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(54) **HINGED ROOF VENT FOR ATTIC**

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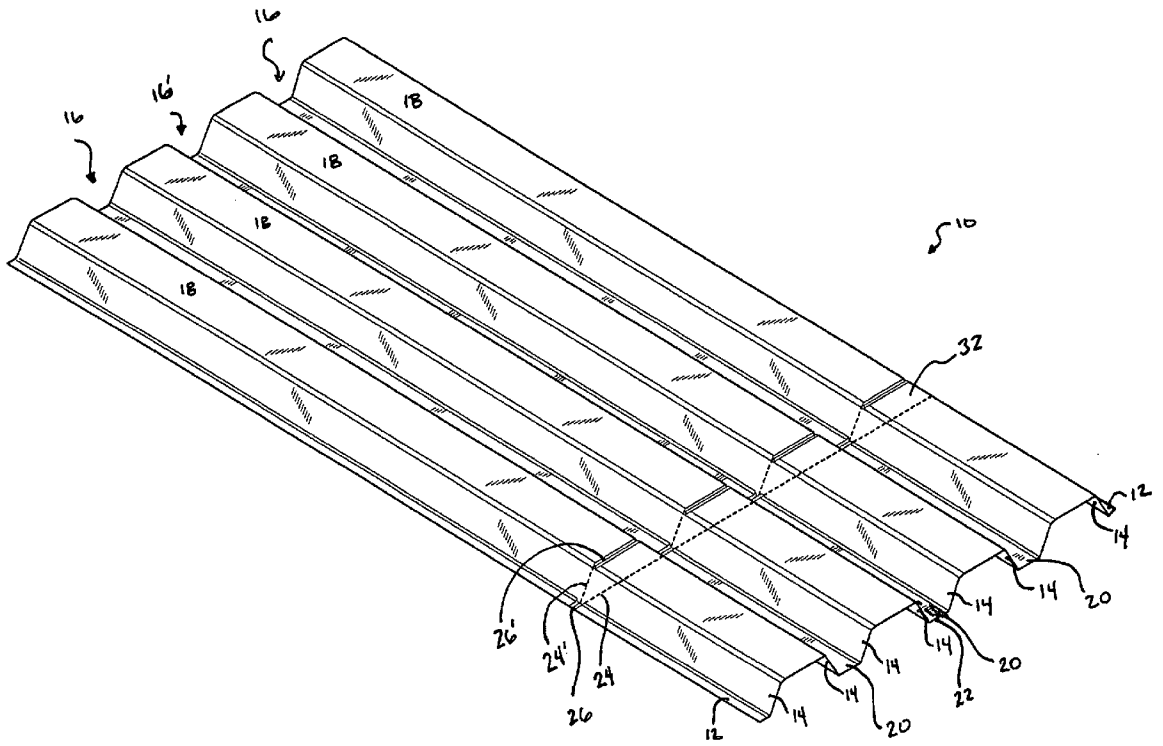
(57) **ABSTRACT**

A hinged roof vent panel is provided which includes a combination of hinged ridges that allow the panel to be cut and folded to form an insulation block which inhibits the flow of loosefill insulation which may block soffit vents and which provides suitable ventilation to inhibit condensation during cold periods and to allow acceptable airflow during warm periods. The vent panel is typically thermoformed from a thin sheet of extruded polystyrene foam into the shape described and claimed. The panel is relatively planar and stackable so that a large number of panels may be packaged together for shipping.



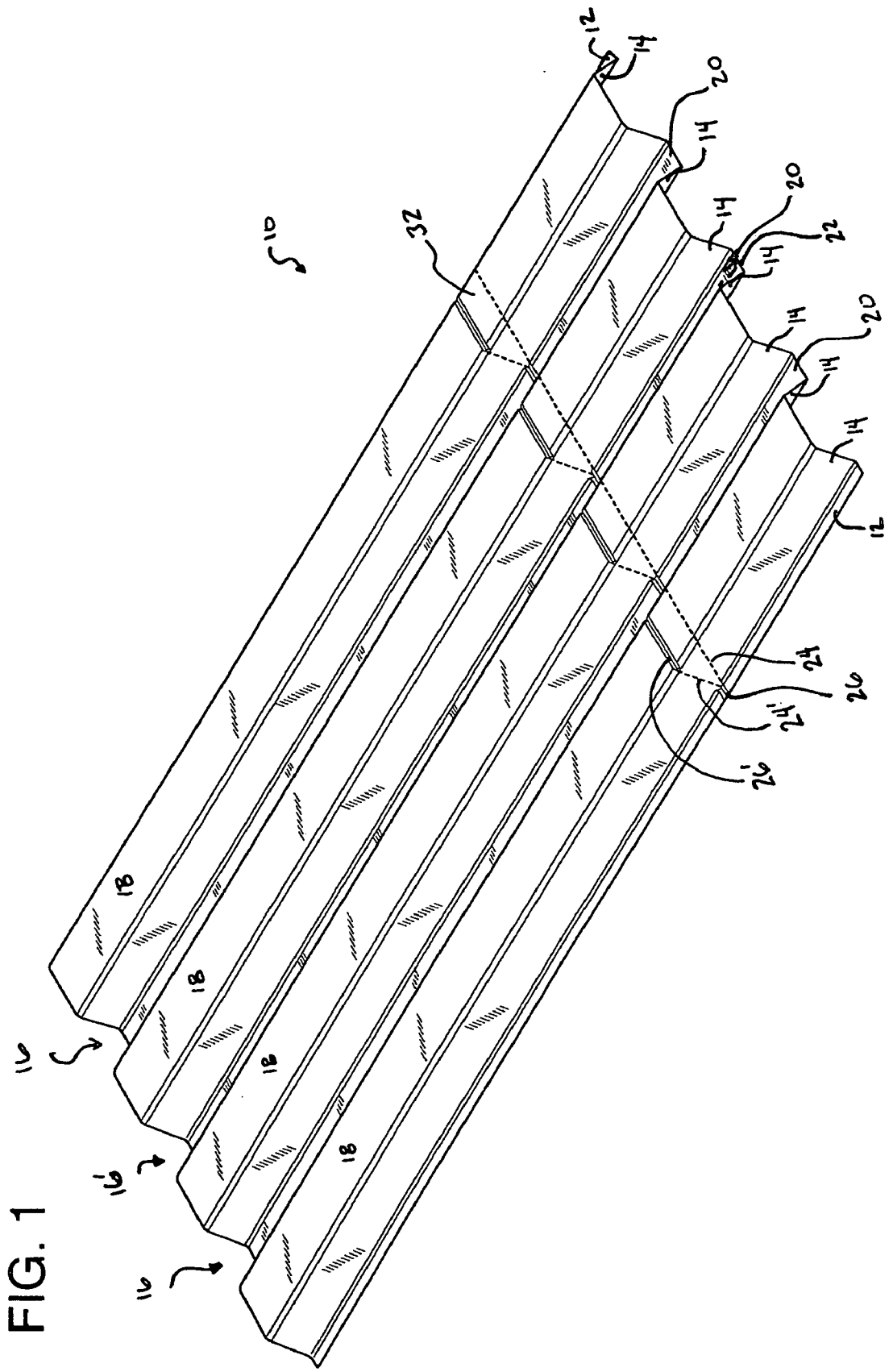
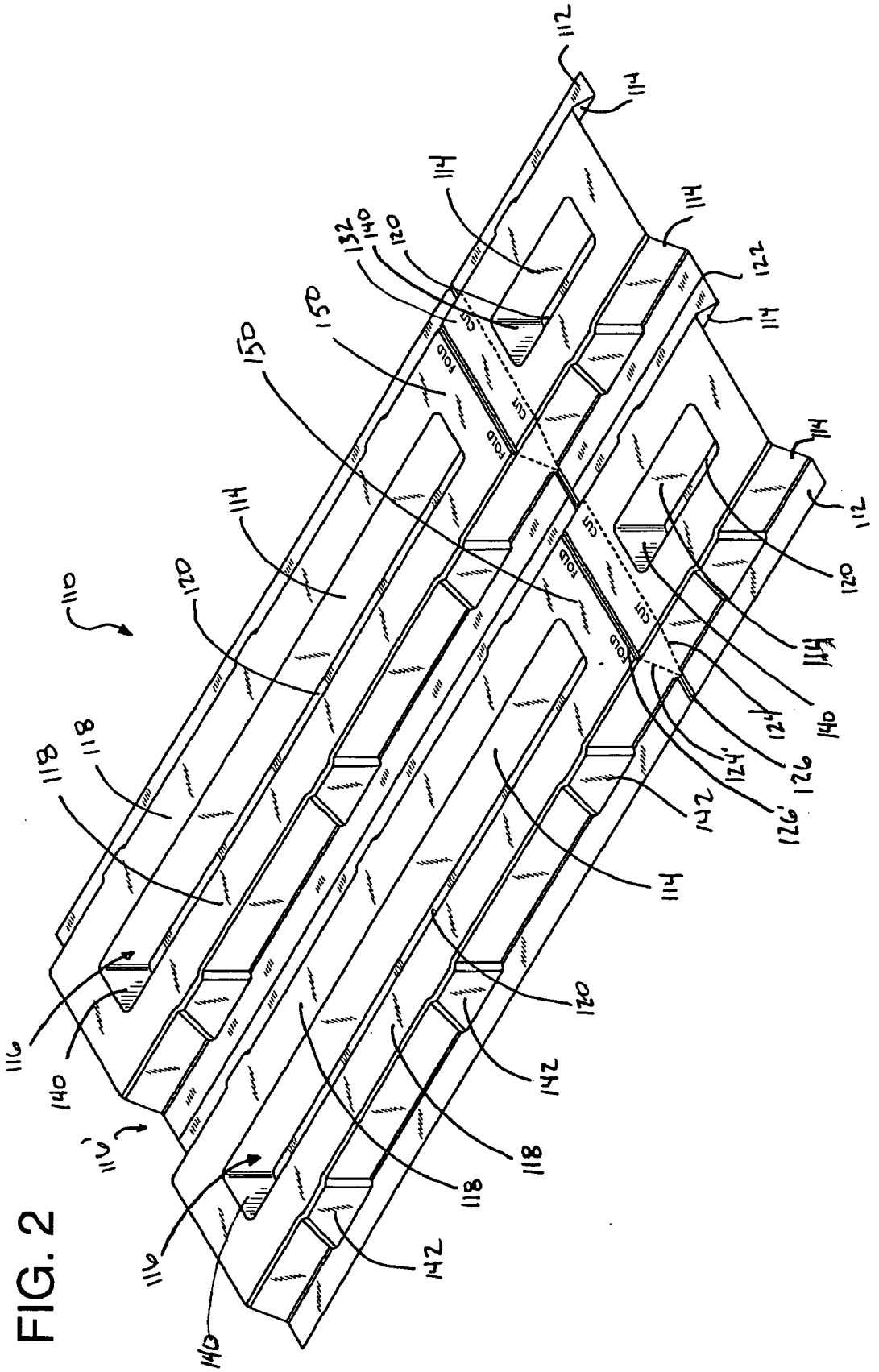


FIG. 1


110
112
114
116
116'
118
120
121
122
124
124'
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126'
132
140
142
150
FOLD
FOLD
FOLD

FIG. 2

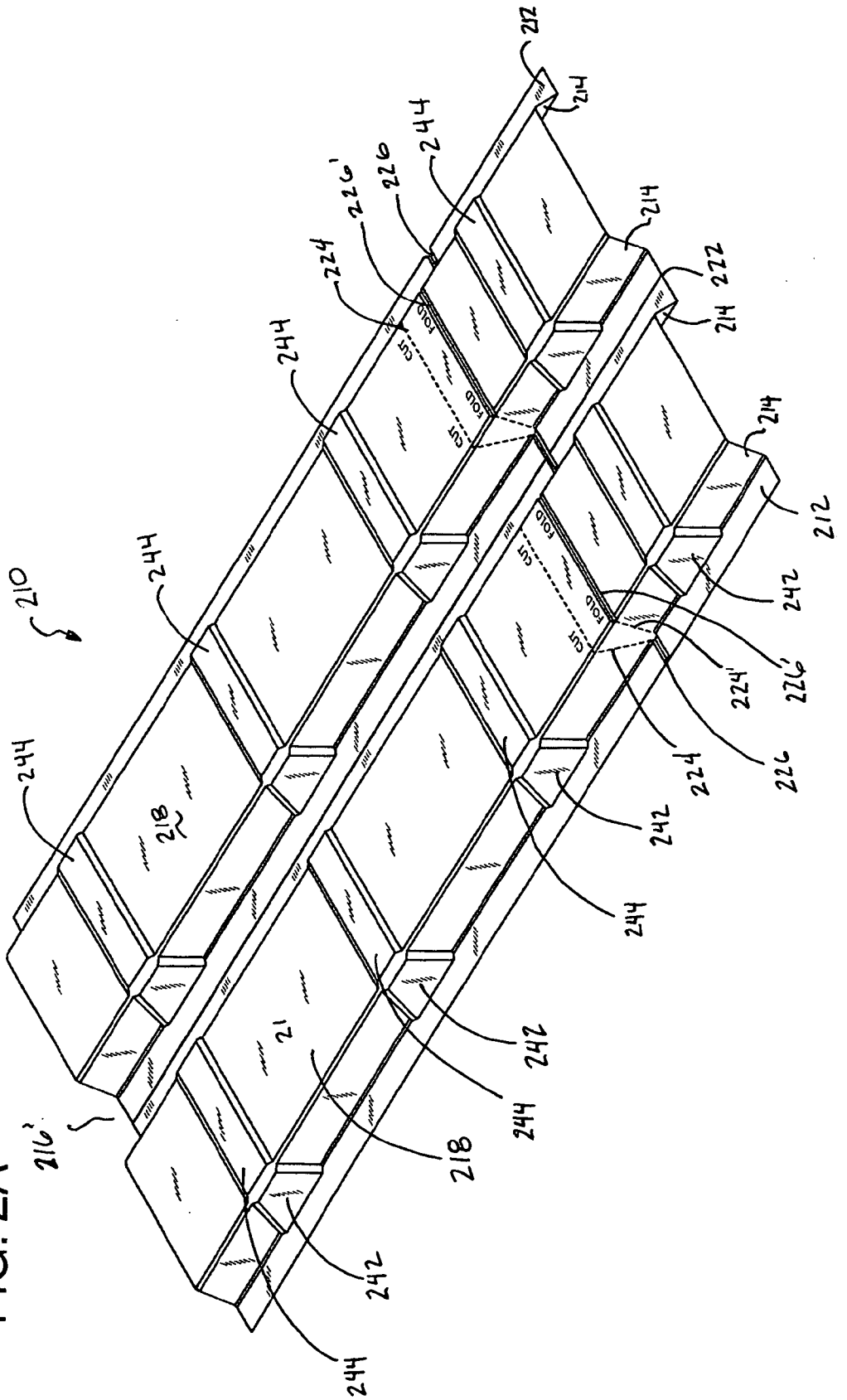


FIG. 2A

FIG. 3

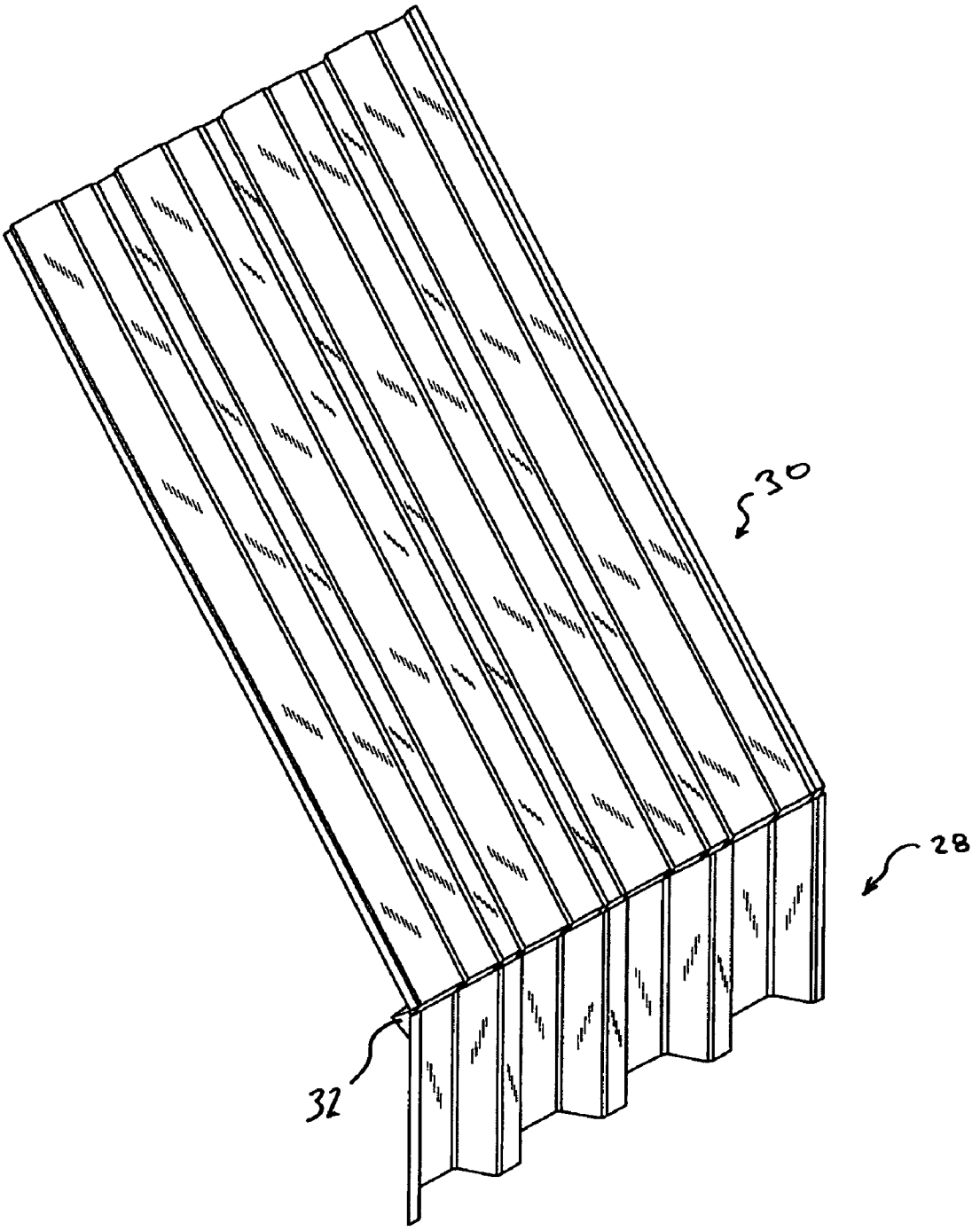


FIG. 4

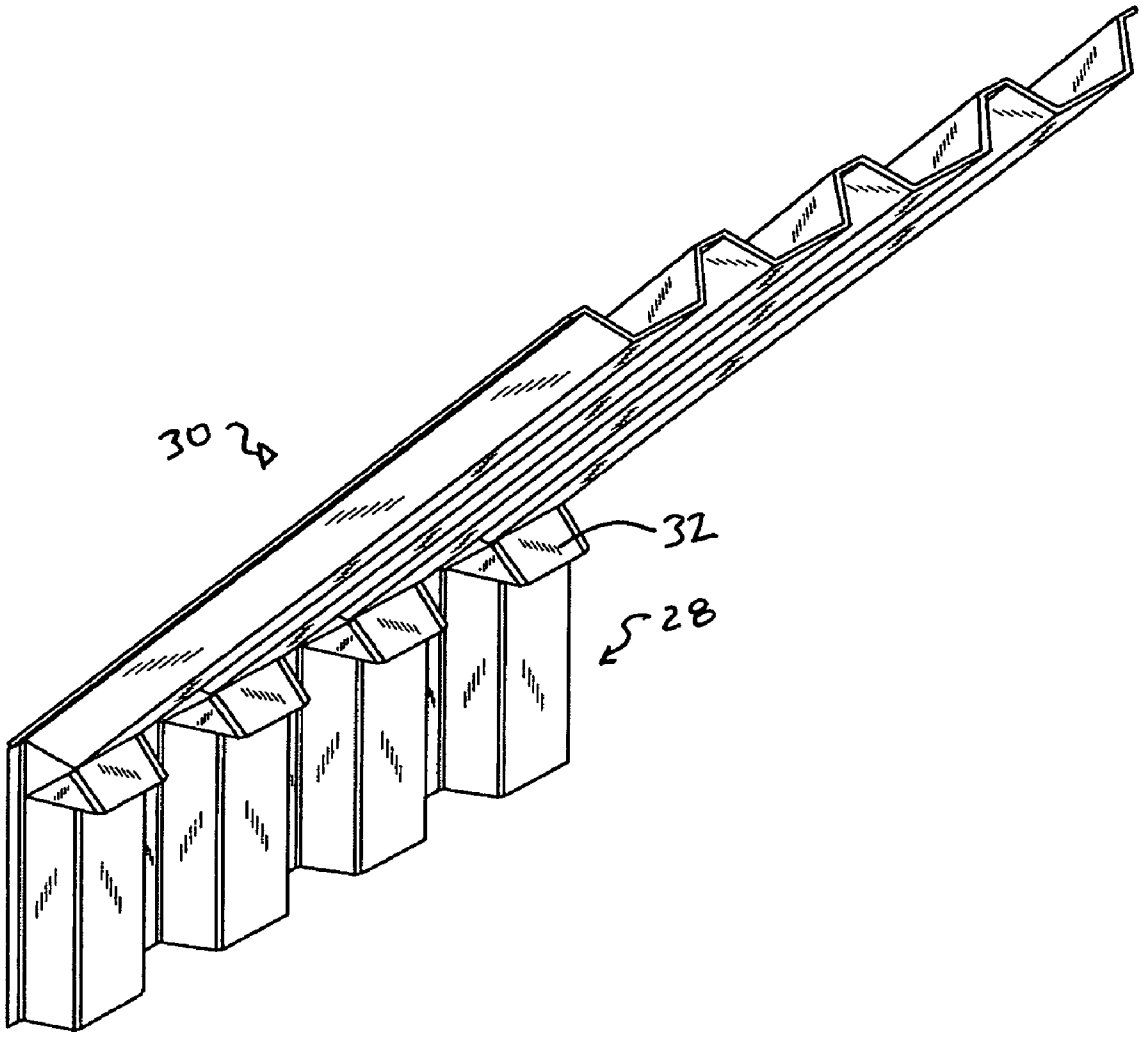
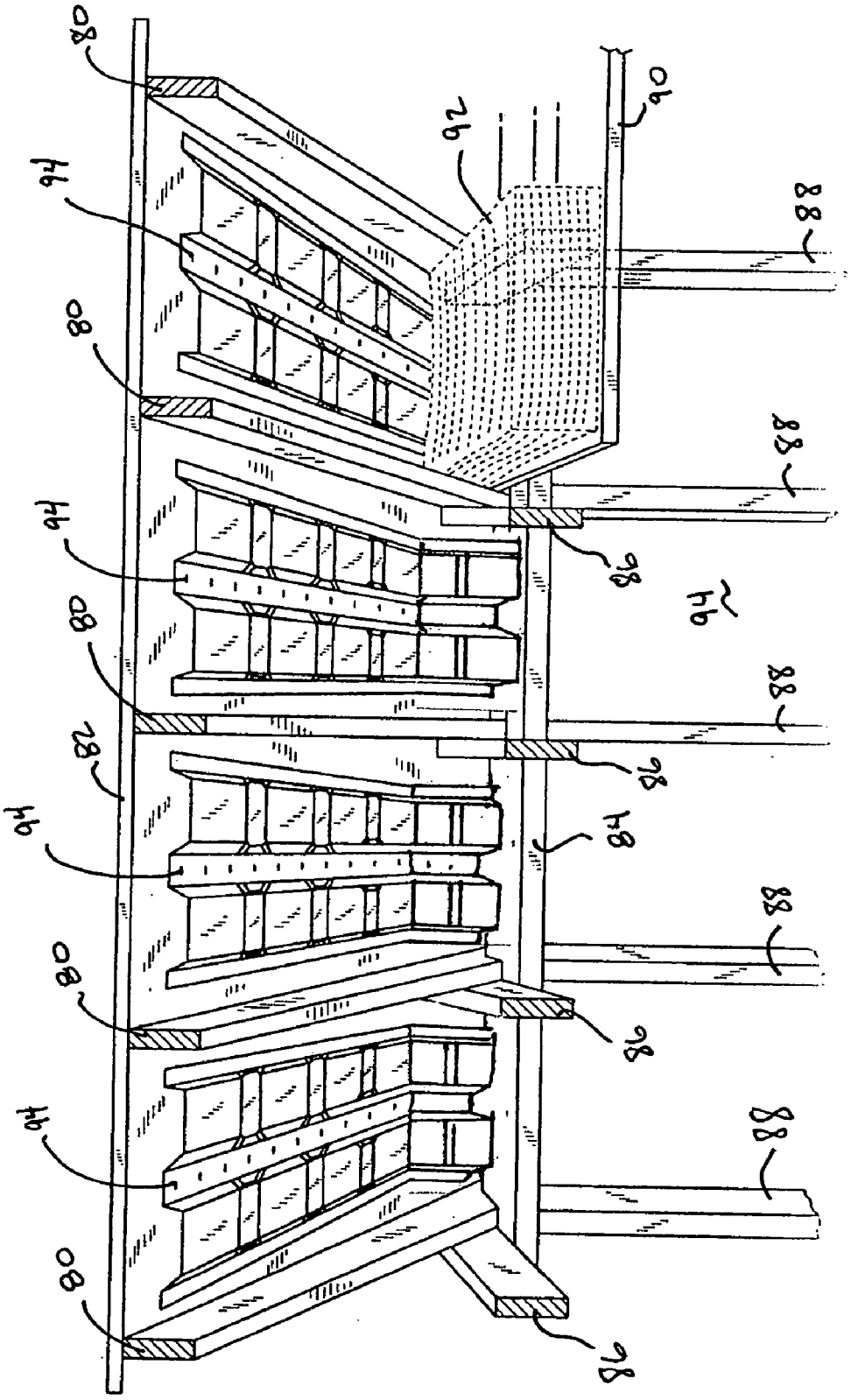


FIG. 5



HINGED ROOF VENT FOR ATTIC

TECHNICAL FIELD AND INDUSTRIAL APPLICABILITY OF THE INVENTION

[0001] This invention relates generally to a panel for use as a roof vent, and more particularly, to a hinged vent panel for use on a sloping roof to allow for attic ventilation and to inhibit the flow of insulation out of an attic area into the soffit of a structure to block a soffit attic vent.

BACKGROUND OF THE INVENTION

[0002] Homes and commercial buildings with sloped or pitched roofs typically include an open, unheated attic. The area of the attic is typically insulated by a layer of fibrous insulation, for example, loosefill fiberglass, batts or rolls of fiberglass insulation, or other insulation materials such as cellulose, mineral wool. Building codes often require that an unheated attic be vented to release heat and moisture that may otherwise build up. Often the vents are positioned in the soffit at the eaves of the house to allow airflow from the soffit vents to the peak vents. Due to the position of the soffit vents, heat loss at the eaves may occur and with freezing and thawing temperatures, ice dams may form at the eaves, thereby causing roof leaks usually in the coldest of weather. In the summer, improper ventilation of the attic causes heat to buildup within the attic, which will increase the temperature within the structure. An unvented attic may also permit humidity to condense on the underside of the roof during winter. In addition, a roof vent also may create an uninsulated space between the insulation and the underside of the roof to prevent unwanted condensation.

[0003] To achieve such venting, a wide variety of sheet-like products have been used which are fastened to the underside of the roof between the rafters. Some of these products include flanges that provide ease of fastening and a spaced or offset wall forming open troughs extending end-to-end. It has been found that such products when made from an extruded foam polystyrene sheet have excellent break resistance and resist moisture so they will not rot or deteriorate. Generally, extruded polystyrene has greater strength than simply expanded polystyrene such as bead board or sheet.

[0004] U.S. Pat. No. 5,341,612 discloses a baffle vent that is positioned against the underside of a roof to allow air-flow from the soffit vent over the interior surface of the roof. The baffle vent is described as an elongated self-supporting unitary structure of sheet-like material having a generally channel-shaped cross-section defining longitudinal sidewalls joined by a bottom wall. The baffle vent includes flanges that project from the top edges of the sidewalls to facilitate the attachment of the baffle vent to the underside of the roof. A triangular cross-sectional longitudinal reinforcing rib in the bottom wall runs along the length of the baffle vent to resist a collapse of the baffle vent if subjected to external forces such as from roof insulation. The narrow apex of the triangular cross-sectional longitudinal reinforcing rib prevents the use of staples or other fastener within the channel.

[0005] It has also been found that a hinged roof vent will allow venting of an open attic space to the soffit vent and serves as a dam to inhibit loose fill insulation from blocking airflow from the soffit vents to the hinged vent chute. U.S. Pat. No. 6,347,991 discloses a hinged vent chute that includes an elongated chute segment and an insulation dam segment. The vent or air passage from the soffit to the open attic space is provided by one or more upwardly open channels extending from a lower end to an upper end of the elongated chute segment. The air passes through the channel(s) and over an interior surface of the roof from the soffit region of the roof and up into the open attic space beneath the roof. The hinged vent chute has a hinge or fold line which joins the insulation dam segment to the elongated chute segment. The hinge or fold line permits the insulation dam segment to be folded or bent downward at the hinge or fold line relative to the elongated chute segment and secured in place to form an insulation dam which prevents loose fill insulation in an attic from flowing down into a soffit region of a roof and blocking airflow. The hinged roof vent of U.S. Pat. No. 6,347,991 includes at least two hinges and cut-lines which must be manipulated by the installer. The number of steps required to install the hinged roof vent increases the cost of installation. In addition, the complexity of the vent increases production costs such as the cost of manufacturing the mold for forming the vent. Further, the shape of the hinge also allows more air to flow through the vent than is necessary and allows loosefill insulation to escape from the attic and block the soffit vents.

[0006] Accordingly, it would be desirable to have a hinged roof vent that allows a suitable amount of air to circulate through the attic while providing venting. It is also useful to have a hinged roof vent that provides structural integrity when compressed by the installation of insulation.

SUMMARY OF THE INVENTION

[0007] A hinged roof vent panel for use at the eaves of a building structure is disclosed. The hinged panel includes flanges that have a hinge, walls raised from the lateral flanges and insulation blocking walls raised from above the flanges by the walls to form ventilation troughs. Each insulation blocking wall includes a hinge and a cut marking line and the cut marking line separates the insulation blocking wall into an insulation damn and a vent portion. In another embodiment, gussets and/or saddles may be formed along the lateral walls. In yet another embodiment, the roof vent includes a number insulation blocking walls with a base positioned between the insulation blocking walls. The base preferably includes a perforation that allows the panel to be divided without the use of a cutting tool. In yet another embodiment, a trapezoidal ridge extends substantially the length of the panel. The trapezoidal ridge includes a land that is level with the insulation blocking wall. Preferably, the base of the trapezoidal ridge is sized to allow the use of an air-nailer or stapler to secure the panel to the roof deck. Preferably, the hinged roof vent panel is formed of an extruded foam polystyrene sheet.

BRIEF DESCRIPTION OF THE DRAWING

[0008] FIG. **1** is an isometric view of a roof vent panel in accordance with an embodiment of the present invention;

[0009] FIG. **2** is an isometric view of a roof vent panel in accordance with another embodiment of the present invention;

[0010] FIG. **2**A is an isometric view of a roof vent panel in accordance with another embodiment of the present invention;

[0011] FIG. **3** is an isometric top view of a roof vent panel in accordance with another embodiment of the present invention, which has been cut and folded and is ready for insertion into an attic;

[0012] FIG. **4** is an isometric bottom view of a roof vent panel in accordance with another embodiment of the present invention, which has been cut and folded and is ready for insertion into an attic;

[0013] FIG. **5** is a perspective view of a roof structure, partially cut away, incorporating a roof vent panel of an embodiment of the present invention.

DETAILED DESCRIPTION AND PREFERRED EMBODIMENTS OF THE INVENTION

[0014] A hinged roof vent panel is provided which includes a combination of hinged ridges that allow the panel to be cut and folded to form an insulation block. The insulation block inhibits the flow of loosefill insulation which may block soffit vents and which provides suitable ventilation to inhibit condensation during cold periods and to allow acceptable airflow during warm periods. The vent panel may be thermoformed from a thin sheet of extruded polystyrene foam into the shape described and claimed herein. The panel is relatively planar and stackable so that a large number of panels may be packaged together for shipping.

[0015] As shown in FIG. **1**, a hinged roof vent panel **10** in accordance with one embodiment of the present invention is formed with edge flanges **12** and sloping lateral walls **14** which extend upwardly to offset insulation blocking segments **18** that are positioned parallel to but raised from flanges **12** and bases **20** of trapezoidal ridges **16** and **16'**. Next to the offset insulation blocking segments **18** is a central trapezoidal ridge shown generally at **16**, which extends from one end of panel **10** to the opposite end. The base **20** at the center of the panel **10** may optionally include a perforation **22** to allow the panel **10** to be divided into two parts without the use of a cutting tool.

[0016] In the embodiment shown in FIG. **1**, the panel **10** includes a series of cut-lines **24**, **24'** and fold-lines **26**, **26'** to allow the panel **10** to be cut and folded into a hinged panel that includes an insulation/air-block portion **28**, a rafter vent portion **30** and a flange portion **32** (as shown in FIG. **3** and FIG. **4**). When installed in an attic cavity (shown in FIG. **5**), the vent **10** is placed between rafters **80** and adjacent roof deck **82**. The rafter vent portion **30** is fixed to the roof deck **82** and the insulation/air-block portion **28** contacts a top plate **84** to inhibit the flow of insulation **92** that may block a soffit vent (not shown) outside sheathing **94**. The flange portion **32** extends outwardly to inhibit the flow of air and/or insulation **92**. The panel **10** may be secured to the roof deck **82** with a single line of staples **94** through the base **20** of trapezoidal ridges **16**. A single line of staples **94** along a central trapezoidal ridge **20** provides improved installation speed when compared to double line of staples on the flanges of the panels of the prior art.

[0017] As shown in FIG. **1**, the cut-lines **32**, **32'** may be positioned on the insulation/air-block **28** side of the fold lines **26**, **26'** so that flange portion **32** remains attached to the rafter vent portion **30**. During construction, a panel **10** while flat is cut along cut-lines **24**, **24'**, and the insulation/air-block **28** is bent upwardly to provide the desired angular shape for installation. FIG. **3** and FIG. **4** show a hinged roof vent that has been bent to conform to the angle of the roof and which has the flange portion extending from the panel **10**. In the configuration shown in FIG. **3** and FIG. **4**, the flange portion **32** extends inwardly to provide improved blockage of blown-in insulation **92**. As shown in FIG. **5** the flange portion **32** extends outwardly to provide improved wind screening.

[0018] Alternative structures in accordance with the present invention are available. As shown in FIG. **2**, the number of required cuts may be reduced by providing a land **150** along the length of trapezoidal ridges **116** at the position of the cut-line **124**. As illustrated in the embodiment of FIG. **1**, the panel **110** includes edge flanges **112** and sloping lateral walls **114** that extend upwardly to offset insulation blocking segments **118** that are parallel to but raised from flanges **112** and the bases **120** of trapezoidal ridges **116** and **116'**. Next to the offset insulation blocking segments **118** is a central trapezoidal ridge shown generally at **116'** which extends from substantially the length of the panel. At the end of each trapezoidal ridge **116** is a trapezoidal ramped section **140**. The base **120** at the center of the panel **110** may optionally include a perforation **122** to allow the panel **110** to be divided into two parts without the use of a cutting tool.

[0019] In the embodiment shown in FIG. **2**, the panel **110** also includes a series of cut-lines **124**, **124'** and fold-lines **126**, **126'** to allow the panel **110** to be cut and folded into a hinged panel that includes an insulation/air-block portion, rafter vent portion and a flange portion. The panel **110** may optionally include gussets **142** along the length of the sloping lateral walls **124**. Gussets **142** provide increased strength to inhibit crushing of the panel due to the force of insulation **92**. As with the embodiment shown in FIG. **1**, the installer may secure the panel **110** to the roof deck **82** with a single line of staples **94** positioned in the base of the trapezoidal ridge **116**.

[0020] Yet another alternative structure in accordance with the present invention is shown in FIG. **2**A, in which the panel **210** includes edge flanges **212** and sloping lateral walls **214** that extend upwardly to offset insulation blocking segments **218**, parallel to and raised from flanges **112** and the bases **120** of trapezoidal ridge **216'**. The base **220** at the center of the panel **210** may optionally include a perforation **222** to allow the panel to be divided into two parts without the use of a cutting tool.

[0021] In the embodiment shown in FIG. **2**A, the panel **210** includes a series of cut-lines **224**, **224'** and fold-lines **226**, **226'** to allow the panel **210** to be cut and folded into a hinged panel that includes an insulation/air-block portion, rafter vent portion and a flange portion. The panel **210** may optionally include gussets **242** and saddles **244** along the length of the sloping lateral walls **214**. Gussets **242** and saddles **244** provide increased strength to inhibit crushing of the panel due to the force of insulation **92**.

[0022] The invention of this application has been described above both generically and with regard to specific embodiments. Although the invention has been set forth in what is believed to be the preferred embodiments, a wide variety of alternatives known to those of skill in the art can be selected within the generic disclosure. The invention is not otherwise limited, except for the recitation of the claims set forth below.

I claim:

1. A hinged roof vent panel, comprising:

an elongated panel including:

lateral flanges, each of said lateral flanges including a hinge;

lateral walls formed in said elongated panel extending from said lateral flanges; and

an insulation blocking wall spaced from said lateral flanges by said lateral walls and forming a ventilation trough;

wherein said lateral walls and said insulation blocking wall may be cut to form a hinged panel.

2. The hinged roof vent panel of claim 1, further comprising:

at least one generally trapezoidal ridge extending the length of said panel, said trapezoidal ridge having a rectilinear base offset from said insulation blocking wall and said trapezoidal ridge being open from one end of the elongated panel to the other.

3. The hinged roof vent panel of claim 1, further comprising:

at least one gusset formed along said lateral walls.

4. The hinged roof vent panel of claim 1, further comprising:

at least one saddle formed along said insulation blocking wall.

5. The hinged roof vent panel of claim 1, further comprising:

a plurality of gussets formed along said lateral walls; and

a plurality of saddles formed along said insulation blocking wall.

6. The hinged roof vent panel of claim 1, further comprising:

a plurality of gussets formed along said lateral walls; and

a plurality of saddles formed along said insulation blocking wall, said saddles being adjacent said gussets.

7. The hinged roof vent panel of claim 1, further comprising:

a plurality of insulation blocking walls spaced from said flanges by said lateral walls and forming a ventilation trough;

a base between said insulation blocking walls; and

a perforation in said base to allow the elongate panel to be divided without the use of a cutting tool.

8. The hinged roof vent panel of claim 1, further comprising:

at least one generally trapezoidal ridge extending substantially the length of said panel, said trapezoidal ridge having at least one land formed therein, said land being level with said insulation blocking wall.

9. The hinged roof vent panel of claim 8, further comprising:

a rectilinear base in said trapezoidal ridge offset from said insulation blocking wall and open from one end of the vent panel to the other.

10. The hinged roof vent panel of claim 1, wherein said elongated panel is formed of an extruded foam polystyrene sheet.

11. A hinged roof vent panel, comprising:

an elongated panel including:

lateral flanges, each of said lateral flanges including a hinge;

lateral walls formed in said elongate panel extending from said lateral flanges; and

a plurality of insulation blocking walls spaced from said flanges by said lateral walls and forming a ventilation trough;

wherein said lateral walls and said insulation blocking walls are cut to form a blocking portion and a vent portion with a second hinge therebetween.

12. The hinged roof vent panel of claim 11, further comprising:

at least one gusset formed along said lateral walls.

13. The hinged roof vent panel of claim 11, further comprising:

at least one saddle formed along said insulation blocking walls.

14. The hinged roof vent panel of claim 11, further comprising:

a plurality of gussets formed along said lateral walls; and

a plurality of saddles formed along said insulation blocking wall, said saddles being adjacent said gussets.

15. The hinged roof vent panel of claim 11, further comprising:

a base between said insulation blocking walls; and

a perforation in said base to allow the elongate panel to be divided without the use of a cutting tool.

16. A hinged roof vent panel, comprising:

an elongated panel including:

lateral flanges, each of said lateral flanges including a hinge;

lateral walls formed in said panel extending from said lateral flanges; and

a plurality of insulation blocking walls spaced from said flanges by said lateral walls, each forming a ventilation trough;

at least one generally trapezoidal ridge extending substantially the length of said elongate panel positioned in each of said insulation blocking walls, each of said trapezoidal ridges having at least one land formed therein, said land being level with said insulation blocking wall.

wherein said lateral walls and each of said insulation blocking walls are cut to form a blocking portion, and a vent portion with a hinge therebetween.

17. The hinged roof vent panel of claim 16, further comprising:

at least one gusset formed along said lateral walls.

18. The hinged roof vent panel of claim 16, further comprising:

at least one saddle formed along said insulation blocking walls.

19. The hinged roof vent panel of claim 16, further comprising:

a plurality of gussets formed along said lateral walls; and

a plurality of saddles formed along said insulation blocking walls, said saddles being adjacent said gussets.

20. The hinged roof vent panel of claim 16, further comprising:

a base between said insulation blocking walls; and

a perforation in said base to allow the elongate panel to be divided without the use of a cutting tool.

* * * * *