(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
18 September 2014 (18.09.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/143787 A1

(51) International Patent Classification:
F24F 7/02 (2006.01) *E04D 13/143* (2006.01)
E04D 13/14 (2006.01)

(21) International Application Number:
PCT/US2014/027897

(22) International Filing Date:
14 March 2014 (14.03.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/793,677 15 March 2013 (15.03.2013) US

(71) Applicant: **MARCO INDUSTRIES, INC.** [—/US]; 9410 East 54th Street, Tulsa, Oklahoma 74145 (US).

(72) Inventor: **POLUMBUS, Mark D.**; 1804 South Dogwood Place, Broken Arrow, Oklahoma 74012 (US).

(74) Agents: **KANABER, Kerith M.** et al.; Dorsey & Whitney LLP, 1400 Wewatta Street, Suite 400, Denver, Colorado 80202 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to the identity of the inventor (Rule 4.17(i))*

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

— *with international search report (Art. 21(3))*

[Continued on next page]

(54) Title: SYSTEM FOR ROOF VENTILATION

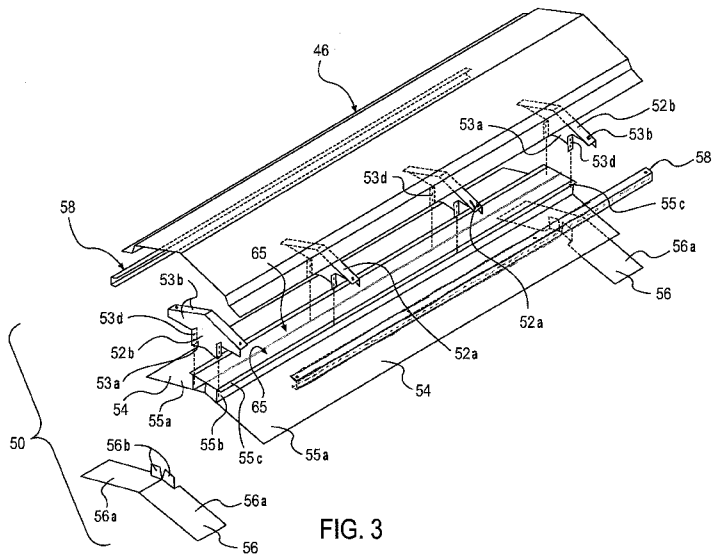

FIG. 3

(57) Abstract: Disclosed herein is a system for roof ventilation. In one aspect, the system may include a base including a roof engagement portion and at least one flange. The system may further include at least two trusses received in the base and coupled to the at least one flange, the trusses including a support surface for engagement with a ridge cap. The system may also include at least two end flashings, each flashing including an engagement section and at least two closure flanges, the engagement section coupled to the roof engagement portion of the base and the closure flanges coupled to a truss. The system may also include at least two channels, each defining a recess and coupled to an exterior edge of the trusses. In one aspect, the system may further include a screen, wherein the screen is received in the recess of the channel. In one aspect, the system may further include an air permeable composite material, wherein the material is received in the recess of the channel.

WO 2014/143787 A1

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

TITLE

System for Roof Ventilation

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of priority under 35 U.S.C. 119(e) to U.S. Application No. 61/793,677 filed March 15, 2013, entitled "System for Roof Ventilation" which is hereby incorporated by reference as though fully set forth herein.

FIELD

[0002] The present disclosure relates to materials that may be used in the roofing industry. More specifically, the disclosure relates to a roof ventilation system used to provide ventilation in roofs or other building structures.

BACKGROUND

[0003] It is common to ventilate roofs of building structures to remove stagnant or hot air, with such ventilating systems sometimes including vents in the gables of the building structure, along the soffits or along the ridge or apex of the roof. The vents are provided to permit the ingress and egress of air and when the vent is along the ridge, the air naturally egresses through the vent from beneath the roof by convection. Ridge vents are typically combined with gable or soffit vents through which air can flow into the space below the roof to encourage a continuous flow of air from the ambient environment, through the space beneath the roof and back to the ambient environment through the ridge vent.

[0004] The information included in this Background section of the specification, including any references cited herein and any description or discussion thereof, is included for technical reference purposes only and is not to be regarded subject matter by which the scope of invention is to be bound.

SUMMARY

[0005] A system for roof ventilation is disclosed herein. In one aspect, the system may include a base including a roof engagement portion and at least one flange. The system may further include at least two trusses received in the base and coupled to the at least one flange, the trusses including a support portion for engagement with a ridge cap. The system may also include at least two channels, each defining a recess and coupled to an exterior edge of the trusses. In one aspect, the system may further include at least two

end flashings, each flashing including an engagement section and at least two closure flanges, the engagement section coupled to the roof engagement portion of the base and the closure flanges coupled to a truss. In one aspect, the system may further include a screen, wherein the screen is received in the recess of the channel. In some embodiments, the screen may be comprised of metal, a metal alloy or plastic. In one aspect, the system may further include an air permeable composite material, wherein the material is received in the recesses of the channels. In some embodiments, the air permeable composite material is comprised of compressible nonwoven fibers and a binding agent. In some aspects, the system may further include a ridge cap positioned on the at least two trusses. In some aspects, each truss comprises a base portion and the support portion. In some embodiments, the base portion and the support portion are individual pieces coupled together to form the truss. In some embodiments, the base portion and the support portion are a single piece. In some embodiments, the base portion of the truss is configured to be received in the base of the roof ventilation system and the base portion further comprises apertures configured to receive a fastening device for coupling with the base of the roof ventilation system.

[0006] In some aspects, the system further includes an overhang opening defined by the trusses. In some aspects, the system further includes an opening defined by the base and the at least two trusses, the opening generally corresponding to a slot defined at an apex of a roof structure. In some aspects, components of the system are composed of stainless steel, aluminum, a metal alloy or a combination thereof. In some aspects, the roof engagement portion of the base is angled to accommodate or complement a slope of a roof structure. In some aspects, the roof engagement portion and the flange define an opening that generally corresponds to the slot in a ridge of a roof structure.

[0007] A method of installing a roof ventilation system is disclosed herein. In some aspects, the method includes positioning a roof ventilation system over a slot defined in an apex of a roof having at least two roof panels and securing at least a portion of the roof ventilation system to the at least two roof panels. In some embodiments, the roof ventilation system includes a base including a roof engagement portion and at least one flange, at least two trusses received in the base and coupled to the at least one flange, the trusses including a support surface for engagement with a ridge cap and at least two channels, each defining a recess and coupled to an exterior edge of the trusses. In some aspects, the method further includes engaging a support surface of the at least two trusses of the roof ventilation system with a ridge cap and securing the ridge cap to the roof ventilation system. In some aspects, the roof ventilation system comprises at least

two end flashings, each flashing including an engagement section and at least two closure flanges, the engagement section coupled to the roof engagement portion of the base and the closure flanges coupled to a truss, and the method further includes securing one or more additional roof panels over the end flashings. In some aspects, the method further includes securing an air permeable material in the recesses defined in the channels of the roof ventilation system.

[0008] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter. Other features, details, utilities, and advantages of the present invention will be apparent from the following more particular written description of various embodiments of the invention as further illustrated in the accompanying drawings and defined in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Fig. 1 is an isometric view of a building structure having a roof with a ridge cap and one embodiment of a roof ventilation system according to the present disclosure.

[00010] Fig. 2A is an enlarged cross section taken along line 2-2 of Fig. 1.

[00011] Fig. 2B is a perspective view of the ridge cap and the roof ventilation system of FIG. 1.

[00012] Fig. 3 is a perspective exploded view of the roof ventilation system of FIG. 1 and a ridge cap.

[00013] Fig. 4 is a front perspective view of the roof ventilation system of Fig. 1.

[00014] Fig. 5 is a side perspective view of the roof ventilation system of Fig. 4.

[00015] Fig. 6 is a top and side perspective view of the roof ventilation system of Fig. 4.

[00016] Fig. 7 is a top elevation view of the roof ventilation system of Fig. 4.

[00017] Fig. 8 is an enlarged view of the roof ventilation system of Fig. 7.

[00018] Fig. 9 is a bottom elevation view of the roof ventilation system of Fig. 4.

[00019] Figs. 10A-1 through Fig. 10C-4 depict various views of a truss and a channel of some embodiments of the roof ventilation system of Fig. 1.

[00020] Fig. 11 illustrates a method of installing a roof ventilation system in accordance with the present disclosure.

[00021] Fig. 12 is a top elevation view of a known roof ventilation system.

[00022] While multiple embodiments are disclosed, still other embodiments of the present invention will become apparent to those skilled in the art from the following Detailed Description, which shows and describes illustrative embodiments of the

invention. As will be realized, the invention is capable of modifications in various aspects, all without departing from the spirit and scope of the present invention. Accordingly, the drawings and detailed description are to be regarded as illustrative in nature and not restrictive.

DETAILED DESCRIPTION

[00023] Typical ridge roof vents are provided on roof structures wherein a pair of roof sections is angled relative to each other so as to define a roof of generally inverted v-shaped transverse cross-section. At the apex of the roof, a slot is provided or formed that defines a gap between the roof sections and through which air can be vented from beneath the roof system. A ridge cap, also typically of inverted v-shaped cross-section, overlies the slot to prevent rain or other undesirable elements from passing downwardly through the slot with the ridge cap being spaced from the underlying roof sections to permit the egress of air from the underlying building structure. The disclosed roof ventilation system is provided for placement between the ridge cap and the underlying roof sections in a manner to be sealed or otherwise fastened to the underlying roof sections while permitting the egress of air from the building structure, but inhibiting the ingress of animals, moisture, insects, or the like. The present roof ventilation system is advantageous because air flow is directed through the top of the building structure, and out of openings in at least a portion of the roof ventilation system, thereby providing increased ventilation more efficiently. In one embodiment, the system includes an opening in a portion of the system between the trusses such that air flows up and out of the roof of the building structure and down and out of the roof ventilation system through these openings. This system may ventilate up to twice as much air as other systems. Further, any commercially available ridge cap may be used with the roof ventilation system.

[00024] A building structure 10 having a roof system 5 incorporating the disclosed roof ventilation system 50 is shown in FIG. 1 and includes sidewalls 12, gables 14 at opposite ends (only one being shown), and an inverted v-shaped roof structure 16 having a pair of roof sections 18 intersecting along an apex or ridge 20 of the roof 16. As shown in FIG. 2A, a slot or ridge opening 22 is established along the ridge 20 of the roof system 5 with the slot 22 being established between layers of decking material 24 associated with each roof section 18. The decking is supported on rafters 26 which are in turn interconnected with a longitudinal beam 28 as is common in the building trade. The decking 24 is overlaid with an outer covering 30 of roofing material which may be composed of interconnected, elongated strips or channels 32 of metal or the like of generally u-shaped

cross-section as well as flat outer coverings or outer coverings of corrugated materials, tile, or the like.

[00025] The ridge cap 46 has an inverted v-shaped cross-section corresponding to the cross-sectional configuration of the interconnected roof sections. The ridge cap 46 is rigid and adapted to overlie the roof ventilation system 50 which has been placed on and secured (or will be secured) to the underlying roof sections. The ridge cap 46 can be secured in position on the trusses 52 with fasteners 49, such as nails, screws, adhesives, or other appropriate fastener. The ridge cap 46 may be any ridge cap known in the art, such as a 4' or 8' ridge vent manufactured by Air Vent, Inc..

[00026] Figs. 2A-10C depict various views of an embodiment of the roof ventilation system 50. As shown in Fig. 3, and with reference to Figs. 2A, 2B and 4-10C, the system 50 includes trusses 52, base 54, end flashings 56 and channels 58. The roof ventilation system 50 may be composed of stainless steel, aluminum or other metal, metal alloy or composite material or a combination thereof. In one embodiment, the ventilation system has a total length of 54 inches.

[00027] As shown in Figs. 2B, 3, 4, 9, 10A-1 through 10A-3, and others, the base 54 may form an inverted v shape that may be complementary to the roof profile with which it will engage. The base 54 may include roof engagement portions 55a and flanges 55b. The roof engagement portion 55a may be angled to accommodate or complement the slope of the roof. In use, the roof engagement portion 55a (together with the end flashings 56) is secured to the roof 30, 32 by any appropriate fastener such as nails, screws or adhesive. The flanges 55b extend from the roof engagement portions 55a and may further include side flanges 55c extending from the flanges 55b and the flanges 55b, 55c are configured to receive the trusses 52. The side flanges 55c provide a lip for engagement with both a support portion 53b of the truss 52 and a screen 60. With reference to Figs. 10A-1 through 10A-3, which show an isolated view of the base 54, the base 54 may have a length L and a height H, side flange 55c may have a width W_B and flange 55b may have a width W_C and an angle A_t between the flange 55b and the roof engagement portion 55a. In one embodiment, the length L is 45 inches, the height of the flange 55b is 1.54 inches, the width W_B is 0.50 inches and the width W_C is 4.02 inches and the angle A_t is 104.0°. The dimensions may differ in other embodiments.

[00028] As shown in Figs. 3, 4 and 8, and others, the roof engagement portions 55a and flanges 55b, 55c (together with the trusses 52) define an opening 65a in the system 50 that generally corresponds to the slot or ridge opening 22 in the ridge of the roof

structure. The roof engagement portions 55a and flanges 55b, 55c (together with the trusses 52) further define an overhang opening 65b. The openings 65a, 65b permit air to flow up and out of the roof of the building structure and down and out of the roof ventilation system through these openings. The presently disclosed system may ventilate up to twice as much air as other known systems (see e.g. the known system of Fig. 12).

[00029] As shown in at least Figs. 2B, 3 and 4, and others, the system 50 may include both interior trusses 52a and exterior trusses 52b. The trusses 52 may include a base portion 53a and a support portion 53b. In some embodiments, the base portion 53a and the support portion 53b may be integral with each other (see e.g. Fig. 3). In some embodiments, the base portion 53a and the support portion 53b may be separate pieces that are joined together during manufacturing or during assembly at the job site (see e.g. Figs. 10A-1 through 10B-4). Figs. 10B-1 through 10B-4 illustrate another embodiment of the base portion 53a having a length L, a height H and a width W. Fig. 10B-1 illustrates a top plan view, Fig. 10B-2 illustrates a perspective back view, Fig. 10A-3 illustrates a side plan view and Fig. 10B-4 illustrates a front plan view. In one embodiment, the length L is 2.96 inches, the height H is 1.50 inches and the width W is 0.52 inches. The dimensions may differ in other embodiments. Figs. 10C-1 through 10C-4 illustrate another embodiment of the support portion 53b having a base length L_B, a leg length L_L, a height H, a width W and an angle between the legs of A_L. In one embodiment, the base length L_B is 8.0 inches, the leg length L_L is 4.25 inches, the height H is 0.78 inches, the width W is 0.52 inches and an angle between the legs of A_L is 140.00°. The dimensions may differ in other embodiments.

[00030] As shown in at least Figs. 3 and 5, and others, the base portion 53a may include apertures 53d and the base portion 53a is received in and coupled to the flanges 55b of the base 54 via a fastening device 70a such as a screw or a nail that is received in the apertures 53d. The support portion 53b is generally angled to correspond to the shape of the ridge cap 46 with which it will engage. While four trusses are depicted in Fig. 3, it can be appreciated that less than four trusses 52 or greater than four trusses 52 may be used in the system 50 depending on, for example, the support requirements of the ridge cap or the length of the roof structure. In use, the support portion 53b of the trusses 52 engages with the ridge cap 46.

[00031] As indicated in at least Fig. 3 and with reference to Figs. 4-7, and others, the end flashings 56 may also form an inverted v shape that may be complementary to the roof profile with which it will engage. The end flashings 56 include an engagement portion 56a and closure flanges 56b extending therefrom. The engagement portions 56a

may be angled to accommodate or complement the slope of the roof and generally align with and are secured to the roof engagement portions 55a of the base 54. The closure flanges 56b are configured to be receivingly engaged with and coupled to the base portion 53a of an exterior truss 52b. The closure flanges 56b may be coupled to the exterior truss 52b by any appropriate securing device such as a nail, a screw or adhesive. In use, the end flashings 56 provide additional stability to the system 50 when the system 50 is secured to the roof.

[00032] As shown in Figs. 4, 5, 8 and others, the channels 58 may include an elongated body 58a with two truss engagement features 58b, 58c extending therefrom. The truss engagement features 58b, 58c are configured to receive a top and bottom surface of the support portion 53b of the truss 52. The channels 58, via the truss engagement features 58b, 58c, are secured to the truss 52 by a securing device 70, such as a nail, screw or adhesive. The channels 58 also define a pocket or recess 75 configured to receive a screen 60 and/or an air permeable composite material 62 (see Figs. 2A and 2B).

[00033] As indicated in Figs. 2A and 2B, and others, the system 50 may further include a screen 60 and/or an air permeable composite material 62. The screen 60 may be made of any appropriate material, such as metal, metal alloy or plastic. The screen 60 is received in the recess 75 defined in the truss 52 or may otherwise be attached to some portion of the trusses 52 and channels 58. The screen 60 allows for the egress of air but prevents birds and other animals from entering the building structure. The air permeable material 62 is received in the recess 75 defined in the truss 52 or may otherwise be attached to some portion of the trusses 52 and channels 58. In some embodiments, the air permeable material 62 is positioned over or on the screen 60. The air permeable composite material 62 may be made from any appropriate air permeable material. In one embodiment, the air permeable material 62 is composed of compressible nonwoven fibers, such as polyester and/or nylon, and a binding agent. In one embodiment, the material 62 is the fiber matting strip of air-permeable compressible nonwoven fibers (made of polyester and/or nylon) and a thermoplastic polymer binding agent disclosed in U.S. Patent Publication No. 20120047831, manufactured by Marco Industries and sold under the tradename “Python”.

[00034] Fig. 11 illustrates one embodiment of a method 200 of using or installing the roof ventilation system. In use, and in accordance with operation 202, the roof ventilation system 50 as disclosed herein is installed on a building structure 5 having a slot or vent 22 at an apex of the roof panels 30, 32. In accordance with operation 204, if not already

present, an air permeable material is positioned in and received in the recess 75 defined in the trusses 52. In accordance with operation 206, the roof engagement portions 55a are positioned on the roof panels 30, 32 and secured by an appropriate fastener. In accordance with operation 208, if needed, an air permeable material is positioned in and received in the recess 75 defined in the trusses 52. In accordance with operation 210, a ridge cap may then be positioned over the roof ventilation system 50 and secured to the ventilation system by a fastener. In some embodiments, and in accordance with operation 212, an additional roof panel 30, 32 may be positioned over and secured to the end flashings 56 to provide additional stability to the roof ventilation system. It should be appreciated that the operations of the method 200 may be performed in the order illustrated, in another suitable order and/or one or more operations may be performed simultaneously. Moreover, in some embodiments, the method 200 may include more or fewer operations than those illustrated.

[00035] It will therefore be appreciated that with the ridge cap 46 secured to the trusses 52 and the air permeable composite material 62 sealing the space therebetween that an air permeable connection is established between the ridge cap and the building structure through which air can easily pass but through which rain, insects or other such undesirable materials are inhibited from passing. The roof ventilation system disclosed herein provides a top-side air intake configuration that provides increased ventilation to a building structure when compared to other ventilation systems.

[00036] Fig. 12 depicts a prior art ventilation device. As can be understood from Fig. 12, the ridge cap 100 includes two portions 102 with a slot 104 located therebetween. Such a ventilation system is less efficient than the presently disclosed system because it ventilates less air. Further, the present system does not require an integrated ridge cap. Because the prior systems require an integrated ridge cap, a supplier/retail store is required to store and carry a larger variety of sizes and colors of the known product. The presently disclosed system may be used with any ridge cap, thus a supplier/retail store can maintain its current stock of varied colors and sizes of ridge caps, which are more easily stored than the integrated, known product.

[00037] All directional references (e.g., proximal, distal, upper, lower, upward, downward, left, right, lateral, front, back, top, bottom, above, below, vertical, horizontal, clockwise, and counterclockwise) are only used for identification purposes to aid the reader's understanding of the present invention, and do not create limitations, particularly as to the position, orientation, or use of the invention. Connection references (e.g., attached, coupled, connected, and joined) are to be construed broadly and may include

intermediate members between a collection of elements and relative movement between elements unless otherwise indicated. As such, connection references do not necessarily infer that two elements are directly connected and in fixed relation to each other. The exemplary drawings are for purposes of illustration only and the dimensions, positions, order and relative sizes reflected in the drawings attached hereto may vary.

[00038] The above specification and examples provide a complete description of the structure and use of exemplary embodiments of the invention as claimed below. Although various embodiments of the invention as claimed have been described above with a certain degree of particularity, or with reference to one or more individual embodiments, those skilled in the art could make numerous alterations to the disclosed embodiments without departing from the spirit or scope of this invention. Other embodiments are therefore contemplated. It is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative only of particular embodiments and not limiting. Changes in detail or structure may be made without departing from the basic elements of the invention as defined in the following claims.

CLAIMS

What is claimed is:

1. A roof ventilation system comprising

a base including a roof engagement portion and at least one flange;

at least two trusses received in the base and coupled to the at least one flange, the trusses including a support portion for engagement with a ridge cap; and

at least two channels, each defining a recess and coupled to an exterior edge of the trusses.

2. The roof ventilation system of claim 1 further comprising at least two end flashings, each flashing including an engagement section and at least two closure flanges, the engagement section coupled to the roof engagement portion of the base and the closure flanges coupled to a truss.

3. The roof ventilation system of claim 1 further comprising a screen, wherein the screen is received in the recesses of the channels.

4. The roof ventilation system of claim 3, wherein the screen is comprised of metal, a metal alloy or plastic.

5. The roof ventilation system of claim 1 further comprising an air permeable composite material, wherein the material is received in the recesses of the channels.

6. The roof ventilation system of claim 5, wherein the air permeable composite material is comprised of compressible nonwoven fibers and a binding agent.

7. The roof ventilation system of claim 1 further comprising a ridge cap positioned on the at least two trusses.

8. The roof ventilation system of claim 1, wherein each truss comprises a base portion and the support portion.

9. The roof ventilation system of claim 8, wherein the base portion and the support portion are individual pieces coupled together to form the truss.

10. The roof ventilation system of claim 8, wherein the base portion and the support portion are a single piece.

11. The roof ventilation system of claim 8, wherein the base portion of the truss is configured to be received in the base of the roof ventilation system and the base portion further comprises apertures configured to receive a fastening device for coupling with the base of the roof ventilation system.

12. The roof ventilation system of claim 1 further comprising an overhang opening defined by the trusses.

13. The roof ventilation system of claim 1 further comprising an opening defined by the base and the at least two trusses, the opening generally corresponding to a slot defined at an apex of a roof structure.

14. The roof ventilation system of claim 1, wherein the system is comprised of stainless steel, aluminum, a metal alloy or a combination thereof.

15. The roof ventilation system of claim 1, wherein the roof engagement portion of the base is angled to accommodate or complement a slope of a roof structure.

16. The roof ventilation system of claim 1, wherein the roof engagement portion and the flange define an opening that generally corresponds to the slot in a ridge of a roof structure.

17. A method of installing a roof ventilation system comprising

positioning a roof ventilation system over a slot defined in an apex of a roof having at least two roof panels; and

securing at least a portion of the roof ventilation system to the at least two roof panels;

wherein the roof ventilation system comprises

a base including a roof engagement portion and at least one flange;

at least two trusses received in the base and coupled to the at least one flange, the trusses including a support surface for engagement with a ridge cap; and

at least two channels, each defining a recess and coupled to an exterior edge of the trusses.

18. The method of claim 17 further comprising engaging a support surface of the at least two trusses of the roof ventilation system with a ridge cap and securing the ridge cap to the roof ventilation system.

19. The method of claim 17, wherein:

the roof ventilation system comprises at least two end flashings, each flashing including an engagement section and at least two closure flanges, the engagement section coupled to the roof engagement portion of the base and the closure flanges coupled to a truss, and

the method further comprises securing one or more additional roof panels over the end flashings.

20. The method of claim 17 further comprising securing an air permeable material in the recesses defined in the channels of the roof ventilation system.

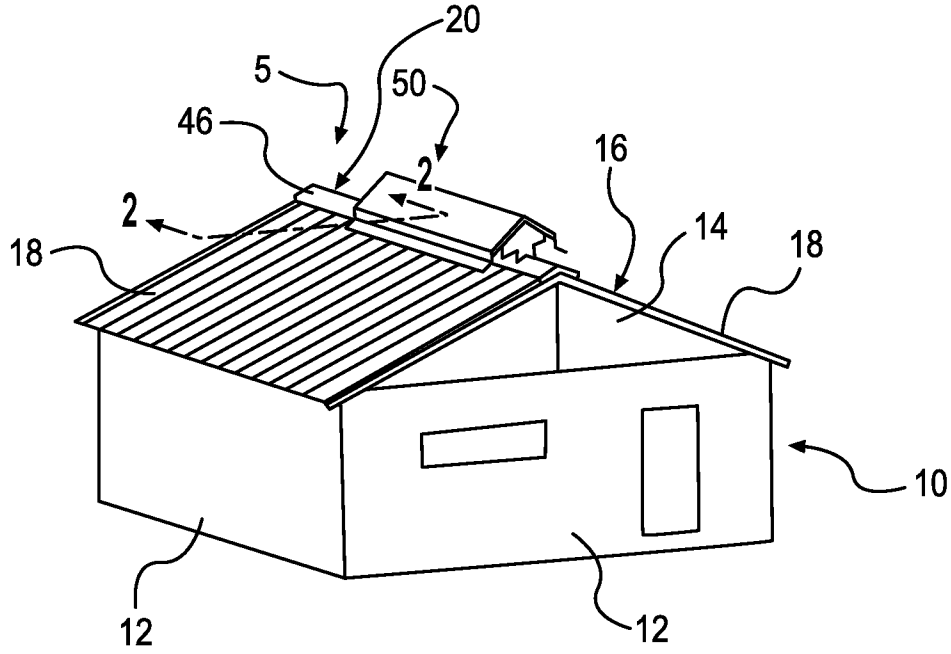

FIG. 1

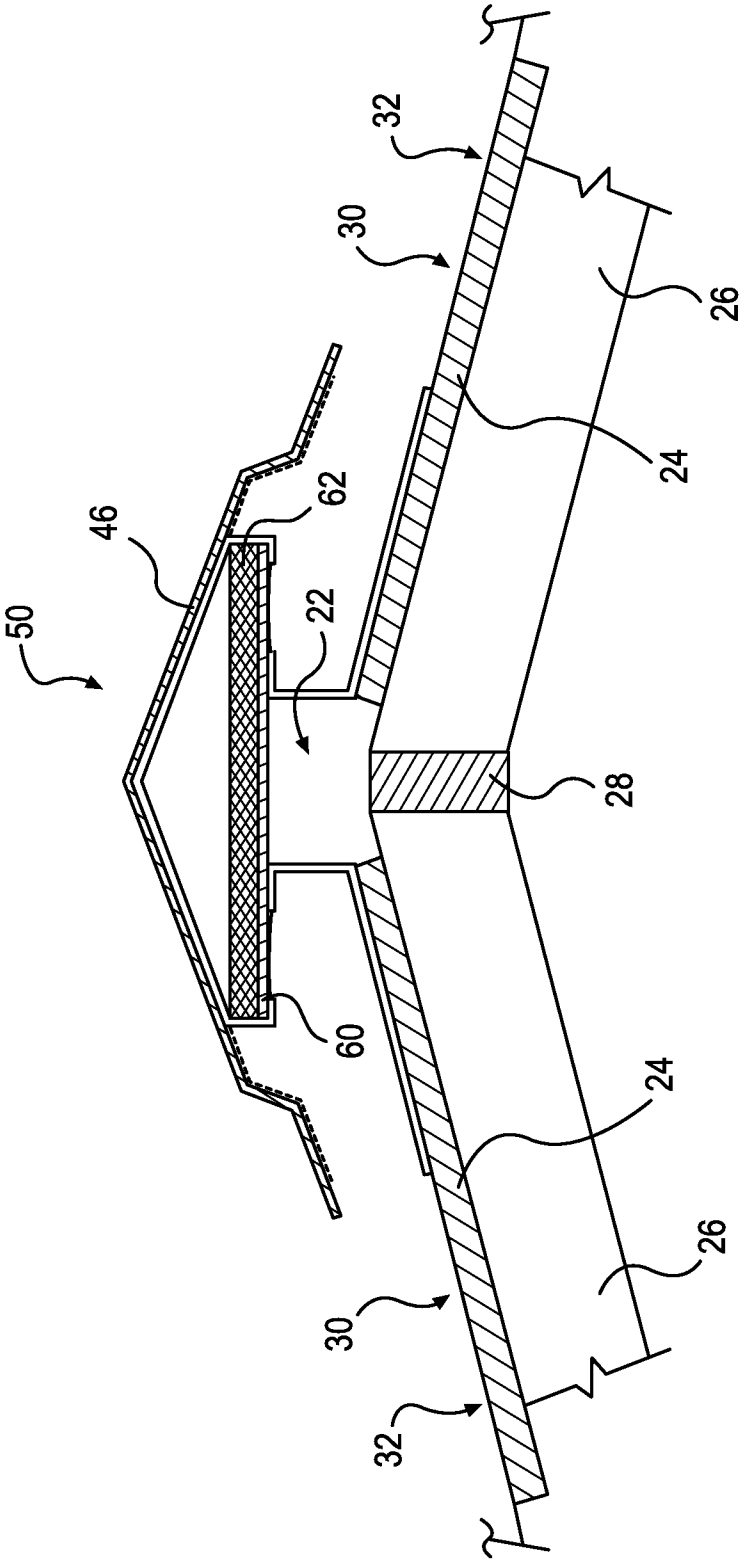

FIG. 2A

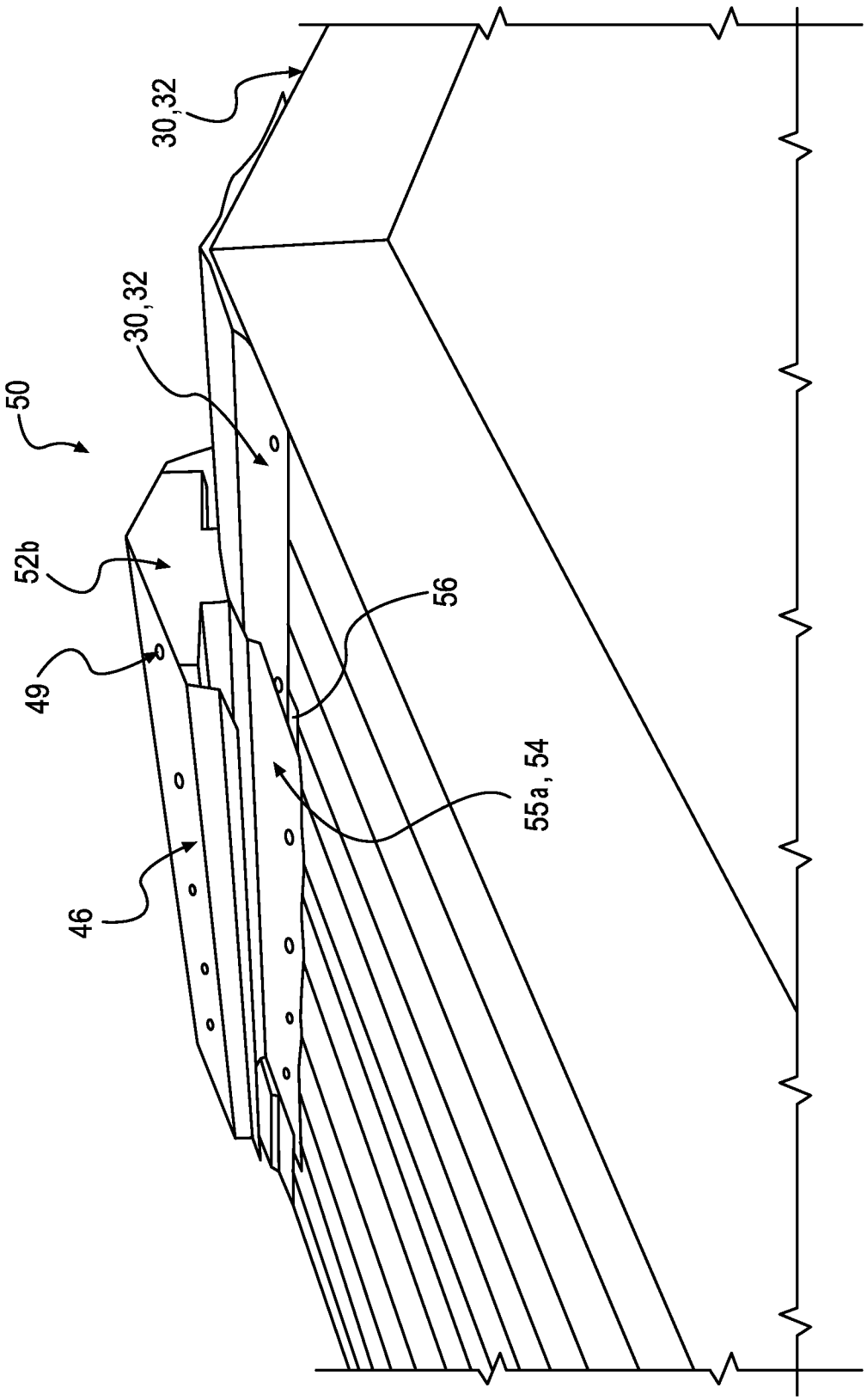

FIG. 2B

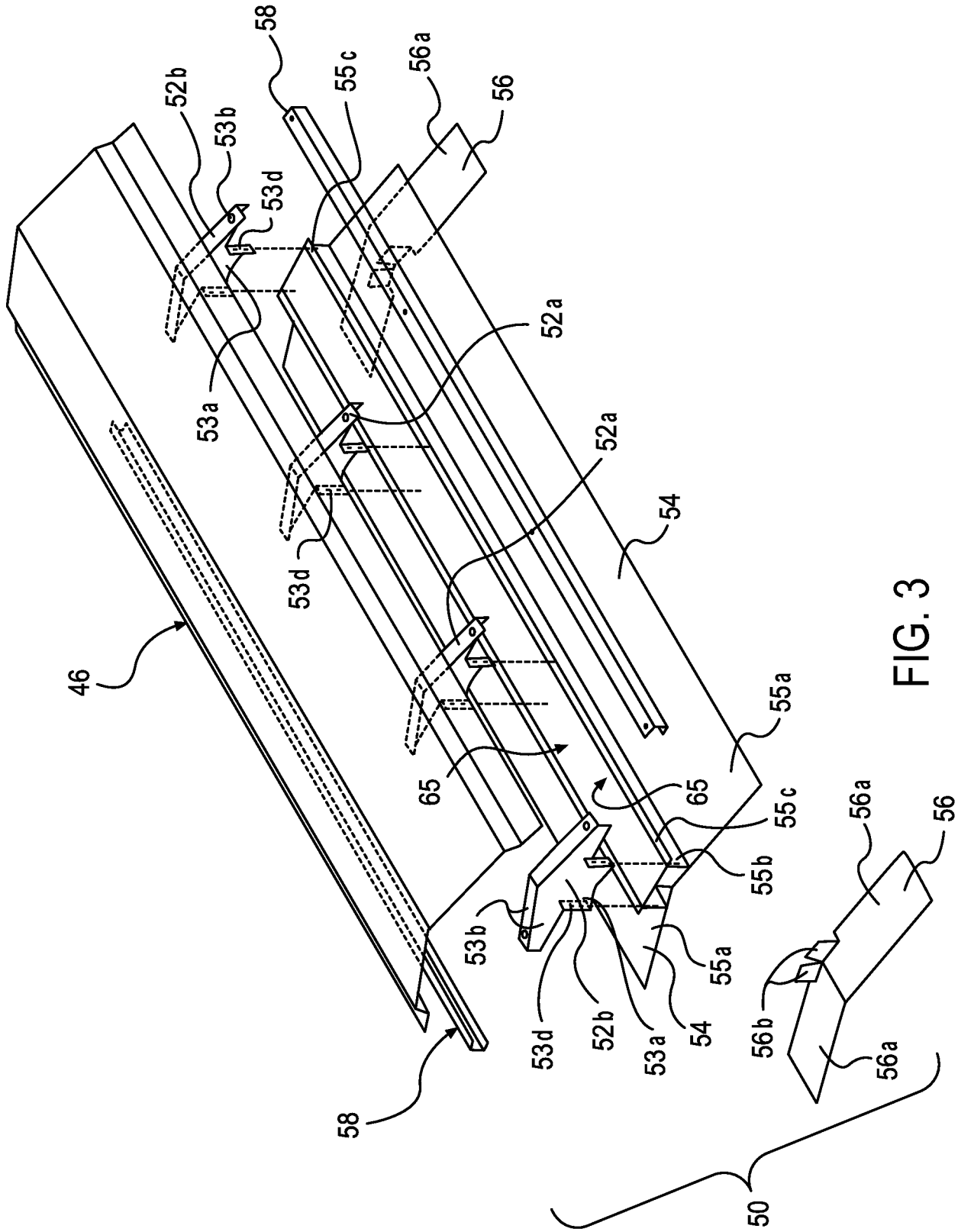
58
55c
56a
56
52b
53b
53d
52a
53a
53d
52a
54
46
65
55a
65
55c
55b
53b
55a
53d
52b
53a
54
56b
56a
56
58
50

FIG. 3

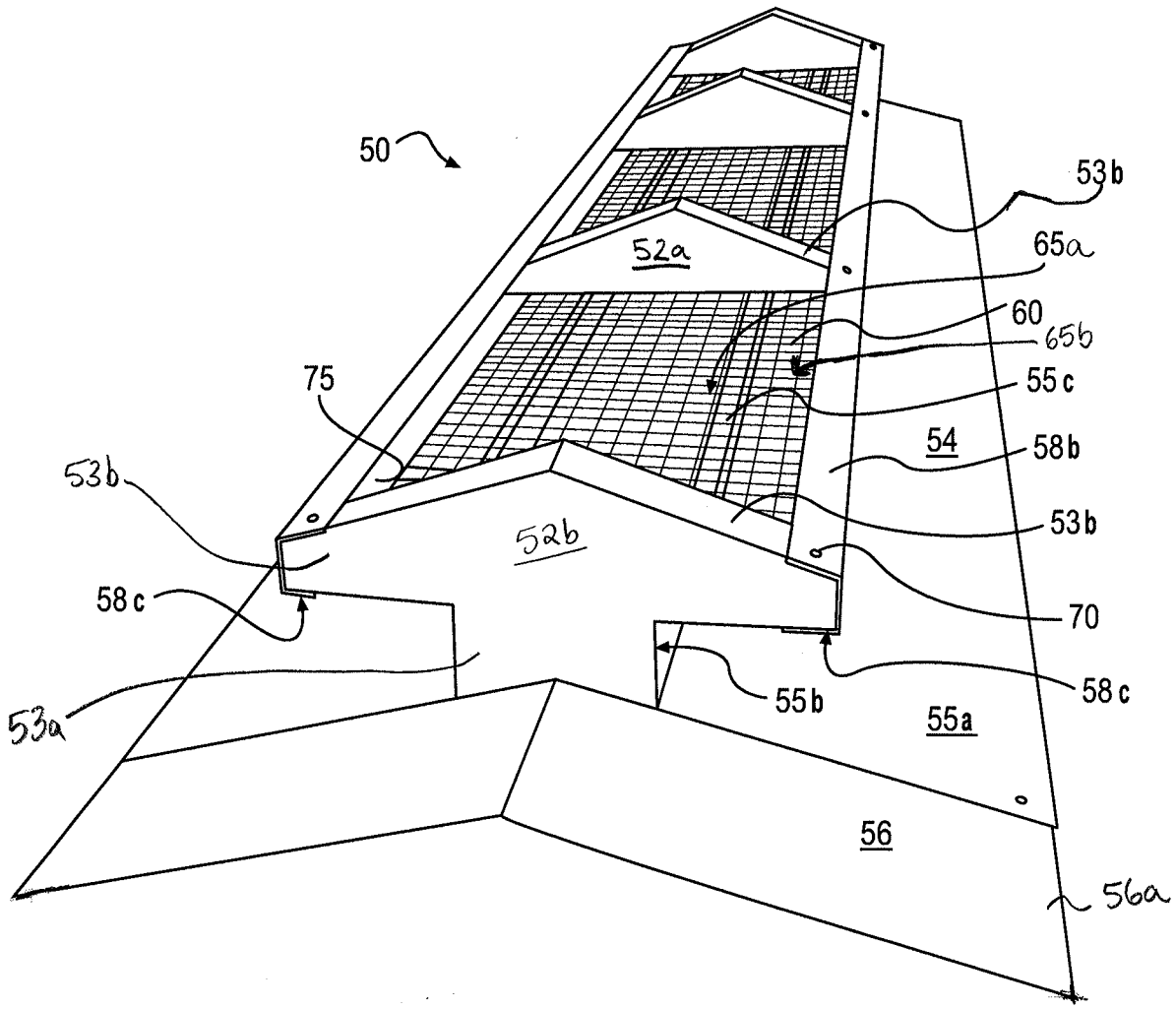
50
53b
65a
52a
60
65b
75
55c
54
58b
53b
52b
53b
58c
70
58c
55b
53a
55a
56
56a

FIG. 4

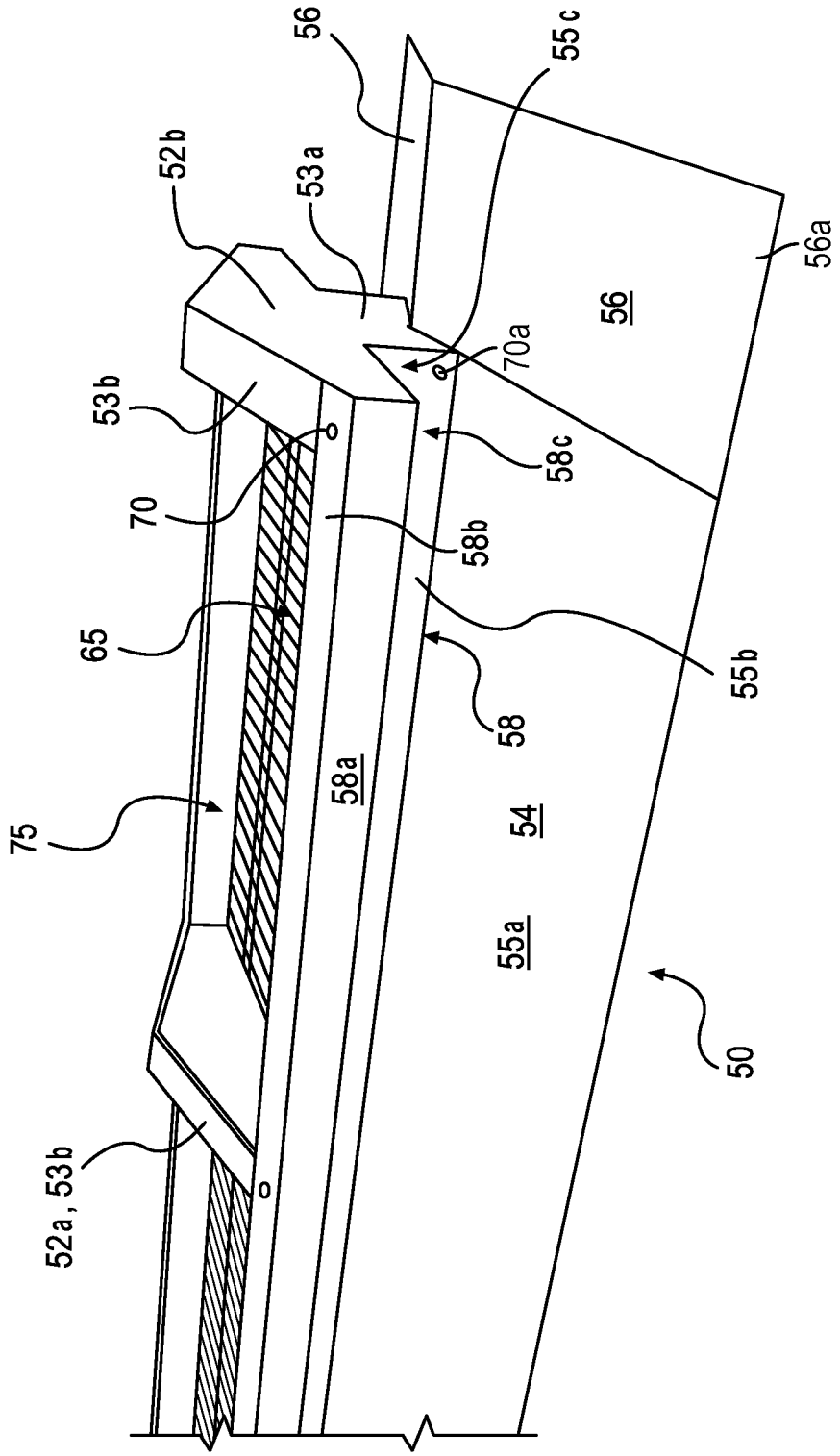
56
55c
52b
53a
56a
56
70a
53b
58c
70
58b
65
55b
58
58a
75
54
55a
50
52a, 53b

FIG. 5

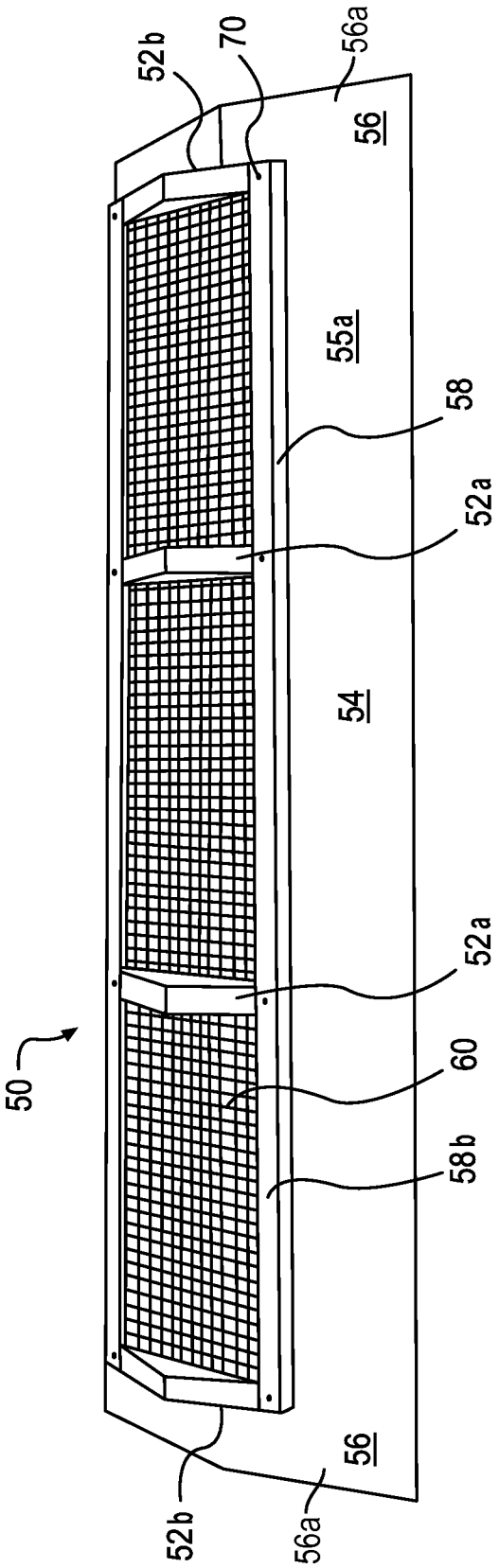

FIG. 6

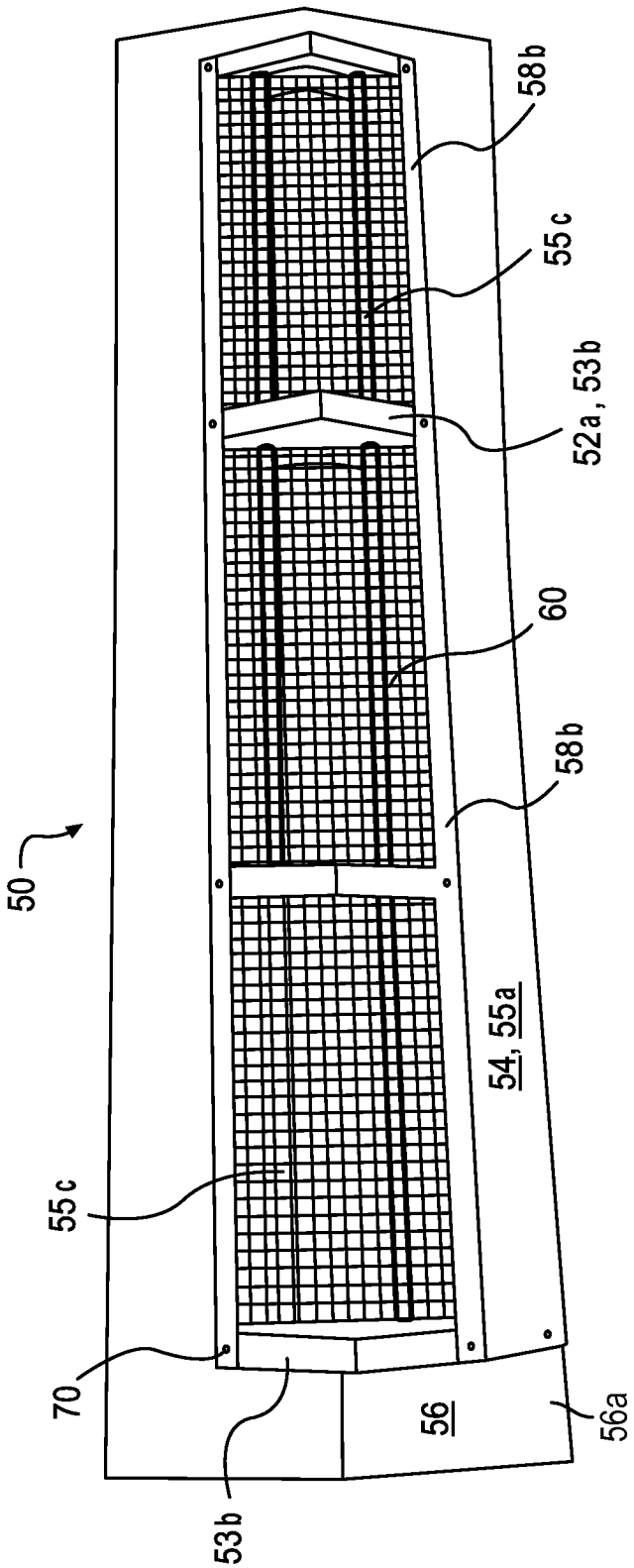

FIG. 7

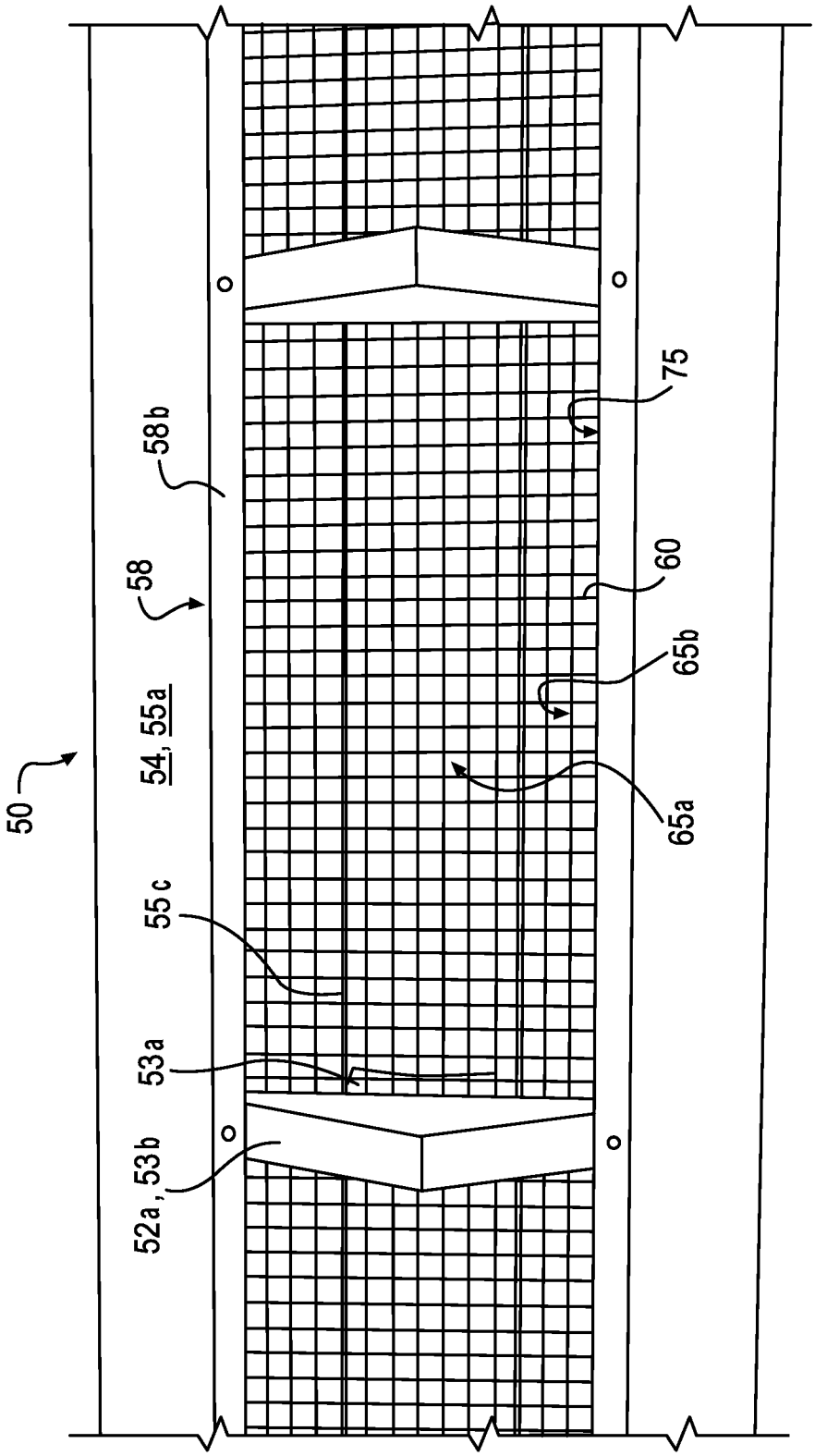

FIG. 8

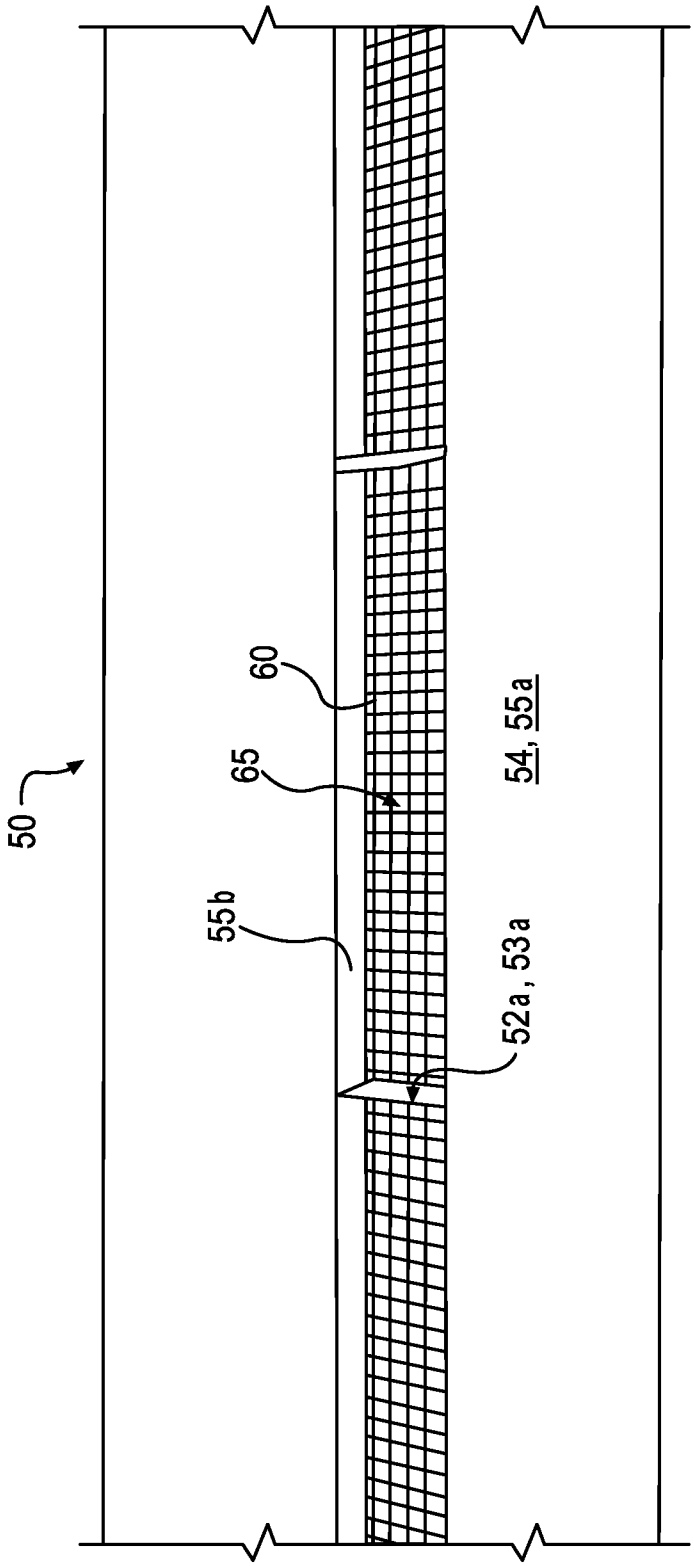

FIG. 9

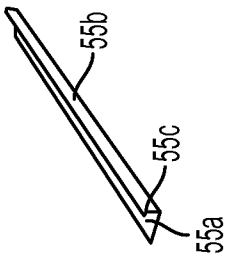

FIG. 10A-1

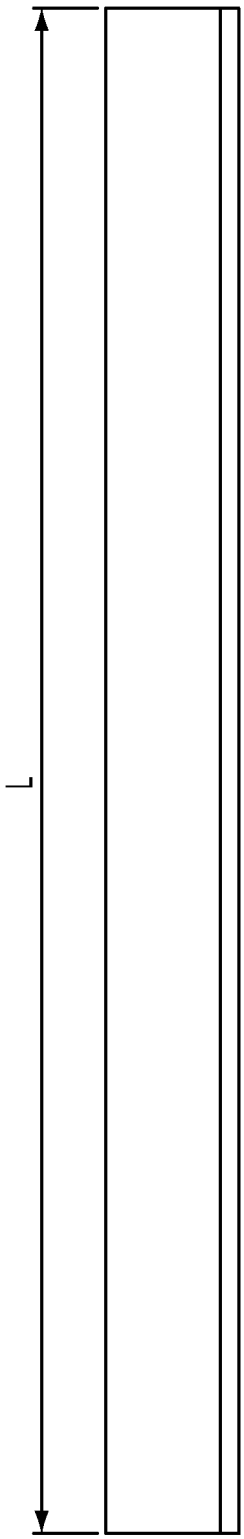

FIG. 10A-2

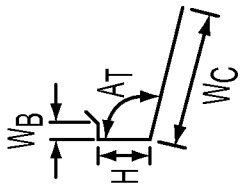

FIG. 10A-3

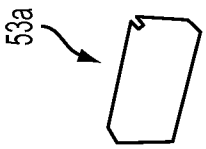

FIG. 10B-2

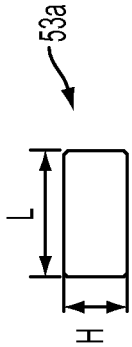

FIG. 10B-4

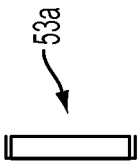

FIG. 10B-1

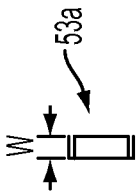

FIG. 10B-3

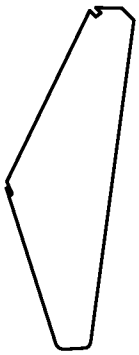

FIG. 10C-2

FIG. 10C-1

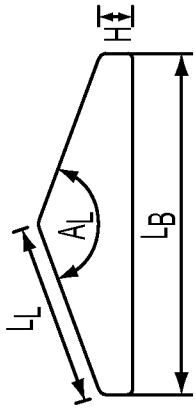

FIG. 10C-4

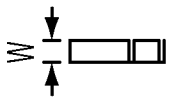

FIG. 10C-3

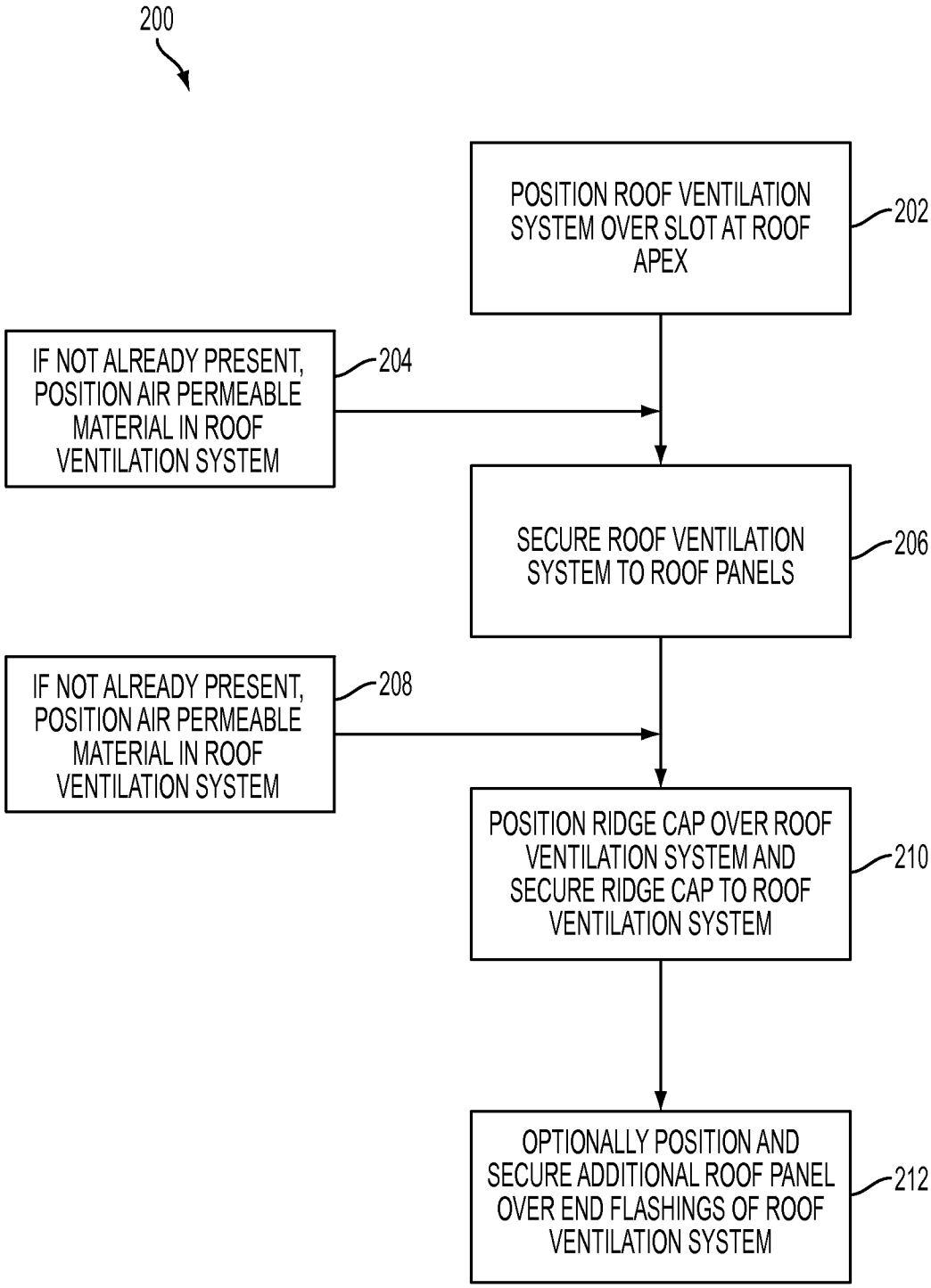
200
POSITION ROOF VENTILATION SYSTEM OVER SLOT AT ROOF APEX
202
IF NOT ALREADY PRESENT, POSITION AIR PERMEABLE MATERIAL IN ROOF VENTILATION SYSTEM
204
SECURE ROOF VENTILATION SYSTEM TO ROOF PANELS
206
IF NOT ALREADY PRESENT, POSITION AIR PERMEABLE MATERIAL IN ROOF VENTILATION SYSTEM
208
POSITION RIDGE CAP OVER ROOF VENTILATION SYSTEM AND SECURE RIDGE CAP TO ROOF VENTILATION SYSTEM
210
OPTIONALLY POSITION AND SECURE ADDITIONAL ROOF PANEL OVER END FLASHINGS OF ROOF VENTILATION SYSTEM
212

FIG. 11

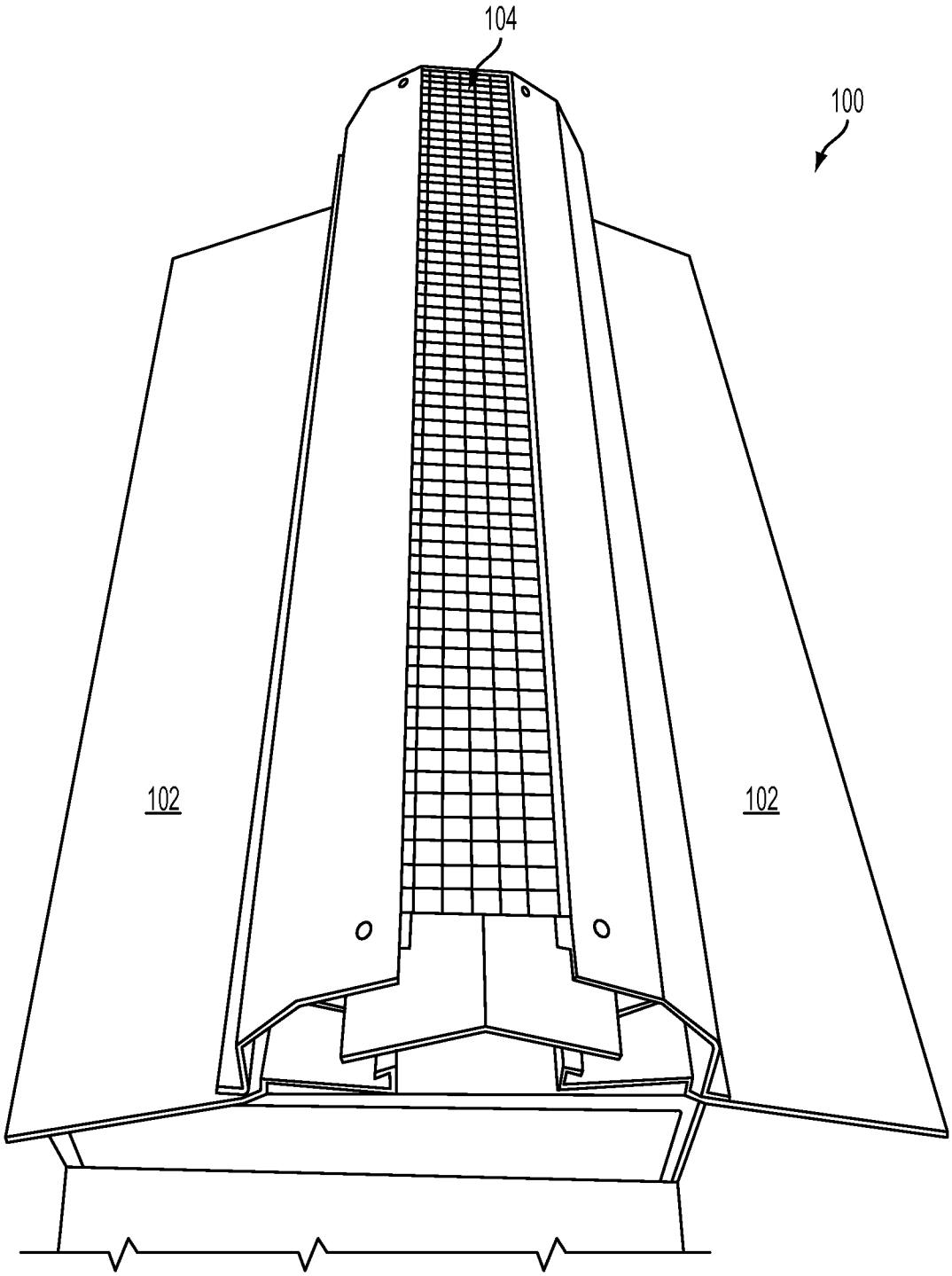

FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/027897

A. CLASSIFICATION OF SUBJECT MATTER

F24F 7/02(2006.01)i, E04D 13/14(2006.01)i, E04D 13/143(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24F 7/02; F24F 7/04; E04H 12/28; E04B 7/00; E04D 13/14; E04D 13/143

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: ventilation, roof, truss, ridge cap, and channel

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5924925 A (NYSTROM, BRUCE C.) 20 July 1999 See column 2, line 39 - column 4, line 17; claim 18 and figures 1-5.	1-20
Y	US 2002-0194799 A1 (SHARP et al.) 26 December 2002 See paragraphs [0039]-[0045]; claims 1,22 and figures 1-6.	1-20
Y	US 5803805 A (SELLS, GARY L.) 08 September 1998 See column 3, lines 9-19; column 4, lines 30-64 and figures 1a,3-4.	1-20
A	US 6267668 B1 (MORRIS, RICHARD J.) 31 July 2001 See column 3, lines 7-57 and figures 1-2.	1-20
A	US 4545292 A (INOKAWA et al.) 08 October 1985 See column 2, line 6 - column 3, line 65 and figures 1-6.	1-20

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 July 2014 (22.07.2014)	**23 July 2014 (23.07.2014)**

Name and mailing address of the ISA/KR
International Application Division
Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701,
Republic of Korea
Facsimile No. +82-42-472-7140

Authorized officer
HWANG, Chan Yoon
Telephone No. +82-42-481-3347

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/US2014/027897

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5924925 A	20/07/1999	US 6088971 A	18/07/2000
US 2002-0194799 A1	26/12/2002	US 2004-0128920 A1	08/07/2004
		US 6662509 B2	16/12/2003
		US 7024829 B2	11/04/2006
US 5803805 A	08/09/1998	None	
US 6267668 B1	31/07/2001	AT 323871 T	15/05/2006
		CA 2356133 A1	29/06/2000
		CA 2356133 C	14/03/2006
		DE 69930967 D1	24/05/2006
		DE 69930967 T2	21/12/2006
		EP 1153248 A2	14/11/2001
		EP 1153248 A4	31/03/2004
		EP 1153248 B1	19/04/2006
		HK 1043184 A1	27/10/2006
		US 2001-0024941 A1	27/09/2001
		US 2002-0197952 A1	26/12/2002
		US 6458029 B2	01/10/2002
		US 6599184 B2	29/07/2003
		WO 00-37750 A2	29/06/2000
		WO 00-37750 A3	09/11/2000
US 4545292 A	08/10/1985	JP 58-161032 U	26/10/1983
		JP 62-044014 Y	18/11/1987