United States Patent

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[54] **ROOF RIDGE VENTILATOR**
11 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **98/42,**
98/66, 98/82, 98/83, 52/199
[51] **Int. Cl.** **F24F 7/02**
[50] **Field of Search** 98/42, 42.1,
43, 66, 82, 83, 84; 52/199, 200

[56] **References Cited**
UNITED STATES PATENTS

2,207,671	7/1940	King	98/42
2,214,886	9/1940	McKeown	52/199 X
3,086,323	4/1963	Pine	52/199 X
3,481,263	12/1969	Belden	98/42

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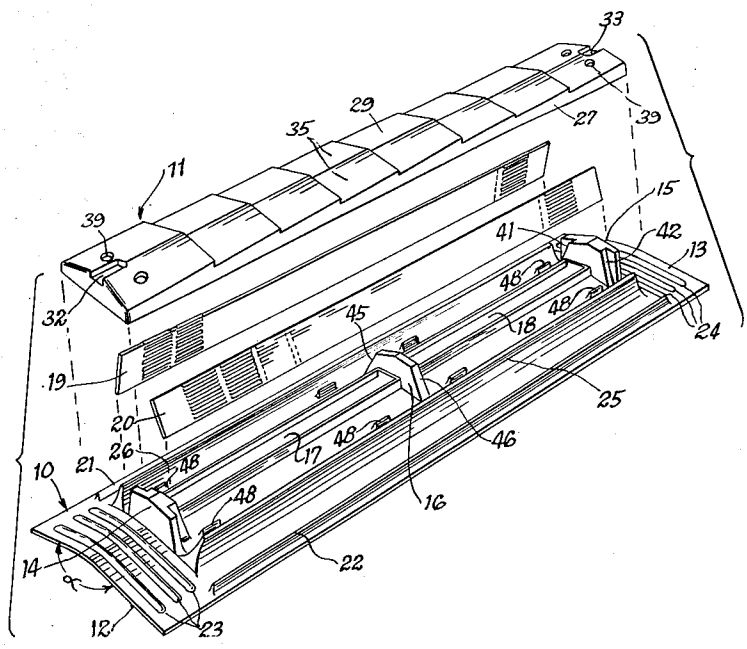
ABSTRACT: A roof ridge ventilator made of molded plastic parts except for louvered metal sheets closing the open sides of the ventilator, the design providing a low silhouette with a large air flow area through the louvered sheets by sloping the louvered sheets. Stiffness is built into the thin flashing forming part of the ventilator by molding beads into the flashing to inhibit buckling, particularly under extremes of temperature. The ventilator is formed from two molded parts to one of which the louvered sheets which, when fastened together, form a unit which may be installed in multiples to cover any desired length of roof ridge vent opening.



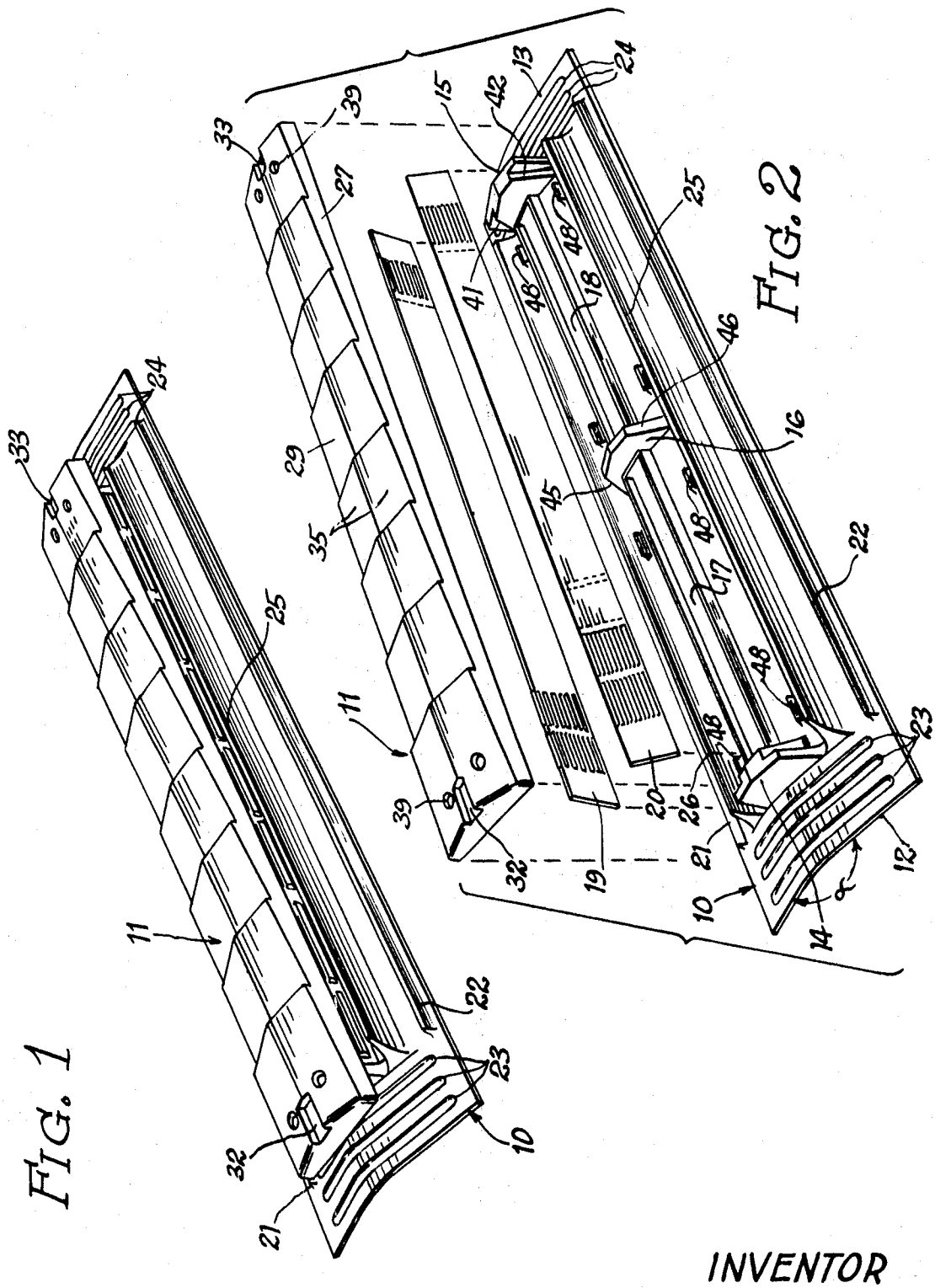


FIG. 1

FIG. 2

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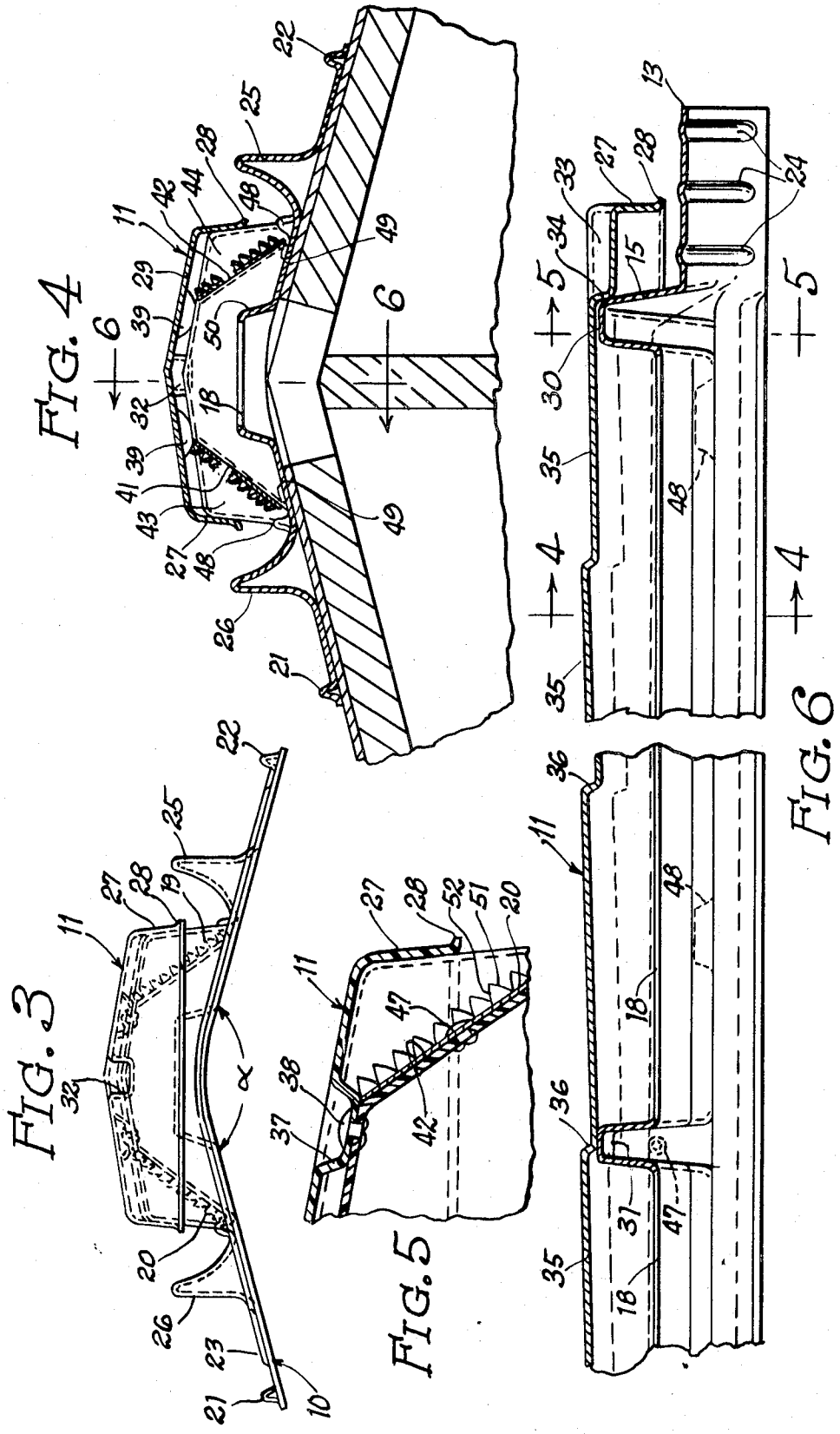
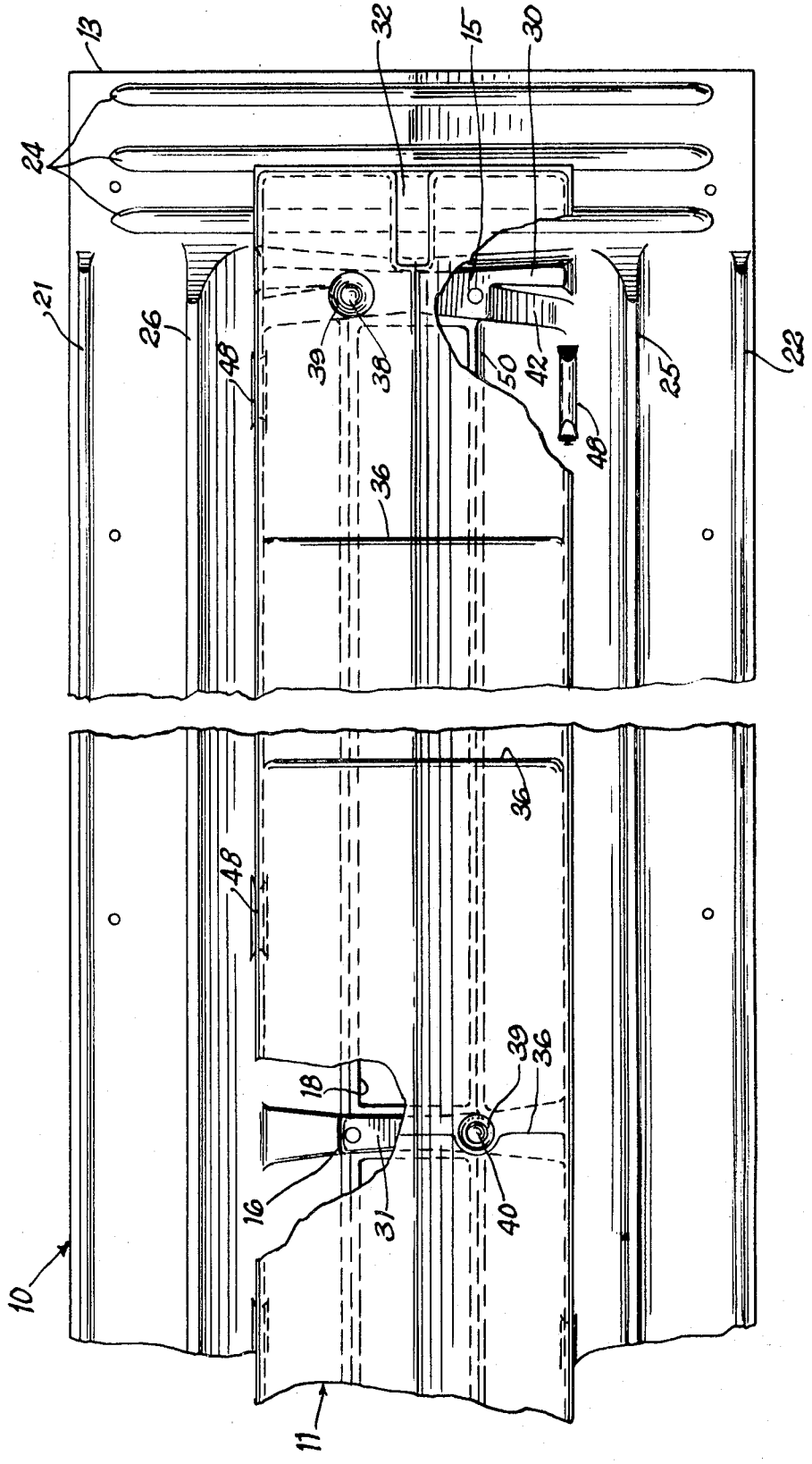


FIG. 4
FIG. 3
FIG. 5
FIG. 6

FIG. 7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ROOF RIDGE VENTILATOR

BACKGROUND OF THE INVENTION

This invention relates to roof ridge ventilators made principally of sheet plastic material.

Prior roof ventilators designed and manufactured by applicant were either of the roof ridge type which straddled an elongated opening at the ridge type which straddled an elongated opening at the ridge of the roof, or of a relatively symmetrical design such as a square or circle intended for placement over a symmetrical opening located on a side of a peaked roof. The roof ridge type was fabricated from sheet metal parts to form units which could be placed end-to-end over an elongated roof ridge opening. The side-mounted type was smaller and more compact, and although initially made of sheet metal, was subsequently changed in design and made of molded plastic sheets (See Smith, et al., U.S. Pat. No. 3,238,862), with the exception of a louvered portion which could more conveniently be made of sheet metal. The molded form, when manufactured in large quantities, proved to have several advantages over the sheet metal form among which were lower cost, lighter weight, absence of corrosion, and permanent color. The change from sheet metal to molded plastic in the roof ridge ventilator, however, presented problems in design since the sheet metal design did not lend itself to molding.

SUMMARY OF THE INVENTION

The principal object of this invention is to provide a roof ventilator adapted to be installed over openings in the roof located at the ridge thereof, said ventilator having a low silhouette and being otherwise formed to be as inconspicuous as possible, but which nevertheless provides a large free area therein for the passage of a maximum quantity of air therethrough.

As a more specific object, this invention seeks to provide a ventilator for mounting over openings in a roof located at the ridge thereof wherein access to or from the openings can be effected only through louvers formed in a metal sheet, said louvered sheet being so disposed in the ventilator as to block entry of rain, hail or snow into the openings, but to provide nevertheless a large free area through which the air escaping from the interior of the roof can pass.

A further specific object of this invention is to provide a roof ridge ventilator of low silhouette which, although made principally of molded plastic parts, will retain its shape in extremes of temperature.

DESCRIPTION OF DRAWINGS

These and other objects of this invention will become apparent from the following detailed description of a preferred embodiment of the invention when taken together with the accompanying drawings in which:

FIG. 1 is a plan view in perspective of an assembled roof ridge ventilator unit;

FIG. 2 is an exploded view of the ventilator of FIG. 1;

FIG. 3 is an end elevational view on an enlarged scale of the roof ridge ventilator;

FIG. 4 is an end elevational view in section of the ventilator of FIG. 1 taken along line 4—4 of FIG. 6 and on the scale of FIG. 3;

FIG. 5 is a fragmentary, still further enlarged end elevational view in section taken along line 5—5 of FIG. 6;

FIG. 6 is a fragmentary side elevational view in section of the ventilator, on the scale of FIG. 3, the section being taken along line 6—6 of FIG. 4; and

FIG. 7 is a fragmentary plan view of the ventilator of FIG. 6 with portions cut away to show the construction of certain supports thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

By way of general description the roof ridge ventilator of this invention is comprised of two molded plastic parts which when assembled define a pair of elongated side openings symmetrically located relative to the ridge through which air from within the roof of the structure may pass. These openings are covered by metal louvers which are so proportioned and disposed as to prevent rain, snow, sleet and hail from passing therethrough into the roof. The metal sheets are inclined to the vertical so that the louvers therein provide openings the sum of the areas of which is at least as great as the area of an opening formed in the lower of the plastic sheets which is disposed over a corresponding opening in the roof ridge. Both of the first said pieces are made from molded sheet plastic and are formed in a manner to provide beads, folds, flanges and other nonplanar contours each of which provides stiffness for the molded piece in a desired direction. The lowermost sheet or piece constitutes the base for the ventilator and has flashing formed integrally therewith by which the base can be nailed or otherwise secured to the roof.

Referring now to FIG. 2 for a detailed description of the preferred form of ventilator illustrated therein, the two molded plastic parts of the ventilator are comprised of a base **10** and a cover **11** both being of elongated rectangular form. Base **10** is symmetrically formed with respect to a longitudinal center line corresponding to the highest point of the roof ridge over which the base is to be secured. Base **10** is molded with an obtuse angle α which is substantially the same as the angle between the sides of the peaked roof to which the base is to be applied.

Inwardly from the end edges **12** and **13** of base **10** are formed end posts **14** and **15** which are substantially identical except that they face one another. Between end posts **14** and **15** is formed a center post **16** which is of substantially the same height as posts **14** and **15**, all three posts serving as supports for top **11**. Elongated openings **17** and **18** are formed in the central region of base **10** between posts **14** and **16**, and **16** and **15**, respectively. The air to be vented from the roof passes upward through openings **17** and **18** between top **11** and base **10** and laterally into the surrounding atmosphere. The space between top **11** and base **10**, however, is shielded from exterior precipitation by louvered metal strips **19** and **20** appropriately supported by posts **14**, **15** and **16**, firmly secured thereto as will hereinafter be described.

The side and end regions of base **10** are stiffened by longitudinal ribs **21** and **22** and by transverse ribs **23** and **24**, the latter being disposed between end post **14**, and edge **12** at the one end, and end post **15** and edge **13** at the other end.

As shown in FIG. 1, cover **11** is shorter and narrower than base **10**. Between each longitudinal rib **21**, **22** and the corresponding side of cover **11** is formed on base **10** a wind deflector rib **25** and **26** respectively (FIG. 2). Said wind deflector ribs are quite high and so contoured that wind moving across the ventilator from one side to the other will strike one or the other of the deflector ribs **25**, **26** and will be deflected over the cover **11** thereby. According to aerodynamic principles, this creates a subatmospheric pressure on the opposite side of the cover which then assists in drawing air out of the roof ridge through opening **17**, **18** and through the respective louvered strip **19** or **20** as the case may be.

The details of construction of the ventilator are shown in FIGS. 3–7 inclusive, to which reference is now made. Cover **11** is formed with a depending peripheral flange **27** which terminates in an outwardly turned edge **28** to provide stiffness for the unsupported edge of said flange **27**. Cover **11** is formed symmetrically about the same longitudinal centerline as base **10**, and its top surface **29** is sloped downwardly from said centerline at a small angle which is less than the corresponding angle of the base **10** so that surface **29** and base **10** diverge slightly from said centerline. The tops **30** of the end posts **14**, **15** and top **31** of center post **16** are formed with similar angles

such that cover **11** may be made to rest upon and be supported by said posts. As shown in FIG. **4**, the transverse dimension of each post is substantially equal to the transverse dimension between the opposite sides of flange **27** such that cover **11** is located on the base in a transverse direction by said posts. Cover **11** is longer than the dimension between end posts **14** and **15**, but it is located in an endwise direction on base **10** by inwardly formed bosses **32** and **33** (FIGS. **1** and **6**) the inner ends **34** of which abut upon the outer sides of end posts **14** and **15**.

A feature of this invention is the formation of the upper surface **29** of cover **11** in a manner to simulate overlapping shingles nailed to a roof ridge. As shown in FIG. **6** such formation results in a series of sloping surfaces **35** connected by upwardly disposed sections **36**. This leaves a somewhat indeterminate surface upon which to rest the cover, and therefore, instead of depending upon said sloping surfaces **35** for support inwardly formed bosses **37** are provided in the cover over posts **14** and **15**, as shown in FIG. **5**, which are calculated to rest upon the upper surfaces or tops **30** of the end posts, at which point a rivet **38** may be applied for firmly securing the cover **11** to said end posts. Similar bosses **39** (FIG. **7**) are formed in cover **11** over center post **16**, and the cover is secured to said post **16** at bosses **39** by rivets **40**. It is understood that two such rivets are used at each end or center post to furnish adequate support and fastening for the cover upon said posts.

Each end post **14** and **15** is formed with symmetrically disposed sloping substantially flat surface **41** and **42** on the side of the end post facing center post **16**. These sloping surfaces **41** and **42** form, in effect, a step or ledge on each side of the post relative to the line of symmetry of the ventilator so as to leave inner, vertically disposed end walls **43** and **44**, respectively, the function of which is to locate louvered metal strips **19** and **20** endwise on the ventilator. Center post **16**, in the form selected to illustrate this invention has only the sloping walls **45** and **46** (FIG. **2**) which are aligned with the sloping walls or ledges **41** and **42** of the end posts **14** and **15**. Thus louvered metal strips **19** and **20** may be made of a length sufficient to reach from inner end wall **44** on one end post to the corresponding inner wall **44** of the outer end post and to rest upon the sloping wall **45** or **46** of the center post **16**. As shown in FIG. **5**, the louvered metal strip may be secured to such sloping walls by rivets **47** passing through the lands on the strip at the ends and between the louvers of the center of the strip.

It may be noted that at longitudinally spaced intervals on base **10** near the lower edges of the deflectors **25** and **26** are formed vertically extending lugs **48** which serve as abutments against which the bottoms of the louvered strips may rest. The relationship of the lugs **48** to the sloping walls **41** and **42** on the end posts is such that when a louvered strip is mounted on sloping walls **41** or **42** with its bottom edge abutting against a lug **48** a small clearance **49** is created through which any water which may find its way through the louvers of the strips **19** or **20** and into the space between the louvered strips may flow down the base toward the wind deflectors **25** or **26**, then therealong around an end thereof to the end flashings and thence downward off base **10** and upon the roof.

As an additional deterent to the entry of water into the openings **17** or **18**, it may be noted from FIG. **4** that each said opening is formed in the top of the center portion of the base **10**, said center portion being raised above the general plane of the base to form an elongated boss **50**. Thus any liquid which may pass through the louvered strips will be contained between the raised bosses **50** and the wind deflectors **25** or **26**, and because of the open ends of the wind deflectors, such accumulation will not persist for any appreciable length of time since the liquid will simply flow around the ends of the wind deflectors and drain completely out of said space and upon the roof.

The louvers **51** (FIG. **5**) formed in the louvered strips **19** and **20** are substantially identical and are disposed in an almost vertical direction when the strips are mounted in position in the ventilator. This places the openings **52** between adjacent louvers in the upper side of the strip in its mounted condition so that it is vulnerable to the passage thereinto of precipitation such as rain, snow or hail. However, a portion of the cover **11** overhangs the louvers **51** and the flanges **27** which depend from the sides of the cover extend substantially halfway down the vertical height of the louvered strip so that any precipitation falling vertically cannot enter the space between the louvers. Any laterally moving precipitation is deflected by the wind deflectors **25, 26** before it can reach the said spaces and any precipitation which may chance to fall between the wind deflectors and the edges **28** of the flanges **27** will be at best fall into the lowermost openings **52** in the louvered strips, which spaces are well below opening **18** so that such precipitation will simply flow down between the bottom edge of the louvered strip and the base **10** and then along and around the wind deflectors as previously described.

In a cross wind, air leaves the interior of the roof through openings **17** and **18** and is drawn through the louvers on both sides of the roof ridge by virtue of venturi action created by the baffle on the windward side, as well as by reduced pressure on the lee side. It is important that the air flow area provided by the spaces between the louvers of the strip collectively shall be substantially equal to the areas of the openings **17** and **18** to avoid impeding the flow of air out of the ventilator. One way to accomplish this relationship is to insure that the vertical height between the cover **11** and base **10** is substantially equal to the width measured transversely of the line of symmetry of opening **18**. This, however, results in a relatively high profile for the ventilator, which is undesirable. In the ventilator of this invention, however, a low profile is maintained without sacrificing area of of opening through the louvered strip by inclining the strip in the manner illustrated in FIG. **4**. Thus, the sum of the areas of the openings **52** between louvers adjacent an opening **18** is substantially equal to the area of said opening **18** and the desired flow of air is achieved.

It may be recalled that cover **11** extends endwise beyond end posts **14** and **15**, as described with reference to the inwardly formed bosses **33** in FIG. **6**. The overhanging ends of cover **11** serve to prevent precipitation which may be driven diagonally across cover **11** from entering the upturned louvers **51** around said end posts. The overhang is of sufficient length to ensure that under even extreme conditions of wind and precipitation, substantially none will enter the louvers around said end posts.

It is anticipated that the ventilator will be subjected to extremes of temperature from the subzero temperatures reached in winter to the highest developed under a hot summer sun. The plastic material of which base **10** and cover **11** may be made may be a plastic sold under the trade name of GSE Cyclolac with Korad laminate. The thinness of this material used in the ventilator illustrated, may be 0.050 inch. In extremes of weather, as when exposed to the heat of the sun, the material may tend to buckle by virtue of uneven expansion and contraction, even when the sides and end regions of the base **10** are nailed to the roof. Such buckling, however is inhibited along the sides of the ventilator by the beads **21, 22** extending lengthwise of the ventilator, and at the extreme ends of the base **10** by the beads **23** extending transversely across the portion of the base outside end post **14** and **15**. Additional stiffness is, of course, provided by the wind deflectors **25** and **26**, and the central regions of the base **10** are well buttressed against warping or buckling by the posts **14, 15** and **16**.

In the form illustrated herein, the ventilator is a complete unit assembled at the factory and mounted on a roof ridge, either alone or in multiples space along the roof ridge. It is contemplated, however, that by overlapping the end regions of the bases **10** of adjacent units, the covers **11** may be made to substantially abut one another so as to give the appearance of a continuous roof ridge. This appearance is reinforced by the simulated overlapping shingle contour molded into the covers **11**.

It may be apparent from the above description that the design of the plastic base and cover does not incorporate any reentrant curves and hence both can be made in two-part molds. Such drafts as are required in the design for ready opening of the mold and removal of the molded parts therefrom do not have any deleterious effect either upon the form or function of the completed ventilator. It may also be apparent that the sloping louvered sheets make possible an adequate flow of air through the ventilator while at the same time reducing the silhouette to a minimum. Once installed, the plastic parts of the ventilator require no painting, and by making the louvered strips aluminum, such strips will likewise require no painting. This is particularly true because the strips are concealed by the cover **11** and the wind deflectors **25** and **26** and hence, even though the aluminum may in time pit, the condition of the finish would not be observable from the ground.

I claim:

1. A roof ridge ventilator comprising a base sheet of moldable material, said sheet being substantially rectangular in outline and having a central boss extending upwardly from the plane of said sheet, said boss having an opening therethrough, spaced posts formed in the sheet and extending above the central boss, a cover for the opening, said cover being formed of moldable material, a louvered sheet disposed in the space between the cover and base to allow air to pass from the opening in the boss to the exterior of the ventilator, and means on the cover to prevent entry of moisture into said opening.

2. A roof ridge ventilator as described in claim **1**, said base having aligned abutments and said louvered sheet being disposed between said cover and said abutments.

3. A roof ridge ventilator as described in claim **1**, said posts having downwardly sloping inwardly extending ledges, and said louvered sheet overlying and being supported by said ledges.

4. A roof ridge ventilator as described in claim **3**, said means on the cover to prevent entry of moisture into said ventilator comprising a peripheral flange, said cover being supported by said posts and said depending flanges extending around said posts and louvered sheets.

5. A roof ridge ventilator as described in claim **3**, said cover being supported by said posts and having a pair of downwardly extending bosses disposed one on either side of said posts in snug relation thereto to locate said cover lengthwise on the posts.

6. A roof ridge ventilator as described in claim **3**, said cover having temperature transverse steps formed at regular intervals along its length to provide stiffness for said cover, said steps simulating overtapping shingles.

7. A roof ridge ventilator as described in claim **3**, said base having further a central post disposed between said first-mentioned posts, means securing the cover to the top of said central post, and means securing an intermediate portion of said louvered sheet to the side of said central post.

8. A roof ridge ventilator as described in claim **7**, said end and central posts being molded integrally with said base sheet.

9. A roof ridge ventilator as described in claim **1**, said base having formed therein spaced aligned lugs against which said louvered sheet bears, said lugs serving to raise the louvered sheet above the surface of the base to allow drainage of water under said louvered sheet from the interior of the ventilator to the exterior thereof.

10. A roof ridge ventilator as described in claim **1**, said downwardly extending flanges extending around the periphery of the cover and substantially to the level of the opening in said boss.

11. A roof ridge ventilator as described in claim **9**, said posts having downwardly sloping inwardly extruding ledges, said louvered sheet overlying and being supported by said ledges, a central post disposed between said spaced posts, means securing the cover to the tops of said end and central posts, said end and central posts being molded integrally with said base sheet, a pair of downwardly extending bosses on the cover disposed to retain between them in snug relation thereto a post of said base sheet to locate said cover lengthwise with respect to said base sheet, simulated overlapping shingles formed in said cover, and said downwardly extending flanges extending around the periphery of the cover and substantially to the level of the opening in said boss.

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