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MANTYLA et al.(10) **Pub. No.: US 2017/0146253 A1**(43) **Pub. Date: May 25, 2017**(54) **OFF PEAK TOP VENTING ROOF VENT**(52) **U.S. Cl.**(71) Applicant: **CANPLAS INDUSTRIES LTD.,**
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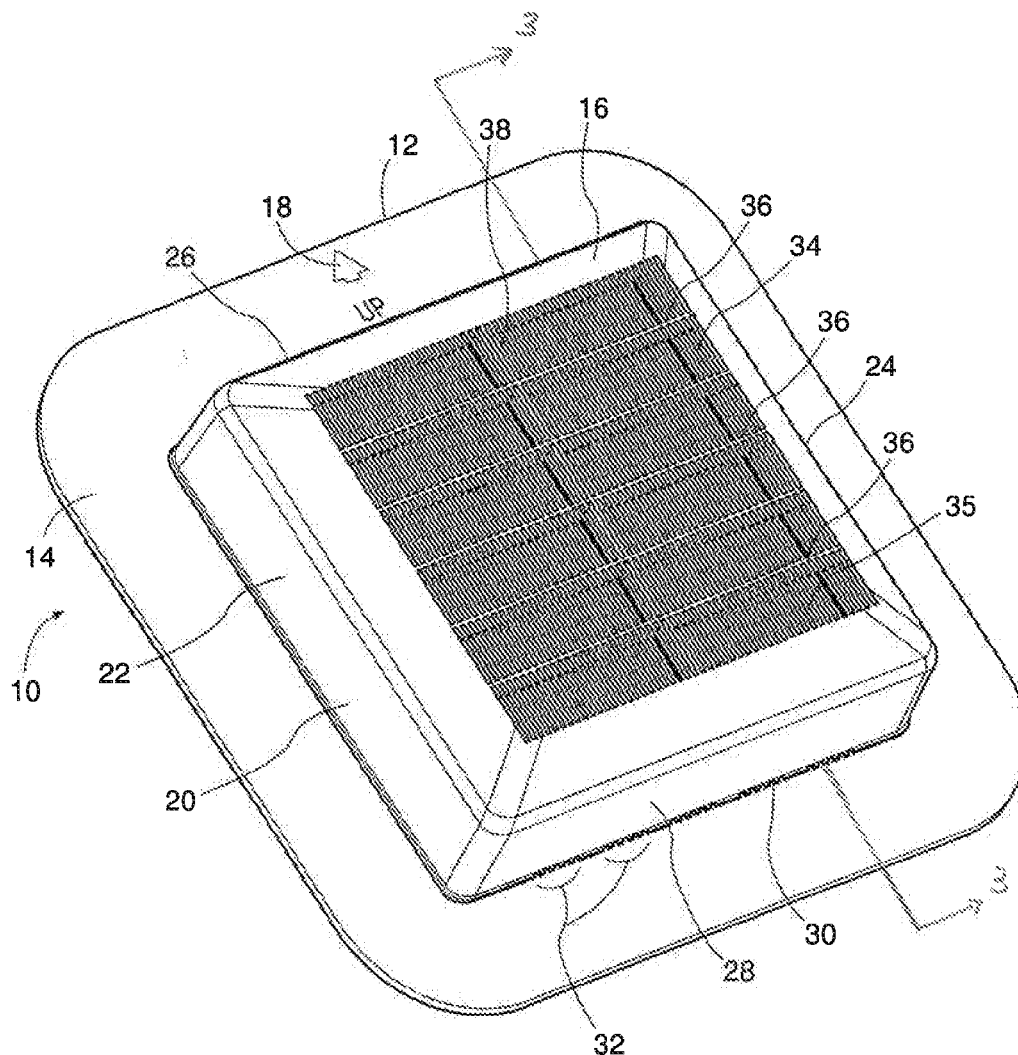
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A roof vent for an off peak roof location. The roof vent has a base and vent cap. The base includes an attachment flange, a central opening and an upstanding wall surrounding the central opening. The vent cap covers the central opening and has a solid periphery extending down to the attachment flange, and a grill portion located on an outer upwardly facing surface of the cap. A barrier platform is disposed under the grill portion over the central opening to deflect moisture passing through the grill away from the central opening. Vented air passes through the central opening, between the underside of the barrier platform and the attachment flange, between the top side of the barrier platform and the underside of the vent cap and then out through the grill.



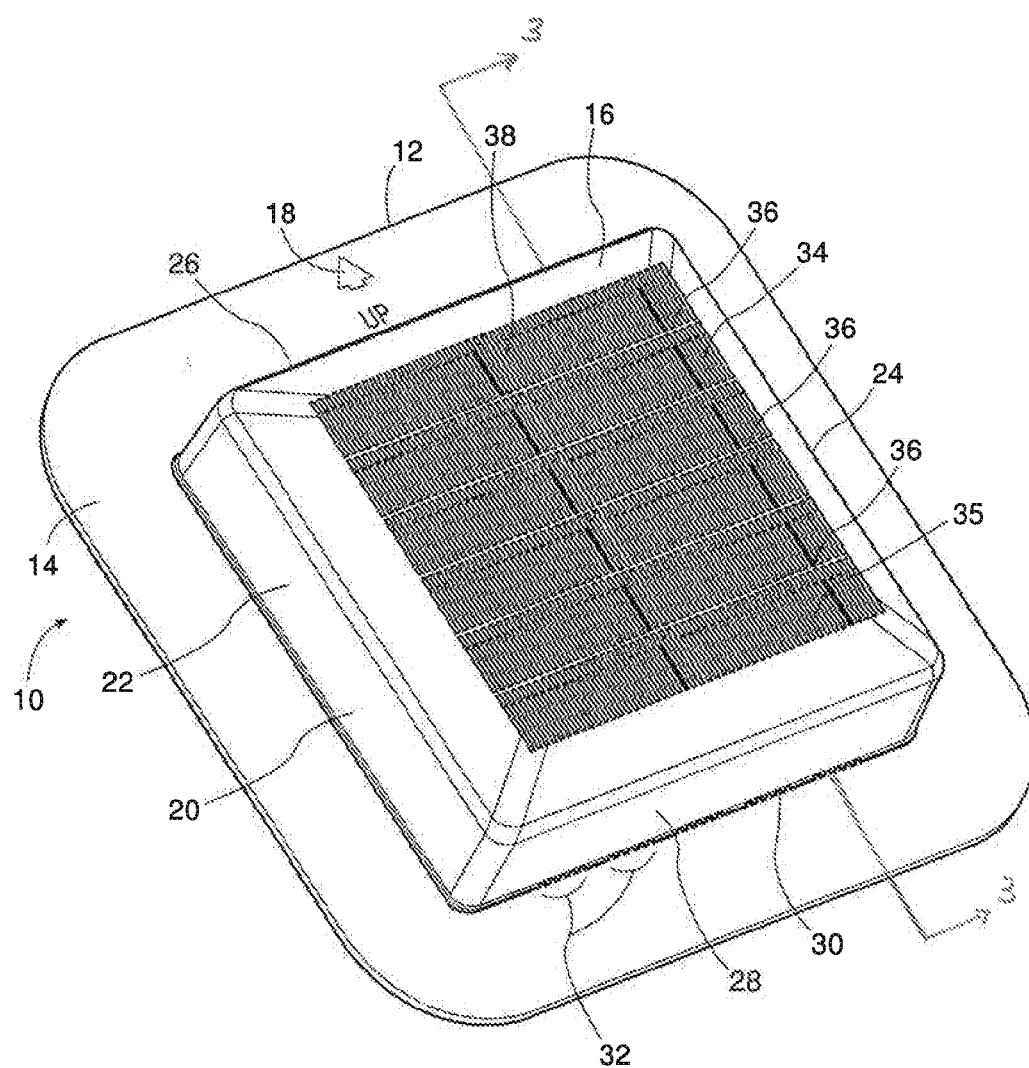


Figure 1

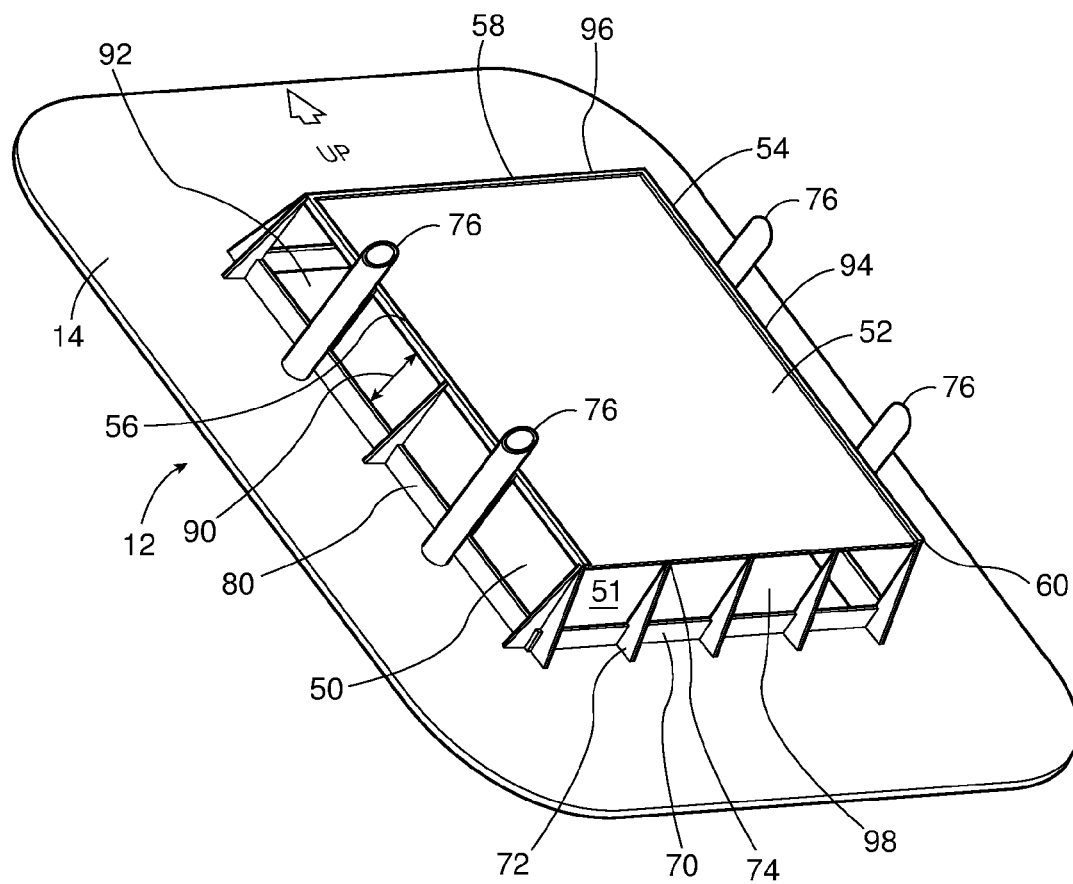


Figure 2

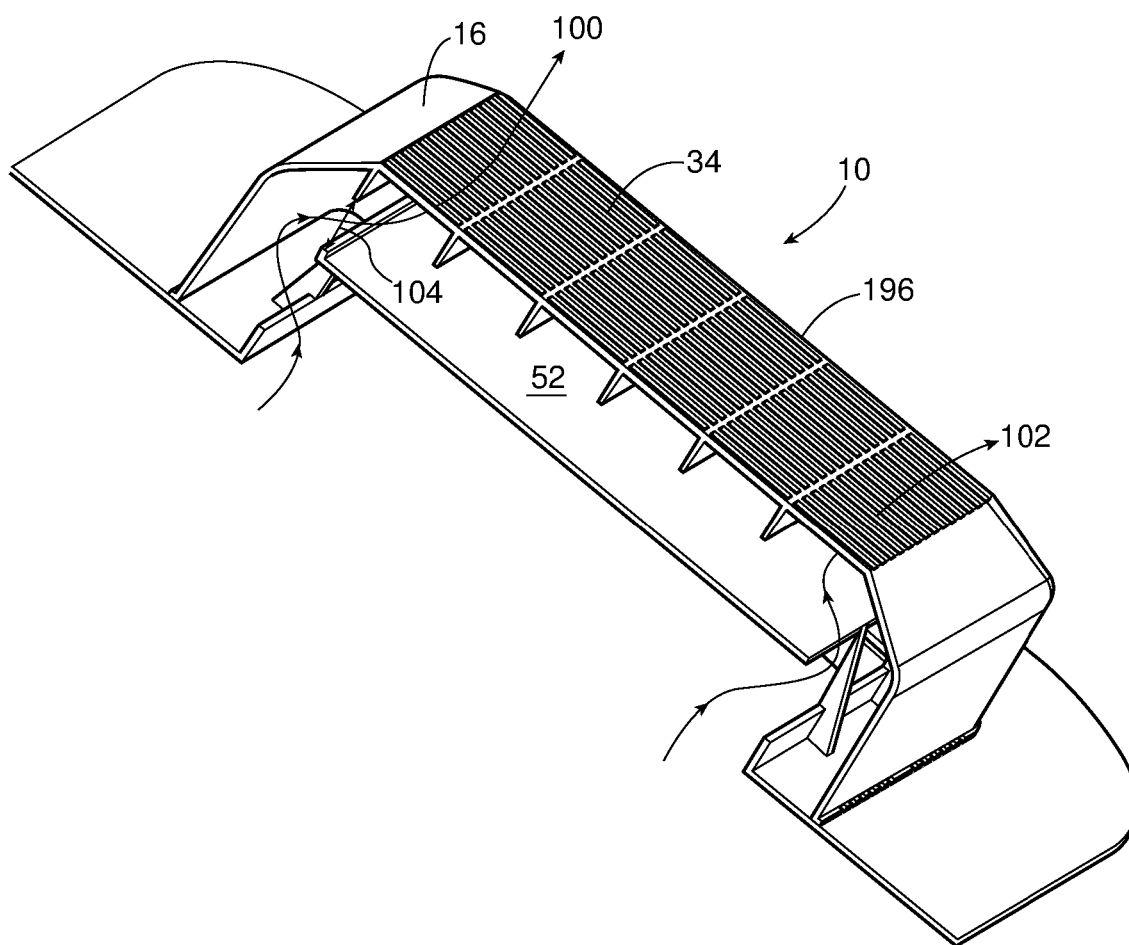


Figure 3

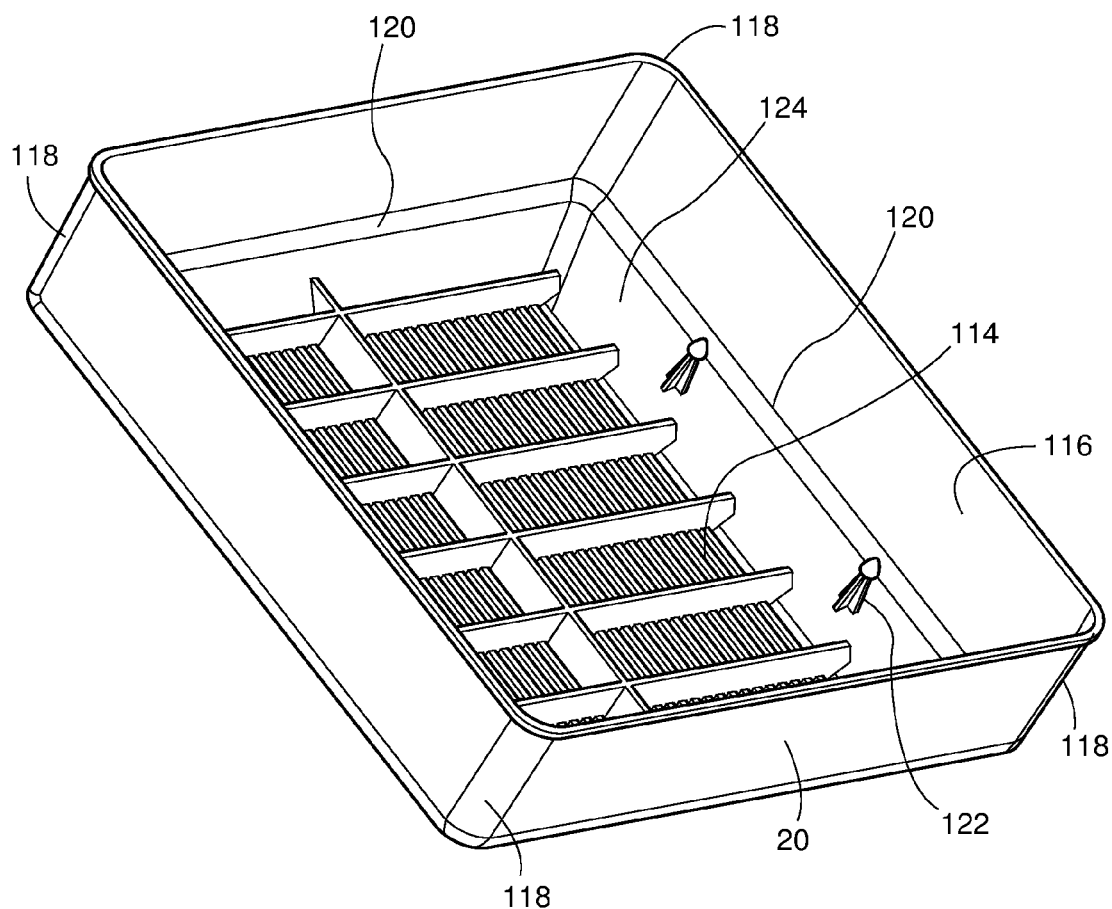


Figure 4

OFF PEAK TOP VENTING ROOF VENT

FIELD OF THE INVENTION

[0001] This invention relates generally to the field of roof vents and in particular passive roof vents of the type that are used to provide ventilation to portions of a building envelope such as attic spaces. Most particularly this invention relates to an off peak roof vent which can be placed on the roof at a location other than the roof peak.

BACKGROUND OF THE INVENTION

[0002] Off peak roof vents are well known and are used to provide ventilation to building envelopes. Such vents are used to control moisture. For example, if a building is warm inside and it is cold outside, and there is sufficient humidity within the air inside the building, this humidity will condense on contact with the cold interior surface of the building in un-insulated spaces such as attics. This is usually most prominent at the underside of the roof. Such condensed humidity or moisture could eventually cause the wood and other roof material to rot or could create harmful mould or the like. Thus building codes require building features designed to limit such condensation. One such feature is to adequately ventilate all parts of the building envelope where such condensation is likely to occur. This ventilation may be established between passive inlet vents located lower down, for example, under the eaves or in the soffits and outlet vents located higher up, for example, either at the peak or just off the peak.

[0003] Apart from the condensation problem mentioned above, there also exists the basic ventilation problem of removing stale air from enclosed spaces, and replacing it with fresh outside air. Roof mounted ventilation devices can also be used for this purpose. One form of such ventilation devices are passive roof vents. These are passive in that they do not include any moving components such as fans or the like and instead rely on natural convection (warm air rising) to cause the air to pass through the vent. This air circulation is facilitated by including a means to allow air to enter into the attic space lower down adjacent to the eaves for example.

[0004] Passive roof vents typically include base portions to be attached and integrated into a shingle roof for example and vent caps which are structures that are used to prevent, or at least reduce, the likelihood of precipitation such as rain or snow getting in through the roof opening on which the vent is mounted. The influx of moisture into the interior structure by weather passing through the vent may also cause damage to the building and is undesirable. Many different roof vent cap or cover designs have been proposed to help prevent weather from passing down through the vent from the outside to the inside, while at the same time allowing the air to pass up through the roof and then through the vent from the inside to the outside.

[0005] Modern roof vents may be made from molded plastic or other materials and come in many different designs. An important consideration for roof vent design is the net free air flow area. This is the effective size of the ventilation opening that a specific vent provides and is measured by subtracting from the overall ventilation opening in the vent, any solid area occupied by grills, screens or the like. Modern building codes specify how much net free ventilation area is to be provided for a given sized structure

or space of a building, to ensure that adequate ventilation is provided to prevent moisture damage. Another important objective is to create an efficient vent design. Efficient in this sense may mean designing the vent body to reduce material use and optimize the costs of producing the device, while at the same time providing a predetermined net free flow air ventilation area, all with a desired durability and desired weather resistance.

[0006] Examples of prior art designs include:

[0007] U.S. Pat. No. D612,040

[0008] U.S. Pat. No. 4,545,291

[0009] United States Publication No. US-2011-0294412A1

[0010] United States Publication No. US-2010-0184366A1

[0011] United States Publication No. US-2006-0223437A1

SUMMARY OF THE INVENTION

[0012] What is desired is a design which seeks to maximize the net free flow area for a vent structure while minimizing the amount of material used to fabricate the device, to for example, reduce costs, while at the same time providing a robust, durable and weather resistant design. The present invention may include an attachment flange which has a central opening to register with a ventilation opening formed in a roof, for example, and a water deflecting wall surrounding the opening to prevent precipitation and condensation which may take the form of water, snow, rain, ice or the like, from crossing the attachment flange and passing through the opening into the vented space below the roof. A second part of the vent may include a cover which has continuous sides which extend down to the flange and a central upwardly facing or top mounted grill or air passageway. A barrier platform may be provided between the central grill above and the central opening below which may inhibit rain, precipitation and water or the like from passing through the grill and then through the central opening. The grill may include ribs which extend downwardly from the central grill towards the barrier platform to encourage precipitation which may be carried on the air to be directed onto the barrier platform. The barrier platform may be supported from the attachment flange or suspended from the cover. The barrier platform may be sized and shaped to cover the central opening to provide a weather or precipitation barrier. The barrier platform may include a lip to prevent such precipitation or moisture from spilling off an edge of the platform into the central opening below. Most preferable the barrier platform is positioned above the central opening to define a lower vapour flow gap and below the cover to define an upper vapour flow gap where each of the lower and upper vapour flow gaps are at least as big as the net free air flow area defined by the central grill formed in the cover.

[0013] Therefore, according to a first aspect the present invention provides a roof vent for an off peak roof location, said roof vent comprising:

[0014] a base including an attachment flange, a central opening to allow the passage of vapour through the base, and an upstanding wall surrounding the central opening to direct water flowing along the attachment flange around the central opening;

[0015] a vent cap covering said central opening, said vent cap including a solid periphery extending down to said attachment flange around the central opening, said vent cap

including a grill portion located an outer, upwardly facing surface for allowing vapour to pass through said cover, the openings of said grill portion defining a net air flow area, [0016] and a barrier platform supported over the central opening between said grill portion and said central opening; [0017] wherein said barrier platform is sized, shaped and positioned to deflect water passing through said grill portion away from said central opening.

[0018] According to a further aspect of the present invention, there is provided a roof vent comprising:

[0019] a base including an attachment flange, a central opening through the attachment flange to allow the passage of air through the roof vent, and a lower water deflecting rib adjacent to the central opening;

[0020] a vent cap covering said central opening, and attached to said base, said vent cap including side, up slope and downslope walls which all extend down to said attachment flange, said vent cap including a grill portion located on an outer, upwardly facing top surface, said grill portion allowing air to pass through said vent cap and defining a net air flow area, and

[0021] a barrier platform supported over the central opening between said grill portion and said central opening to inhibit weather passing directly through said grill portion and said central opening;

[0022] wherein said barrier platform is sized and shaped to define a lower air passageway between said base and said barrier platform and an upper air passageway between said barrier platform and said vent cap, each air passageway being sized to be at least equal to said net air flow area.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] Reference will now be made by way of example only to preferred embodiments of the invention by reference to the following drawings in which:

[0024] FIG. 1 is a top view of the invention comprising a base and a vent cap according to a first embodiment;

[0025] FIG. 2 is a top view of the base of FIG. 1 with the vent cap removed for illustration purposes;

[0026] FIG. 3 is a cross sectional view of the invention of FIG. 1 along the lines 3-3; and

[0027] FIG. 4 is a view from below of the vent cap of FIG. 1 according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] The present invention is directed to a roof vent for an off peak location. An embodiment of the invention is illustrated as 10 in FIG. 1. In the description below the invention will be described in association with a roof vent placed on a sloped roof. While this is a typical example of the type of installation for the invention, the invention can be used on other types of roofs. The vent 10 consists of a base 12 having an attachment flange 14 and a vent cap 16. The attachment flange 14 may include surface markings such as an arrow 18 to indicate to an installer which direction the roof vent 10 should be mounted relative to the roof slope, when used on a sloped roof as aforesaid. The arrow with the word "up" indicates that this is the upslope side of the roof vent, when placed on a sloped roof

[0029] A vent cap 16 is secured to the base 12, and is generally located above the base 12. Various forms of attachment between the vent cap or cover 16 and the base 12

are comprehended, including plastic welding, fasteners, and the like, but the most preferred is to use a mechanical interlock to create a secure attachment between the two parts. One preferred attachment form is the use of arrowhead snaps which fit into retaining slots and thereby secure the cap to the base. FIG. 1 also shows that the vent cover includes a continuous periphery 20 which extends generally down to the base 12. The continuous periphery includes a pair of opposed side slope walls 22 and 24, an upslope wall 26 and a down slope wall 28. As shown, the down slope wall 28 may include a plurality of openings 30 to permit precipitation or moisture which is located below the vent cover to drain out onto the attachment flange outside of the vent cover 16. Although the openings 30 are shown in the form of sets 32 of generally rectangular openings 30, the present invention comprehends that the openings 30 may be any shape or arrangement provided that the openings 30 are sized and shaped to permit precipitation and water which may have found its way under the vent cap 16 to exit through the openings 30 to the outside surface.

[0030] FIG. 1 also shows the central grill portion 34 which is preferably integrally molded into the vent cap. Although various other forms of grills are also comprehended, such as screens, filters and the like, the molded in grill is preferred for convenience, simplicity, low cost and ease of fabrication. The grill 34 allows the passage of air through the vent cap 16, while excluding pests and the like. As shown in this embodiment the grill portion consists of a plurality of small slats 35 which extend across the grill, generally parallel to the direction of the "up" arrow. Small ventilation openings are defined between each of the solid small slats. As will be understood by those skilled in the art the numerical sum of the areas of each of the small ventilation openings defines the net free air flow area for the grill and if this is the smallest cross sectional flow area, ultimately for the vent 10. The small grill slats 35 are supported by a number of side to side ribs 36 which extend from side to side and are generally perpendicular to the direction of the "up" arrow. A center beam 38 is used to provide support to the ends of the ribs 36 across the middle of the grill 34.

[0031] It will be noted that the ventilation openings are generally rectangular with the long dimension extending from the lower side of the vent, when installed, to the upper side of the vent when installed and the short dimension extending side to side across the vent. Other patterns of ribs and slats could be used. While not essential, this orientation may be used to encourage any precipitation which splashes onto the grill and then through the grill openings to be directed in a down slope manner, as opposed to directing the same in a side slope manner which would occur if the vent openings were oriented in a manner which is perpendicular to that shown. The down slope direction may help guide the precipitation out from under the cover onto the exterior roof surface through the drain openings 30 shown in FIG. 1, as explained in more detail below.

[0032] FIG. 2 shows the base portion 12 with the vent cap 16 removed for ease of understanding. The base portion includes the attachment flange 14 which defines a central opening 50. The opening 50, when the roof vent is installed, registers with an opening 51 formed in a roof surface and so permits the air to flow out of the space in the building envelope below the roof. Also shown is a barrier platform 52 which includes side walls 54, 56 and top wall 58. The walls 54, 56, and 58 are to direct any moisture, which penetrates

down through the top facing grill, to stay on the platform **52** and then with the help of gravity, to fall off the bottom edge **60**, which has no wall. When the vent is tilted, such as by being installed on a sloping roof, the barrier platform **52** will have a slight overhang extending the edge **60** below the opening **50**, which means any such moisture which falls off the edge **60** lands on the attachment flange and away from the central opening. In this manner any such moisture is directed to pass out through the drain holes **30** (FIG. 1), again under the influence of gravity.

[0033] FIG. 2 also shows how the barrier platform **52** may be supported over the base **12**. As shown a number of upright supports **72** are preferred which in this embodiment extend from the attachment flange upwardly to the barrier platform **52**. In this preferred embodiment the upright supports are tapered with a wide base **72** to allow a strong molded bond along the base and a more narrow attachment point **74** where the uprights intersect the barrier platform **52**. The present invention further comprehends that the barrier platform **52** could be suspended from the cover rather than being supported above the base. All that is required is that the barrier platform **52** be located between the cover and the base and interposed between the roof opening **51** below and the open grill **34** above.

[0034] Also shown are four cap support posts **76** which include snap in catches to retain corresponding attachment elements formed on the underside of the cover, in the usual manner. As shown the attachment elements take the form of solid arrowheads while the catches take the form of a deformable edge. Also shown is a continuous perimeter wall **80** which is formed around the central opening **50**. This perimeter wall **80** prevents moisture from running along the attachment flange and then over the edge and into the central opening **50** and then into the roof opening **51**. As can now be understood, the gap between the top of the wall **80** and the underside of the platform defines a lower vapour gap **90**. The total area of the lower vapour gap **90** is equal to the height times the width of each of the openings between the support posts, **70** of which 12 are used in a preferred embodiment, and **76** of which 4 are used in a preferred embodiment, including generally the two side slope facing sections **92**, **94** and the up and down slope facing sections **96** and **98** less the area taken up by the support posts and the upright supports. This may be called the total lower net free area. It can now be understood that the support posts **70** are preferred to define a narrow profile perpendicular to the vapour gap **90** to reduce the amount of obstruction of the lower net free flow area that is occasioned by the posts **70**.

[0035] FIG. 3 shows a cross sectional view of the roof vent **10** according to a preferred embodiment of the invention in partial cross sectional view. In this figure the cover **16** is shown with the central vent or grill **34**. Located below the grill is the barrier platform **52**. The barrier platform **52** extends laterally to a position beneath the edges of the grill **34** so that any moisture passing through the grill **34** will land on the platform **52** instead of passing directly into the central opening **51**. The vapour path for vapours flowing out from under the roof vent is shown in the drawing as **100** and **102** by way of illustration. The distance between the top wall of the barrier platform and the underside of the grill defines a second or upper net free area **104**. As will now be understood the preferred form of the invention is to make the upper net free area **104** at least the same size as the lower net free area **90**. As further understood the grill itself defines a net free

flow area **106** which is determined by adding up the total area of the openings in the grill. According to the present invention, it is preferred if the grill openings in total area are at least equal to the upper flow area, the lower flow area or both. As can now be appreciated that the three flow areas, **90**, **104** and **106** may be made all the same size to optimize the overall design. In the event one of the flow areas is smaller than the others, then this will become the defining limit of the net free flow area for the vent. In the preferred form of the vent, the cross sectional area of all three net free areas, namely the lower net free area, the upper vapour flow area and the net free area of the grill portion, may be the same size. In this way the overall size of the vent body may be optimized, and the total use of material in fabricating the vent may also be optimized.

[0036] FIG. 4 shows a view of the cover **14** from the underside. As can be seen each of the central rib **38** and the cross ribs **36** include a downwardly extending portion **110** and **112** (not shown) respectively. These downwardly extending portions may make contact with moisture passing through the grill **54** (not shown) to help direct such moisture onto the barrier platform **52** (shown on FIGS. 2 and 3). The preferred form of the cover is a molded plastic material, such as PP, ABS or PVC plastic with appropriate UV protection and dyes for colouring the final product as is known to those skilled in the art.

[0037] In the molded embodiment there is an upper grill section **114** and a lower skirt portion **116**. It is preferred to include rounded corners **118** on the skirt portion and to extend the skirt **20** outwardly somewhat from the grill section by means of a small extension outwardly shown as **120**. As well the arrowhead fasteners **122** are shown mounted within the interior sidewall **124** of the upper grill section. These fasteners may be used to secure the cover to the base as described above. As will be understood by those skilled in the art other types of fasteners can also be used.

[0038] It will be understood by those skilled in the art that the foregoing description comprehends various embodiments of the invention some of which have been described above and some of which will be apparent to those skilled in the art. For example, the barrier platform may be supported on the base or suspended from the cap and still fall within the scope of the appended claims.

We claim:

1. A roof vent for an off peak roof location, said roof vent comprising:

- a base including an attachment flange, a central opening to allow the passage of air through the base, and an upstanding wall surrounding the central opening to direct water flowing along the attachment flange around the central opening;
 - a vent cap covering said central opening, said vent cap including a solid periphery extending down to said attachment flange around the central opening, said vent cap including a grill portion located an outer, upwardly facing surface for allowing air to pass through said cover, the openings of said grill portion defining a net air flow area,
 - and a barrier platform supported over the central opening between said grill portion and said central opening;
- wherein said barrier platform is sized, shaped and positioned to deflect water passing through said grill portion away from said central opening.

2. The roof vent of claim 1 wherein said barrier platform defines a lower air gap between the barrier platform and the base and the lower air gap defines an opening at least equal to said net air flow area of said grill portion.

3. The roof vent of claim 1 wherein said barrier platform defines an upper air gap between said barrier platform and said vent cap and the upper air gap comprises an opening at least equal to said net air flow area of said grill portion.

4. The roof vent of claim 3 wherein the grill portion, the lower air gap and the upper air gap all define a similar net free flow area.

5. The roof vent of claim 1 wherein the barrier platform is supported from the vent cap by means of a plurality of suspension members.

6. The roof vent of claim 5 wherein said suspension members releasably attach said barrier platform to said vent cap.

7. The roof vent of claim 5 wherein there are at least four suspension members.

8. The roof vent of claim 1 wherein the barrier platform is supported over the central opening by means of a plurality of support columns extending from said base.

9. The roof vent of claim 8 wherein the barrier platform is releasably supported over said central opening by said plurality of support columns.

10. The roof vent of claim 5 wherein there are a number of support columns.

11. The roof vent of claim 10 wherein said support columns are configured to have a small profile in cross section across the air flow area.

12. The roof vent of claim 1 wherein the central opening includes a lower water deflecting rib on all sides to help deflect water away from the central opening.

13. The roof vent of claim 1 wherein the barrier platform further includes an upper water deflecting rib on at least three sides to help deflect water away from the central opening.

14. A roof vent comprising:

a base including an attachment flange, a central opening through the attachment flange to allow the passage of air through the roof vent, and a lower water deflecting rib adjacent to the central opening;

a vent cap covering said central opening, and attached to said base, said vent cap including side, up slope and downslope walls which all extend down to said attachment flange, said vent cap including a grill portion

located on an outer, upwardly facing top surface, said grill portion allowing air to pass through said vent cap and defining a net air flow area, and

a barrier platform supported over the central opening between said grill portion and said central opening to inhibit weather passing directly through said grill portion and said central opening;

wherein said barrier platform is sized and shaped to define a lower air passageway between said base and said barrier platform and an upper air passageway between said barrier platform and said vent cap, each air passageway being sized to be at least equal to said net air flow area.

15. The roof vent of claim 1 wherein the lower water deflecting rib extends at least above an upslope edge of said central opening and beside said side slope edges of said central opening.

16. The roof vent of claim 2 wherein said side slope lower water deflecting ribs extend past said down slope edge of said central opening.

17. The roof vent of claim 2 wherein said lower water deflecting rib extends below said down slope edge of said central opening.

18. The roof vent of claim 1 wherein said lower water deflecting rib encircles said central opening.

19. The roof vent of claim 1 wherein said down slope wall of said vent cap includes drainage holes to allow water to drain from underneath said vent cap onto said roof

20. The roof vent of claim 1 wherein said barrier platform is positioned below said grill portion and has an area at least as large as an area having openings defined by said grill portion.

21. The roof vent of claim 1 wherein said barrier platform includes a raised edge to promote water containment.

22. The roof vent of claim 7 wherein the raised edge extends along at least some of said side slope edges of said barrier platform.

23. The roof vent of claim 8 wherein said upper air passageway is at least partially defined between a top edge of said raised edge and an underside of said vent cap.

24. The roof vent of claim 2 wherein said lower air passageway is at least partially defined between a top edge of said water deflecting rib and a lower surface of barrier platform.

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