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(54) ROOF RIDGE VENT WITH WATER BARRIER

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(57) ABSTRACT

The present invention provides a roof ridge vent system for asphalt shingle or composition roofs which include a vent slot located through the roof structure along the roof ridge. Vent strips, each comprised of a vent material having an upper water barrier connected to an upper surface thereof are provided on each side of the vent slot to prevent ingress of moisture and debris. The upper water barriers extend beyond the vent material and over the vent slot where they overlap one another. Alternatively, a single water barrier is provided which extends from a first vent strip and bridges the roof ridge and contacts the top of a second vent strip on an opposite side of the vent slot. A mesh screen is attached to respective exposed surfaces of the vent strips to further prevent ingress of moisture and debris. A ridge cap is installed over the vent strips. A water dam may be connected to a lower surface of the vent strip, and extend in an up-slope direction under the ridge cap to further prevent ingress of moisture.

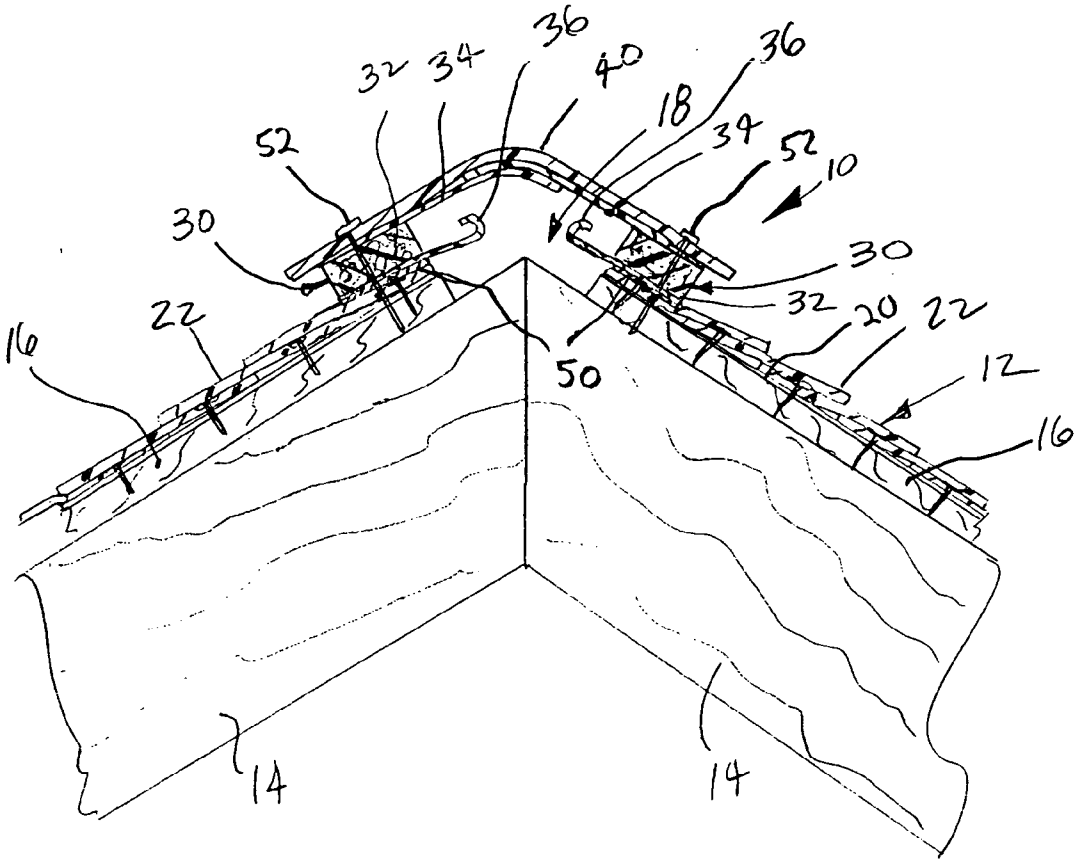

FIG. 1

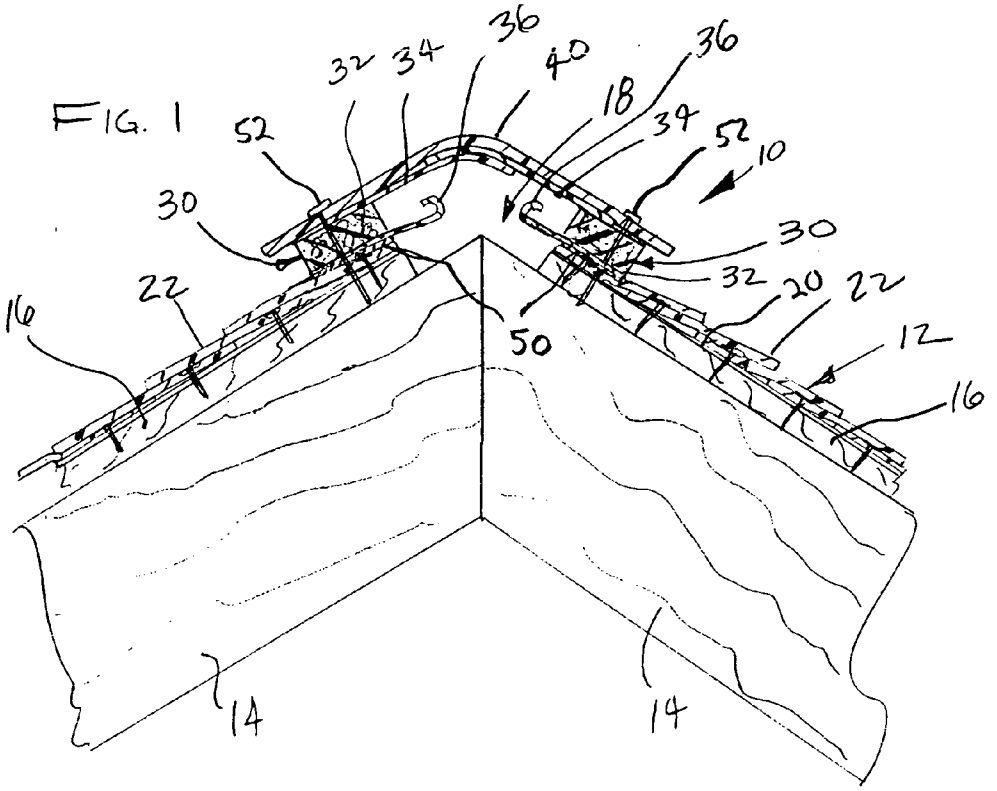
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FIG. 2

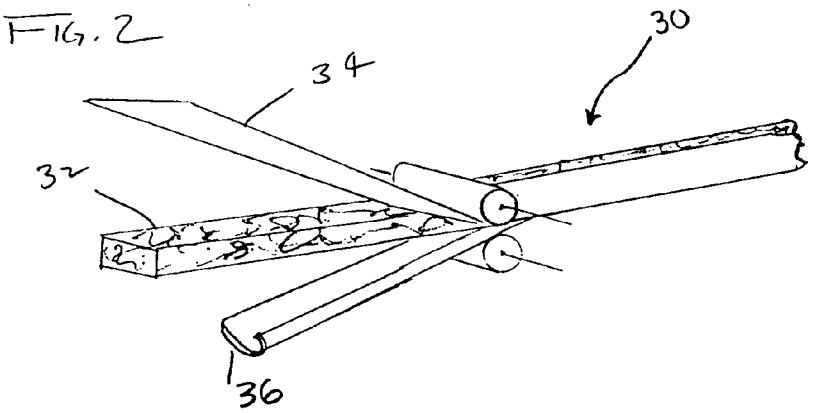
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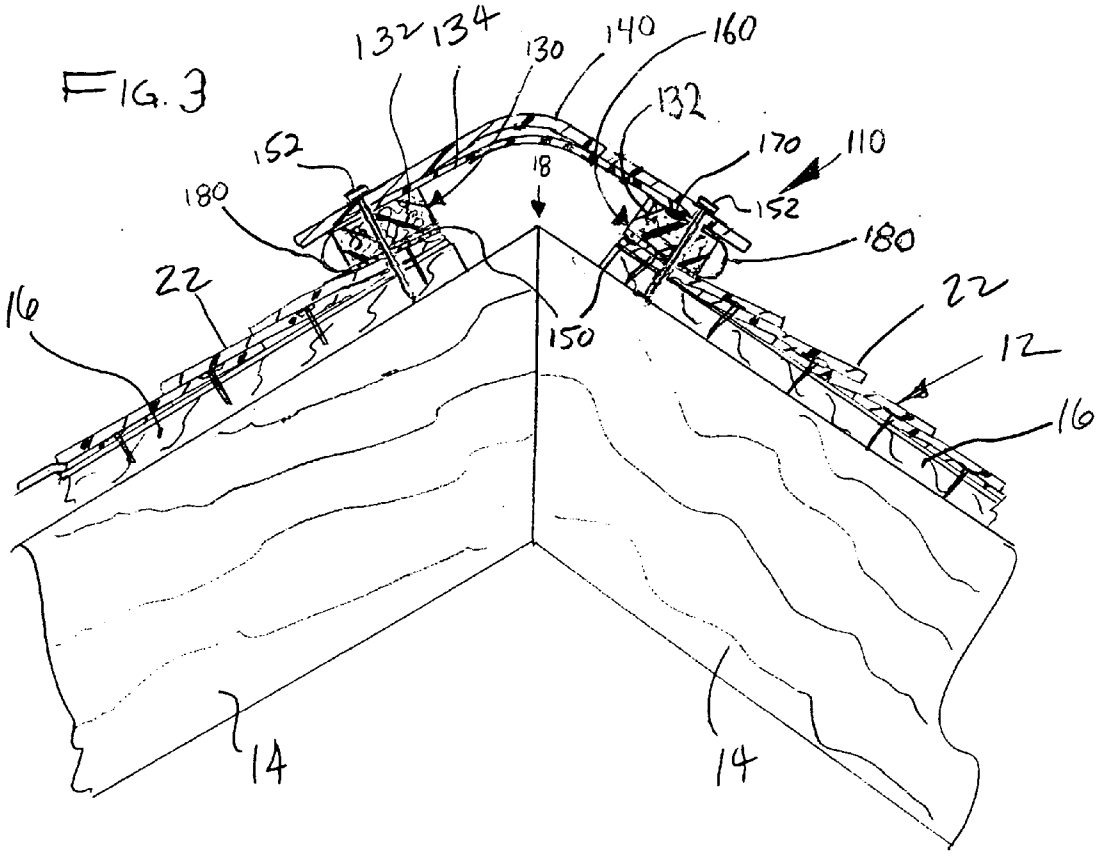
FIG. 3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ROOF RIDGE VENT WITH WATER BARRIER

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 60/415,377, filed Oct. 2, 2002, which is incorporated by reference herein as if fully set forth.

BACKGROUND

[0002] The present invention relates to a ridge vent for roofs, and in particular to a ridge vent for use on asphalt shingle or other composition roofs, preferably having a pitch of at least 2/12.

[0003] It has been known to ventilate attics under gable roofs by running a vent along the roof ridge. Such vents are created during construction by sizing the uppermost row of sheathing panels to leave an open slot running along the ridge essentially the length of the roof. The slot creates effective heat ventilation by convection flow and suction caused by wind across the roof ridge.

[0004] Soffit ventilators are perforated or louvered openings located along the eaves of an overhanging roof. The vents allow fresh ambient air to flow into the attic to equalize attic temperature and pressure with the outside. This equalization inhibits moisture from condensing on insulation and wood roofing materials which causes mildew and rot, prevents build-up of ice dams which could buckle shingles and gutters, and reduces air-conditioning costs when hot attic air is replaced by cooler ambient air.

[0005] A soffit ventilation system works in conjunction with a ridge vent to provide passive ventilation. As hot stale air is withdrawn from the ridge slot vent by convection and/or wind suction, it is replaced by fresh ambient air through the soffit vents.

[0006] One known ridge vent that has proven to be very successful is described in the inventor's prior U.S. Pat. No. 5,167,579. This roof vent is formed using a non-woven synthetic fiber mat having randomly aligned fibers located over a vent slot at the roof ridge. Cap shingles are then installed over the non-woven synthetic fiber mat. The synthetic fiber mat allows for air flow through the slot at the roof ridge, while preventing the ingress of moisture and debris. However, while this type of vent has proven effective at stopping the ingress of moisture coming up the roof slope, for example due to wind driven rain, it cannot prevent moisture ingress from above, such as when wind driven rain is oriented parallel to the roof ridge line, forcing water between the cap shingles, where it then can pass directly down through the vent material. Additionally, it does not always form a clean ridge line due to the material becoming rounded as it extends over the slot and partially down on each side of the roof.

SUMMARY

[0007] Briefly stated, the present invention provides a roof ridge vent system for asphalt shingle or composition roofs which include a vent slot located through the roof structure along the roof ridge. Vent strips, each comprised of a vent material having an upper water barrier connected to an upper surface thereof are provided on each side of the vent slot to prevent ingress of moisture and debris. The upper water barriers extend beyond the vent material and over the vent slot where they overlap one another. Alternatively, a single water barrier is provided which extends from a first vent strip and bridges the vent slot at the roof ridge and contacts the top of a second vent strip on an opposite side of the vent slot. The vent strips can be moved closer to or farther from the vent slot to accommodate different sized cap shingles, with the upper water barriers overlapping to a greater or lesser extent depending on the spacing. Preferably, a mesh screen is attached to respective exposed surfaces of the vent strips. This acts to break up wind driven rain into smaller droplets to further prevent ingress of moisture and debris. A ridge cap is installed over the vent strips. A water dam may be connected to a lower surface of the vent strip, and extend in an up-slope direction under the ridge cap to further prevent the ingress of moisture.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention will be explained in more detail in connection with the drawings in which presently preferred embodiments are shown.

[0009] In the drawings:

[0010] **FIG. 1** is a cross-sectional view of a roof ridge vent system in accordance with a first preferred embodiment of the present invention.

[0011] **FIG. 2** is a perspective view showing the continuous process used to form the vent strip used with the roof ridge vent system of **FIG. 1**.

[0012] **FIG. 3** is a cross-sectional view of a roof ridge vent system in accordance with a second preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] Certain terminology is used in the following description for convenience only and is not considered limiting. Words such as "front", "back", "top" and "bottom" designate directions in the drawings to which reference is made. This terminology includes the words specifically noted above, derivatives thereof and words of similar import. Additionally, the terms "a" and "one" are defined as including one or more of the referenced item unless specifically noted.

[0014] The preferred embodiments of the present invention will be described with reference to the drawing figures where like numerals represent like elements throughout.

[0015] Referring now to **FIG. 1, a** roof ridge ventilation system **10** is shown. The ventilation system **10** is installed on a roof **12**, preferably having a 2/12 pitch or greater. The roof **12** is formed from rafters **14** having a sheathing **16**, as shown, installed thereon. Alternatively, purlins or other support structures can be utilized. The sheathing **16** may end below the ridge peak or may be cut back so that a vent slot **18** is formed at the peak. Preferably, tar paper, roofing felt, or another type of moisture impervious layer **20** is installed over the sheathing **16** prior to asphalt shingles **22**, another type of composition roofing material, or any other generally flat roofing material being installed up to the vent slot **18**.

[0016] Vent strips **30** in accordance with a first preferred embodiment of the present invention are then installed along each side of the roof ridge in a position below the vent slot **18**. Each of the vent strips **30** is comprised of a strip of vent material **32**, which is preferably a non-woven matting as described in U.S. Pat. No. 5,167,579, which is incorporated herein by reference as if fully set forth. However, other vent materials could be used. The vent material **40** may be heat treated so that it "lofts" or expands, and then calendered down to a specific thickness to allow the completed vent strips to expand and conform to uneven surfaces when solar energy raises the roof temperature.

[0017] The vent strips **30** are preferably adhered to the shingles **22** by an adhesive **50** applied to at least one of the vent material **32** and the shingles **22**. The adhesive **50** may include a fluid or semi-solid substance, or alternatively, the adhesive **50** may include adhesive strips, of the type known in the art, supplied pre-attached along a lower surface of each vent strip **30**. These adhesive strips preferably include a release strip which, when removed, reveals an adhesive such as acrylic or silicone.

[0018] An upper water barrier **34** is connected to an upper surface of the vent material **32**. The upper water barrier **34** is preferably made of a flexible polymeric material, and may be a polyvinyl chloride sheet, polyethylene or polyurethane sheet, a closed cell foam sheet or any other suitable water resistant material. The upper water barrier **34** may be connected to the vent strip **30** by stitching, heat staking, friction, heat or solvent welding, using adhesive or any other suitable method. The upper water barrier **34** extends past the edge of the vent material **32** and up over the top of the roof ridge. Preferably, it extends at least five inches from the vent material **32**. However, this distance can vary depending on the application. One or both surfaces of the free end of the upper water barrier **34** may be coated with an adhesive so that the upper water barriers from the vent strips **30** on each side of the vent slot **18** can be adhered to one another in the overlap area. The upper water barrier **34** is flexible enough to allow the vent strip **30** to be rolled for packaging and shipping, but has sufficient stiffness in the width direction so that it can not collapse into the vent slot **18**.

[0019] In a preferred embodiment, the vent strips **30** each include a water dam **36**. However, these can be omitted, depending on the width of the vent material **32** in each vent strip **30**. The water dam **36** preferably has a J or L shape, and is attached to the lower surface of the vent material **32** by utilizing an adhesive, stitching, heat staking, friction, heat or solvent welding, or any other suitable method. The water dam **36** is preferably made of a water resistant, flexible polymeric material that is sufficiently flexible to allow the vent strips **30** to be rolled for packaging and shipping. However, the material has sufficient rigidity so that the water dam **36** will not collapse into the vent slot **18**, even at elevated temperatures which can exceed 140° F., on a vented roof.

[0020] Since the two vent strips **30** are not connected together, the vent strips **30** can be positioned closer to or farther from the vent slot **18**, depending on the width of ridge cap shingles **40** which overlie the water barriers **34**. The upper water barriers **34** of the vent strips **30** merely have a smaller or greater overlap within a designed range and can therefore accommodate cap materials **40** of different widths. Preferably, adhesive on the free ends of one or both of the upper water barriers **34** connect the two water barriers **34** together. The ridge cap shingles **40** or other cap material are then preferably secured to the ridge using nails **52** driven through the vent strips, which further secure the vent strips **30** in position.

[0021] The vent strips **30** are preferably assembled in a continuous process, as shown in **FIG. 2**, using an adhesive to attach the upper water barrier **34** and the water dam **36** to the upper and lower surfaces, respectively, of the vent material **32**. Alternatively, the water barrier **34** and water dam **36** are connected to the vent material **32** by stitching or other appropriate means.

[0022] Referring now to **FIG. 3, a** ventilation system **110** according to a second preferred embodiment of the present invention is shown. In this embodiment, a single water barrier **134** is attached to a first vent strip **130**. The water barrier **134** may be attached to the first vent strip **130** by the procedures described above with reference to the upper water barriers **34** of the first preferred embodiment. A second vent strip **160** is provided without a pre-attached water barrier and is positioned parallel to the first vent strip **130** on the opposite side of the vent slot **18**. An adhesive strip **170** is provided for attaching a free end of the water barrier **134** to the second vent strip **160** during installation. The adhesive strip **170** can be located on a free end of the water barrier **134** or on the upper surface of the second vent strip **160**. As described with reference to the first preferred embodiment, the adhesive **170** may include a fluid or semi-solid substance, or alternatively, adhesive strips having a release strip.

[0023] Mesh screens **180** are preferably connected to each vent strip **130, 160** along the exposed edge, and extend the length of the respective vent strip to assist in preventing the ingress of water into an interior of the roof. The mesh screens **180** may be attached to the vent strips **130, 160** by utilizing an adhesive, stitching, heat staking, friction, heat or solvent welding, or any other suitable method. The mesh screens **180** preferably have openings with widths of less than 1/16" and are preferably bowed outward forming an air gap between the mesh screen and the vent strip.

[0024] An adhesive strip **150** is provided for attaching the vent strips **130, 160** to the roof shingles **22** during installation. The adhesive strip **150** is preferably located on the respective lower surfaces of the vent strips **130, 160**. As described with reference to the first preferred embodiment, the adhesive **150** may include a fluid or semi-solid substance, or alternatively, adhesive strips having a release strip. Nails **152** are also provided, in a manner identical to that described in the first preferred embodiment, to secure the ridge cap shingles **140** and vent strips **130, 160** to the roof surface.

[0025] In use, the upper water barriers **34, 134** prevent moisture, for example wind driven rain that travels parallel to the roof ridge from falling through the vent slot **18** if it passes between gaps in the ridge cap **40,140**, or lifts a portion of the ridge cap shingles **40,140**. The vent material **32,132** prevents the ingress of insects, debris or moisture in the up-slope direction of the roof. Additionally, if the water dam **36** is utilized, this traps and redirects any moisture that may penetrate the vent material **32**, for example wind driven rain, so that it travels back down the roof slope, and does not enter the building structure through the ridge vent slot **18**.

Depending on the thickness (in a direction parallel to the roof surface) and porosity of the vent material **32,132**, it is possible that the water dam **36** can be entirely omitted as shown in the second preferred embodiment of **FIG. 3**. The mesh screen **180** further acts to help prevent moisture ingress by having the effect of breaking up larger water droplets, which appears to enhance the overall moisture ingress prevention of the vent strips **30,130**. The mesh screen **180** and water dam **36** can also be used in combination if desired.

[**0026**] While the preferred embodiments of the invention have been described in detail, the invention is not limited to these specific embodiments described above which should be considered as merely exemplary. Further modifications and extensions of the present invention may be developed and all such modifications are deemed to be within the scope of the present invention as defined by the appended claims.

What is claimed is:

1. A roof ventilation system for asphalt shingle or composition roofs which include a vent slot located through the roof structure along a roof ridge, comprising:

a first vent strip comprised of first vent material, and having a first surface in contact with a surface of the roof and a second surface;

a second vent strip located generally parallel to the first vent strip on an opposite side of the roof ridge, comprised of second vent material, and having a first surface in contact with the surface of the roof and a second surface; and

at least one upper water barrier connected to at least one of the second surfaces of the first and second vent strips and extending therefrom toward the roof ridge and extending over the vent slot.

2. The roof ventilation system according to claim 1, wherein the at least one water barrier includes first and second water barriers attached to the first and second vent strips, respectively, each of the water barriers extending from a respective vent strip toward the other water barrier.

3. The roof ventilation system according to claim 2, wherein the first and second water barriers each include free ends which overlap each other.

4. The roof ventilation system according to claim 3, wherein the free ends of the first and second water barriers are adhered to each other.

5. The roof ventilation system according to claim 1, further comprising at least one ridge cap placed over the vent strips, whereby the water barrier is located between the ridge cap and the first and second vent strips.

6. The roof ventilation system according to claim 5, wherein first and second ends of the ridge cap extend past respective second surfaces of the vent strips in directions opposite the vent slot.

7. The roof ventilation system according to claim 6, further comprising fasteners driven through the ridge cap and a respective vent strip to attach the ridge cap and the respective vent strip to the roof.

8. The roof ventilation system according to claim 1, wherein the at least one water barrier comprises a single water barrier having a first end that is attached to the first vent strip, and a second end that is in contact with the second vent strip.

9. The roof ventilation system according to claim 1, wherein the at least one water barrier comprises a single water barrier, and a first end of the single water barrier is attached to the first vent material, and a second end of the water barrier is connected by an adhesive at installation to the second vent material.

10. The roof ventilation system according to claim 9, wherein the water barrier is bonded by a strip adhesive, having a removable strip, to the second vent strip.

11. The roof ventilation system according to claim 1, wherein the vent materials are comprised of a non-woven mesh material.

12. The roof ventilation system according to claim 11, wherein the non-woven mesh material is a synthetic fiber web treated with at least one binding agent.

13. The roof ventilation system according to claim 1, wherein at least one of the first and second vent strips and the surface of the roof includes adhesive applied thereon for securing the first and second vent strips to the surface of the roof.

14. The roof ventilation system according to claim 13, wherein the adhesive is a pressure sensitive strip adhesive having a removable backing which exposes a pressure sensitive adhesive.

15. The roof ventilation system according to claim 1, wherein at least one of the first and second vent strips includes a water dam connected thereto which extends along a length of the respective vent strip, for preventing ingress of water.

16. The roof ventilation system according to claim 15, wherein the water dam includes a free end having a curved portion to assist in preventing ingress of water.

17. The roof ventilation system according to claim 1, wherein the upper water barrier is at least one of polyvinyl chloride and a closed cell foam.

18. The roof ventilation system according to claim 1, further comprising a ridge cap, and nails which secure the ridge cap to the roof, wherein the vent strips are positioned between the ridge cap and the surface of the roof.

19. The roof ventilation system according to claim 1, wherein at least one of the vent strips further includes a respective third surface adjacent to the first and second surfaces, and further comprising a screen mesh attached to the third surface.

20. The roof ventilation system according to claim 19, wherein the third surface faces an exterior of the roof, and the screen mesh includes first and second ends which attach to the vent strip to cover substantially an entire portion of the third surface, and wherein an air gap is located between the screen mesh and the third surface.

21. A method of improving ventilation to a building comprising:

providing a roof having a surface and at least one vent slot disposed along a roof ridge,

applying a first vent strip to the roof, the first vent strip including a first surface which contacts the surface of the roof and a second surface having at least a first upper water barrier attached thereto and extending therefrom, wherein the first vent strip is aligned generally adjacent to the roof ridge and wherein the water barrier at least partially bridges the roof ridge; and

applying a second vent strip to the roof, the second vent strip including a first surface which contacts the surface of the roof and a second surface, wherein the second vent strip is aligned generally adjacent to the roof ridge on an opposite side of the vent slot from the first vent strip.

22. The method according to claim 21, further comprising connecting a free end of the first water barrier to the second surface of the second vent strip.

23. The method according to claim 22, wherein the step of connecting the free end of the first water barrier includes attaching the free end of the water barrier to the second surface of the second vent strip by an adhesive applied to at least one of the second surface of the second vent strip and the free end of the water barrier.

24. The method according to claim 22, wherein the step of connecting the free end of the first water barrier includes attaching the free end of the water barrier to the second surface of the second vent strip by an adhesive strip which is attached to at least one of the second surface of the second vent strip and the free end of the water barrier by removing a removable backing, and exposing the adhesive.

25. The method according to claim 21, further comprising connecting at least one ridge cap over the vent strips, whereby the water barrier is located between the ridge cap and the first and second vent strips.

26. The method according to claim 25, wherein the step of connecting the ridge cap includes driving a plurality of fasteners through the ridge cap and through the first and second vent strips to secure the ridge cap and the vent strips to the roof.

27. The method according to claim 21, wherein the steps of applying the first and second vent strips include providing at least one of the first and second vent strips with a water dam extending along a length of a respective first surface and attached therewith, wherein the water dam includes a bent portion for preventing ingress of water.

28. The method according to claim 21, wherein the step of applying a second vent strip includes providing the second vent strip with a second upper water barrier attached thereto and extending therefrom, wherein the second upper water barrier at least partially bridges the roof ridge.

29. The method according to claim 28, further comprising the step of attaching free ends of the first and second upper water barriers together.

30. The method according to claim 21, wherein the steps of applying the first and second vent strips include providing a screen mesh extending over a third surface of the first and second vent strips.

31. The method according to claim 21, wherein the steps of applying first and second vent strips include applying adhesive to at least one of the first and second vent strips and the roof surface.

32. The method according to claim 21, wherein the steps of applying first and second vent strips include providing the first and second vent strips with adhesive strips with removable backings which expose adhesive when removed to the respective first surfaces of the first and second vent strips, and removing the removable backings.

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