 a roof, the set comprising roof ridge tiles according to the last seven preceding paragraphs and roof tiles provided with channels extending lengthwise at mid-portions thereof, the roof ridge tiles and the roof tiles being adapted, in use, to mutually complement their respective shapes and configurations
25 where lower edge portions of the roof ridge tiles lie adjacent an associated, uppermost roof tile on a roof.

In use on a roof, the set facilitates their application to
30 pitched roofs having pitches down to seven degrees.

Preferably, the roof tiles of the sets of tiles each have a

density of from 2.11 to 2.16 g/cm³ and a durability of more than 400DIN freeze/thaw cycles.

There now follows, by way of example, a detailed description
5 of the invention, which description is to be read with reference to the accompanying drawings in which:

Figure 1 is an upper perspective view of a roof ridge enclosed in a set of tiles provided by the invention;

10

Figure 2 is a diagrammatic section view through an upper part of a roof as seen in the direction of the arrow II in Figure 1;

15 Figure 3 is front side view of a ridge tile of the invention;

Figure 4 is a right hand upper perspective view of the tile shown in Figure 3;

20 Figure 5 is a front side view of a ridge end cap of the invention; and,

Figure 6 is a right hand upper perspective view of a main roof tile of the invention.

25

The novel set of roof tiles of the present invention generally comprises a ridge tile 2 positioned in use at the apex 4 of a pitched roof 6, a ridge tile end cap 8 located at each end 10 of the apex 4 of the roof 6, only one such ridge end cap 8
30 being shown in Figure 1, a main roof tile 12 and right and left hand verge tiles 14, only the left hand verge tile 14 being shown in Figure 1.

The ridge tile 2, which is substantially of half-round configuration, see Figures 2 and 4, comprises a downwardly facing interlock 16 at a right end 18 thereof and an
5 upwardly facing interlock 20 at a left hand end 22 thereof, see Figure 4.

The ridge tile 2 also comprises a portion configured as a channel 24, which extends over the ridge tile 2 at a mid-
10 portion 26 thereof, see Figures 1, 2, and 3, the channel 24 having a multi-facettted base portion 28, see Figures 3 and 4.

A centre line 25 of the ridge tile, when viewed in use on the roof, lies in the channel 24, the ridge tile appearing symmetrical about the centre line 25.

15

The multi-facettted base portion 28 is bounded by multi-facettted sloping walls 30 and 32, see Figure 3 and 4, the shape and configuration of base portion 28 and sloping walls 30 and 32 being complemented by corresponding exterior facets
20 34 and 36 of the roof ridge tile 2, see Figures 1, 3 and 4.

From Figure 3, it will be readily appreciated that each lower edge portion 38a and 38b of the roof ridge tile 2 is configured to be complementary to the shape and configuration
25 of respective main roof tiles 12 against which it is positioned, see Figures 1 and 2.

The ridge tile 2 is provided with protuberances 42 along its lower edge portions 38a and 38b, see Figure 3, the
30 protuberances 42 being arranged to abut against upwardly facing surfaces of the main roof tiles 12 when in use on a roof to define a ventilation gap 41 therebetween, see Figures

1 and 2.

At its left hand end 22, the ridge tile 2 is provided with a raised nail hole 44 for facilitating the attachment of the ridge tile 2 to a ridge batten 46 provided at the apex 4 of a roof.

The ridge tile end cap 8 is generally of the same configuration as a ridge tile 2; however, while it is provided with an upwardly facing interlock 48 at a right hand end 50 thereof for engagement in use with a next in line roof ridge tile 2, see Figure 1, at its left hand end 52 the end cap 8 is closed by an end wall 54, see Figure 5.

The main roof tile 12 is generally rectangular in plan and comprises a downwardly facing sidelock 56 at a right hand side 58 thereof and an upwardly facing sidelock 60 at a left hand side 61 thereof, see Figure 6.

The tile 12 also comprises an upwardly facing channel 62 at a mid portion 64 thereof, the channel 62, which extends lengthwise of from top to bottom of the tile 12, has a wider mid portion 66, see Figures 1 and 6. A centre line 64 of the tile, when viewed in use on a roof, lies in the channel 62, the tile appearing symmetrical about the centre line 64.

The channel 62 of the roof tile 12 is bounded on opposite sides thereof by sloping walls 68 and 70 giving the roof tile 12 a distinctive upper face configuration, see Figures 1 and 6.

The verge tile 14 is generally of the same shape and

configuration as the roof tile 12 except that it is provided with a downwardly extending wall 71 at a left hand end thereof to close the verge side 72 of the roof, see Figure 1.

5 From Figure 1, it will be readily be appreciated that when the roof tiles 12, verge tiles 14, the ridge tiles 2 and the ridge end cap 8 are assembled on a roof, all of the tiles complement each other with the channels 62 of the roof tiles 12 and verge tiles 14 being extended over the roof by the complementary
10 channels 24 of the ridge tiles 2 and the end cap 8 respectively.

The ridge tiles 2 are fastened in position by fastening elements, not shown, passing through the raised nail holes 44
15 into the ridge batten 46.

When completed, the roof ridge is well ventilated by provision of the ventilation gaps 41 that are defined between the ridge tile lower edge portions 38a and 38b and the upper surfaces of
20 the main roof tiles 12 against which the protuberances 42 make contact on either side of the roof ridge apex 4.

The ventilation gaps 41 are bridged by a sealing member provided by foam elements 43 or the like, which foam elements
25 allow adequate ventilation of a roof while preventing the ingress of small birds and large insects to the inside of the roof structure.

The roof ridge tiles 2 are supplied with their sealing
30 members, viz. the foam elements 43 attached thereto. Thus, when a roofer covers a roof ridge using the set of tiles provided by the present invention, the use of the

prefabricated roof ridge tiles 2 and foam element 43 facilitate the fast and efficient covering of the roof ridge 4.

- 5 In alternative embodiments provided by the present invention, the pervious sealing members may be provided by grills or combinations of grills and foam elements co-joined with roof ridge tiles.
- 10 It will be appreciated that the simplified construction of a roof, incorporating the set of tiles provided by the invention, reduces the numbers of the components used when compared with roofs having multi-component ventilation means at the roof ridge. This leads to an appreciable reduction in
- 15 product and labour costs for the end user.

The roof tiles of the set of tiles provided by the invention are made by a method of moulding concrete roof tiles as disclosed in a United Kingdom patent application 0508652.5

20 filed 28 April 2005 entitled 'Method and Plant for the Manufacture of Building Products' (attorney references F54/058GB and 16768/DG), details of which are imported herein by reference.

- 25 The roof tiles may be cast from a cementitious composition by a method leading to a density of 2.11 to 2.16 g/cm³ and a durability of more than 400DIN freeze/thaw cycles.

CLAIMS

1. A roof ridge tile, which is generally half round in shape and is provided with a flat bottomed central channel portion
5 (24).
2. A roof ridge tile according to Claim 1, wherein lower edge portions of the roof ridge tile are provided with protuberances (42) adapted, in use, to rest on an upper
10 surface of an adjacent roof tile and to define a ventilation opening between the roof ridge tile and the adjacent roof tile.
3. A roof ridge tile according to Claim 1 and 2, wherein the
15 channel of the ridge tile is bounded by sloping side walls (30, 32).
4. A roof ridge tile according to any preceding claim, having a density of from 2.11 to 2.16 g/cm³.
20
5. A roof ridge tile according to any preceding claim, having a durability of more than 400 DIN freeze/thaw cycles.
6. A roof ridge tile according to any preceding claim,
25 wherein the roof ridge tile comprises means (16, 20) for interlocking with adjacent roof ridge tiles along a ridge of a roof when in use.
7. A roof ridge tile according to claim 6, wherein said
30 interlocking means comprising a downwardly facing lock portion at one end of the roof ridge tile and an upwardly facing lock portion at an opposite end thereof.
8. A set of tiles for use on a roof, the set comprising a

plurality of roof ridge tiles according to Claims 1 to 8 and a plurality of roof tiles (12) each provided with a flat bottomed central channel (62) extending lengthwise at mid- portions thereof, the roof ridge tiles and the roof tiles
5 being adapted, in use, to mutually complement their respective shapes and configurations where lower edge portions of the roof ridge tiles lie adjacent an associated, roof tile on a roof.

10 9. A set of tiles according to Claim 8, wherein lower edge portions of the roof ridge tile are provided with protuberances (42) adapted, in use, to rest on an upper surface of an adjacent roof tile and to define a ventilation opening (41) between the roof ridge tile and the adjacent roof
15 tile and the ventilation opening is bridged by a pervious sealing member (43).

10. A set of tiles according to Claim 9, wherein the pervious sealing member is provided by a grill, a strip of foam
20 material or a combination of a grill and foam strip.

11. A set of tiles according to either one of Claims 9 or 10, wherein the pervious sealing member is co-joined with the roof ridge tile to form a prefabricated unit.
25

12. A set of tiles according to any one of claims 8 to 11, wherein the channel of each tile is bounded by sloping side walls which also complement, in use on a roof, sloping side walls of the channel formed in the upper surface of the
30 adjacent roof tile.

13. A set of roof tiles according to any one of claims 8 to

12, wherein the roof tiles of the set each have a density of from 2.11 to 2.16 g/cm³.

14. A set of tiles according to any one of claims 8 to 13,
5 wherein the roof tiles of the set each have a durability of more than 400DIN freeze/thaw cycles.

15. A set of tiles according to any one of claims 8 to 14,
wherein each roof ridge tile has a length that is equal, or
10 substantially equal to the width of the adjacent roof tile.

AMENDED CLAIMS

Received by the International Bureau on 17 August 2006

1. A set of tiles for use on a roof, the set comprising a plurality of roof ridge tiles (2) and a plurality of roof
5 tiles (12), wherein each roof ridge tile is generally half round in shape in its transverse cross-section and is provided with a central channel portion (24) which extends along the transverse centre line of the tile, said channel having a bottom which is flat in its longitudinal cross-section, and
10 each roof tile is provided with a flat bottomed central channel (62) extending lengthwise at mid-portions thereof, the roof ridge tiles and the roof tiles being adapted, in use, to mutually complement their respective shapes and configurations where lower edge portions of the roof ridge tiles lie adjacent
15 an associated, roof tile on a roof.

2. A set of tiles ~~roof ridge tile~~ according to Claim 1, wherein lower edge portions of the roof ridge tile are provided with protuberances (42) adapted, in use, to rest on
20 an upper surface of an adjacent roof tile and to define a ventilation opening between the roof ridge tile and the adjacent roof tile.

3. A set of tiles ~~roof ridge tile~~ according to Claim 1 and
25 2, wherein the channel of the ridge tile is bounded by sloping side walls (30, 32).

4. A set of tiles ~~roof ridge tile~~ according to any preceding claim, wherein the ridge tiles have ~~having a~~ density of from
30 2.11 to 2.16 g/cm³.

5. A set of tiles ~~roof ridge tile~~ according to any preceding claim, wherein the ridge tiles have ~~having a~~ durability of

more than 400 DIN freeze/thaw cycles.

6. A set of tiles ~~roof ridge tile~~ according to any preceding claim, wherein each ~~the~~ roof ridge tile comprises means (16,
5 20) for interlocking with adjacent roof ridge tiles along a ridge of a roof when in use.

7. A set of tiles ~~roof ridge tile~~ according to claim 6, wherein said interlocking means comprising a downwardly facing
10 lock portion at one end of the roof ridge tile and an upwardly facing lock portion at an opposite end thereof.

~~8. A set of tiles for use on a roof, the set comprising a plurality of roof ridge tiles according to Claims 1 to 6 and a
15 plurality of roof tiles (12) each provided with a flat bottomed central channel (62) extending lengthwise at mid-
portions thereof, the roof ridge tiles and the roof tiles being adapted, in use, to mutually complement their respective
shapes and configurations where lower edge portions of the
20 roof ridge tiles lie adjacent an associated, roof tile on a roof.~~

9. A set of tiles according to Claim 1 ~~6~~, wherein lower edge portions of the roof ridge tile are provided with
25 protuberances (42) adapted, in use, to rest on an upper surface of an adjacent roof tile and to define a ventilation opening (41) between the roof ridge tile and the adjacent roof tile and the ventilation opening is bridged by a pervious sealing member (43).

30

10. A set of tiles according to Claim 9, wherein the pervious sealing member is provided by a grill, a strip of foam material or a combination of a grill and foam strip.

11. A set of tiles according to either one of Claims 9 or 10, wherein the pervious sealing member is co-joined with the roof ridge tile to form a prefabricated unit.

5

12. A set of tiles according to any preceding claim ~~one of claims 8 to 11~~, wherein the channel of each tile is bounded by sloping side walls which also complement, in use on a roof, sloping side walls of the channel formed in the upper surface of the adjacent roof tile.

10

13. A set of roof tiles according to any preceding claim ~~one of claims 8 to 12~~, wherein the roof tiles of the set each have a density of from 2.11 to 2.16 g/cm³.

15

14. A set of tiles according to any preceding claim ~~one of claims 8 to 13~~, wherein the roof tiles of the set each have a durability of more than 400DIN freeze/thaw cycles.

20

15. A set of tiles according to any preceding claim ~~one of claims 8 to 14~~, wherein each roof ridge tile has a length that is equal, or substantially equal to the width of the adjacent roof tile.

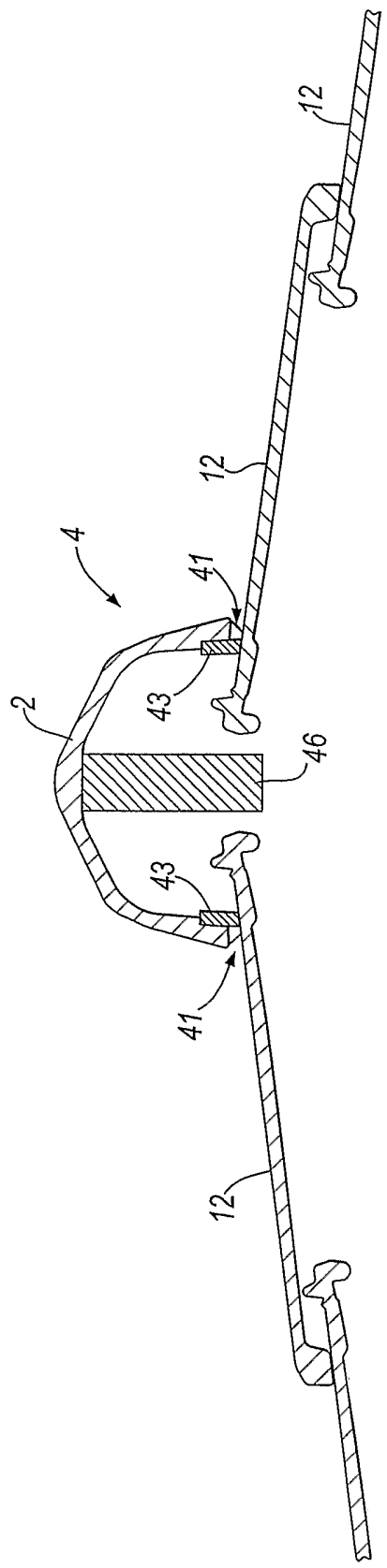


Fig. 2

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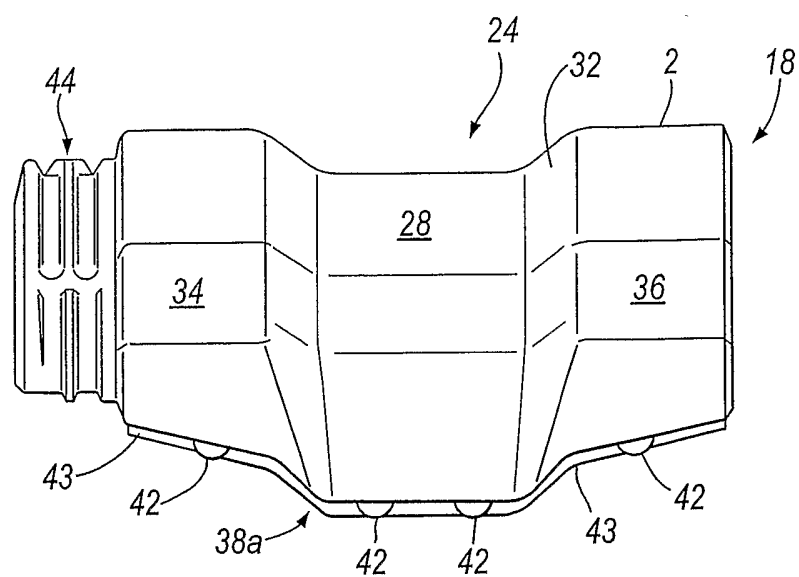


Fig.3

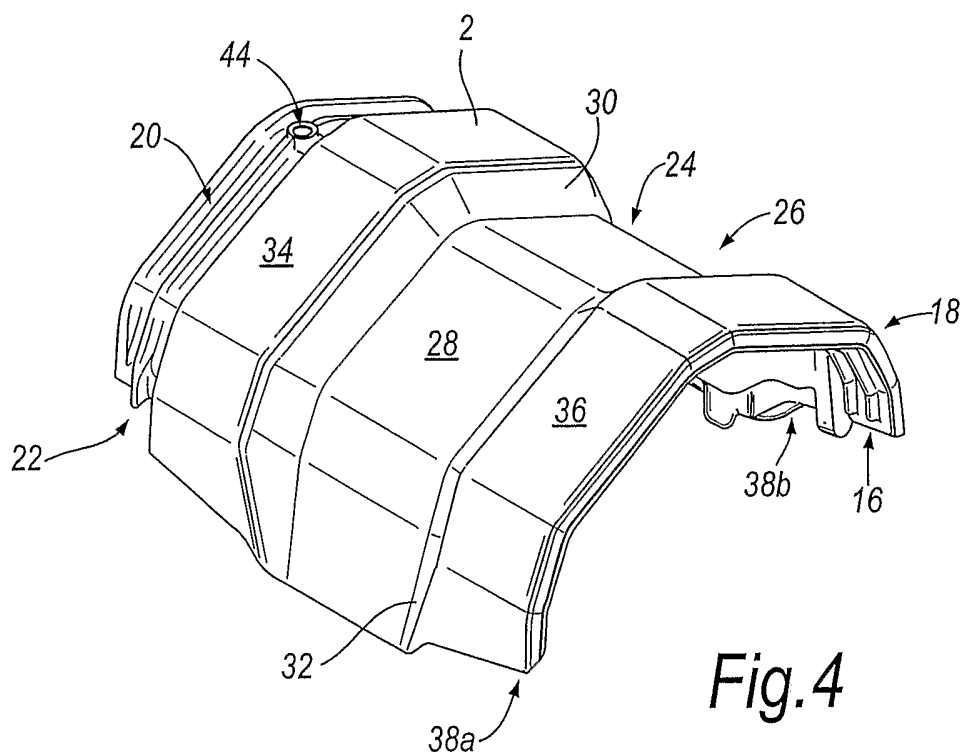


Fig.4

4/4

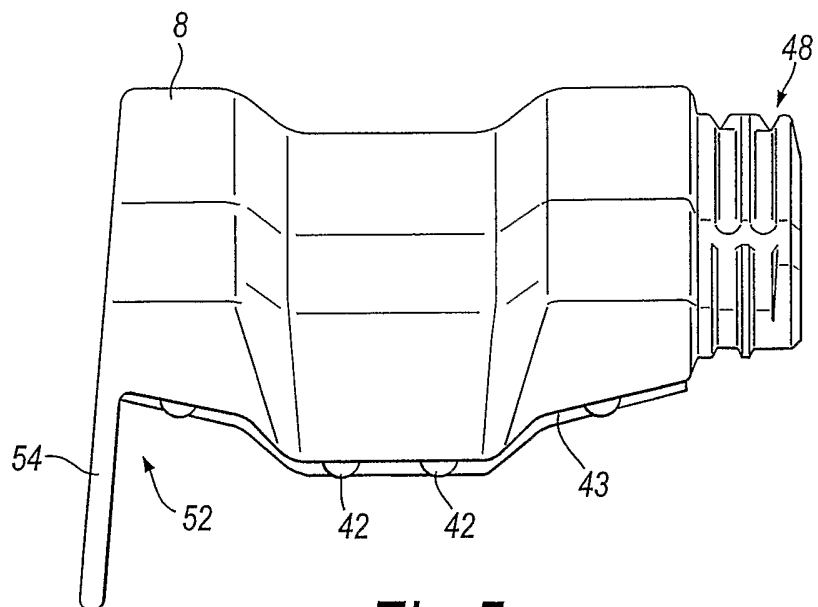


Fig. 5

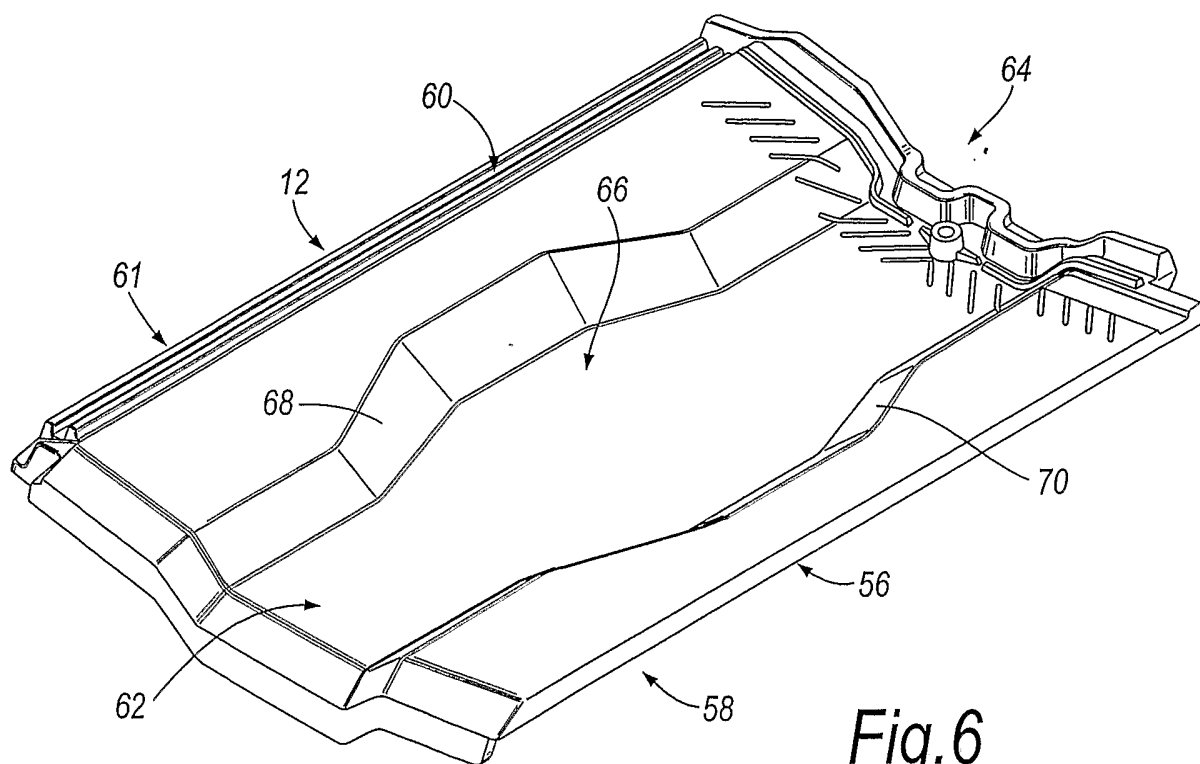


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/001544

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04D1/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 296 05 344 U1 (FRIEDRICH OSSENBERG-SCHULE & SOEHNE GMBH & CO. KG, 58762 ALTENA, DE) 30 May 1996 (1996-05-30)	1, 3-7
Y	figures 1,2	2
Y	----- WO 01/36764 A (LAFARGE BRAAS ROOFING ACCESSORIES GMBH & CO. KG; HEYER, ANDREAS; RINKL) 25 May 2001 (2001-05-25)	2
A	abstract; claims 9,10; figure 4 page 4, paragraphs 2,3 page 6, last paragraph - page 7, paragraph 1	9-11
A	----- CH 185 863 A (KELLER & CO. AKTIENGESSELLSCHAFT) 31 August 1936 (1936-08-31) the whole document	2,9
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

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- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

18 July 2006

Date of mailing of the international search report

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Demeester, J

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/001544

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 140 869 A (ANTHONY ROBERT FLETCHER-TREW) 8 April 1920 (1920-04-08) figures 5,14,15 -----	1,4-6,8, 12-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2006/001544

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