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- 1 -

A DEVICE FOR A VALLEY GUTTER FOR A ROOFFIELD OF THE INVENTION

The present invention relates to valley gutters of
rooves. The present invention also relates to roof tiles
5 slates, shingles, sheet metal roofs and like roof covering
materials, and their location adjacent a valley gutter of
a roof.

BACKGROUND TO THE INVENTION

Roof covering materials are typically attached to a
10 roof structure by the use of timber or metal battens.
These battens are typically nailed or screwed to the
rafters/truss top cords of the roof structure, parallel to
the fascia/gutter, at a gauge suitable to the roof
covering material's longitudinal length. The roof covering
15 materials are then attached to these battens, typically by
use of nails or screws; however, in the case of the roof
tiles and slates, there are many product specific clips
which are also used. A hole is usually formed in roof
tiles or slates prior to the tiles or slates being nailed
20 to a batten, the hole typically being positioned centrally
at the top of the tile in a position suitable for
attachment to the batten. A single roof tile, slate or
shingle typically spans across two adjacent, approximately
parallel tile/slate/shingle battens and the tile, slate or
25 shingle is typically nailed to the upper of the two
tile/slate/shingle battens. A roof iron typically also
spans across two adjacent, approximately parallel battens;
although, the roof iron is typically nailed to both of the
adjacent battens at a number of locations along the length
30 of the roof iron.

Roof tiles, slates or shingles are typically laid by
laying them side by side in rows, on the same two adjacent
battens so that they extend in a straight line. Each tile,
slate or shingle is positioned so that one of its
35 longitudinal edges overlaps a longitudinal edge of the
adjacent tile, slate or shingle. The row of tiles, slates
or shingles which spans between the two lowest

- 2 -

tile/slate/shingle battens is typically laid first and subsequent rows are laid by moving progressively up the roof, in a direction which is transverse to the longitudinal axes of the tile/slate/shingle battens. An upper row of tiles, slates or shingles is positioned relative to an adjacent lower row of tiles, slates or shingles so that lower ends of the upper row of tiles, slates or shingles overlap upper ends of the lower row of tiles, slates or shingles.

Roof irons are laid in a manner which is similar to the above description relating to roof tiles, slates or shingles; although a single roof iron is typically much longer in length than a single roof tile, slate or shingle.

Longitudinal axes of battens slope in accordance with a designed slope of a roof in a direction which is aligned with the longitudinal axes of the battens, while the transverse axes of battens slope generally in accordance with the desired slope of a roof in a direction which is aligned with longitudinal axes of the rafters. Differently sloping regions of a roof meet to form either a ridge, hip or valley gutter. Valley battens extend along the longitudinal length of a valley gutter, either side of the valley gutter and intersect the battens which extend downwardly toward the valley gutter. The valley gutter typically includes a sheet of metal known as a valley iron which extends between the valley battens and along the length of the valley battens. The valley iron slopes downwardly from each valley batten, toward a region which is approximately midway between the valley battens. Outer longitudinal edge regions of the valley iron extend upwardly to form upwardly directed extensions. Outer surfaces of the upwardly directed extensions typically abut the valley battens.

The roof covering materials are positioned on the roof so that the differently sloping regions of the roof which extend toward each other to form a valley gutter, do

- 3 -

not actually meet. That is, lower edges of the roofing covering materials which are positioned relative to each other to form a valley gutter, are spaced apart to enable water to flow downwardly beyond lower edges of the roof covering materials and onto an upper surface of the valley iron. The valley iron typically slopes downwardly from one of its ends to the other of its ends so that water which flows into the valley gutter flows in a downward direction along the length of the valley iron and off the roof.

10 If high winds are present during rain, water which is deposited onto the valley iron can be forced toward the upwardly directed extensions. In certain situations, the combination of rain and wind can be such that water is forced upwardly over the upper longitudinal edges of the valley iron and into the roof. Water can enter the roof either by passing over the valley battens and/or by passing between outer surfaces of the upwardly directed extensions of the valley irons and surfaces of the valley battens which the valley irons abut. Water is typically
15 also absorbed into the valley battens.
20

Roof tiles and slates pose another problem in the region proximal a valley gutter, to that described above relating to water entering the roof space via a valley gutter. Some of the roof tiles or slates which extend into the valley gutter, beyond the valley batten, are required to be cut so that tiles or slates extending downwardly and inwardly toward a central region of the valley gutter, which extends along the longitudinal length of the valley gutter, do not meet. The tiles or slates are typically cut along a line known as the cut line. The resulting gap between tiles or slates extending downwardly and inwardly from either side of the valley gutter enables water to flow downwardly onto the valley iron which extends along the longitudinal length of the valley gutter, beneath the tiles or slates which extend downwardly beyond the valley batten.
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30
35

The process of cutting the tiles or slates along the

- 4 -

cut line results in portions of tiles or slates being positioned along either side of the valley gutter. The portions are typically corner, triangular portions and these portions can be so small that a corner of the tile or slates rests on the valley batten and the remainder of the tile or slates extends beyond the valley batten so that the majority of the tile or slate is unsupported by either the valley batten or a tile/slate batten. Because slate is brittle and because most tiles are typically formed of a brittle material, tiles and slates can typically only be nailed through the hole which is provided centrally at one end of the tile or slate or fastened by other conventional means. Therefore, when only a corner of a tile or slate extends upwardly beyond the valley batten, the tile or slate typically cannot be nailed or clipped to either the tile/slate batten or the valley batten. These unattached tiles or slates are therefore only held in position by the weight of overlaid tiles or slates and as such are prone to being out of alignment with tiles or slates secured to battens, as well as sliding out of position with expansion and contraction of the roof. The worst scenario is that they become dislodged completely, sliding out into the middle of the valley iron.

It is therefore desirable to provide a method and/or device which is suitable for at least partially addressing (a) the problem of water passing over an upper edge of a valley iron and into the roof space of a roof; and/or (b) one or more of the aforementioned problems associated with unattached tiles.

SUMMARY OF THE INVENTION

In a first aspect, the present invention provides a method of locating a roof tile adjacent a valley gutter of a roof, the valley gutter of a roof being formed by the intersection of two differently sloping portions of a roof that intersect so as to form a valley, the method comprising the step of:

- 5 -

(a) abutting a lower edge of the sloping roof tile with abutment means to prevent the sloping roof tile from sliding downwardly toward the valley gutter.

The method of the first aspect of the present invention may further include the step of supporting part of a sloping roof tile proximal a lower edge of the sloping roof tile.

In a second aspect, the present invention provides a device for locating a roof tile adjacent a valley gutter of a roof, the valley gutter of a roof being formed by the intersection of two differently sloping portions of a roof that intersect so as to form a valley, the device comprising abutment means for abutting a lower edge of a sloping roof tile, and locating means for locating the abutment means in a valley gutter wherein, wherein the abutment means is arranged to extend along at least part of the longitudinal length of a valley gutter.

The device of the second aspect of the present invention may further include a support means for supporting part of a roof tile.

In a third aspect, the present invention provides a method of at least partially minimising passage of liquid into a roof space via the valley gutter of the roof, the valley gutter being formed by the intersection of two differently sloping portions of a roof that intersect so as to form a valley, the method comprising the steps of:

(a) providing wind prevention means having spaced apart walls, the spaced apart walls being arranged to locate in a valley gutter, between lower opposite edges of the sloping roof covering materials which extend along opposite sides of the valley gutter, the wind prevention means being arranged to at least partially minimise wind blowing into a space between the roof covering materials and valley gutter and subsequently forcing liquid which is contained in the valley gutter into the roof space;

(b) locating the wind prevention means in the valley gutter between the lower opposite edges of the sloping

- 6 -

roof covering materials.

The method of the third aspect of the present invention may include the step of abutting lower opposite edges of the sloping roof covering materials which extend
5 along opposite sides of the valley gutter with outer surfaces of the spaced apart walls.

The method of the third aspect of the present invention may include the step of providing support means, the support means being arranged to support part of single
10 units of the roof covering materials proximal a lower edge of the sloping roof covering materials.

In a fourth aspect, the present invention provides a device for at least partially minimising passage of liquid into a roof space via the valley gutter of the roof, the
15 valley gutter being formed by the intersection of two differently sloping portions of a roof that intersect so as to form a valley, the device comprising wind prevention means having spaced apart walls, the spaced apart walls being arranged to locate in a valley gutter, between lower
20 edges of the sloping roof covering materials which extend along opposite sides of the valley gutter, the wind prevention means being arranged to at least partially minimise wind blowing into a space between the roof covering material and valley gutter and subsequently
25 forcing liquid which is contained in the valley gutter into the roof space.

Outer surfaces of the spaced apart walls of the fourth aspect of the present invention may be arranged to abut lower edges of the sloping roof covering materials
30 which extend opposite sides of the valley gutter.

The wind prevention means of the fourth aspect of the present invention may include support means which is arranged to support single units of the roof covering materials proximal a lower edge of the sloping roof
35 covering materials.

The locating means may comprise an elongated member.
The abutment member may comprise an abutment wall of

- 7 -

the elongated member.

The width of the wall is preferably such that an upper end of the abutment wall extends beyond an upper surface of the lower edge of the sloping roof covering material, when the elongated member is positioned in the valley gutter so that it extends along at least part of the longitudinal length of the valley gutter and in the case of a roof tile or slate, when an underneath surface of the sloping roof tile is supported by the support means.

The abutment means of the first and second aspects of the present invention, and spaced apart walls of the wind prevention means may comprise two abutment walls of the elongated member which are positioned opposite each other and arranged to abut opposite lower edges of roof covering components which extend along opposite sides of a valley gutter.

The opposed abutment walls which are positioned opposite each other may be connected by a transverse wall having openings therein, the transverse wall extending between corresponding ends of the abutment walls.

The opposed abutment walls may also have openings formed therein.

The support means may comprise a protrusion.

The protrusion may extend along the longitudinal length of the elongated member.

Alternatively, the support means may comprise a strap, a longitudinal axis of the strap being substantially aligned with a longitudinal axis of the elongated member.

The strap may extend along the longitudinal length of the elongated member.

The support means may comprise two straps, each strap extending substantially transversely of one of the opposed abutment walls.

In another alternative form, a contacting strap may extend laterally of the abutment wall, from a first

- 8 -

longitudinal edge of the abutment wall, a first surface of the contacting strap which is substantially parallel with a plane that contains the longitudinal and transverse axes of the contacting strap being arranged to contact an upper
5 surface of a valley iron which extends at least part way along the length of the valley gutter.

Edge regions of the contacting strap which are distal the abutment wall may be arranged to extend upwardly, away from the upper surface of the valley iron.

10 The support means may comprise a resiliently flexible member which extends from the abutment wall.

The resiliently flexible member may be formed of high density foam rubber or like materials and may attach to an upper surface of the contacting strap.

15 The resiliently flexible member may be formed in the shape of a prism, pyramid, cylinder, cone, sphere, a solid figure which is a combination of any one or more such solid figures, or any other solid figure.

The support means may further comprise a supporting
20 wall which may extend substantially transversely relative to the strap, from an underneath surface of the strap, a free edge of the supporting wall which is distal an intersection region where the supporting wall and strap intersect being arranged to contact part of the valley
25 gutter when the elongated member is positioned in the valley gutter so that it extends along at least part of the longitudinal length of the valley gutter.

The supporting wall may extend along the longitudinal length of the strap.

30 The supporting wall may extend from a region of the strap which is closer to an edge of the strap which abuts the abutment wall of the elongated member than the other edge of the strap.

The strap may extend from the first longitudinal edge
35 of the abutment wall so that the abutment wall and supporting wall extend away from each other, from opposite sides of the strap. Alternatively, the support means may

- 9 -

comprise an angled strap, the angled strap comprising first and second straps which extend at an angle relative to each other and the longitudinal axis of the angled strap being substantially aligned with the longitudinal axis of the elongated member, the first strap extending outwardly of the abutment wall and a free edge of the second strap which is distal an intersection region where the first and second straps intersect being adapted to contact part of a valley gutter when the elongated member is positioned in the valley gutter so that it extends along at least part of the longitudinal length of the valley gutter.

The angled strap may be orientated so that the intersection region is distal the abutment wall from which the first strap extends.

The elongated member and abutment wall are preferably integrally formed.

The abutment wall preferably extends along the longitudinal length of the elongated member.

The protrusion, strap and first strap may extend from the abutment wall, from a region which is closer the first longitudinal edge of the wall than the second longitudinal edge. Alternatively, the protrusion, strap and first strap may extend from the abutment wall, from a region which is closer the second longitudinal edge of the abutment wall than the first longitudinal edge. The transverse wall preferably extends between the second longitudinal edges of the opposed abutment walls.

Openings may be formed in the opposed abutment walls, between second longitudinal edges of the opposed abutment walls and the protrusion, strap or first strap.

The angled strap is preferably orientated relative to the elongated member so that the second strap extends away from both the first strap and the second longitudinal edge of the abutment wall.

The opposed abutment walls of the elongated member are preferably inclined relative to each other so that the

- 10 -

first longitudinal edges of the opposed abutment walls are separated by a greater amount than the second longitudinal edges.

5 The locating means may further comprise one or more locating straps which extend substantially transversely of a plane which contains the abutment wall, the length of the locating straps being sufficient to enable an end of the locating straps which is distal the elongated member to be attached to a proximal batten which is proximal the valley gutter.

The one or more locating straps preferably extend from a region of the abutment wall which substantially coincides with a plane that contains an upper surface of the proximal valley batten.

15 The one or more locating straps preferably extend from the first strap and are preferably substantially aligned with a plane that contains the first strap.

The locating straps are preferably positioned along the elongated member so that they are separated by predetermined distances. The locating straps may be separated by approximately 1m. The spacing between adjacent locating straps may vary along the longitudinal length of the elongated member. Locating straps which extend from a central region of the elongated member which is positioned centrally along the longitudinal length of the elongated member, may be separated by a greater distance than locating straps which extend from end regions of the elongated member which are positioned at either end of the elongated member. Each locating strap may be aligned with a corresponding locating strap that extends from the opposite opposed abutment wall.

The elongated member, strap, protrusion, angled strap, and locating strap may each be resiliently flexible.

35 Surfaces of the abutment wall, strap, protrusion, and angled strap which are arranged, in use, to contact a surface of the roof covering material may be adapted to

reduce slippage between said surfaces and the roof covering material. For example, said surfaces may be roughened or may have a material attached thereto for this purpose.

5 The openings in the transverse and opposed walls may be arranged for passage of liquid through the transverse wall while restricting the passage therethrough of materials such as leaves.

10 First and second protrusion members which are positioned opposite each other may extend outwardly of each of the abutment walls, either side of the respective upper and lower surfaces of the roof covering material, the first and second protrusion members being arranged to support the elongated member.

15 Each of the first and second protrusion members may be formed of a plurality of protrusion members which are spaced apart along the length of the elongated member.

20 The first and second protrusion members may extend along the longitudinal length of the elongated member. The first and second protrusion members may function to hold the device in the valley gutter particularly if the device is arranged to be suspended in the valley gutter, above a valley iron of the valley gutter.

25 The phrase "roof covering materials" when used throughout the description and claims refers to any one or more of the following and any one or more other items that may be used to cover a roof: roofing tiles, roofing shingles, roofing slates, roof iron.

30 The phrase "single unit of the roof covering materials" when used throughout the description and claims refers to a single roof tile, and/or a single roof slate, and/or a single roof shingle, and/or a single roof iron, and/or a single unit of any other item that may be used to cover a roof.

35 According to another aspect of the present invention there is provided a device for a valley gutter of a roof, the device comprising side wall portions with a plurality

of openings and a cover portion extending therebetween for
defining a flow path for water and support portions for
supporting the device on a roof over a valley gutter with
each support portion including a flexible member for
5 supporting a roof covering component.

Preferably the device includes abutment portions for
abutting with end portions of roof covering components,
such as tiles, corrugated iron, slats etc.

The device may define a channel, including the side
10 wall portions, which channel provides a flow path for
water.

The device may include a cover portion which extends
between the side wall portions.

The cover portion preferably includes openings.

15 The cover portion is preferably generally horizontal
when the device is located over a valley gutter.

Preferably the openings are sized and/or shaped to
filter debris from rain water passing therethrough.

Preferably the openings comprise slots oriented cross
20 wise to the longitudinal axis of the device.

The device may be elongate.

Preferably the side wall portions are inclined
outwardly with respect to the cover portion.

The cover portion preferably is integrally formed
25 with the side walls.

The support portions preferably comprise legs.

The legs may have feet.

Preferably the support portions include lateral wall
portions for supporting a roof covering component.

30 The lateral wall portions are preferably located at
the bottom of the support portions and are adapted to rest
on a valley gutter.

Preferably the support portions comprise lower end
portions of the side wall portions.

35 Preferably the lateral wall portions include side
support portions.

Each side support portion is preferably adapted to

12 a

support a roof covering component.

Alternatively each side support portion comprises an elongate member.

- 13 -

The elongate members are preferably located on an upper surface of each lateral wall portion.

Each side support portion preferably comprises a flexible member.

5 According to one embodiment each side support portion comprises a plurality of flexible members for supporting a roof covering component.

The or each flexible member may be made from a plastics material.

10 According to one embodiment the or each flexible member comprises a foam pad.

Each flexible member may be resiliently flexible.

Preferably each flexible member comprises a strip of foam or rubber material.

15 It is preferred that the or each flexible member is attached to an upper surface of each lateral wall portion.

It is preferred that each lateral wall portion includes a foot located on a lower surface thereof.

20 According to one embodiment each foot comprises a pad made of a plastics material.

Each foot may comprise a plurality of foot members located along the length of the lateral wall portions.

25 It is preferred that each lateral wall includes an upwardly extending edge wall against which each side wall portion is adapted to be located.

It is preferred that each side support portion has sufficient flexibility to allow roofing components oriented at different angles to be support thereby with a minimum gap between the lower surface of the roofing component and the upper surface of the side support portions.

It is preferred that each side support portion is spaced away from each side wall portion.

35 According to one embodiment each side wall portion comprises a side wall having a plurality of openings adapted to substantially reduce air flow into the channel located between the side wall portions.

- 14 -

According to one embodiment the device is in the form of a sheet of metal which is formed with a central peak with a channel defined therebelow.

According to one embodiment the lateral wall portions
5 comprise side channels on either side of each side wall portion.

According to another embodiment of the present invention the legs comprise downwardly extending portions which support the side wall portions at lower corners
10 thereof.

According to another embodiment the device is in the form of a frame with attachable side walls and top wall.

The attached wall, side walls and top wall preferably include a plurality of holes.

The elongate members are preferably located on
15 outwardly extending portions.

Preferably the abutment portion comprises side channels.

Preferably the side channels include lateral ridges
20 for support of a roof covering.

Preferably the device is designed to minimise air flow through the channel.

In the preceding summary of the invention, except where the context requires otherwise, due to express
25 language or necessary implication, the words "comprising", "comprises" or "comprise" are used in the sense of "including", that is the features specified may be associated with further features in various embodiments of the invention.

30 BRIEF DESCRIPTION OF THE DRAWINGS

The preferred embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a plan view of roof tiles positioned
35 either side of a valley gutter;

Figure 2 is a lateral sectional view of the valley gutter of Figure 1;

- 15 -

Figure 3 is a front sectional view of a first embodiment of a valley gutter device of the present invention;

Figure 4 is a lateral sectional view of a valley gutter with the valley gutter device of Figure 3 inserted in the valley gutter;

Figure 5 is a plan view of the valley gutter device of Figures 3 and 4;

Figure 6 shows a front sectional view of a valley gutter device according to a second embodiment of the present invention;

Figure 7 shows the valley gutter device of Figure 6 inserted in a valley gutter;

Figure 8 shows a plan view of the valley gutter device shown in Figures 6 and 7;

Figure 9 shows a front sectional view of a valley gutter device according to a third embodiment of the present invention;

Figure 10 shows the valley gutter device of Figure 9 when located in a valley gutter;

Figure 11 shows a plan view of the valley gutter device shown in Figures 9 and 10;

Figure 12 shows a front sectional view of a valley gutter device according to a fourth embodiment of the present invention;

Figure 13 shows the valley gutter device shown in Figure 12 when located in a valley gutter;

Figure 14 shows a plan view of the valley gutter device shown in Figures 12 and 13;

Figure 15a shows a front sectional view of a valley gutter device according to a fifth embodiment of the present invention;

Figure 15b shows a front sectional view of a valley gutter device according to a sixth embodiment of the present invention;

Figure 15c shows a front sectional view of the valley gutter device shown in Figure 15a in use in a valley

- 16 -

gutter of a roof;

Figure 16 shows an angled side view of a valley gutter device having vertical slots in the side walls; and

Figure 17 shows an angled side view of a valley gutter device having horizontal slots in the side walls.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring to Figure 1, valley battens 10 and 12 extend longitudinally down either side of a valley gutter 14. The valley battens 10 and 12 extend at an angle of approximately 45° from a left hand corner of the page of Figure 1 diagonally and upwardly toward a top right hand corner of the page of Figure 1. Tile/slate battens intersect the valley batten 10 and extend to the left hand side of the valley batten 10. In plan view, as shown in Figure 1, the tile/slate battens 16-26 appear as substantially horizontal beams. However, the tile/slate battens 16-26 actually slope downwardly with the pitch of the roof face, in the direction of arrow 27. The valley batten 10 is also sloping at the equivalent pitch/fall. Tile/slate battens 28-38 are positioned on an opposing roof face and are also sloping downwardly with the pitch/fall on this roof face, in the direction of arrow 37. Both battens 16-26 and 28-38 intersect with valley battens 10 and 12 and are mitred into the valley battens so that upper surfaces of battens 16-26 and 28-38 lie in the same plane as upper surfaces of battens 10 and 12 respectively. The tile/slate battens and valley battens of Figure 1 are nailed to rafters (not shown) which are positioned beneath the battens. The tile/slate battens 16-26 and 28-38, and the valley battens 10 and 12 can slope at any desired angle which is required to produce a roof having a particularly sloped regions. The battens of Figure 1 therefore provide one particular example of the occurrence of a valley gutter 14.

The rafters (not shown) which support the tile/slate battens 16-26 of Figure 1 slope upwardly in moving from the tile/slate batten 16 through to the tile/slate batten

- 17 -

26. When laying tiles on the tile/slate battens 16-26, tiles are therefore laid firstly spanning battens 16 and 18 to produce a row of tiles which extends along the roof spanning battens 16 and 18 and tiles are laid lastly spanning battens 24 and 26. Tiles 40, 42 and 44 are shown positioned spanning battens 20 and 22. Tile 40 is laid first and is nailed to batten 22 via a hole which is positioned centrally, toward an upper end of the tile 40. A lower right hand region of tile 40 extends downwardly beyond the valley batten 10. Tile 42 is laid between tile/slate battens 20 and 22, adjacent tile 40 so that a right hand edge of tile 42, as seen in Figure 1, is positioned over a left hand edge of tile 40 (also as seen in Figure 1), so that adjacent edges of tiles 40 and 42 overlap. Tile 42 is then similarly nailed to the tile/slate batten 22 by driving a nail through a hole which is positioned centrally, toward an upper end of the tile 42. The lower right hand corner of tile 42 extends downwardly beyond a valley batten 10. The lower right hand corner of the tile 42 which extends beyond the valley batten 10 is smaller than the right hand region of the tile 40 which similarly extends downwardly beyond the valley batten 10. Tile 44 is laid in a similar manner to that described in relation to tile 42 so that its longitudinal edge overlaps an adjacent longitudinal edge of tile 42.

After a row of tiles has been laid utilizing tile/slate battens 20 and 22, a row of tiles is then laid utilizing tile/slate battens 22 and 24. Referring to Figure 1, tiles 46-52 are laid utilizing tiles/slate battens 22 and 24 in a similar manner to that described up in relation to tiles 40-44. The longitudinal length of the tiles 40-52 is such that a lower end of tiles 46-52 overlap an upper end of tiles 40-44, when the tiles 46-52 are nailed to the tile/slate batten 24 in a similar manner to that described above in relation to the nailing of tiles 40-44 to tile/slate battens 22. A lower right hand

- 18 -

region of the tile 46 extends downwardly beyond the valley batten 10 in a similar manner to that described above in relation to tile 40 and a small right hand corner of tile 48 extends downwardly beyond the valley batten 10 in a similar manner to that described above in relation to the tile 42.

Tiles are similarly laid utilizing tile/slate battens 28-38 so that tiles extend inwardly toward each other from opposite sides of the valley gutter 14. The tiles are cut along a cut line 54 to provide an opening between the tiles which extend from either side of the valley gutter 14 and also so that a straight edge is provided along the longitudinal length of the valley gutter, on both sides of the valley gutter. In cutting the tiles 40 and 46 along the cut line 54, lower right hand corners, as viewed in Figure 1, of tiles 40 and 46 are removed. A region which lies between lower transverse edges of tiles 46 and 48, a longitudinal edge of tile 40 and the cut line 54 is not covered with a tile. A tile is therefore required to be cut to the dimensions of the region 56 so that it can be placed in such a region to provide a complete covering of roof tiles down to the cut line 54.

Only a top left hand corner of tile which is cut to correspond to the region 56 is able to contact the valley batten 10. Unless the tile which is cut to correspond to region 56 is made of bitumen it is not able to be nailed through the top left hand corner because such a process would result in the piece of tile fracturing due to its brittle nature. (Tiles are typically formed out of concrete, terracotta, bitumen, slate or synthetic material and for tiles not formed from bitumen, they are typically required to be nailed through holes which are formed in the tiles during the process of forming the tiles.) A cut tile is therefore typically attached back to the nearest secured tile(s) by gluing the cut tile to the nearest one or more secured tiles. Because the small tiles such as those which are cut to correspond to the region 56 are not

- 19 -

supported at an end which is suspended over the valley gutter 14, they are prone to falling downwardly onto the valley iron which extends across the width of the valley gutter and along the longitudinal length of the valley gutter 14.

Referring to Figure 2, tiles 58 and 60 extend inwardly toward each other from opposite sides of a valley gutter 14. Lower edges 62 and 64 of the tiles 58 and 60 respectively are suspended above the valley iron 66. The lower opposed edges 62 and 64 of the tiles 58 and 60 respectively are formed by cutting the tiles along the cut line 54 of Figure 1. Water flowing over the tiles of Figure 2 flows downwardly toward lower opposed edges 62 and 64 of the tiles 58 and 60 respectively and onto the valley iron 66. The valley iron 66 is supported by valley boards 68 and 70 and the valley boards 68 and 70 are supported by a valley rafter 72. A longitudinal axis of the valley rafter 72 is other than substantially horizontal to enable water which flows off the roof tiles 58 and 60 and onto the valley iron 66, to flow along the longitudinal length of the valley iron 66 and into a gutter which is typically positioned around the periphery of a roof.

Referring to Figures 3 and 4 a valley gutter device 74 is designed to locate in the valley gutter 14 so that it is positioned on an upper surface of the valley iron 66 and extends along at least part of the longitudinal length of the valley gutter 14. The device 74 comprises an elongated member, one example of which is the central elongated member 75, and locating straps, one example of which is straps 94 and 96 which extend transversely of the central elongated member 75. The central elongated member 75 may be extruded from plastic and may also be fabricated from plastic or metal. The straps 94 and 96 may also be formed of plastic or metal and may be welded to the central elongated member 75. The central elongated member 75 is approximately 3m in length. The central elongated member 75 comprises a central large channel 76 and two

- 20 -

outer small channels 78 and 80. The channels 76-80 are inverted channels, each channel having two side walls and an upper wall which connects the two side walls. An upper wall 82 of the large central channel 76 is substantially horizontal and two side walls 84 of the large central channel 76 are splayed outwardly relative to each other so that the lower edges of the walls 84 are spaced apart by a greater amount than the upper edges. Upper walls 86 and 88 of the two small outer channels 78 and 80 respectively extend transversely of the side walls 84 of the larger central channel 76. The walls 86 and 88 extend from the lower half of the side walls 84. Side walls 90 and 92 of the outer smaller channels 78 and 80 respectively are splayed slightly outwardly of the side walls 84 of the central large channel 76 so that the lower edges of the walls 90 and 92, and the lower edges of the adjacent walls 84 are separated by a greater amount than the upper edges of the walls 90 and 92, and regions of the walls 84 where the transverse walls 86 and 88 intersect the walls 84. Lower edges of the outer walls 90 and 92 are not horizontally aligned with lower edges of adjacent side walls 84 of the larger central channel 76, but are positioned above the lower edges of the adjacent side walls 84. Such relative positioning of the lower edges of the side walls 84, and 90 and 92 enables lower edges of each of the side walls to contact an upper surface of a valley iron which typically slopes upwardly from a central lower most region which extends along the longitudinal length of the valley gutter 14.

The straps 94 and 96, extend outwardly from transverse walls 86 and 88 of the small outer channels 78 and 80 respectively. The straps 94 and 96 are approximately 0.6mm thick, approximately 20mm wide and approximately 300mm long. The straps 94 and 96 are substantially aligned and extend from either side of the extruded member approximately every one metre along the longitudinal length of the extruded member 74.

- 21 -

Referring to Figure 4, a valley gutter device 74 is positioned in a valley gutter 14 by aligning longitudinal axes of the outer small channels 78 and 80, and the large central channel 76 with a longitudinal axis of the valley gutter 14. The device 74 is then positioned in the valley gutter 14 by centrally locating the device 74 across the width of the valley gutter 14 and lowering the device 74 so that lower ends walls 90 and 92 and 84 contact an upper surface of the valley iron 66. The location of the device 74 is adjusted so that the central lower most region of the valley iron 66 is roughly centrally positioned between the side walls 84 of the central large channel 76. Ends of the straps 94 and 96 are then nailed to valley battens 10 and 12 which extend either side of the valley gutter 14, along the longitudinal length of the valley gutter 14. In this way the device 74 is securely located in the valley gutter 14.

For valley gutters which are greater than 3 metres in length valley gutter devices 74 are abutted end to end until they extend along the full length of the valley gutter 14. When required, the devices 74 can be cut to fit valley gutters having a longitudinal length that is not a whole number multiple of the longitudinal length of the device 74.

Referring to Figure 5, the upper transverse wall 82 of the central larger channel 76 has rectangular slots 98 which extend transversely across the upper wall 82. A longitudinal portion of the side walls 84, which lies between walls 82, and 86 and 88 also has rectangular slots 99. Longitudinal axes of the rectangular slots 99 are substantially transverse to the longitudinal axis of side walls 84. The slots are approximately 5mm wide and are separated from each other, along the longitudinal length of the wall 82 by a distance of approximately 10mm. The slots enable water to pass through the upper transverse wall 82 and side walls 84 of the central large channel 76 while preventing entry to objects such as leaves which, if

- 22 -

found their way inside the large central channel 76 could impair the flow of water along the valley gutter 14.

With the valley gutter device 74 positioned along the longitudinal length of a valley gutter 14 has described above, upper surfaces of the transverse walls 86 and 88 of the outer small channels 78 and 80 respectively provide a support for underneath surfaces of outer, lower ends of tiles which are near the cut line 54. The transverse walls 86 and 88 therefore provide support to ends of tiles which would other wise be suspended above the valley iron 66. Cut tiles such as those which would be cut to correspond to region 56 of Figure 1 can therefore be appropriately located simply by placing the tile in the corresponding region such that one end of the tile is supported by a valley batten 10 or 12 and another end of the cut tile is supported by transverse walls 86 or 88 respectively.

Side walls 84 of the central large channel 76 which extend above the transverse walls 86 and 88 prevent the cut tiles from sliding downwardly into the valley gutter 14. In this way a cut tile can be located in a region which abuts the cut line simply by placing the cut tile on the valley batten 10 or 12, and transverse walls 86 or 88 respectively. Upper ends of the cut tiles are therefore not required to be attached (typically via adhesive) to the nearest secured tile. However, adhesive can still be used with the device 74 if desired. Because upper ends of the cut tiles are overlapped by adjacent tiles the cut tiles are locked in place by the tile locating device 74. This is because if a cut tile were to lift upwardly away from the valley iron 66 a lower right hand edge of the cut tile which fits into the corner provided by the intersection of transverse walls 86 and 88, and side walls 84 would come into contact with the side wall 84. The other end of the cut tile which is overlapped by the adjacent tiles is prevented from lifting away from the valley batten because each of the tiles of the roof are overlapped which results in the combined weight of the

tiles on the roof holding upper ends of lower cut tiles securely in place.

With the tiles positioned on upper surfaces of the transverse walls 86 and 88, wind must pass through the slots 98 and 99 in order for it to enter the space between the roof tiles and the valley iron 66. By restricting the access of wind to the space between the roof tiles and the valley iron 66, the valley gutter device 74 is able to minimise or prevent water which flows along the length of the valley iron 66 from being forced by wind which flows into the valley gutter, upwardly and outwardly over the upper outer edges of the valley iron 66 and into the roof space of the roof which is covered by the roof tiles. If the valley gutter device 74 was being used in a valley gutter of a roof that was covered by roofing iron or shingles as opposed roof tiles or slates, the outer small channels 78 and 80 would not be necessary because the roof shingles or iron do not need to be supported the way in which tiles or slates do at regions along the length of a valley gutter. However, the valley gutter device 74 could be used on rooves that are covered by roofing iron or shingles in a similar manner to that in which it would be used roofing tiles as describe in relation to Figure 4. The transverse walls 86 and 88 of the outer small channels 78 and 80 would simply extend laterally underneath a lower surface of the roofing iron or roofing shingles rather than roofing tiles.

Upper ends of a device 74 which are positioned at an upper end of a valley gutter 14 are enclosed by a cap (not shown). Lower ends of the device 74 are left open to enable water to flow downwardly along the valley iron 66 and into a gutter (not shown) which extends around the periphery of a roof.

For ease of explanation features of the valley gutter devices of Figures 6-15 which correspond to similar features of the valley gutter device of Figures 3-5 will be referred to using identical reference numerals.

- 24 -

Referring to Figures 6-8, the valley gutter device 110 is identical to the valley gutter device 74 of Figures 3-5 with the exception that the part of the width of the walls 84 which extends between the upper wall 82 and the transverse walls 86 and 88 is much reduced. This is because the valley gutter device 110 is designed for use with bitumen tiles 200 which are typically much thinner than other tiles. The width of the walls which extend between walls 86 and 88, and the upper wall 82 is slightly greater than the width of a typical bitumen tile.

Referring to Figures 9-11, another alternative valley gutter device 112 is similar to the valley gutter device 74 of Figures 3-5 with the following exceptions. The walls 84 do not extend beneath a lower surface of walls 86 and 88. Walls 90 and 92 extend downwardly from a region of the walls 86 and 88 respectively which is part way along the width of the walls 86 and 88. The walls 90 and 92 therefore do not extend downwardly from outer edges of the walls 86 and 88 which are distal to the walls 84. The walls 90 and 92 also extend substantially transversely of the walls 86 and 88 respectively rather than extending relative to the walls 86 and 88 respectively so that the walls 90 and 92 are splayed outwardly relative to the walls 84. The walls 90 and 92 extend from a region of the walls 86 and 88 which is slightly closer to the walls 84 than outer edges of the walls 86 which are distal of the walls 84.

The upper transverse wall 82 has opposed rectangular slots 101 which extend transversely either side of a central strip 103 which extends centrally along the longitudinal length of the upper wall 82 so that longitudinal axes of the central strip 103 and upper wall 82 substantially coincide.

Referring to Figures 12-14, another alternative locating and supporting valley gutter device 114 is similar to the valley gutter device 112 of Figures 9-11 with the exception that the valley gutter device 114

- 25 -

includes a cover strip 116 which attaches to the upper transverse wall 82. The cover strip 116 comprises a sheet which is approximately the same length as the upper wall 82 and pins 118 which extended downwardly from the sheet 117. The width of the sheet 117 is approximately 6mm thick and 120mm wide. The width of the sheet 117 is slightly greater than the width of the upper wall 82. Longitudinal axes of the pins 118 substantially coincide with a longitudinal axes of the sheet 117 and the pins 118 are approximately equidistantly spaced along the longitudinal length of the sheet 117. Adjacent pins 118 are separated by approximately 600mm. Lower ends of the pins 118 which are remote from the sheet 117 are pointed and are designed for insertion in appropriately dimensioned holes 120 (see Figure 11) which are formed in the central strip 103 of the upper wall 82. The holes 120 are formed in the upper wall 82 to approximately coincide with a longitudinal axis of the upper wall 82 and the holes 120 are equidistantly spaced along the longitudinal length of the upper wall 82 to correspond to the spacing of the pins 118 of the cover strip 116. The cover strip 116 is attached to the upper wall 82 by inserting the pins 118 in the holes 120.

The pointed ends of the pins 118 are resiliently flexible and designed to deform upon insertion into the holes 120 and to resume their initial shape after insertion through the holes 120. In this way, the pointed ends, once inserted through the holes 120 expand and abut an underneath surface of the upper wall 82. A region of the pins 118 which is proximal the pointed ends of the pins 118 preferably has a diameter which is slightly larger than the diameter of the holes 120 to prevent the pins 118 from being inserted too far through the holes 120 and also to provide means by which regions of the upper wall 82 which surround holes 120 can be clamped between a lower surface of the enlarged diameter of the pin 118 and an upper surface of the pointed end of the pin 118. In this way, the pin 118 can be clipped into the holes 120 in

- 26 -

the upper wall 82 of the valley gutter device 114. The longitudinal length of the pins 118 is such that outer longitudinal edges of the sheet 117 are slightly above upper surfaces of tiles which are supported by the valley gutter device 114, when the cover strip 116 is fitted to the upper wall 82. After clipping the pins 118 into the holes 120, the cover strip 116 can be securely attached to the central strip 103 of the upper wall 82 by screwing stainless steel self tapping screws downwardly through the longitudinal axis of the sheet 117 and into the central strip 103 of the upper wall 82. The spacing in between the stainless steel self tapping screws can be selected to ensure the cover strip 116 is securely attached to the upper wall 82.

Referring to Figure 14, the sheet 117 has rectangular slots 105 similar to rectangular slots 98 of Figures 5 and 8. Each rectangular slot 99 of Figure 14 extend from almost entirely across the width of the sheet 117.

The cover strip 116 can be coloured to match the colour of tiles which cover a roof.

Figures 15a and 15b show an alternative valley gutter device according to a fifth and sixth embodiment of the present invention.

In contrast to the embodiment shown in Figure 9 the device is provided with slightly diverging side walls 84 which at their bottom ends extend outwardly into lateral walls 124, 126 which terminate in an upwardly extending lip 126 and 128.

The valley gutter device 122 also has two high density lengths of foam 130 and 132 which have approximately rectangular cross sections. The lengths of foam 130 and 132 are approximately 15mm x 20mm. The lengths of foam 130 and 132 are attached to upper surfaces of the walls 124 and 126 respectively so that the lengths of foam 130 and 132 extend approximately 15mm above the upper surfaces of the walls 124 and 126 respectively. The foam strips 130 and 132 can be attached to the walls 124

- 27 -

and 126 by any appropriate means. However, the foam strips 130 and 132 would typically be attached to the walls 124 and 126 respectively by an appropriate adhesive. The bottom of walls 124 and 126 are provided with foot pads 136 to reduce slippage between the side walls 124, 126 and the opposing valley gutter on which the device rests.

Figure 15b shows a variation to the shape of the foam pads 130, 132 in which foam pads 140, 142 have top surfaces which are angled downwardly from an inner side to an outer side adjacent rims 128. Thus the top surface of the foam pads may be angled to suit the particular roof covering which is to be supported thereby.

Figure 15c shows the valley gutter device 122 located over a roof valley gutter and with tiles resting on the foam pads 130, 132. It is noted that the rim 128 serves to retain the foam pads on the side walls 124, 126.

The valley gutter device 122 can be designed with slots which are similar to the slots 98 and 99 of the valley gutter device 74; however, the slots are not shown in Figure 15. Slots which correspond to the slots 99 of Figure 5 can be formed in the walls 84 of the valley gutter device 122 so that they extend from outer edges of the walls 84 approximately across the entire width of the walls 84.

The valley gutter device 122 can also be designed with slots that correspond to slots 101 of Figure 11. The wall 82 of the valley gutter device 122 can also have slots formed in it which correspond to the slots 105 of Figure 14. Finally, holes 120 can be formed in the wall 82 of the valley gutter device 122, between slots corresponding to slots 101 of Figure 11 to enable a cover strip corresponding to the cover strip 116 to be attached to the valley gutter device 122.

The valley gutter device 122 shown in Figure 16 has a series of vertical slots 131 in each side wall 133. These slots may be in the form of angled louvres or equivalent.

Optionally the top surface 134 is completely closed

- 28 -

or comprises a cover which fits over a slotted roof (not shown).

It is also noted that a top portion 135 of each side wall 132, 133 consists of a continuous wall with the slots
5 extending therebelow.

The rest of the valley gutter is similar to that shown in Figures 15a and 15b, although the side walls may be vertical.

Each high density length of foam 130, 140 and 132,
10 142 may be in the form of a strip, but preferably has enough flexibility or softness to allow tiles resting thereon to be supported regardless of whether they are angled slightly so that they are out of alignment.

Because the foam 130, 140, 132, 142 is able to
15 depress it is able to absorb varying degrees of pressure resulting from different tiles or sections of roof coverings being lower than adjacent sections.

Both the foam 130, 140, 132, 142 and the foot pads 136 also have the added advantage of reducing corrosion
20 because they limit direct contact with the metal surface of the valley gutter device with which they are associated.

Figure 17 shows another valley gutter device 143 in which horizontally disposed slots 144 are provided instead
25 of vertically extending slots.

Figures 3-5, 6-8, 9-11, 12-14, and 15a, 15b and 15c show alternative examples of a valley gutter device of the present invention. The valley gutter devices as shown in Figures 3-15 are suitable for reducing the amount of wind
30 blowing into a space between roof covering materials such as tiles, slates, shingles or roof iron, and the valley iron of a valley gutter which extends along the length the valley gutter of a roof. By reducing the amount of wind which can enter the space between roof covering materials
35 and the valley iron, the tendency of wind to force water which is running along the valley gutter upwardly over outside edges of the valley iron and into the roof space

- 29 -

can be reduced or prevented. The valley gutter devices of Figures 3 and 5, 6 and 8, 9 and 11, 12 and 14, and 15a, 15b, and 15c can all be used in valley gutters which are formed between tiles, slates, shingles or roof iron.

- 5 However, the aforementioned valley gutter devices of the accompanying Figures are illustrated as positioned in a valley gutter of a roof that is covered with tiles.

CLAIMS

1. A device for a valley gutter of a roof, the device comprising side wall portions with a plurality of openings and a cover portion extending therebetween for
5 defining a flow path for water and support portions for supporting the device on a roof over a valley gutter with each support portion including a flexible member for supporting a roof covering component

2. The device as claimed in claim 1 including
10 abutment portions for abutting with end portions of roof covering components.

3. The device as claimed in claim 1 or 2 wherein the cover portion is substantially flat.

4. The device as claimed in claim 3 wherein the
15 cover portion includes a plurality of apertures.

5. The device as claimed in claim 4 wherein the openings are adapted to filter debris from rain water passing therethrough.

6. The device as claimed in claim 5 wherein the
20 openings comprise slots oriented cross-wise to the longitudinal axis of the device.

7. The device as claimed in claim 5 wherein the openings comprise slots oriented in parallel to the longitudinal axis of the device.

8. The device as claimed in claim 1 or 7 wherein
25 the side wall portions are inclined outwardly with respect to the cover portion.

9. The device as claimed in claim 8 wherein the side wall portions and cover portion form an inverted
30 channel.

10. The device as claimed in claim 9 wherein the support portions includes legs.

11. The device as claimed in claim 10 wherein the legs include feet.

12. The device as claimed in claim 1 or 11 wherein
35 each support portions comprises a lateral portion extending from a lower end of each side wall portion.

13. A device as claimed in claim 12 wherein each side wall portion comprises straight walls with a plurality of rows of openings.

5 14. The device as claimed in claim 13 wherein the plurality of rows of openings comprise a plurality of vertical louvres.

15 15. The device as claimed in claim 14 wherein each side wall portion comprises a substantially straight side wall with upwardly inclined lateral wall portions.

10 16. The device as claimed in claim 15 wherein each flexible member comprises a foam pad.

17. The device as claimed in claim 16 wherein each flexible member comprises any one of a strip of: foam, plastic or rubber material.

15 18. The device as claimed in claim 17 wherein each flexible member is compressible and is attached to an upper surface of each lateral wall portion.

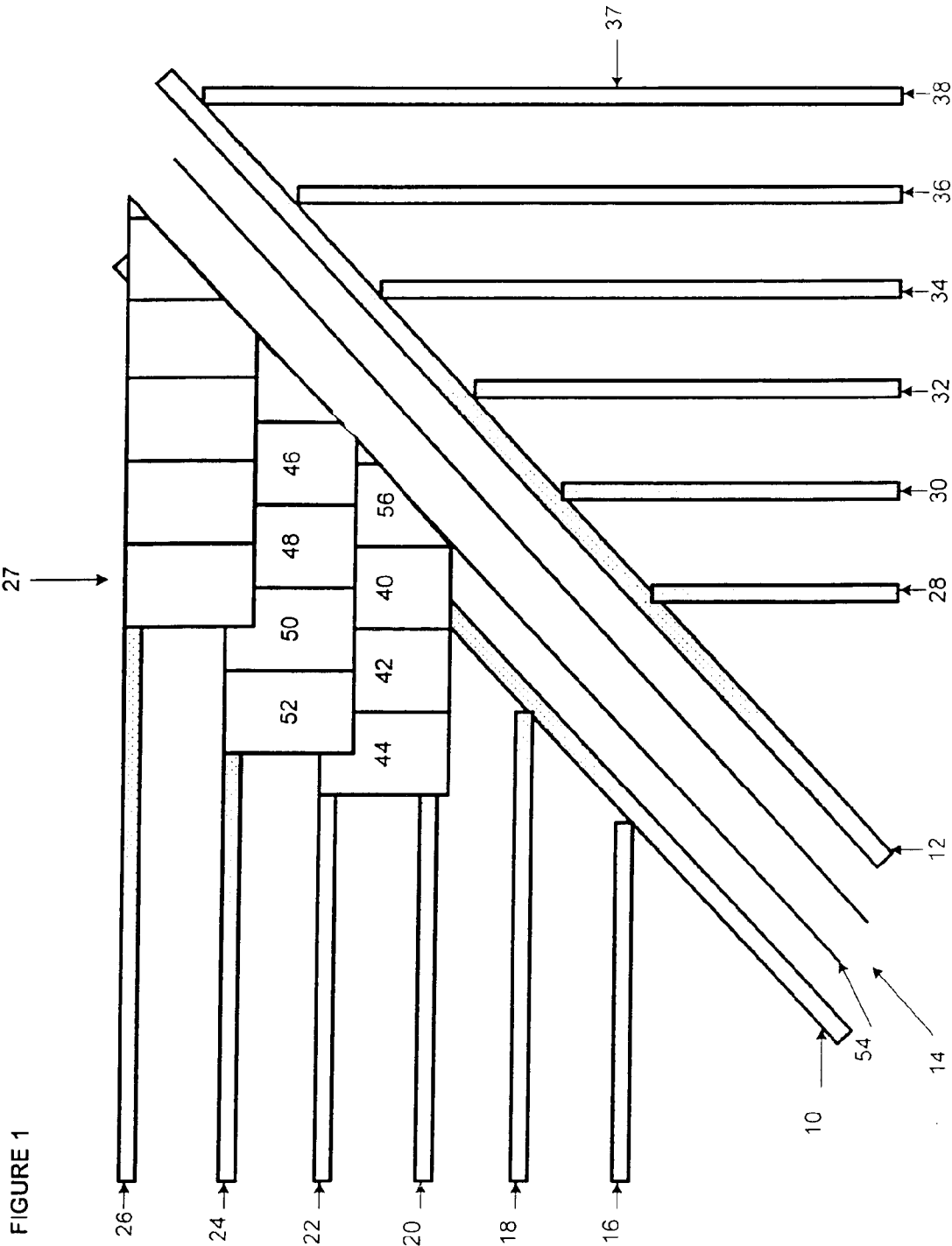
20 19. The device as claimed in claim 18 wherein each lateral wall portion includes a foot portion located on a lower surface thereof.

20. The device as claimed in claim 21 wherein each lateral wall portion comprises an outer upwardly directed lip which is adapted to retain the adjacent flexible member on the adjacent lateral wall portion.

25 21. The device as claimed in claim 20 wherein each lateral wall portion is angled slightly upwardly with respect to a horizontal axis when located on a roof valley gutter.

30 22. The device as claimed in claim 21 wherein each roof portion comprises a pad comprising any one of: foam, plastic or rubber.

23. The device as claimed in claim 22 wherein the device includes a cover strip attachable to the cover.



2/11

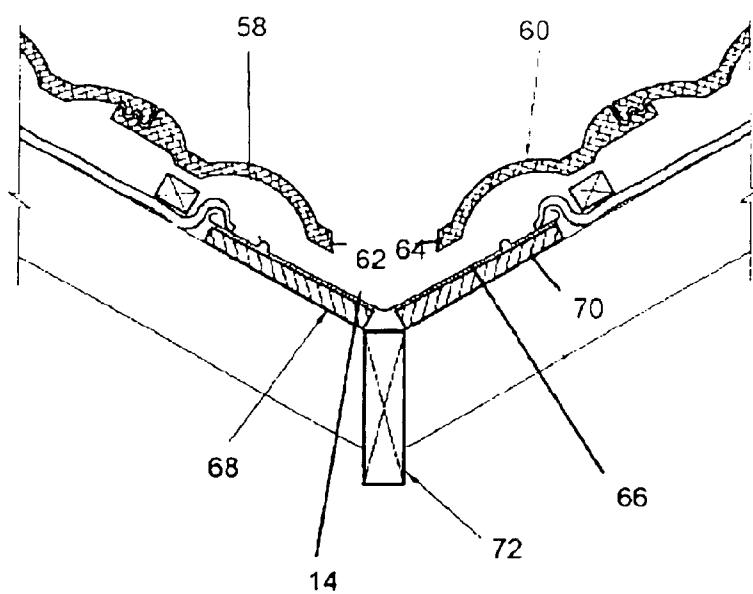


FIGURE 2

3/11
FIGURE 3

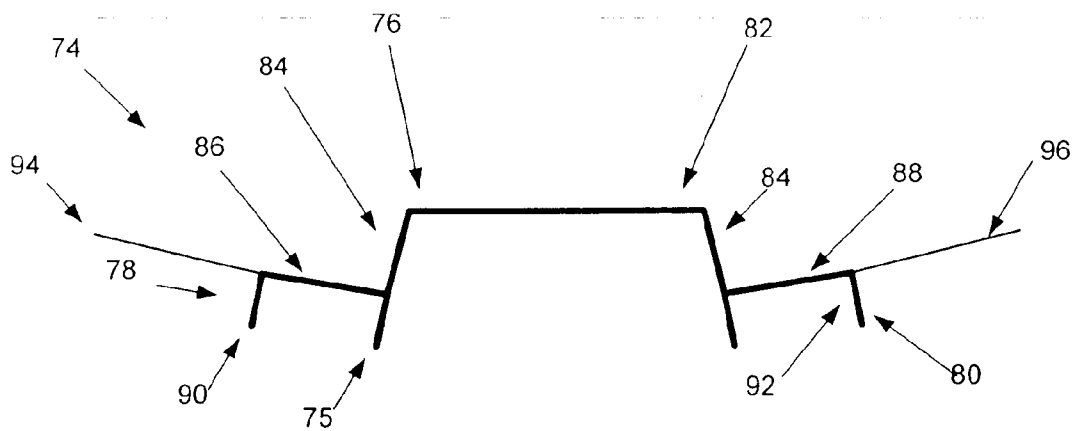


FIGURE 4

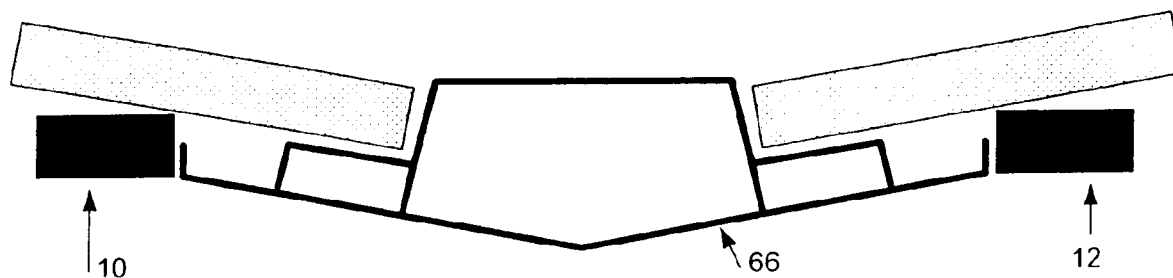
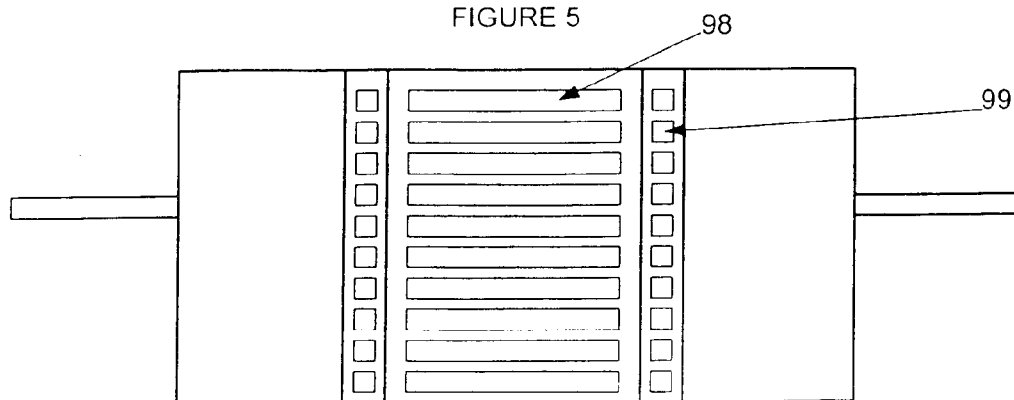


FIGURE 5



4/11

FIGURE 6

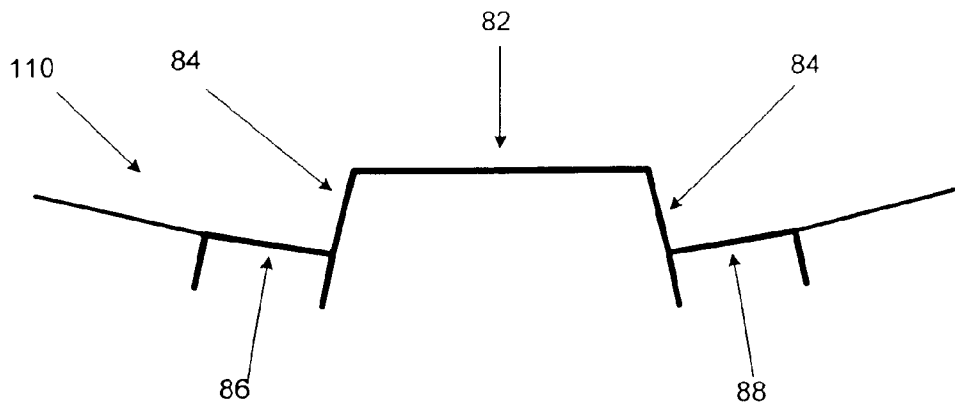


FIGURE 7

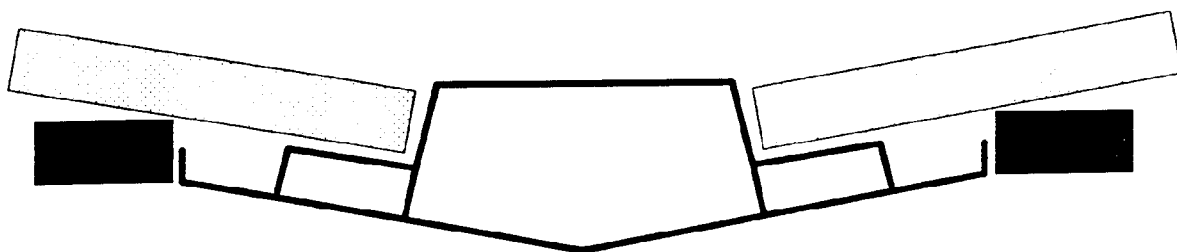


FIGURE 8

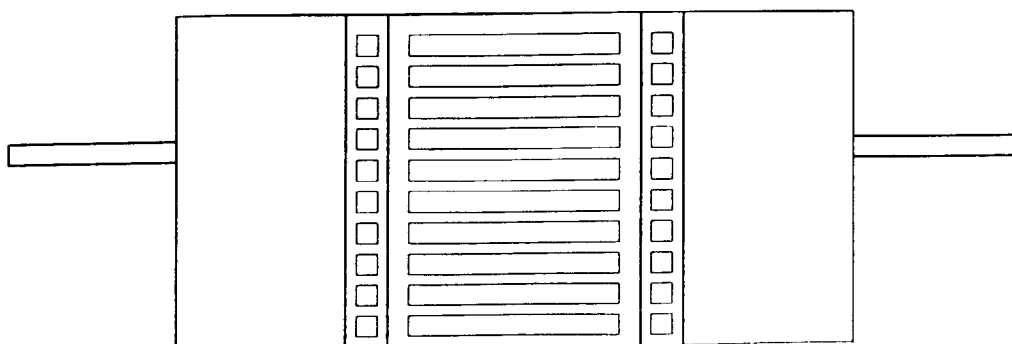


FIGURE 9

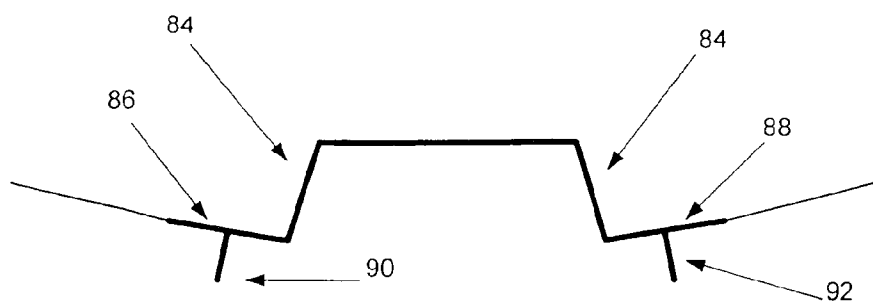


FIGURE 10

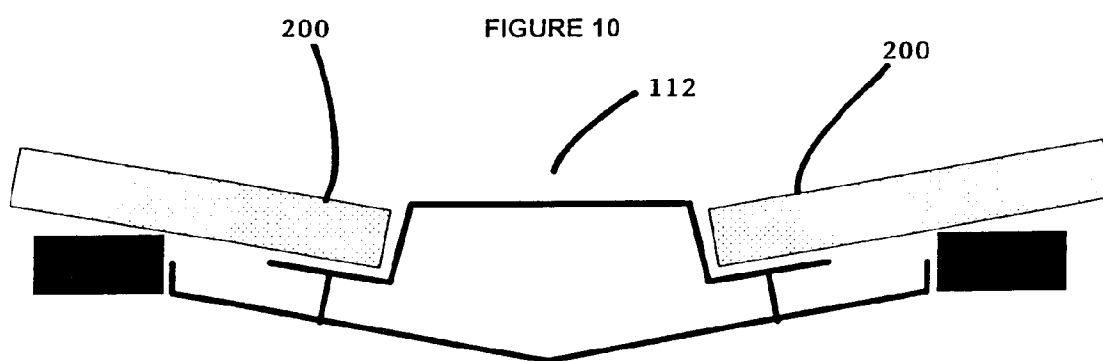
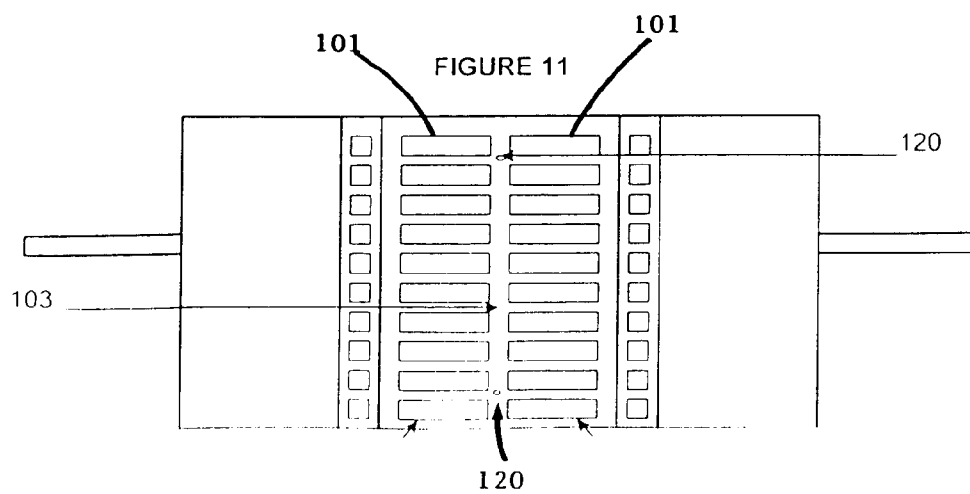


FIGURE 11



6/11

FIGURE 12

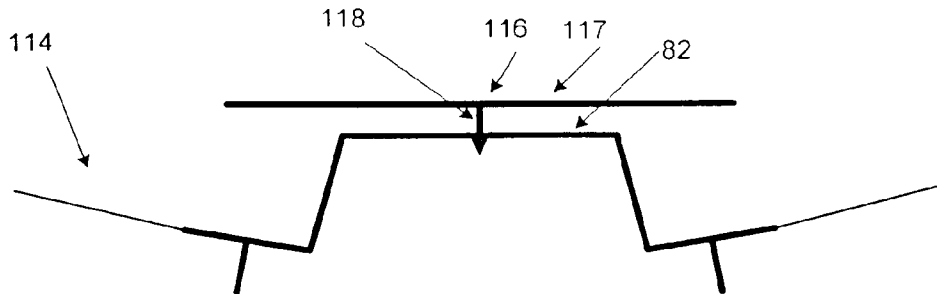


FIGURE 13

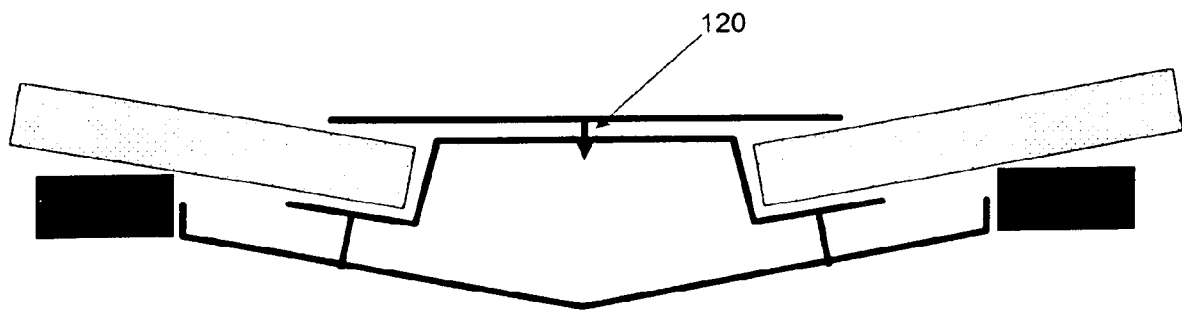
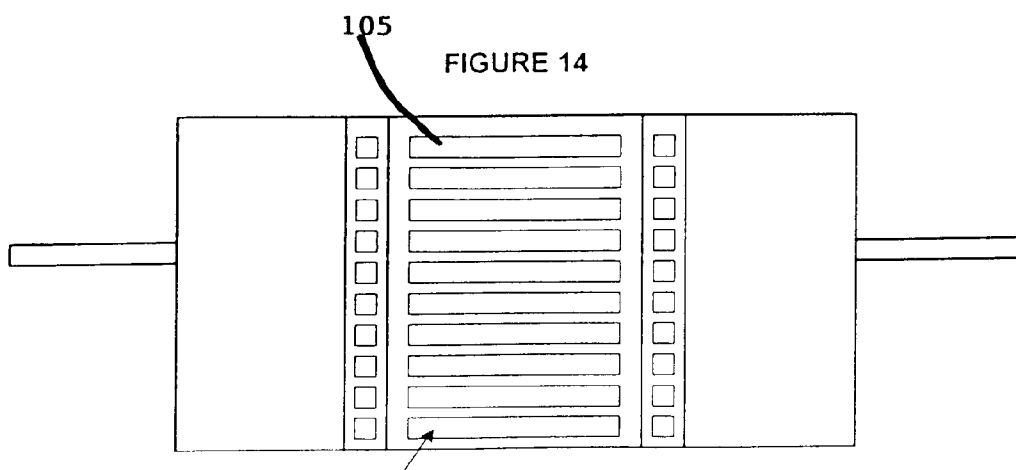
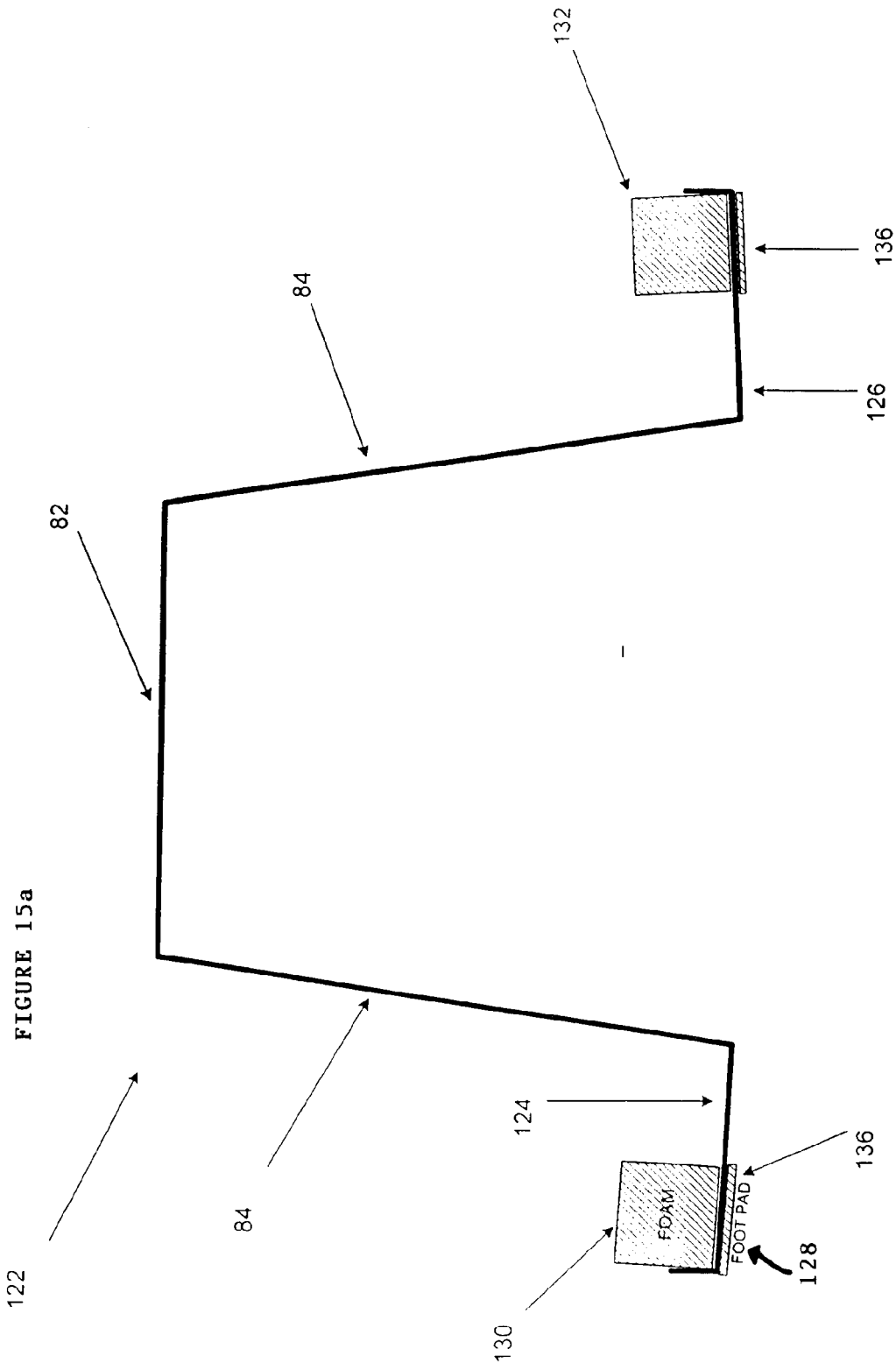


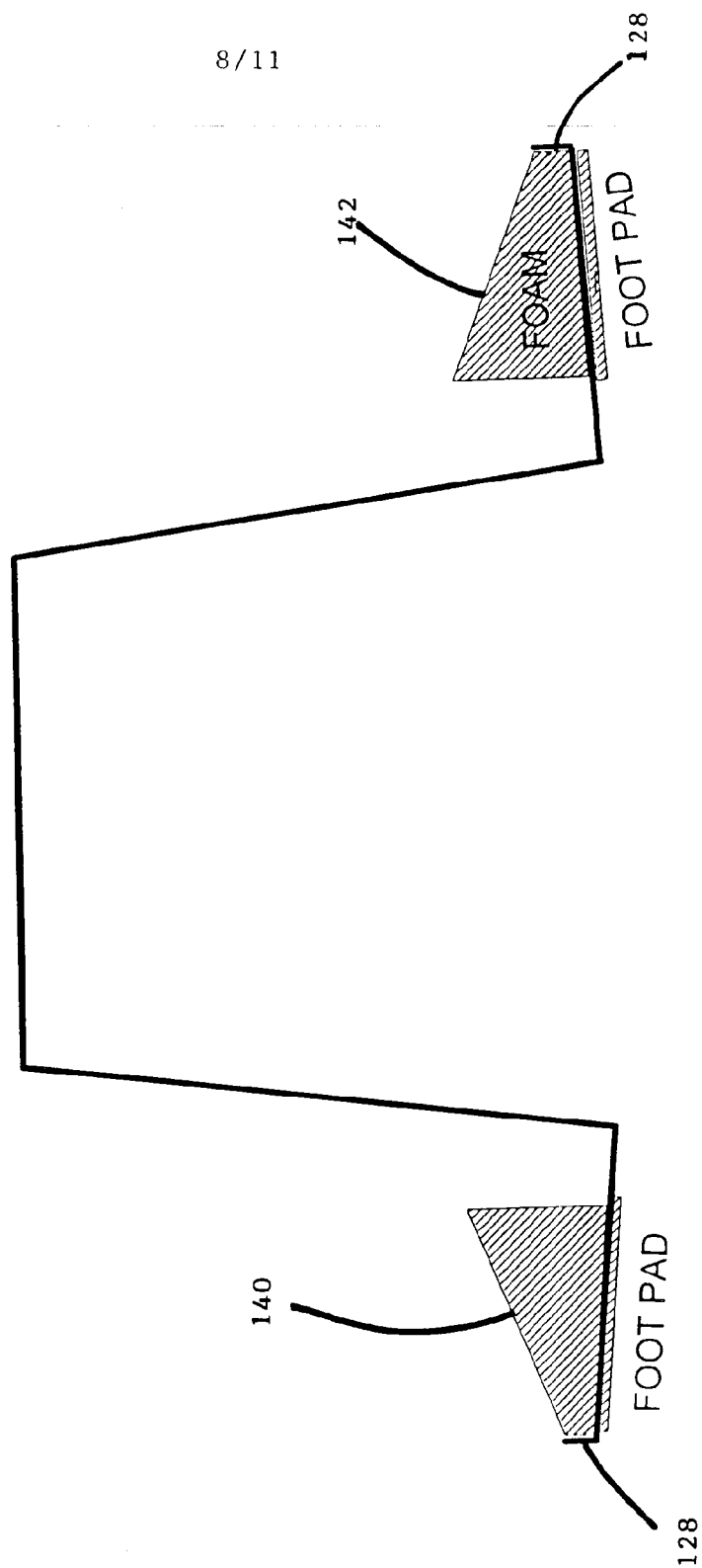
FIGURE 14





8/11

FIGURE 15b



9/11

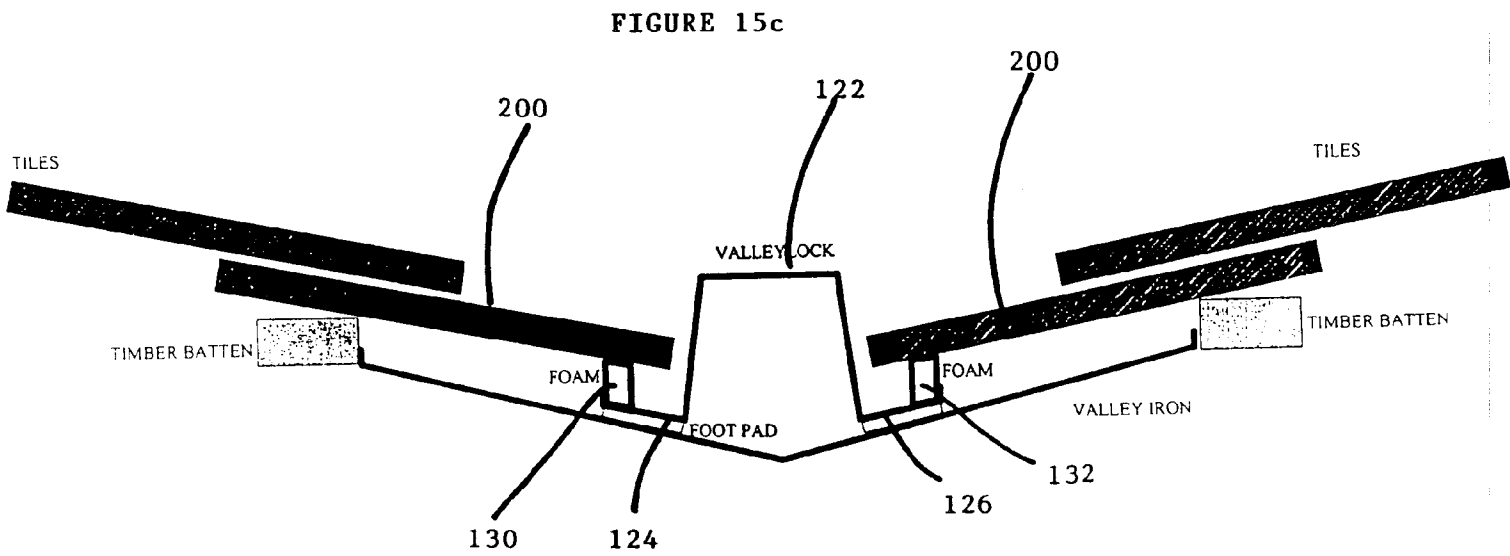
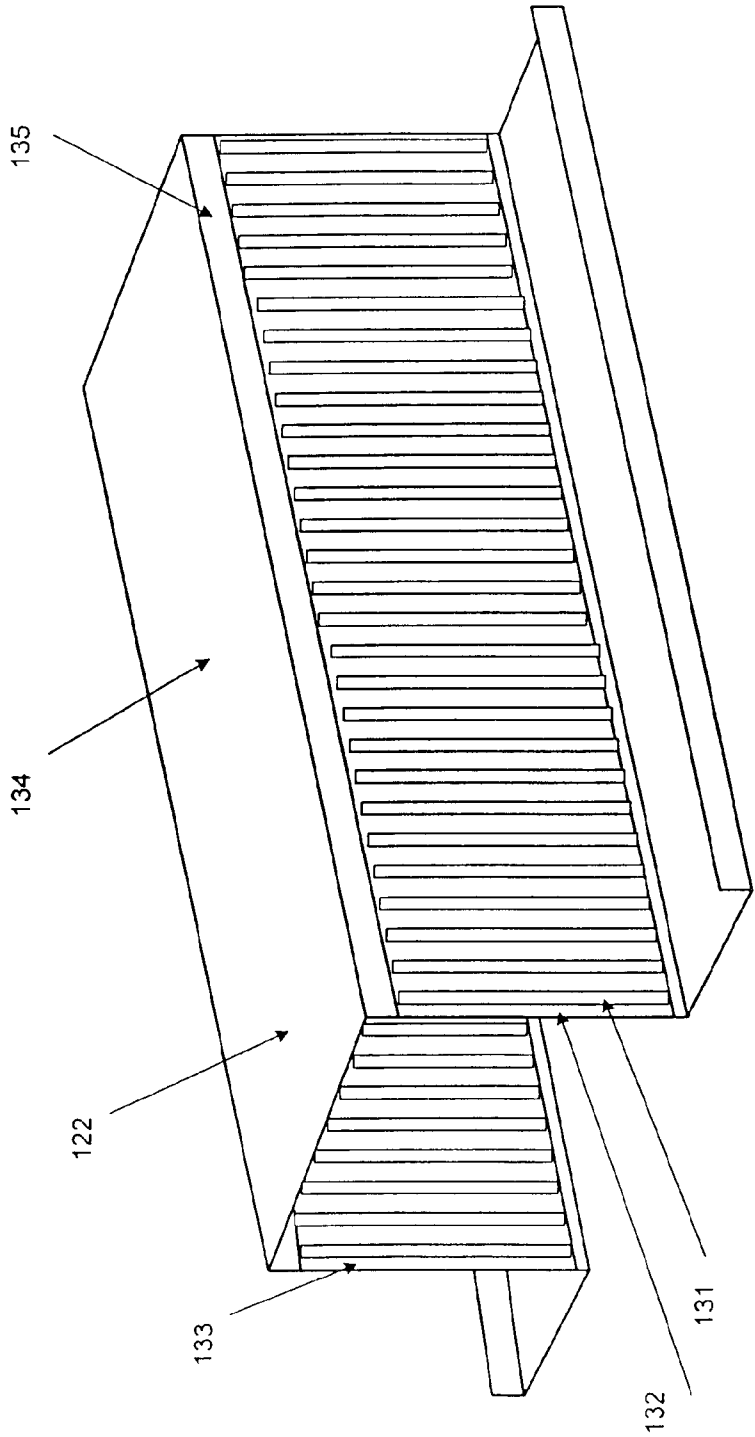


FIGURE 16



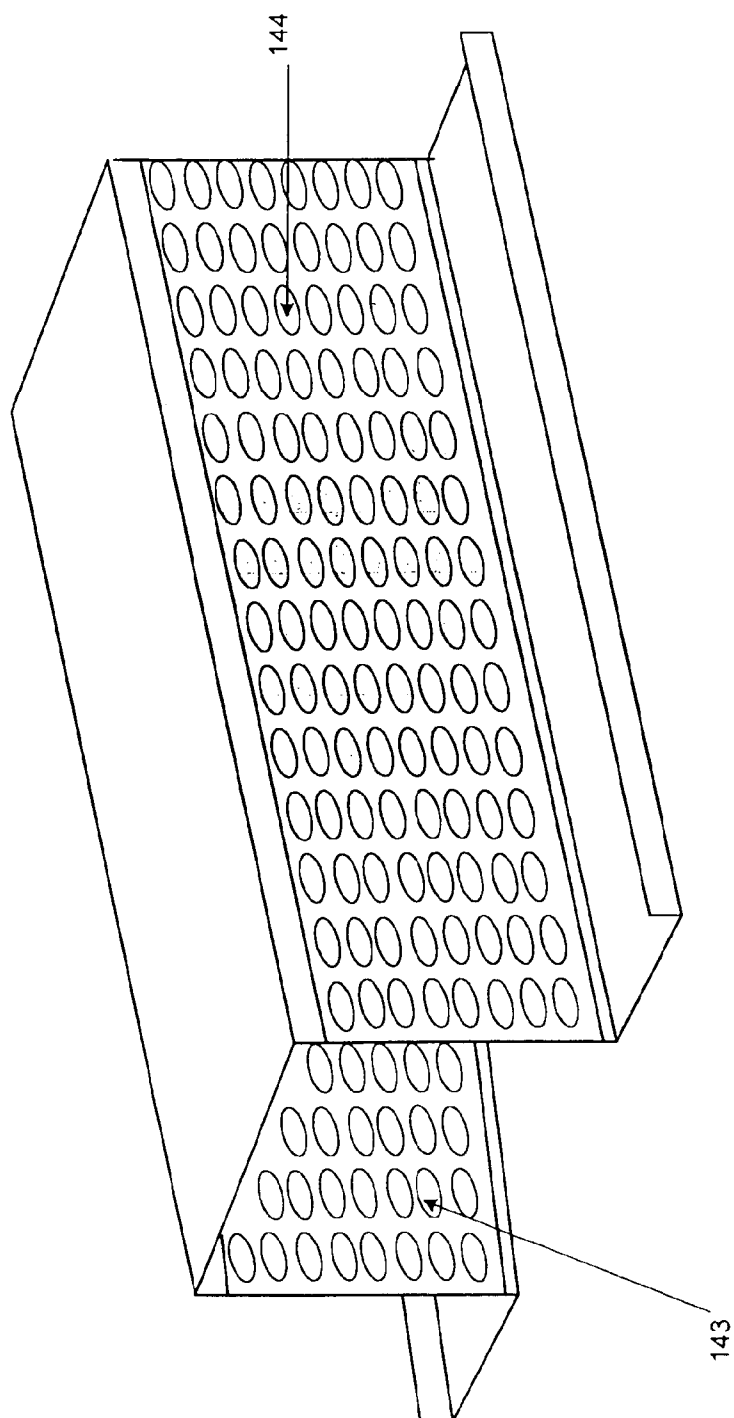


FIGURE 17