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Henderson

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(54) **ONE SIDED ROOF VENT**

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2000.

(51) **Int. Cl.⁷** **F24F 7/02**

(52) **U.S. Cl.** **454/365**; 52/199; 454/366

(58) **Field of Search** 454/82, 107, 115,
454/136, 162, 365, 366; 52/198, 199

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,843,953 A * 7/1989 Sells 454/365
5,439,417 A * 8/1995 Sells 16/225

5,704,834 A * 1/1998 Sells 454/365
5,946,868 A * 9/1999 Morris 454/365
5,947,817 A * 9/1999 Morris et al. 454/365
6,212,833 B1 * 4/2001 Henderson 454/365 X

* cited by examiner

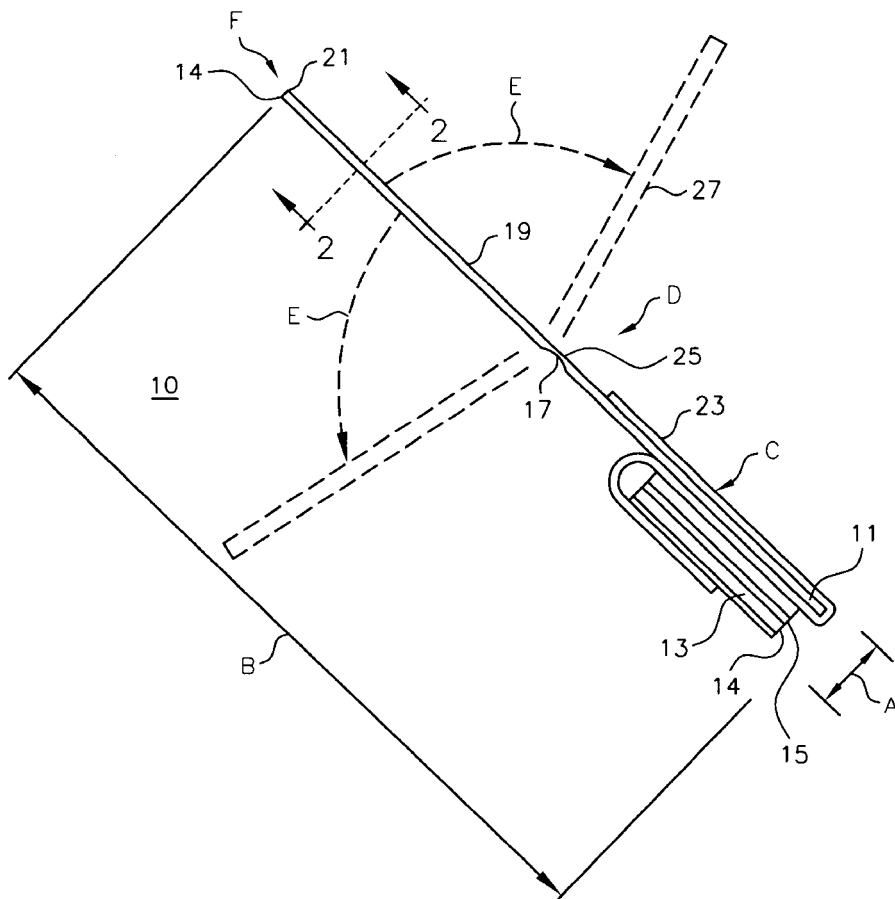
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(57) **ABSTRACT**

A vent device includes a rectangular configuration having a linear axis and edges forming a lift end and a no lift end. The no lift end has a predetermined thickness to thereby define a base cross section. The lift end has a predetermined thickness of at least twice that of the base cross section. The lift end has an opening for transferring air from the environment outside the structure to an opening communicating with its interior. The lift end may have at least two sets of layers to support the device at at least three locations having decreasing cross sectional height at the lift end, the interior position and the no lift end respectively. An optional pivot point permits the device to conform to the structure. Also optionally provided is a baffle or a cover filter to protect environmental particles.

20 Claims, 2 Drawing Sheets



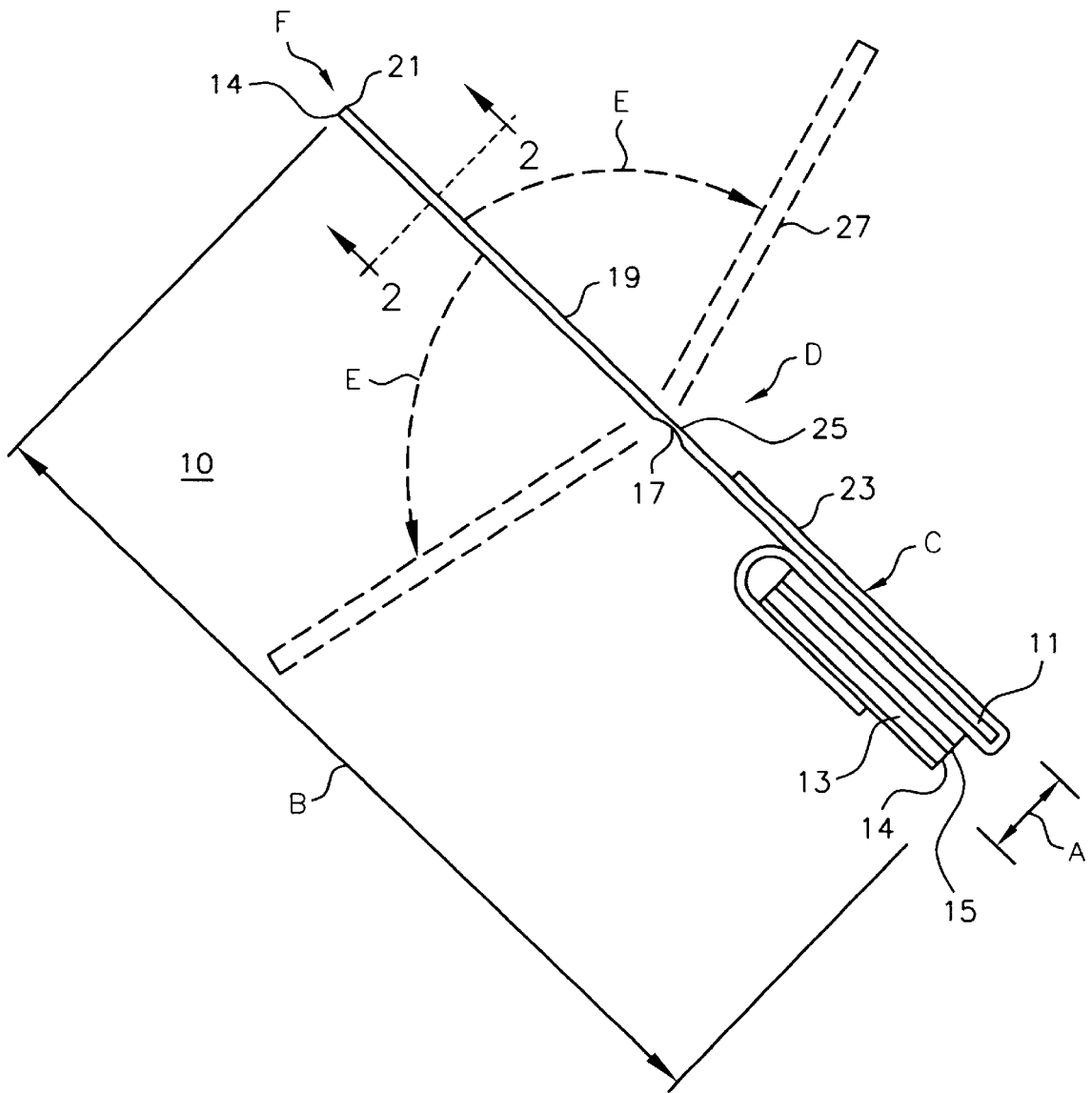


Fig-1

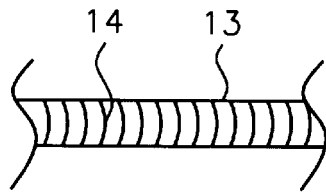


Fig-2

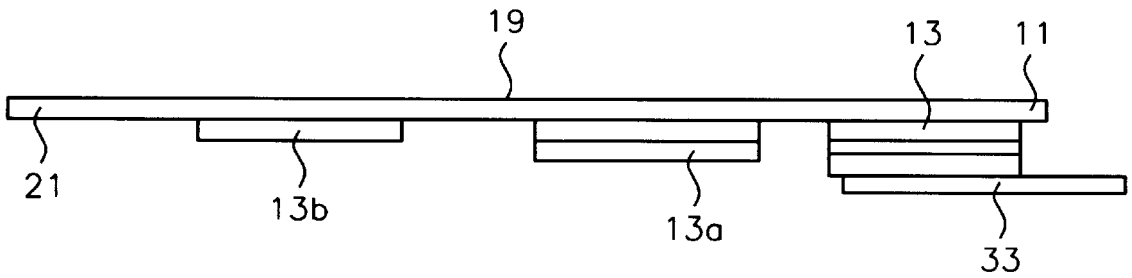


Fig-3

ONE SIDED ROOF VENT

This application claims priority from provisional application No. 60/227,41 filed Aug. 23, 2000.

FIELD OF THE INVENTION

This invention relates to a roof vent device for permitting hot air to escape from an attic area. More particularly, the invention relates to a one sided roof vent for providing a vent on one side of a roof portion to reduce or substantially eliminate rain, turbulence and wind disturbances from interfering with the venting process.

BACKGROUND OF THE INVENTION

At the present time, roof vents are mounted along the roof ridge to provide a vent from the attic area of a house or other structure, to reduce the build-up of heat in the summer. While venting roofs is a necessary part of house construction, use of auxiliary vents are not cost effective. Specifically, the use of separate exhaust fans and vents adds significant cost to the dwelling and have considerably shorter effective life-spans.

In order to preserve the appearance of the house, the height of the vent is kept at a minimum. For that reason, conventional roof vents are open on both sides of the roof ridge, so that they cooperate with a slit or opening in the roof decking to allow air to vent in both directions. Because of this conventional design, the house roof is exposed to high wind, rain and storms in both directions perpendicular to the length of the roof along the roof ridge. This causes damage to the roof deck, sheathing and tarpaper.

It is estimated that, in the United States, westerly driven winds are associated with 90% of the damaging high winds from storms. Manufacturers of conventional two sided roof vents are forced to protect themselves against damage claims by substantial insurance claims. If a conventional vent were to be used on only one side of the roof ridge line, the opening would have to be so large to be effective that even more damage to the roof deck and perhaps other parts of the attic and roof system. A larger opening would not be facing these westerly winds, of course, but the size itself would still provide undesirable access to the interior of the roof.

It would be of great advantage in the art if a roof vent system could be provided that would eliminate significant exposure to prevailing storm winds and the like, while permitting venting of the attic in a simple, easy to install and attractive manner, allowing continuous uninterrupted air flow.

It is therefore an object of this invention to provide an improved roof vent.

Another object is to provide a roof ridge vent device that is easy to install in conventional roof construction, utilizing conventional roof decking construction while providing continuous ventilation.

Yet another object of the present invention is to provide a roof vent while eliminating at least half of any lift up to which the roof would conventionally be exposed.

Other objects will appear hereinafter.

SUMMARY OF THE INVENTION

It has now been discovered that the above and other objects of the present invention may be accomplished in the following manner. The unique aspect of this invention is the use of a vent device for a framed roof structure and the like.

The device is constructed so it may be used at any location on the roof that is in communication with an area of the structure where venting is necessary or simply desirable. For example, the device of the present invention is to be used at any location around a building, including the roof ridge, soffit area, hip area, fascia areas, walls, and others, to provide proper ventilation in unventilated or poorly ventilated areas. The present invention may also be used on the walls and/or the roof, or can be used anywhere on a building or other structure where proper ventilation is required or desired.

The device functions such that when used at the ridge, for example, a negative air pressure is developed when wind blows from the no lift side across the ridge and then flows above and perpendicular to the lift up side of the device. The device has a no lift side and a lift side, preferably divided in the middle where the device may, if desired, be able to bend in one or both directions about a center line parallel to the ends of the two sides.

It is not necessary to have the divided middle, and this is a preferred embodiment when the device requires bending. The device can be used anywhere on a structure, and particularly lower on the roof so that the device fits without bending.

The material used to construct this planar one sided lifted vent may be corrugated plastic of a range of thicknesses. Any material that permits air penetration along the axis of desired air flow may be used to construct the device described herein.

The invention permits air to ventilate with only one side exposed to the environment and provides a physics-based solution to drawing air from poorly vented areas. The manufacture of this device is substantially less costly than prior art two-sided lift up vents.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the invention, reference is hereby made to the drawings, in which:

FIG. 1 is a cross sectional view of the design of the present invention, with the device as sold shown in solid lines and the optionally moveable portion or no lift side shown in two different positions in dashed lines;

FIG. 2 is a cross sectional view of the device of FIG. 1, taken along the line 2—2; and

FIG. 3 is a cross sectional view of another embodiment of the present invention showing alternative options.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is useful for most forms of roofing. The device, **10** generally in FIG. 1, has upper and lower surfaces sized to define a generally rectangular configuration having a linear axis. The device **10** includes a lift end **11** having a thickness **A**, which lift end **11** comprises a plurality of layers **13** (three are shown in FIG. 1) that are corrugated or otherwise shaped to provide channels **14** for air flow from the opening **15** of lift end **11** to the center **17** of the device. The linear axis goes into the drawing and is parallel to lift end **11**.

The layers **13** is, in one preferred embodiment a 4 mm thick black polyethylene corrugated sheet, but can be any material such as, for example, polypropylene, and may have any shape that provides the air passages as set forth above. Examples of suitable materials are molded plastics, fabricated plastic sheets or rolls, aluminum or other metal sheets with corrugations to provide air passages, and combinations

of materials. All that is required is that the layers **13** be capable of providing passageways or channels **14** for air flow from one part to another part of the device. The thickness of the no lift end **21** is the thickness of the base **19**.

The channels **14** in layers **13** is supported on a support base **19**, also made from polyethylene corrugated sheet to provide a plurality of air passages as is the lift end portion **11**. Support base **19** can also be formed as part of layers **13** by folding base **19** integrally at one time or base **19** and layers **13** can be separately formed and attached to one another. The lift end **11** is formed from several folded or stacked portions, each of which is preferably the same size as one layer **19** of no lift end **21**, so that at least one step differential in cross sectional thickness is achieved. As previously noted, lift end **11** has two layers **13** added to base **19** to form a three tier step differential. At least one layer **13** is necessary and the maximum number of layers **13** is limited only by design choice to permit adequate venting of the structure to which it is to be attached.

Overlapping the lift end **11** in FIG. 1 is a fabric **23**, which acts as a filter to protect the device from insects, wind, snow and dust, no matter what direction the air flow of the device is aligned to permit. In some instances, fabric **23** may be eliminated from the device, when the environment is suitable. An alternative is shown in FIG. 3, where a wind baffle **33** is attached to lift end **11**. Also shown in FIG. 3 is a lift end where stacks **13**, **13a** and **13b** have decreasing height so that the lift is supported along the entire device. The device of FIG. 3 does not have a pivot point, like pivot point **17** of FIG. 1, as this is an optional feature.

While the size of the device is not critical to the function as a vent, the length B of a specific device built for the purpose of reducing the invention to practice was 10.5 inches in thickness. The thickness A for the device was $\frac{3}{4}$ inches or 18.75 mm in thickness. The thickness F is about 0.16 inches or 4 mm, which is the thickness of the composite material and, when folded, as the layers **13**. Pivot point **25**, located proximate the middle of the device, say at 5.25 inches in the experimental model, permits the device to be folded to positions other than straight, as shown by dashed lines **27** and arrow E. These sizes are merely illustrative and are not to be construed as limitations on the size of the device of this invention. Size is to be determined by the particular structure on which the device is to be used to permit adequate venting of inside regions of the structure, such as, by way of example and not limitation, along different portions of the roof or walls of a house. As has been shown above, a non-pivoting vent device is to be utilized at specific applications in various places on the structure.

The center **17** at pivot point **25** includes a gap or opening that extends over the linear axis of the device. The gap serves as an entrance for an air tunnel to the vent, for example in a roof ridge, to vent air from beneath the roof ridge. The gap defines pivot point **25**, about which the configuration can be folded to conform to a roof having any roof pitch.

Pivot point **25** also provides for easy installation of the present invention since there is no resisting matrix at pivot point **25**, but rather is a thin area about which the configuration folds to conform to a roof pitch having a predetermined angle. The angle is determined by the construction of the roof and may be anywhere from less than 45°, to 90° as shown in FIG. 1, to more than 135°. In any configuration, the device of this invention functions effectively to provide a superior vent.

While particular embodiments of the present invention have been illustrated and described, it is not intended to limit

the invention to any specific embodiment. The dimensions and materials given are for the preferred embodiment and are not to be construed as limitations on the scope of this invention. The description of the invention is not intended to limit the invention.

What is claimed is:

1. A vent device for use with a structure having a roof and walls exposed to the environment, comprising: upper and lower outer surfaces, said surfaces being sized to define a generally rectangular configuration having a linear axis and linear edges parallel to said axis, said configuration having a lift end and a no lift end proximate said linear edges;

said no lift end being generally flat and having a predetermined thickness to thereby define a base cross section;

said lift end being generally flat and having a predetermined thickness of at least twice that of said base cross section and having an opening, said lift end having a plurality of channels for transferring air therethrough along said lift end toward said no lift end, at least one of said upper and lower outer surfaces having an opening to permit access at said opening to said channels.

2. The device of claim **1**, wherein said device is positioned on a structure to expose said lift end to the environment outside of said structure.

3. The device of claim **1**, which additionally includes a pivot point positioned to permit said lift end and said no lift end to pivot about said pivot point, and said pivot point includes said opening.

4. The device of claim **3**, wherein said device is positioned on a roof to expose said opening in said pivot point to the environment inside said roof, and wherein said pivot point permits said device to bend in one or both directions about said axis.

5. The device of claim **1**, wherein said device is positioned on a wall to expose said lift end to the environment outside said wall.

6. The device of claim **1**, which further includes a baffle to prevent direct flow of environmental air into said lift end.

7. The device of claim **1**, wherein said lift end comprises at least two sets of layers, the first of which is positioned proximate said lift end linear edge and the second of which is positioned closer to the interior of said device to support said device at at least three locations on said structure, said three locations having decreasing cross sectional height at said lift end, said interior position and said no lift end respectively.

8. The device of claim **1**, which further includes a cover filter extending across said channels to protect the lift end of said device from insects, wind, snow or dust no matter what direction the device is aligned to permit air flow through said passages.

9. The device of claim **1**, wherein said pivot point permits said device to bend in one or both directions about said axis.

10. The device of claim **1**, which is formed from molded plastic.

11. The device of claim **10**, where said molded plastic is selected from polyethylene and polypropylene corrugated sheet.

12. The device of claim **10**, where said molded plastic is nylon.

13. The device of claim **1**, wherein said device is formed from metal.

14. The device of claim **13**, wherein said metal is aluminum.

15. A method of venting a structure having a roof and walls exposed to the environment and having unventilated or poorly ventilated areas, comprising the steps of:

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forming a vent device having an upper and lower outer surfaces, said surfaces being sized to define a generally rectangular configuration having a linear axis and linear edges, said configuration having a lift end and a no lift end proximate said linear edges; said no lift end being generally flat and having a predetermined thickness to thereby define a base cross section; a said lift end being generally flat and having a predetermined thickness at one end thereof of at least twice that of said base cross section and having an opening; said lift end having a plurality of channels for transferring air therethrough; said lower outer surface having an opening in communication with said passages to permit access at said opening to said passages;

positioning said device to place said lift end on said structure to expose said lift end to the environment outside said structure; and

positioning said device to expose said opening to the environment inside said structure.

16. The method of claim 15, which further including the step of bending said device about said axis by forming a said pivot point to permit said device to conform to its position on said structure.

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17. The method of claim 15, wherein said lift end comprises at least two sets of layers, the first of which is positioned proximate said lift end linear edge and the second of which is positioned closer to the interior of said device to support said device at at least three locations on said structure, said three locations having decreasing cross sectional height at said lift end, said interior position and said no lift end respectively.

18. The method of claim 15, which further includes the step of placing a cover filter to protect the lift end of said device from insects, wind, snow or dust no matter what direction the device is aligned to permit air flow through said passages.

19. The method of claim 15, wherein said vent device is formed from molded plastic.

20. The method of claim 19, where said vent device is formed from a material selected from polyethylene corrugated sheet, polypropylene corrugated sheet, nylon, and aluminum.

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