IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Anderson et al. U.S. Patent No. 9,909,302 Issued Mar. 6, 2018 Based on U.S. App. No: 15/612,721 Filed: June 2, 2017 For FLOOD VENT HAVING A PANEL	IPR2019-01061

PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 9,909,302 UNDER 37 C.F.R. § 42.100

Pursuant to 35 U.S.C. § 311 and 37 C.F.R. § 42.100, the undersigned, on behalf of and acting in a representative capacity for petitioner, William Sykes ("Petitioner" and real party in interest), hereby petitions for *inter partes* review of claims 1-18 of U.S. Pat. No. 9,909,302 ("the '302 Patent"), issued to Smart Vent Products, Inc. ("Patent Owner").

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I. INTRODUCTION

This Petition demonstrates that in the '302 Patent and in the prior art cited herein, the panel as described and claimed in the '302 Patent achieves the same function as the prior art, as well as having the same structure as the prior art.

The claimed invention of the '302 patent is a "flood vent" with a panel that is "coupled" with the frame using connectors and the connectors are configured to "uncouple[d] the panel from the frame when 0.5-5.0 pounds per square inch (PSI) of pressure is applied to a portion of the panel" by either a fluid or an object carried by fluid.

Flood vents such as those at issue in this matter are generally designed to be inserted into openings in building foundations. They are intended to close off openings in the structure yet allow the free flow of water through the foundation during flooding events to avoid damage to the structure from the pressure of large amounts of fast-moving water and the debris carried by the water. As described below, the art in the field teaches numerous designs for flood vents that all share the feature of vents or panels with an ability to open partially or fully to allow the flow of water, but also include those designed to: completely seal openings; allow the free flow of air without allowing debris and animals to pass through; hinged vents or panels, panels designed to float up and out of the

vent; and various combinations thereof. As also shown below, all flood vent designs in the art have in common some means of keeping vents and/or panels in place until water pressure from a flooding event forces the vents or panel to open (generally through hinged means) or a flood vent panel to be released completely from the flood vent leaving an unobstructed opening for flood water to pass through. The vent mechanism of the '302 patent teaches

> "a flood gate comprising a passageway through an opening in a structure. The flood vent further includes a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. The flood vent also includes one or more connectors configured to couple the panel to the frame. The one or more connectors are further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch (PSI) of pressure is applied to a portion of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel."

As described below in detail, '302 is the same, functionally and structurally, as the invention taught in Shook, and further as taught in Malitsky.

Petitioner hereby asserts that there is a reasonable likelihood that the Petitioner will prevail that at least one of the challenged claims is unpatentable and respectfully requests institution of an *inter partes* review of the '302 Patent for judgment against Claims 1, 3, 7, 9, 11, 12, and 18 as unpatentable under 35 U.S.C. § 102 and/or § 103.

II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8(A)(1)

A. REAL PARTY IN INTEREST

William Sykes, an individual is the real party-in-interest for Petitioner.

B. RELATED MATTERS

Petitioner and the Patent Owner Smart Vent Products, Inc., are currently involved in litigation in the United States District Court for the District of New Jersey, Case No. 1:13cv05691. The matter does not involve any of the patents at issue in this Petition for Review.

C. NOTICE OF LEAD AND BACKUP COUNSEL

Pursuant to 37 C.F.R. § 42.8(b)(3) and 42.10(a), Petitioner provides the following designation of counsel.

Lead Counsel	Back-up Counsel
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Pursuant to 37 C.F.R. § 42.10(b), a Power of Attorney accompanies this Petition.

D. SERVICE INFORMATION

Service information for lead and back-up counsel is provided in the designation of lead and back-up counsel, above. Service of any documents via hand-delivery may be made at the postal mailing address of the respective lead or back-up counsel designated above.

III. PAYMENT OF FEES

The undersigned is providing payment of fees in the amount of $15,500.00 via check no.10237, sent via overnight express simultaneously with the filing of this Petition.

IV. REQUIREMENTS FOR *INTER PARTES* REVIEW

As set forth below and pursuant to 37 C.F.R. § 42.104, each requirement for *inter partes* review of the '302 Patent is satisfied.

A. GROUNDS FOR STANDING

Pursuant to 37 C.F.R. § 42.104(a), Petitioner hereby certifies that the '302 Patent is available for *inter partes* review and that the Petitioner is not barred or estopped from requesting *inter partes* review challenging the claims of the '302 Patent on the grounds identified herein.

B. IDENTIFICATION OF THE CHALLENGE

Pursuant to 37 C.F.R. § 42.104(b), the precise relief requested by Petitioner is that the Patent Trial and Appeal Board ("PTAB") review and invalidate claims 1-18 of the '302 Patent.

1. The specific art and statutory ground(s) on which the challenge is based

The PTAB applies U.S. law in conducting an *inter partes* review. 35 U.S.C. §§ 311-319. Unpatentability is proven by a preponderance of the evidence. 35 U.S.C. § 316. *Inter partes* review of the '302 Patent is requested in view of the following references:

U.S. Patent No. 8,308,396 to Shook ("Shook" or "'396) (Ex. 1002);

U.S. Patent Pub. No. 2012/0174501 to Malitsky et al. ("Malitsky" or "'501") (Ex. 1003).

Each one of the publications listed above is prior art to the '302 Patent under 35 U.S.C. § 102(a), (b), and/or (e).

Claims 1, 3, 7, 9, 11, 12, and 18 of the '302 Patent are unpatentable under 35 U.S.C. § 103(a) as being obvious over '302 in view of Malitsky.

2. How the challenged claims are to be construed

A claim subject to *inter partes* review receives the "broadest reasonable construction in light of the specification of the patent in which it appears." 37 C.F.R. § 42.100(b); *see also SAP America, Inc. v. Versata Development Group, Inc.*, Case CBM2012-00001, Final Written Decision, p. 23 (P.T.A.B. June 11, 2013). Petitioner's construction of claim terms is not binding upon Petitioner in any subsequent litigation related to the '302 Patent. Petitioner submits, for the purposes of this *inter partes* review only, that the claim terms take on the customary and ordinary meaning that the terms would have to one of ordinary skill in the art in view of the specification of the '302 Patent.

3. How the construed claims are unpatentable under the statutory grounds identified in paragraph (b)(2) of 37 C.F.R. § 42.104

An explanation of how the Claims of the '302 Patent are unpatentable under the statutory grounds identified above, including the identification of where each element of the claim is found in the prior art patents or printed publications, is provided in Section VII, below.

4. Supporting Evidence Relied upon to Support the Challenge

The exhibit numbers of the supporting evidence relied upon to support the challenge and the relevance of the evidence to the challenge raised, including identifying specific portions of the evidence that support the challenge, are provided below. An Exhibit List with the exhibit number and a brief description of each exhibit is filed herewith.

V. BACKGROUND

The '302 Patent is directed to a flood vent having a panel, the panel secured in place with connectors that allow the panel to uncouple from the frame of the flood vent once a certain pressure is applied to the panel by a fluid. (Ex. 1001, abstract).

VI. IDENTIFICATION OF THE REFERENCES AS PRIOR ART

The earliest potential priority date of the '302 Patent is the filing date of parent U.S. Patent Application No. 14/965,403, December 10, 2015 (now U.S. Patent No. 9,719,249, Ex. 1004). Assuming that the '302 Patent is entitled to the filing date of December 10, 2015 as alleged in the '302 Patent, the following references are cited as prior art in this Petition:

- U.S. Patent No. 8,308,396 to Shook ("Shook" or "'396) (Ex. 1002);
- U.S. Patent Pub. No. 2012/0174501 to Malitsky et al. ("Malitsky" or "'501") (Ex. 1003).

Each one of the publications listed above is prior art to the 302 Patent under 35 U.S.C. § 102(a), (b), and/or (e).

VII. DETAILED EXPLANATION OF THE GROUNDS FOR UNPATENTABILITY

A. GROUND 1: CLAIMS 1, 3, 7, 9, 11, 12, and 18 ARE UNPATENTABLE AS BEING ANTICIPATED BY SHOOK AND FURTHER IN LIGHT OF MALITSKY

1. SHOOK IS PRIOR ART AS TO THE '302 PATENT

Smart Vent currently co-owns, by assignment (Ex. 1005) both the '302 patent and Shook. Co-ownership of prior art provides some exceptions to the use of prior art to reject patent claims:

> (2) DISCLOSURES APPEARING IN APPLICATIONS AND PATENTS.— A disclosure shall not be prior art to a claimed invention under subsection (a)(2) if—
>
> (A) the subject matter disclosed was obtained directly or indirectly from the inventor or a joint inventor;
>
> (B) the subject matter disclosed had, before such subject matter was effectively filed under subsection (a)(2), been publicly disclosed by the inventor or a joint inventor or another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor; or

(C) the subject matter disclosed and the claimed invention, not later than the effective filing date of the claimed invention, were owned by the same person or subject to an obligation of assignment to the same person.

MPEP § 706.02(b)(2) (emphasis added).

Here, the Shook patent was assigned to Smart Vent on August 10, 2017. Ex. 1005, 0002. The '302 patent was filed on June 2, 2017. The filing date therefore precedes the date that Smart Vent obtained ownership of the Shook patent and Shook is available as prior art against the '302 patent.

2. CLAIM ELEMENTS IN '302, SHOOK, AND MALITSKY

a. Claim1 Elements

1. A flood vent, comprising: A frame configured to form a fluid passageway. Shook teaches "a flood vent for a structure comprising a shuttered duct. . . . formed in a housing" Ex. 1002, 6:5, FIG. 1.

2. A panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. Shook teaches the duct "pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position

and an open position in response to a floodwater pressure differential in said duct. Ex. 1002, 6:12-16, FIG. 1.

3. One or more first connectors configured to couple the panel to the frame, the one or more first connectors further configured to uncouple the panel from the frame when a first predetermined amount of pressure is applied to a portion of the panel on a first side of the panel by one or more of a fluid or an object carried by the fluid. Shook teaches "[a] lower region of shutter 30 is releasably coupled to a portion of sill by a fin 50. A coupling region is that portion 30 of shutter 30 swing arc where fin 50 is in contact with a portion of sill 28, at least one tab 40 fixed to and projecting away from sill 28, or a combination of both. Movement of shutter 30 to, from or through a coupling region is hampered by the releasable coupling of shutter 30 to sill 28 by fin 50. The presence of at least one tab 40 fixed to and projecting away from sill 28 hampers movement of shutter 30 to, from, or through a coupling region. . . Movement of shutter 30 about a swing arc can be in response to a floodwater pressure differential in or across duct 15. Ex. 1002, 4:28-45.

4. One or more second connectors configured to couple the frame to the structure. Shook does not teach the second connectors. However, Walitsky teaches "[t]he frame assembly may further comprise a set of

opposing ribs 23, located on the upper internal portion of the frame assembly and disposed to removably retain the door assembly 30 via physical contact with the upper portion of the door assembly 30. Ex. 1003, 3:[0037], FIG. 1.

b. Claim 3 Elements

1. The flood vent of claim 1, wherein the one or more first connectors comprise one or more bumps positioned on an inner perimeter of the frame. Shook teaches "[a] lower region of shutter 30 is releasably coupled to a portion of sill by a fin 50. A coupling region is that portion 30 of shutter 30 swing arc where fin 50 is in contact with a portion of sill 28, at least one tab 40 fixed to and projecting away from sill 28, or a combination of both. Movement of shutter 30 to, from or through a coupling region is hampered by the releasable coupling of shutter 30 to sill 28 by fin 50. The presence of at least one tab 40 fixed to and projecting away from sill 28 hampers movement of shutter 30 to, from, or through a coupling region. . . Movement of shutter 30 about a swing arc can be in response to a floodwater pressure differential in or across duct 15. Ex. 1002, 4:28-45, FIG. 1.

c. Claim 7 Elements

1. A flood vent, comprising: a frame configured to form a fluid passageway through an opening in a structure. Shook teaches "a flood vent

for a structure comprising a shuttered duct. . . . formed in a housing" Ex. 1002, 6:5, FIG. 1.

2. A metal panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. Shook teaches the duct "pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position and an open position in response to a floodwater pressure differential in said duct. Ex. 1002, 6:12-16, FIG. 1.

3. One or more connectors configured to couple the metal panel to the frame, wherein the one or more connectors are further configured to uncouple the metal panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to a portion of the metal panel on a first side of the metal panel by the one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the metal panel, wherein the one or more connectors are further configured to uncouple the metal panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to a portion of the metal panel on a second side of the metal panel opposite of the first side of the metal panel by the one or more of the fluid or the object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the metal

panel. Shook teaches "[a] lower region of shutter 30 is releasably coupled to a portion of sill by a fin 50. A coupling region is that portion 30 of shutter 30 swing arc where fin 50 is in contact with a portion of sill 28, at least one tab 40 fixed to and projecting away from sill 28, or a combination of both. Movement of shutter 30 to, from or through a coupling region is hampered by the releasable coupling of shutter 30 to sill 28 by fin 50. The presence of at least one tab 40 fixed to and projecting away from sill 28 hampers movement of shutter 30 to, from, or through a coupling region. . . Movement of shutter 30 about a swing arc can be in response to a floodwater pressure differential in or across duct 15. Ex. 1002, 4:28-45, FIG. 1. Walitsky teaches "[t]he frame assembly may further comprise a set of opposing ribs 23, located on the upper internal portion of the frame assembly and disposed to removably retain the door assembly 30 via physical contact with the upper portion of the door assembly 30. Ex. 1003, 3:[0037], FIG. 1.

d. Claim 11 Elements

1. The flood vent of claim 7, wherein the one or more connectors comprise one or more of: one or more raised bumps positioned on an inner perimeter of the frame and configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid. Shook

teaches "[a] lower region of shutter 30 is releasably coupled to a portion of sill by a fin 50. A coupling region is that portion 30 of shutter 30 swing arc where fin 50 is in contact with a portion of sill 28, at least one tab 40 fixed to and projecting away from sill 28, or a combination of both. Movement of shutter 30 to, from or through a coupling region is hampered by the releasable coupling of shutter 30 to sill 28 by fin 50. The presence of at least one tab 40 fixed to and projecting away from sill 28 hampers movement of shutter 30 to, from, or through a coupling region. . . Movement of shutter 30 about a swing arc can be in response to a floodwater pressure differential in or across duct 15. Ex. 1002, 4:28-45, FIG. 1. Walitsky teaches "[t]he frame assembly may further comprise a set of opposing ribs 23, located on the upper internal portion of the frame assembly and disposed to removably retain the door assembly 30 via physical contact with the upper portion of the door assembly 30. Ex. 1003, 3:[0037], FIG. 1.

e. Claim 12 Elements

1. flood vent, comprising: a frame configured to form a fluid passageway through an opening in a structure. A flood vent, comprising: A frame configured to form a fluid passageway. Shook teaches "a flood vent for a structure comprising a shuttered duct. . . . formed in a housing" Ex. 1002, 6:5, FIG. 1.

2. A panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. Shook teaches the duct "pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position and an open position in response to a floodwater pressure differential in said duct. Ex. 1002, 6:12-16, FIG. 1.

2. One or more connectors configured to couple the frame to the structure, the one or more connectors further configured to uncouple the frame from the structure when a first predetermined amount of pressure is applied to one or more of a portion of the panel on a first side of the panel or a portion of the frame on a first side of the frame by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway, the one or more connectors further configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to one or more of a portion of the panel on a second side of the panel opposite of the first side of the panel or a portion of the frame on a second side of the frame opposite of the first side of the frame by one or more of the fluid or the object carried by the fluid, so as to reduce the amount of blockage of the fluid passageway. Shook teaches "[a] lower region of shutter 30 is releasably coupled to a portion of sill by a fin 50. A

coupling region is that portion 30 of shutter 30 swing arc where fin 50 is in contact with a portion of sill 28, at least one tab 40 fixed to and projecting away from sill 28, or a combination of both. Movement of shutter 30 to, from or through a coupling region is hampered by the releasable coupling of shutter 30 to sill 28 by fin 50. The presence of at least one tab 40 fixed to and projecting away from sill 28 hampers movement of shutter 30 to, from, or through a coupling region. . . Movement of shutter 30 about a swing arc can be in response to a floodwater pressure differential in or across duct 15. Ex. 1002, 4:28-45, FIG. 1. Walitsky teaches "[t]he frame assembly may further comprise a set of opposing ribs 23, located on the upper internal portion of the frame assembly and disposed to removably retain the door assembly 30 via physical contact with the upper portion of the door assembly 30. Ex. 1003, 3:[0037], FIG. 1.

f. Claim 18 Elements

3. The flood vent of claim 12, wherein the one or more connectors comprise one or more of: one or more raised bumps positioned on an inner perimeter of the opening in the structure and configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the

fluid or the object carried by the fluid. Shook teaches "[a] lower region of shutter 30 is releasably coupled to a portion of sill by a fin 50. A coupling region is that portion 30 of shutter 30 swing arc where fin 50 is in contact with a portion of sill 28, at least one tab 40 fixed to and projecting away from sill 28, or a combination of both. Movement of shutter 30 to, from or through a coupling region is hampered by the releasable coupling of shutter 30 to sill 28 by fin 50. The presence of at least one tab 40 fixed to and projecting away from sill 28 hampers movement of shutter 30 to, from, or through a coupling region. . . Movement of shutter 30 about a swing arc can be in response to a floodwater pressure differential in or across duct 15. Ex. 1002, 4:28-45, FIG. 1. Walitsky teaches "[t]he frame assembly may further comprise a set of opposing ribs 23, located on the upper internal portion of the frame assembly and disposed to removably retain the door assembly 30 via physical contact with the upper portion of the door assembly 30. Ex. 1003, 3:[0037], FIG. 1.

3. '302 IS ANTICIPATED BY SHOOK IN LIGHT OF WALITSKY.

As shown above, each of the claim elements of the Claims at issue in the '302 patent are anticipated by Shook in light of Walitsky. It would have been obvious to one skilled in the art to modify Shook to add tabs (or connectors as described in '302) to the upper portion of a flood vent frame in order to retain a

panel within the frame and allowing the release of the panel with the application of water pressure on one side of the panel.

B. INDEPENDENT CLAIM 1 OF THE '302 PATENT RECITES LIMITATIONS THAT WERE DISCLOSED IN SHOOK.

Although the examiner cited Shook as prior art reviewed in the prosecution of the '302 patent, the examiner did not reject the claims of the '302 patent in light of the Shook patent. Shook describes a coupling region where a vent "shutter" has a "fin" at the bottom portion of the shutter and the fin contacts . . . "at least one tab 40 fixed to and projecting away from [the] sill" of the vent frame. Ex. 1002 4:29-32, FIGS. 1 & 4.

The "tabs" in Shook were claimed in the original Claims 3 and 9 filed with the application:

> Claim 3: A flood vent as claimed in claim 2, *wherein at least one tab is fixed to and projects away from said sill to releasably couple with said fin to hamper movement of said shutter to, from, or through a said closed position*. Ex. 1006, 0069.
>
> Claim 9: A flood vent for a structure comprising:
>
> a bezel connected to two opposing walls, an upper wall and a sill to form a housing which is inserted into the structure at an elevation above

ground to form a duct with an interior duct opening on the inside of the structure and an exterior duct opening to the outside of the structure, said bezel surrounds a periphery of said exterior duct opening and attaches said housing to the structure by fasteners, resulting in fluid communication between the interior and exterior of the structure when floodwater rises above said sill;

said sill being angled between approximately 2 to 8 degrees to shed water away from said inner duct opening;

a shutter with an upper and lower region, wherein said upper region of said shutter is pivotally fixed to an upper portion of said housing resulting in said shutter to rotate about a substantially horizontal axis to define a swing arc ranging between approximately 160 degrees to approximately 225 degrees;

a fin fixed by fasteners to a lower region of said shutter and projecting away from said lower region of said shutter; and

at least one tab fixed to and projecting away from said sill to releasably couple with said fin to impede rotation of said shutter along a portion of said swing arc defined as a coupling region, wherein the presence of a substantial amount of floodwater within at least a portion of said duct causes said shutter to move out of said

coupling region to allow the flow of the floodwater between the interior and exterior of the structure and in the absence of a substantial amount of floodwater within said duct.

Ex. 1006, 0071-72 (Emphasis added).

'302 describes "one or more connectors configured to couple the panel to the frame. . ." '302; 1:38-39, 47-48; 2:16-17, FIGS. 3A-3C. As described in '302 and as shown in '302 FIGS. 3A-3C, the connectors 30 are simply raised portions on the inside surface of the frame 10 of the flood vent taught in '302. The connectors are first described in '302 in functional terms:

"Connectors 30 may be configured to couple the panel 22 to the frame 10. Furthermore, the connectors 30 may be further configured to uncouple the panel 22 from the frame 10. For example, the connectors 30 may be configured to uncouple the panel 22 from the frame 10 when a predetermined amount of pressure is applied to the panel 22, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel 22 of flood vent 8 may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent 8 until a predetermined amount of pressure is applied to the panel 22, and after the predetermined amount of pressure is applied to the panel 22,

the panel 22 may be uncoupled from the flood vent 8 and may no longer prevent objects and/or fluids from passing through the flood vent 8 (or the amount of blockage of the fluid passageway provided by the panel 22 may be reduced).

This may, in particular embodiments, allow the flood vent 8 to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings 26 in the panel 22, when the openings 26 in the panel 22 are too small to allow sufficient fluids to pass through the flood vent 8, when the openings 26 in the panel are closed, and/or when the panel 22 does not include any openings 26." Ex. 1001, 8:38-62.

'302 further describes the structure of the connectors in broad and general terms but terms that make it clear that the "one or more first connectors" claimed in '302 are the same as the tabs 40 as described in Shook:

"A connector 30 may be any type of connector that may couple the panel 22 to the frame 10, and that may further uncouple the panel 22 from the frame 10 when, for example, a predetermined amount of pressure is applied to the panel 22. As a first example, a connector 30 may be one or more raised

bumps (or raised lips), as is illustrated in FIGS. 3A-3C. The raised bumps may allow a panel 22 to be installed in the frame 10, thereby coupling the panel 22 to the frame 10, as is seen in FIG. 3A. For example, an installer (such as a person) may push the panel 22 into the frame 10 with enough force to cause the panel 22 to move past the first 30 set of raised bumps. In such an example, the panel 22 may then rest in a gap (or be sandwiched) in-between the first set of bumps and a second set of bumps (as is seen in FIG. 3A), thereby coupling the panel 22 to the frame 10. Furthermore, the raised bumps may continue to couple the panel 22 to the frame 10 until a predetermined amount of pressure is applied to the panel 22 by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel 22, the panel 22 may be forced past a set of the raised bumps, as is seen in FIG. 38. This may uncouple the panel 22 from the frame 10, causing the panel 22 to be completely separated from the frame 10, and be carried away from the frame 10, as is seen in FIG. 3C. As such, in particular embodiments, the flood vent 8 may no longer prevent objects and/or fluids from passing through the flood vent 8 (or the amount of blockage of the fluid passageway provided by the panel 22 may be reduced). Ex. 1001, 9:20-47. (Emphasis added).

Because '302 merely claims a disclosed utility of the earlier Shook patent, it is not patentably distinct. *Abbvie Inc. v. Mathilda and Terence Kennedy Institute of Rheumatology Trust*, 764 F.3d 1366, 1381 (Fed. Cir. 2014) ("a later expiring patent is not patentably distinct from an earlier expiring patent if it merely claims a disclosed utility of the earlier claimed invention.") *citing Pfizer, Inv. v. Teva Pharmaceuticals USA, Inc.*, 518 F.3d 1353, 1363 (Fed. Cir. 2008). The question of obviousness in a later patent can be answered by using the disclosure in an earlier patent ". . . to answer the question whether claims merely define an obvious variation of what is earlier disclosed and claimed." *Abbvie*, 764 F.3d at 1381.

Here, the '302 patent claims merely define an obvious variation of what is disclosed in the Shook patent – namely, using the "one or more first connectors" 30 (Ex. 1001, Claim 1, 41:16-22) that hold the flood vent panel in place (Ex. 1001, FIG. 3A & B) and where "a connector 30 may be any type of connector that may couple the panel 22 to the frame 10 and that may further uncouple the panel 22 from the frame 10 when [pressure is applied] . . . [and] a connector 30 may be one or more raised bumps or raised lips . . ." merely defines an obvious variation of using the tabs 40 as disclosed in Shook (Ex. 1002, 4:31-37, FIG. 4) as a means to "hamper movement of shutter 30" (Ex. 1002, 4:35-37). Having a vent panel held in place by the "one or more first connectors" at both the top and the bottom of the vent frame is simply such an obvious variation.

C. THE CLAIMS OF THE '302 PATENT RECITE LIMITATIONS THAT WERE DISCLAIMED IN THE SHOOK APPLICATION AND SMART VENT CANNOT RECAPTURE THE DISCLAIMED MATTER IN THE '302 PATENT.

As noted above, Shook was assigned to Smart Vent on August 10, 2017, Ex. 1005, 0002, while the '302 patent was filed on June 2, 2017 such that Shook is available as prior art against the '302 patent. The "one or more connectors" of the '302 patent are therefore subject to review in light of the "tabs" as disclosed in Shook.

"In some cases the Patent and Trademark Office (PTO) may have rejected an earlier version of the patent application on the ground that a claim does not meet a statutory requirement for patentability. 35 U.S.C. § 132 (1994 ed., Supp. V). When the patentee responds to the rejection by narrowing his claims, this prosecution history estops him from later arguing that the subject matter covered by the original, broader claim was nothing more than an equivalent." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 535 U.S. 722, 727 (2002).

The prosecution history of related patents are used to aid interpreting claims consistently within a patent family. *Laitram Corp. v. Morehouse Indus., Inc.*, 143 F.3d 1456, 1460 n.2 (Fed. Cir. 1998); *Jonsson v. Stanley Works*, 903 F.2d 812, 818 (Fed. Cir. 1990). While the '302 patent does not claim priority based upon Shook,

the patents cover the same or similar technical content (as well as being co-owned by Smart Vent) and are therefore part of the same patent family.

During the examination of Shook, the examiner specifically rejected Claims 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, and 18 as

> "being unpatentable over Bergaglio 2008/0236062 in view of Albanese 7,270,498. Bergaglio discloses a flood vent comprising a shuttered duct 12, a shutter 14, and a fin 20 coupled to the lower region of the shutter. Bergaglio does not disclose the lower region of the duct being angled. Albanese, col. 3, lines 6-10, discloses a shutter comprising a sloped sill 110. It would have been obvious to one of ordinary skill in the art to angle a sill, since Albanese teaches that doing so facilitates drainage of water. *Furthermore, the provision of a tab would have been an obvious matter of design choice, since the use of tabs as a catch type device is well known.* The size and shape also being considered an obvious matter of design choice." Ex. 1006, 0036. (Emphasis added)

In response to the rejection of Claims 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, and 18 in Shook, the applicant withdrew Claims 1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19 and rewrote the remaining Claims in accordance

with the examiner's rejection. The remaining Claims 1 and 2 of the Shook patent do not Claim the tabs as described in Shook (Ex. 1002, 4:35-37, FIG. 4). Smart Vent took ownership of Shook by assignment, and is therefore bound by the narrowing of the Shook Claims to disclaim the "tabs" as described in Shook. An applicant clearly and unambiguously disavows claim scope by amending matter out of claims as a response to a rejection. Smart Vent has therefore disavowed the tabs as described in Shook and cannot recapture the tabs as part of the '302 patent.

VIII. CONCLUSION

Based on the above, there is a reasonable likelihood that Petitioner will prevail in its challenge of patentability for at least one of claims 1-18 of the '302 Patent. For the reasons set forth in this Petition, it is respectfully requested that the Petition for *Inter Partes* Review of the '302 Patent be granted.

Dated: April 28, 2019

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,909,302 and supporting materials (Exhibit List, Exhibits 1001-1006, and Power of Attorney) have been served in its entirety this 6th day of May, 2019, by Federal Express on:

Counsel for Smart Vent:

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CERTIFICATE OF COMPLIANCE

This Petition complies with the type-volume limitation of 37 C.F.R. §42.24(a)(1)(i) because, according to the "word count" function of Microsoft Word 2010, the Petition contains 6,730 words in total.

/Duncan G. Byers/
Duncan G. Byers
Reg. No. 50707

EXHIBIT LIST

1001	U.S. Patent No. 9,909,302 (Patent subject to review)
1002	U.S. Patent No. 8,308,396
1003	U.S. Patent Pub. No. 2012/0174501
1004	U.S. Patent No. 9,719,249
1005	Assignment of U.S. Patent No. 9,909,302
1006	U.S. Patent No. 8,308,396 File Wrapper

US009909302B2

(12) **United States Patent**
Anderson, Jr. et al.

(10) **Patent No.: US 9,909,302 B2**
(45) **Date of Patent: *Mar. 6, 2018**

(54) **FLOOD VENT HAVING A PANEL**

(71) Applicant: **Smart Vent Products, Inc.**, Pittman, NJ (US)

(72) Inventors: **Winfield Scott Anderson, Jr.**, Palm Beach Gardens, FL (US); **Tom Little**, Pittman, NJ (US); **Michael J. Graham**, Pittman, NJ (US)

(73) Assignee: **SMART VENT PRODUCTS, INC.**, Pitman, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/612,721**

(22) Filed: **Jun. 2, 2017**

(65) **Prior Publication Data**

US 2017/0260739 A1 Sep. 14, 2017

Related U.S. Application Data

(63) Continuation of application No. 14/965,403, filed on Dec. 10, 2015, now Pat. No. 9,719,249.

(51) **Int. Cl.**
E02B 7/20 (2006.01)
E04B 1/70 (2006.01)

(52) **U.S. Cl.**
CPC ***E04B 1/7076*** (2013.01)

(58) **Field of Classification Search**
CPC E04B 1/7076; E06B 2009/007
USPC 405/92; 49/10; 52/169.5
See application file for complete search history.

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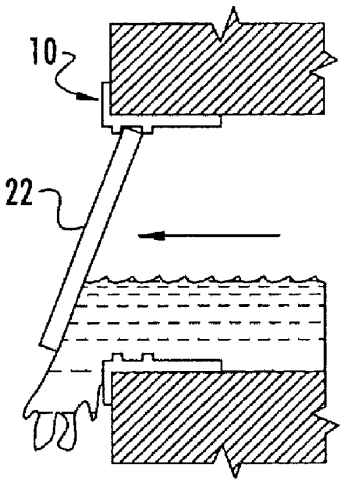
Primary Examiner — Benjamin F Fiorello
(74) *Attorney, Agent, or Firm* — Akerman LLP

(57) **ABSTRACT**

According to one embodiment, a flood vent includes a frame configured to form a fluid passageway through an opening in a structure. The flood vent further includes a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. The flood vent also includes one or more connectors configured to couple the panel to the frame. The one or more connectors are further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch (PSI) of pressure is applied to a portion of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel.

18 Claims, 9 Drawing Sheets



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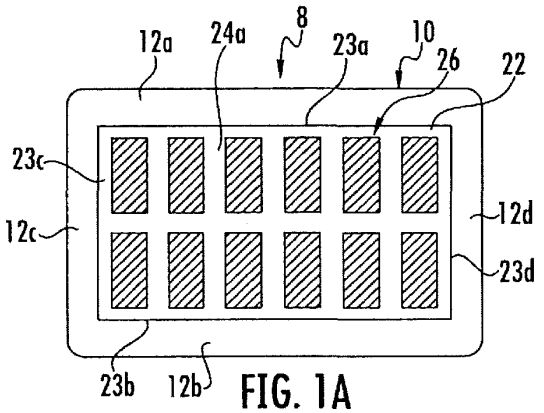

FIG. 1A

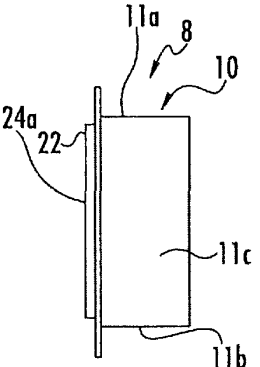

FIG. 1B

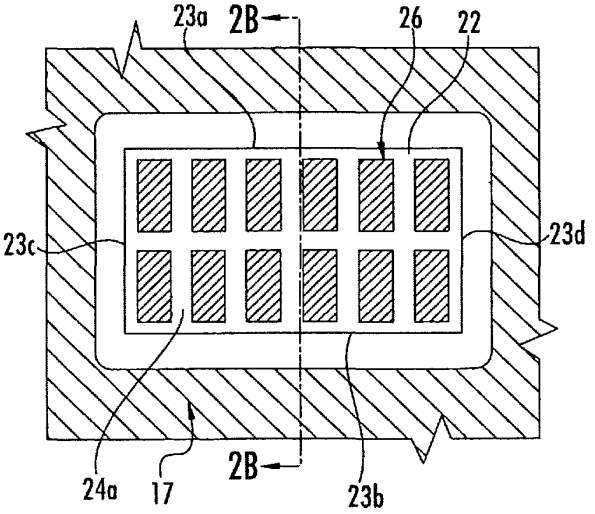

FIG. 2A

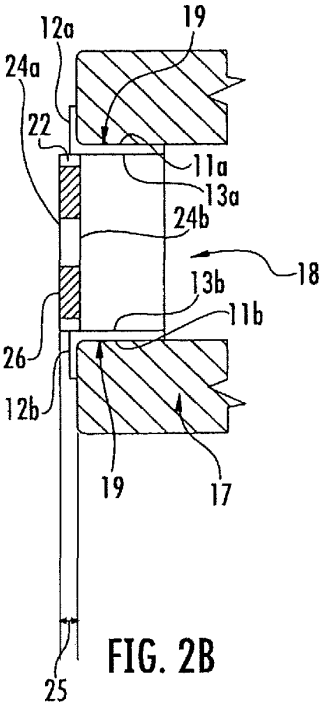

FIG. 2B

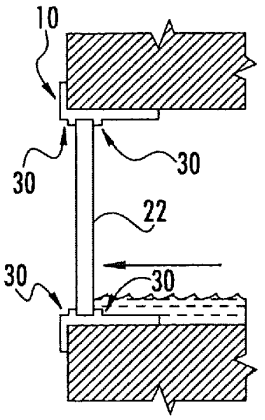

FIG. 3A

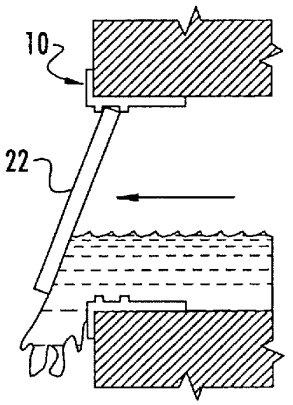

FIG. 3B

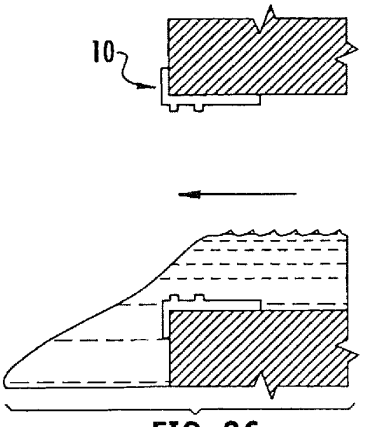

FIG. 3C

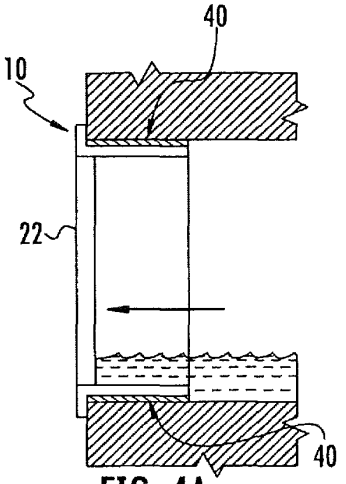

FIG. 4A

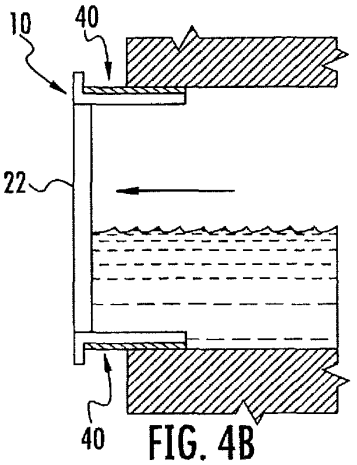

FIG. 4B

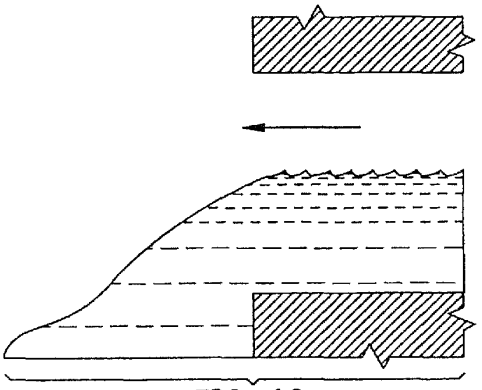

FIG. 4C

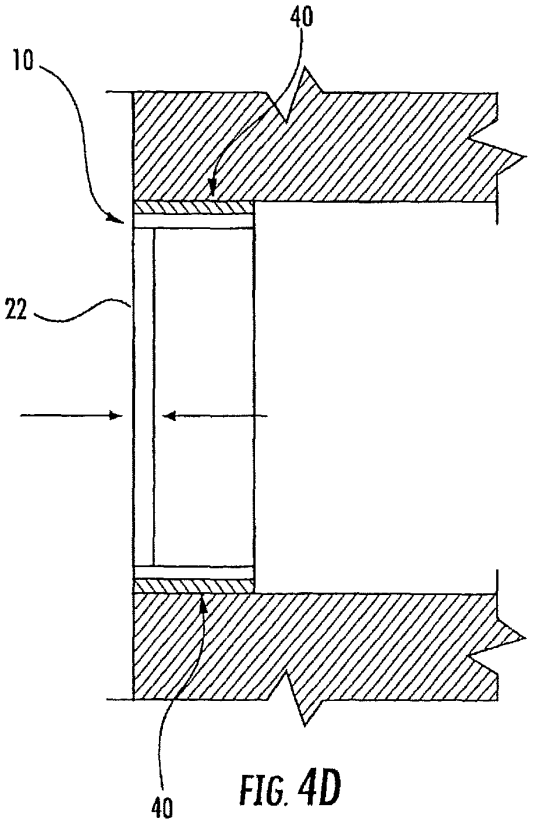

FIG. 4D

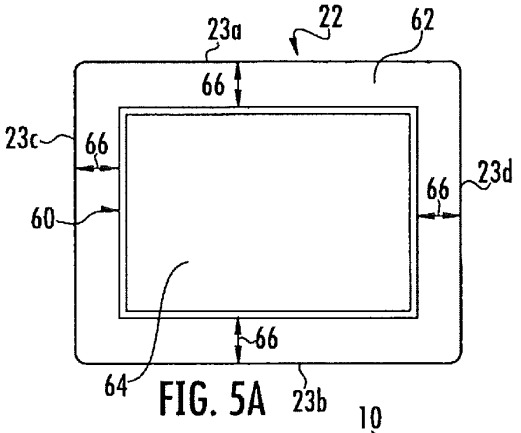

FIG. 5A

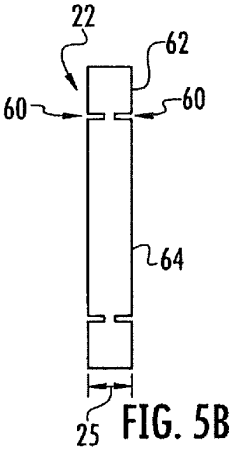

FIG. 5B

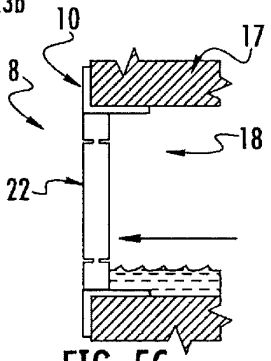

FIG. 5C

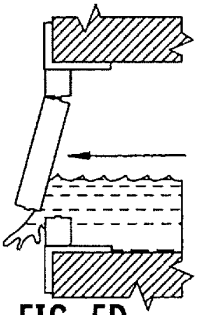

FIG. 5D

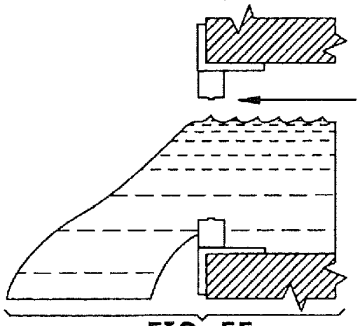

FIG. 5E

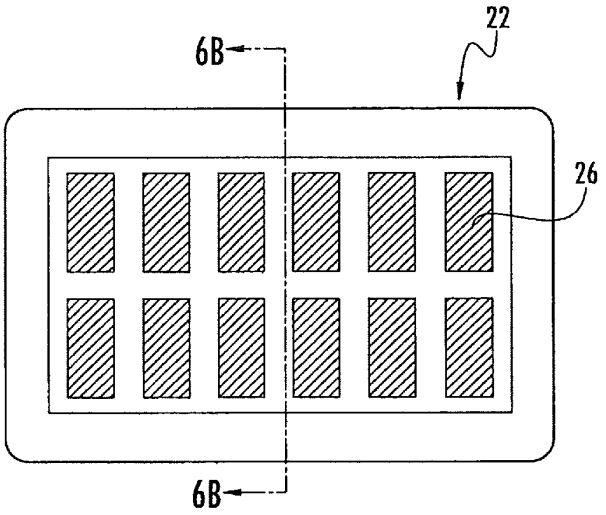

FIG. 6A

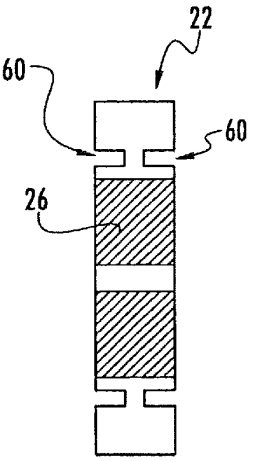

FIG. 6B

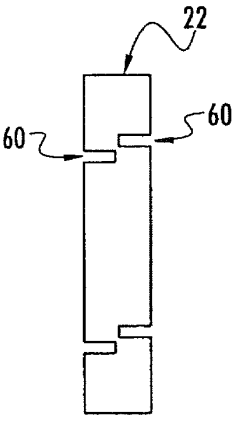

FIG. 6C

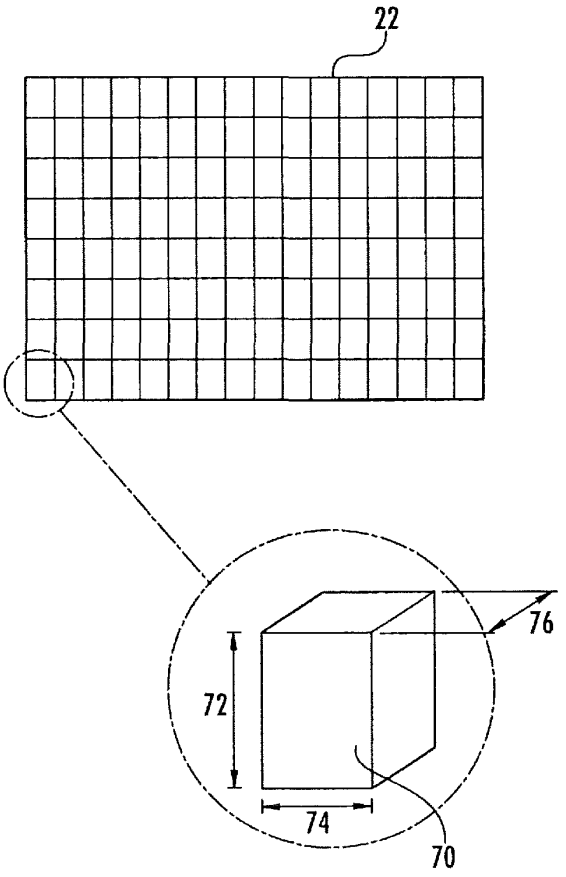

FIG. 7A

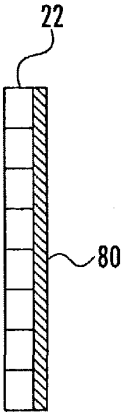

FIG. 7B

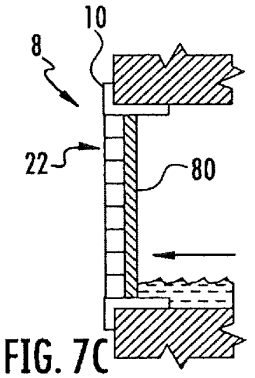

FIG. 7C

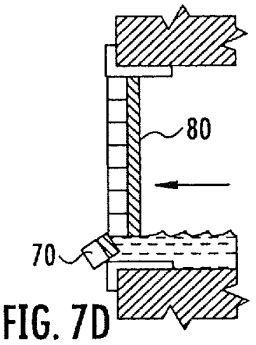

FIG. 7D

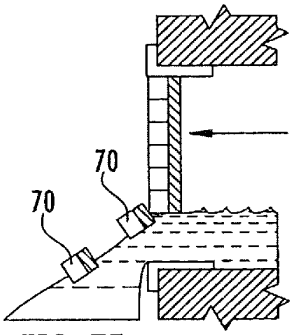

FIG. 7E

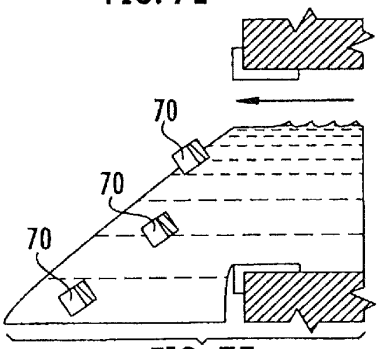

FIG. 7F

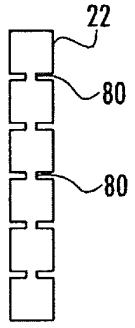

FIG. 7G

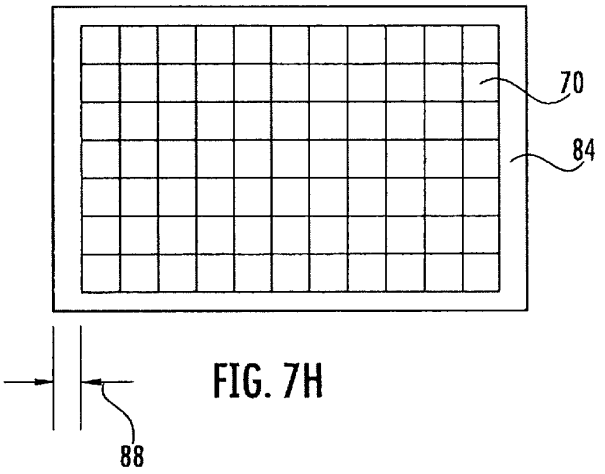

FIG. 7H

FLOOD VENT HAVING A PANEL

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation application and claims the benefit of the filing date under 35 U.S.C. § 120 of U.S. patent application Ser. No. 14/965,403, filed on Dec. 10, 2015, the entirety of which is incorporated herein by reference.

TECHNICAL FIELD

This disclosure relates generally to flood water control devices and more particularly to a flood vent having a panel.

BACKGROUND

Typically, one or more flood vents may be installed into an opening in a structure (such as a building) in order to provide for equalization of interior and exterior hydrostatic forces caused by flooding fluids, such as water. Such typical flood vents may include a screen or grille that may allow flooding fluids to pass into or out of the structure through the flood vent, but that may prevent animals or other pests from entering or exiting the structure through the flood vent. These typical flood vents, however, may be deficient.

SUMMARY

According to one embodiment, a flood vent includes a frame configured to form a fluid passageway through an opening in a structure. The flood vent further includes a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. The flood vent also includes one or more connectors configured to couple the panel to the frame. The one or more connectors are further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch (PSI) of pressure is applied to a portion of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes one or more connectors configured to uncouple the panel from the frame when a predetermined amount of pressure is applied to the panel, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel, and after the predetermined amount of pressure is applied to the panel, the panel may be uncoupled from the flood vent and may no longer prevent objects and/or fluids from passing through the flood vent (or the amount of blockage of the fluid passageway provided by the panel may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

According to another embodiment, a flood vent includes a frame configured to form a fluid passageway through an opening in a structure. The flood vent further includes a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. The flood vent also includes one or more connectors configured to couple the frame to the structure. The one or more connectors are further configured to uncouple the frame from the structure when 0.5-5.0 PSI of pressure is applied to one or more of a portion of the panel or a portion of the frame by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes one or more connectors configured to uncouple the frame from the structure when a predetermined amount of pressure is applied to the panel and/or the frame, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel and/or the frame, and after the predetermined amount of pressure is applied to the panel and/or the frame, the frame (along with the panel) may be uncoupled from the structure and the panel may no longer prevent objects and/or fluids from passing through the opening in the structure (or the amount of blockage of the fluid passing through the opening may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

According to a further embodiment, a flood vent panel includes a first area, a second area, and a first set of one or more perforations positioned on a first side of the flood vent panel in a location in-between the first area and the second area of the flood vent panel. The first set of one or more perforations are configured to break when at least a predetermined amount of pressure is applied to a portion of the second area of the flood vent panel. The flood vent panel is configured to be coupled, at least indirectly, to a structure so as to at least partially block a fluid passageway through an opening in the structure. The break is configured to completely separate the second area of the flood vent panel from the first area of the flood vent panel so as to reduce an amount of blockage of the fluid passageway provided by the flood vent panel.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes one or more perforations configured to uncouple at least a portion of the panel from the flood vent when a predetermined amount of pressure is applied to the panel, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel, and after the predetermined amount of pressure is applied to the panel, the at least a portion of the panel may be uncoupled from the flood vent and may no longer prevent objects and/or fluids from passing through the flood vent (or the amount of blockage of the fluid passageway provided by

the panel may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

According to a further embodiment, a flood vent panel includes a plurality of insulation pieces coupled together to form at least a portion of the flood vent panel. The flood vent panel further includes one or more insulation piece connectors coupled to the plurality of insulation pieces. The one or more insulation piece connectors are configured to couple the plurality of insulation pieces together to form the at least the portion of the panel. The flood vent panel is configured to be coupled, at least indirectly, to a structure, so as to at least partially block a fluid passageway through an opening in the structure. The one or more insulation piece connectors are further configured to uncouple one or more of the plurality of insulation pieces from the panel when at least a predetermined amount of pressure is applied to a portion of the flood vent panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the flood vent panel.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes a plurality of insulation pieces configured to form at least a portion of the panel, and one or more insulation piece connectors configured to uncouple one or more of the insulation pieces from the panel when a predetermined amount of pressure is applied to the panel, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel, and after the predetermined amount of pressure is applied to the panel, one or more of the insulation pieces of the panel may be uncoupled from the panel and may no longer prevent objects and/or fluids from passing through the flood vent (or the amount of blockage of the fluid passageway provided by the panel may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

Certain embodiments of the disclosure may include none, some, or all of the above technical advantages. One or more other technical advantages may be readily apparent to one skilled in the art from the figures, descriptions, and claims included herein.

BRIEF DESCRIPTION OF THE FIGURES

For a more complete understanding of the present disclosure and its features and advantages, reference is now made to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. **1**A illustrates a front view of a door of an example flood vent.

FIG. **1**B illustrates a side view of the door of FIG. **1**A.

FIG. **2**A illustrates a front view of an example flood vent inserted into an opening of a structure.

FIG. **2**B illustrates a cross-sectional view of an example flood vent inserted into an opening of a structure, taken along section line **2**-**2** of FIG. **2**A.

FIGS. **3**A-**3**C illustrate the flood vent of FIGS. **1**-**2** having a first example of connectors.

FIGS. **4**A-**4**D illustrate the flood vent of FIGS. **1**-**2** having a second example of connectors.

FIGS. **5**A-**6**C illustrate the flood vent of FIGS. **1**-**2** with a panel having example perforations.

FIGS. **7**A-**7**H illustrate the flood vent of FIGS. **1**-**2** with a panel having a plurality of insulation pieces and one or more insulation piece connectors.

DETAILED DESCRIPTION

Embodiments of the present disclosure are best understood by referring to FIGS. **1**-**7** of the drawings, like numerals being used for like and corresponding parts of the various drawings.

FIGS. **1**-**2** illustrate an example of a flood vent **8**. The flood vent **8** may be inserted (or otherwise installed) into an opening **18** in a structure **17**, such as an opening in a building, a wall, a foundation, a basement, a garage, a garage door, a foyer, an entry, any structure located below base flood plain levels, any other structure, or any combination of the preceding. The flood vent **8** may provide an entry point and/or exit point in the structure for flooding fluids, such as water. As such, the flood vent **8** may provide equalization of interior and exterior hydrostatic forces caused by the flooding fluids. In particular embodiments, the flood vent **8** may comply with various building code and federal government regulations that mandate that buildings with enclosed spaces located below base flood plain levels, such as crawl spaces, must provide for automatic equalization of interior and exterior hydrostatic forces caused by flooding fluids. According to these regulations, flooding fluids must be permitted to enter and exit the enclosed spaces freely using flood venting.

As illustrated, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing fluids to enter and/or exit the structure **17**. The frame **10** includes a top edge **11***a*, a bottom edge **11***b*, and two side edges **11***c* and **11***d* (not shown). The edges **11** may define an outer perimeter of the frame **10**. The frame **10** further includes a top rail **12***a*, a bottom rail **12***b*, and two side rails **12***c* and **12***d*. When the flood vent **8** is inserted (or otherwise installed) in the opening **18** in the structure **17**, the edges **11** of the frame **10** may be positioned (entirely or partially) within the opening **18** of the structure **17** (as is seen in FIG. **2**B), and the rails **12** may be positioned (entirely or partially) outside the opening **18** of the structure **17** (as is further seen in FIG. **2**B). The frame **10** also includes a top interior edge **13***a*, a bottom interior edge **13***b*, and two side interior edges **13***c* and **13***d* (not shown). The interior edges **13** of the frame **10** may define an inner perimeter of the frame **10**. Furthermore, although the flood vent **8** is illustrated as including a single frame **10** and a single panel **22**, the flood vent **8** may include multiple frames **10** and/or multiple panels **22**. For example, the flood vent **8** may include two frames **10** (or two or more frames **10**) stacked on top of each other (and coupled together), along with one or more panels **22** attached to each frame **10** (or a single panel **22** attached to multiple frames

10). As another example, the flood vent **8** may include two frames **10** (or two or more frames **10**) positioned horizontally next to each other (and coupled together), along with one or more panels **22** attached to each frame **10** (or a single panel **22** attached to multiple frames **10**). As a further example, the flood vent **8** may include two frames **10** (or two or more frames **10**) stacked on top of each other and two frames **10** (or two or more frames **10**) positioned horizontally next to each other (and these four or more frames **10** may be coupled together), along with one or more panels **22** attached to each frame **10** (or a single panel **22** attached to multiple frames **10**).

The frame **10** may have any shape. For example, the frame **10** may be rectangular-shaped. The frame **10** may also have any dimensions. For example, the top and bottom edges **11***a* and **11***b* may be approximately 16" long (16"+/−0.2"), and the side edges **11***c* and **11***d* may be approximately 8" long, thereby forming an 8"×16" rectangular outer perimeter. Furthermore, the top and bottom rails **12***a* and **12***b* may be approximately $17\frac{11}{16}$" long, and the side rails **12***c* and **12***d* may be approximately $9\frac{11}{16}$" long. Additionally, when two or more frames **10** are coupled together (as is discussed above), the flood vent **8** may have an outer perimeter of, for example, approximately 16"×16", 8"×32", 16"×32", or any other dimensions. The frame **10** may be formed (or made) of any material. For example, the frame **10** may be formed of a corrosion resistant material, such as stainless steel, spring steel, plastic, a polymer, cement, brick, any other corrosion resistant material, or any combination of the preceding.

The frame **10** may be configured to be inserted (or otherwise installed) into an opening **18** in any side of the structure **17**. For example, the opening **18** in the structure **17** may extend from the exterior of the structure **17** to the interior of the structure **17** (such as the interior of a building), thereby allowing fluids to enter and/or exit the structure **17**. The frame **10** of the air vent **8** may be inserted (or otherwise installed) on the exterior side of the structure **17** (for an exterior frame **10** for an exterior flood vent **8**, for example) or on the interior side of the structure **17** (for an interior frame **10** for an interior flood vent **8**, for example). As illustrated in FIGS. **1-2**, frame **10** is inserted on the exterior side of the structure **17**. Furthermore, frames **10** may be inserted (or otherwise installed) on both the exterior side of the structure **17** (for exterior frames **10**, for example) and the interior side of the structure **17** (for interior frames **10**, for example). Additionally, in particular embodiments, a sleeve may be positioned in-between an interior frame **10** and an exterior frame **10**. The sleeve may be configured to connect to the exterior frame **10** at a first end of the sleeve, extend through the opening **18** in the structure **17** to the interior frame **10**, and connect to the interior frame **10** at a second end of the sleeve. The sleeve may form a portion of the fluid passageway through the opening **18** in the structure **17**. For example, fluid such as water may enter the opening **18** in the structure **17** through exterior flood vent **8**, flow through the sleeve, and exit the opening **18** into the interior of the structure **17** (or vice versa). The sleeve may have any shape. For example, the sleeve may be a hollow rectangular sleeve. The sleeve may have any dimensions. For example, the sleeve may be sized to fit entirely within the opening **18**, connecting the exterior frame **10** to the interior frame **10**. The sleeve may be formed (or made) of any material. For example, the sleeve may be formed of a corrosion resistant material, such as stainless steel, spring steel, plastic, a polymer, cement, brick, any other corrosion resistant material, or any combination of the preceding.

The flood vent **8** further includes a panel **22**. The panel **22** may be configured to be coupled to the frame **10** (thereby coupling the panel **22** to the structure **17** indirectly). The panel **22** may be coupled to the frame **10** in any manner. For example, the panel **22** may be formed integral with the frame **10**, welded to the frame **10**, coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, attached to the frame **10** using one or more rivets, nails, and/or any other connector, attached to the structure **17** (and thus the frame **10**) using one or more rivets, nails, and/or any other connecter, coupled to the frame **10** in any other manner, or any combination of the preceding. The panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIGS. **2**A-**2**B. The panel **22** may block any portion of the fluid passageway formed by the frame **10**. For example, the panel **22** may block all of the fluid passageway (or completely block the fluid passageway) formed by the frame **10**, thereby preventing all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as preventing objects (such as small, animals) from passing through the panel **22**. As another example, the panel may block only a portion of the fluid passageway, thereby preventing (or substantially preventing) objects (such as small animals) from passing through the panel **22**, but allowing fluids (such as water and/or air) to pass through the panel **22**.

The panel **22** may be any type of panel. For example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**. In such an example, the panel **22** may be a mesh grille panel, a grate, any other panel with one or more openings **26**, or any combination of the preceding. The openings **26** may have any size and/or shape. In particular embodiments, the size of the openings **26** may be sufficiently small to prevent (or substantially prevent) objects, such as small animals, from passing through the panel **22**. The panel **22** may include any number of openings **26**, such as one opening **24**, two openings **26**, three openings **26**, four openings **26**, eight openings **26**, ten openings **26**, or any other number of openings **26**. The openings **26** may be completely open, or the openings **26** may be screened to prevent (or substantially prevent) penetration by small animals and/or insects.

As another example, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as preventing (or substantially preventing) objects (such as small animals) from passing through the panel **22**. As a further example, the panel **22** may be a screen (such as a fine mesh screen) configured to prevent (or substantially prevent) penetration by small animals and/or insects. As another example, the panel **22** may include one or more louvers (such as, for example, four louvers, or any other number of louvers) that may be opened to allow air to pass through the panel **22** (e.g., during warmer temperatures), and closed to prevent (or substantially prevent) air from passing through the panel **22** (e.g., during colder temperatures). Additionally, the louvered panel **22** may be screened to prevent (or substantially prevent) penetration by small animals and/or insects. Further details regarding louvers (and the operation

of such louvers) is included in U.S. Pat. No. 6,692,187 entitled "Flood Gate For Door," which is incorporated herein by reference.

The panel **22** includes a top edge **23***a*, a bottom edge **23***b*, and two side edges **23***c* and **23***d*. The edges **23** may define an outer perimeter of the panel **22**. The panel **22** further includes a first side **24***a* and a second side **24***b* positioned opposite of the first side **24***a*. As is illustrated, the first side **24***a* may be positioned to face the exterior of the structure **17**, and the second side **24***b* may be positioned to face the interior of the structure **17**. However, the first side **24***a* may face either the exterior of the structure **17** or the interior of the structure **17**, and the second side **24***b* may face either the exterior of the structure **17** or the interior of the structure **17**. The panel **22** may have any shape, and may also have any dimensions. For example, the panel **22** may have the same (or substantially the same) shape and/or dimensions as the inner perimeter of the frame **10**. As such, in particular embodiments, the panel **22** may be flush against the inner perimeter of the frame **10**. As another example, the panel **22** may have larger dimensions (or a different shape) than the inner perimeter of the frame **10**. As such, in particular embodiments, the panel **22** may be coupled to the exterior of the frame **10** (such as coupled to the rails **12**) or to the structure **17**. As a further example, the panel **22** may have smaller dimensions (or a different shape) than the inner perimeter of the frame **10**. As another example, the panel **22** may have an outer perimeter of, for example, approximately 7⅝"×15¾". The panel **22** may also have any thickness **25**. For example, panel **22** may have a thickness **25** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0", 4.0", or any other thickness **25**. The panel **22** may be formed (or made) of any material. For example, the panel **22** may be formed of a corrosion resistant material, such as stainless steel, spring steel, plastic, a polymer, cement, brick, any other corrosion resistant material, or any combination of the preceding.

As is discussed above, the flood vent **8** may be inserted (or otherwise installed) into an opening **18** in a structure **17**. The structure **17** may be any structure. For example, the structure may be a building, a wall, a foundation, a basement, a garage, a garage door, a foyer, an entry, any structure located below base flood plain levels, any other structure, or any combination of the preceding. The structure **17** may include one or more edges **19** that form an inner perimeter of the opening **18** in the structure **17**. The opening **18** may have any shape and/or dimensions for receiving the frame **10** (or frames **10**) of the flood vent **8**. For example, when the frame **10** has a rectangular outer perimeter of 8"×16", the opening **18** may have a rectangular inner perimeter of 8¼"×16¼". As another example, when the flood vent **8** has multiple frames **10** (as is discussed above) and a rectangular outer perimeter of 16"×32", the opening **18** may have a rectangular inner perimeter of 16⅜"×33". As such, the flood vent **8** may be inserted (or otherwise installed) into the opening **18** of the structure **17**. The opening **18** may be added to the structure **17** in any manner. For example, the opening **18** may be added (or cut into) the structure **17** after the structure **17** is already built. As another example, the opening **18** may be left in (or built into) the structure **17** as the structure **17** is being built. In such an example, the frame **10** of the flood vent **8** (or the entire flood vent **8**) may be built into the opening **18** of the structure **17** as the structure **17** is being built.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **1-2** without departing from the scope of the disclosure. For example, although the frame **10** of the flood vent **8** has been described above as including rails **12**, in particular embodiments, the frame **10** may not include any rails **12**. As another example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**. Furthermore, in such embodiments, the opening **18** (itself) may form the fluid passageway through the structure **17**.

As is discussed above, a flood vent may typically include a screen or grille that may allow flooding fluids to pass into or out of the structure through the flood vent, but that may prevent animals or other pests from entering or exiting the structure through the flood vent. Unfortunately, such typical flood vents may be deficient. For example, although the screen or grille of the flood vent may prevent objects from entering the flood vent, the screen or grille may also prevent fluids from sufficiently passing through the flood vent. In particular, during a flood event, a large quantity of water may attempt to pass through the flood vent. If openings in the screen or grille are not large enough (or if the flood vent does not have any openings or if the openings in the flood vent are not open), the water may be prevented from quickly passing through the flood vent, which may disrupt the equalization of interior and exterior hydrostatic forces caused by flooding waters. Furthermore, the water may be carrying various pieces of debris (such as tree limbs and dirt) that may clog the openings, preventing the flood vent from allowing any (or most) of the water to pass through the flood vent. Conversely, if the openings are too large, the openings may not prevent objects (such as small animals) from entering the flood vent. Contrary to these typical flood vents, FIGS. **3-7** illustrate examples of flood vents that may provide one or more advantages.

FIGS. **3A-3C** illustrate the flood vent **8** of FIGS. **1-2** having example connectors **30**. Connectors **30** may be configured to couple the panel **22** to the frame **10**. Furthermore, the connectors **30** may be further configured to uncouple the panel **22** from the frame **10**. For example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** when a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel **22** of flood vent **8** may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent **8** until a predetermined amount of pressure is applied to the panel **22**, and after the predetermined amount of pressure is applied to the panel **22**, the panel **22** may be uncoupled from the flood vent **8** and may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced). This may, in particular embodiments, allow the flood vent **8** to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings **26** in the panel **22**, when the openings **26** in the panel **22** are too small to allow sufficient fluids to pass through the flood vent **8**, when the openings **26** in the panel are closed, and/or when the panel **22** does not include any openings **26**.

As is discussed above with regard to FIGS. **1-2**, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby

allowing the flooding fluids to enter and/or exit the structure **17**. The panel **22** may be configured to be coupled to the frame **10**. Furthermore, the panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIG. **3**A. The panel **22** may be coupled to the frame **10** by one or more connectors **30**. The panel **22** may be any type of panel. For example, as is illustrated in FIGS. **3**A-**3**C, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as prevent (or substantially prevent) objects (such as small animals) from passing through the panel **22**. As another example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**.

A connector **30** may be any type of connector that may couple the panel **22** to the frame **10**, and that may further uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. As a first example, a connector **30** may be one or more raised bumps (or raised lips), as is illustrated in FIGS. **3**A-**3**C. The raised bumps may allow a panel **22** to be installed in the frame **10**, thereby coupling the panel **22** to the frame **10**, as is seen in FIG. **3**A. For example, an installer (such as a person) may push the panel **22** into the frame **10** with enough force to cause the panel **22** to move past the first set of raised bumps. In such an example, the panel **22** may then rest in a gap (or be sandwiched) in-between the first set of bumps and a second set of bumps (as is seen in FIG. **3**A), thereby coupling the panel **22** to the frame **10**. Furthermore, the raised bumps may continue to couple the panel **22** to the frame **10** until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the panel **22** may be forced past a set of the raised bumps, as is seen in FIG. **3**B. This may uncouple the panel **22** from the frame **10**, causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**, as is seen in FIG. **3**C. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a second example, a connector **30** may be one or more pieces of velcro configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The pieces of velcro may include, for example, one or more first pieces of velcro that are coupled to the frame **10** and/or the structure **17**, and one or more second pieces of velcro that are coupled to the panel **22**. The first pieces of velcro may be further coupled to the second pieces of velcro, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the pieces of velcro may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the coupling between the pieces of velcro may be broken. This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a third example, a connector **30** may be one or more mechanical fasteners configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The mechanical fasteners may include any one or more devices and/or objects that may mechanically fasten the panel **22** to the frame **10** (and/or the structure **17**), such as one or more nails, screws, rivets, nuts and bolts, rods and studs, anchors, pins, retaining rings and/or clips, any other devices that may mechanically fasten the panel **22** to the frame **10** (and/or the structure **17**), or any combination of the preceding. Furthermore, the mechanical fasteners may be configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the mechanical fasteners may be configured to break or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the mechanical fasteners may be engineered and/or modified to break or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**.

The mechanical fasteners may include one or more mechanical fasteners coupled to the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the mechanical fasteners may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the mechanical fasteners may break or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a fourth example, a connector **30** may be an adhesive configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The adhesive may include any adhesive substance that may adhere the panel **22** to the frame **10** (and/or the structure **17**), such as glue, cement, Lexel® adhesive, any other adhesive substance that may adhere the panel **22** to the frame **10** (and/or the structure **17**), or any combination of the preceding. Furthermore, the adhesive may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the adhesive may be configured to peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the adhesive may be engineered and/or modified to peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example,

a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of adhesive used to adhere the panel **22** to the frame **10** (and/or frame **10** and/or structure **17**) may be selected to cause the adhesive to peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**.

The adhesive may include one or more portions of the adhesive coupled to the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the portions of the adhesive may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the adhesive may peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a fifth example, a connector **30** may be one or more pressure-based connectors configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The pressure-based connectors may include any type of connector that may apply pressure (or otherwise utilize pressure) to couple the panel **22** to the frame **10** (and/or the structure **17**). As an example, the pressure-based connectors may be a pressure-based clip (such as a spring clip) configured to fit in-between the edges **23** of the panel **22** and the inner edges **13** of the frame **10**. In such an example, when the panel **22** is installed into the frame **10** (or the opening **18**), the pressure-based connectors may be compressed by the edge **23** of the panel **22** and the edge **13** of the frame **10** (or the edge **19** of the opening **18**), thereby causing the pressure-based connectors to push outward against the edge **13** of the frame **10** and inward against the edge **23** of the panel **22**. Such pressure applied by the pressure-based connectors (along with friction, in particular embodiments) may at least couple the panel **22** to the frame **10**. Furthermore, although the pressure-based connectors have been described above as being a separate component from the panel **22**, in particular embodiments, the pressure-based connectors may be the panel **22** (or part of the panel **22**), itself. For example, the panel **22** may have dimensions larger than the inner perimeter of the frame **10**. In such an example, inserting the panel **22** may cause the edges **23** and/or corners of the panel **22** to be bent in (or out) against the frame **10**, thereby applying pressure that may couple the panel **22** to the frame **10** (or the structure **17**). The pressure-based connectors may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the pressure-based connectors may be configured to break, slip off, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of pressure applied by the pressure-based connectors may be configured to be overcome by the predetermined amount of pressure applied to the panel **22** by, for example, the fluid.

The pressure-based connectors may include one or more pressure-based connectors coupled to (and/or applying pressure to) the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the pressure-based connectors may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the pressure-based connectors may break, slip off, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a sixth example, a connector **30** may be one or more permanent attachments configured to couple the panel **22** to the frame **10**, and that may be further configured to break (or otherwise fail) so as to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The permanent attachment may include any one or more attachments that may permanently couple (and/or fixedly couple and/or couple in a manner that requires a break or a failure in order to uncouple) the panel **22** to the frame **10** (and/or the structure **17**), such as a weld, the panel **22** being formed integral with the frame **10**, any other attachment, or any combination of the preceding. Furthermore, the permanent attachments may be configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the permanent attachments may be configured to break, fail, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the permanent attachments may be engineered and/or modified to break, fail, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the permanent attachments (such as a weld) may include one or more engineered defects that may cause them to break or fail. As another example, a pressure (or stress) may be constantly applied to the permanent attachments, thereby causing the additional predetermined amount of pressure to cause the permanent attachments to break or fail.

The permanent attachments may include one or more permanent attachments coupled to the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the permanent attachments may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the permanent attachments may break, fail, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids

from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

The flood vent **8** may include any number of connectors **30**. For example, the flood vent **8** may include one connector **30**, two connectors **30**, three connectors **30**, four connectors **30**, six connectors **30**, eight connectors **30**, ten connectors **30**, or any other number of connectors **30**. The connectors **30** may be attached or otherwise coupled to any portion of the panel **22**, frame **10**, and/or structure **17**. For example, the connectors **30** may be attached to the edges **23** of the panel **22** and/or the edges **13** of the frame **10**. As another example, the connectors **30** (such as screws) may be positioned through one or more holes (such as one or more screw holes) in side **24***a* (for example) of the panel **22**, and inserted into one or more holes in the frame **10** and/or the structure **17**, thereby coupling the panel **22** to the frame **10** and/or the structure **17**. The connectors **30** may be added to (or otherwise coupled) to the panel **22** (and/or frame **10** and/or structure **17**), the connectors **30** may be formed integral with (or formed as a part of) the panel **22** (and/or frame **10** and/or structure **17**), or any combination of the preceding.

The connectors **30** may have any size and/or shape that may allow the connectors **30** to uncouple the panel **22** when a predetermined amount of pressure is applied to the panel **22**. For example, the length of the connectors **30** (such as one or more mechanical fasteners) may be selected to cause the connectors **30** to break, fail, or otherwise uncouple the panel **22** when the predetermined amount of pressure is applied to the panel **22**. The connectors **30** may be formed from any material that may allow the connectors **30** to uncouple the panel **22** when a predetermined amount of pressure is applied to the panel **22**. For example, the connectors **30** may be formed from rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized material, any other metal, or any combination of the preceding), any other material that may allow the connectors **30** to uncouple the panel **22** when a predetermined amount of pressure is applied to the panel **22**, or any combination of the preceding. In particular, the connectors **30** (such as one or more mechanical fasteners) may be formed from a particular plastic (for example) that causes the mechanical fasteners to break or fail when the predetermined amount of pressure is applied to the panel **22**.

As is discussed above, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+/−0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 0.1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**). For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22**, the connectors **30** may not uncouple the panel **22** from the frame **10** (and/or structure). On the other hand, if an amount of pressure equal to the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22**, the connectors **30** may uncouple the panel **22** from the frame **10** (and/or structure **17**).

In particular embodiments, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to any portion of the panel **22**. For example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to a bottom portion of the panel **22**, a top portion of the panel **22**, a left and/or right side portion of the panel **22**, any other portion of the panel **22**, or any combination of the preceding. In particular embodiments, the predetermined amount of pressure for causing the connectors **30** to uncouple the panel **22** from the frame **10** (and/or structure **17**) may change based on (or be a function of) the portion of the panel **22** to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel **22** (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel **22** (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the connectors **30** to uncouple the panel **22** from the frame **10** (and/or structure **17**) may change based on (or be a function of) the type of panel **22** included in the flood vent **8**. For example, the predetermined amount of pressure may be less if the panel **22** is a panel without any openings **26** (or with openings that may be closed, using louvers, for example) than if the panel **22** includes openings **26** that may not be closed (or if the panel **22** is a screen). In such an example, a panel **22** without openings **26** (when compared to a panel **22** with openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** without openings **26** at a lower amount of pressure (when compared to a panel **22** with openings **26**). As another example, the predetermined amount of pressure may be less if the panel **22** is a panel with less openings **26** (and/or with smaller openings **26**) than if the panel **22** includes more openings **26** (and/or has bigger openings **26**). In such an example, a panel **22** with less openings **26** (when compared to a panel **22** with more openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** with less openings **26** at a lower amount of pressure (when compared to a panel **22** with more openings **26**).

In particular embodiments, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to any side of the panel **22**. For example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**), thereby causing the panel **22** to be uncoupled from the frame **10** and be carried by the fluids, for example, outside of the structure **17**, as is illustrated in FIGS. **3**A-**3**C. In particular embodiments, this may cause panel **22** to be uncoupled from the frame **10** (and/or structure **17**) when flooding fluids, for example, enter the flood vent **8** from inside the structure **17**. As another example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), thereby causing the panel **22** to be uncoupled from the frame **10** and be carried by the fluids, for example, inside of the structure **17** (e.g., in a direction from left-to-right in FIGS. **3**A-**3**C). In particular embodiments, this may cause panel **22** to be uncoupled from the frame **10** (and/or structure **17**) when flooding fluids, for example, enter the flood vent **8** from outside the structure **17**. As a further example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to either the side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**) or the side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**). In particular embodiments, this may cause panel **22** to be uncoupled from the frame **10** (and/or structure **17**) when flooding fluids, for example, enter the flood vent **8** from either inside the structure **17** or outside the structure **17**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **3**A-**3**C without departing from the scope of the disclosure. For example, although the panel **22** has been described above as being entirely uncoupled from the frame **10** (and/or structure **17**), in particular embodiments, only a portion of the panel **22** may be uncoupled from the frame **10** (and/or structure **17**). In such an example, a first portion of the panel **22** (e.g., an inner area of the panel **22**) may be uncoupled from the frame **10** (and/or structure **17**) when the predetermined amount of pressure is applied to the panel **22** (and/or the first portion of the panel **22**), while the second portion of the panel **22** (e.g., an outer area of the panel **22**) may remain coupled to the frame **10** (and/or structure **17**). Furthermore, in such an example, connectors **30** may be configured to couple the first portion of the panel **22** to the second portion of the panel **22** (and/or the frame **10** and/or the structure **17**). As another example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**, and the connector(s) **30** may couple the panel **22** directly to the structure **17**.

FIGS. **4**A-**4**D illustrate the flood vent **8** of FIGS. **1**-**2** having example connectors **40**. Connectors **40** may be configured to couple the frame **10** to the structure **17**. Furthermore, the connectors **40** may be further configured to uncouple the frame **10** from the structure **17**. For example, the connectors **40** may be configured uncouple the frame **10** from the structure **17** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel **22** of flood vent **8** may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent **8** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, and after the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the frame **10** (along with the panel **22**) may be uncoupled from the structure **17** and the panel **22** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced). This may, in particular embodiments, allow the flood vent **8** to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings **26** in the panel **22**, when the openings **26** in the panel **22** are too small to allow sufficient fluids to pass through the flood vent **8**, when the openings **26** in the panel are closed, and/or when the panel **22** does not include any openings **26**.

As is discussed above with regard to FIGS. **1**-**2**, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing the flooding fluids to enter and/or exit the structure **17**. The frame **10** may be coupled to the structure **18** using one or more connectors **40**. The flood vent **8** further includes the panel **22**. The panel **22** may be configured to be coupled to the frame **10**. Furthermore, the panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIGS. **4**A-**4**B. The panel **22** may be coupled to the frame **10** in any manner. For example, the panel **22** may be formed integral with the frame **10**, welded to the frame **10**, coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, attached to the frame **10** using one or more rivets, nails, and/or any other connector, coupled to the frame **10** in any other manner, or any combination of the preceding. The panel **22** may be any type of panel. For example, as is illustrated in FIGS. **4**A-**4**B, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as preventing (or substantially preventing) objects (such as small animals) from passing through the panel **22**. As another example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**.

A connector **40** may be any type of connector that may couple the frame **10** to the structure **17**, and that may further uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or frame **10**. As a first example, a connector **40** may be an adhesive configured to couple the frame **10** to the structure **17**, and that may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The adhesive may include

any adhesive substance that may adhere the frame **10** to the structure **17**, such as glue, cement, Lexel® adhesive, any other adhesive substance that may adhere the frame **10** to the structure **17**, or any combination of the preceding. Furthermore, the adhesive may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the adhesive may be configured to peel off, break, or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the adhesive may be engineered and/or modified to peel off, break, or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the amount of adhesive used to adhere the frame **10** to the structure **17** may be selected to cause the adhesive to peel off, break, or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

The adhesive may include one or more portions of the adhesive coupled to the frame **10** and/or the structure **17**, thereby coupling the frame **10** to the structure **17**, as is illustrated in FIG. **4**A. Furthermore, the portions of the adhesive may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the adhesive may peel off, break, or otherwise uncouple from the panel **22** and/or the structure **17**, as is seen in FIG. **4**B. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**, as is seen in FIG. **4**C. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a second example, a connector **40** may be one or more raised bumps (or raised lips) in the opening **18** of the structure **17**. The raised bumps may allow a frame **10** to be installed in the opening **18**, thereby coupling frame **10** to the structure **17**. For example, an installer (such as a person) may push the frame **10** into the opening **18** with enough force to cause the frame **10** to move past the first set of raised bumps. In such an example, the frame **10** may then rest in a gap in-between (or sandwiched by) the first set of bumps and a second set of bumps, thereby coupling the frame **10** to the structure **17**. Furthermore, the raised bumps may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the frame **10** may be forced past a set of the raised bumps. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a third example, a connector **40** may be one or more pieces of velcro configured to couple the frame **10** to the structure **17**, and that may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The pieces of velcro may include, for example, one or more first pieces of velcro that are coupled to the frame **10**, and one or more second pieces of velcro that are coupled to the structure **17**. The first pieces of velcro may be coupled to the second pieces of velcro, thereby coupling the frame **10** to the structure **17**. Furthermore, the pieces of velcro may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the coupling between the pieces of velcro may be broken. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a fourth example, a connector **40** may be one or more mechanical fasteners configured to couple the frame **10** to the structure **17**, and that may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The mechanical fasteners may include one or more devices that may mechanically fasten the frame **10** to the structure **17**, such as one or more nails, screws, rivets, nuts and bolts, rods and studs, anchors, pins, retaining rings and/or clips, any other devices that may mechanically fasten the frame **10** to the structure **17**, or any combination of the preceding. Furthermore, the mechanical fasteners may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the mechanical fasteners may be configured to break or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the mechanical fasteners may be engineered and/or modified to break or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

The mechanical fasteners may include one or more mechanical fasteners coupled to the frame **10** and/or the structure **17**, thereby coupling the frame **10** to the structure **17**. Furthermore, the mechanical fasteners may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the mechanical fasteners may break or otherwise uncouple from the frame **10** and/or structure **17**. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a fifth example, a connector **40** may be one or more pressure-based connectors configured to couple the frame **10** to the structure **17**, and that may be further configured to

uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The pressure-based connectors may include any type of connector that may apply pressure (or otherwise utilize pressure) to couple the frame **10** to the structure **17**. As an example, the pressure-based connectors may be a pressure-based clip (such as a spring clip) configured to fit in-between the outer edges **11** of the frame **10** and the edges **19** of the opening **18**. In such an example, when the frame **10** is installed into the opening **18**, the pressure-based connectors may be compressed by the outer edges **11** of the frame **10** and the edges **19** of the opening **18**, thereby causing the pressure-based connectors to push outward against the edges **19** of the opening **18** and inward against the outer edges **11** of the frame **10**. Such pressure applied by the pressure-based connectors (along with friction, in particular embodiments) may at least couple the frame **10** to the structure **17**. Furthermore, although the pressure-based connectors have been described above as being a separate component from the frame **10**, in particular embodiments, the pressure-based connectors may be a part of the frame **10**, itself. For example, the pressure-based connectors may be formed integral with (or as a portion of) the frame **10**.

The pressure-based connectors may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the pressure-based connectors may be configured to break, slip off, or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the amount of pressure applied by the pressure-based connectors may be configured to be overcome by the predetermined amount of pressure applied to the panel **22** and/or the frame **10** by, for example, the fluid.

The pressure-based connectors may include one or more pressure-based connectors coupled to (and/or applying pressure to) the frame **10** and/or the structure **17**, thereby coupling the frame **10** to the structure **17**. Furthermore, the pressure-based connectors may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the pressure-based connectors may break, slip off, or otherwise uncouple from the frame **10** and/or structure **17**. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

The flood vent **8** may include any number of connectors **40**. For example, the flood vent **8** may include one connector **40**, two connectors **40**, three connectors **40**, four connectors **40**, six connectors **40**, eight connectors **40**, ten connectors **40**, or any other number of connectors **40**. The connectors **40** may be attached or otherwise coupled to any portion of the frame **10** and/or structure **17** (and/or the panel **22**). For example, the connectors **40** may be attached to the edges **11** of the frame **10** and/or the edges **19** of the opening **18** of the structure **17**. As another example, the connectors **40** (such as screws) may be positioned through one or more holes (such as one or more screw holes) in rails **12** (for example) of the frame **10**, and inserted into one or more holes in the structure **17**, thereby coupling the frame **10** to the structure **17**. The connectors **40** may be added to (or otherwise be coupled to) the frame **10** (and/or structure **17** and/or the panel **22**), the connectors **40** may be formed integral with (or formed as a part of) the frame **10** (and/or the panel **22**), or any combination of the preceding.

The connectors **40** may have any size and/or shape that may allow the connectors **40** to uncouple the frame **10** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the length of the connectors **40** (such as one or more mechanical fasteners) may be selected to cause the connectors **40** to break, fail, or otherwise uncouple the frame **10** when the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The connectors **40** may be formed from any material that may allow the connectors **40** to uncouple the frame **10** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the connectors **40** may be formed from rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized material, any other metal, or any combination of the preceding), an adhesive, any other material that may allow the connectors **40** to uncouple the frame **10** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, or any combination of the preceding. In particular, the connectors **40** (such as one or more mechanical fasteners) may be formed from a particular plastic (for example) that causes the mechanical fastener to break or fail when the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

As is discussed above, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+/−0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 0.1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the connectors **40** may be configured to uncouple the frame **10** from the structure **17**. For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the connectors **40** may not uncouple

the frame **10** from the structure **17**. On the other hand, if an amount of pressure equal to the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22** and/or the frame **10**, the connectors **40** may uncouple the frame **10** from the structure **17**.

In particular embodiments, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to any portion of the panel **22** and/or frame **10**. For example, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to a bottom portion of the panel **22** (and/or the frame **10**), a top portion of the panel **22** (and/or the frame **10**), a left and/or right side portion of the panel **22** (and/or the frame **10**), any other portion of the panel **22** (and/or the frame **10**), or any combination of the preceding. In particular embodiments, the predetermined amount of pressure for causing the connectors **40** to uncouple the frame **10** from the structure **17** may change based on (or be a function of) the portion of the panel **22** (and/or the frame **10**) to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel **22** (and/or the frame **10**) (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel **22** (and/or the frame **10**) (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the connectors **40** to uncouple the frame **10** from the structure **17** may change based on (or be a function of) the type of panel **22** included in the flood vent **8**. For example, the predetermined amount of pressure may be less if the panel **22** is a panel without any openings **26** (or with openings **26** that may be closed, using louvers, for example) than if the panel **22** includes openings **26** that may not be closed (or if the panel **22** is a screen). In such an example, a panel **22** without openings **26** (when compared to a panel **22** with openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** without openings **26** at a lower amount of pressure (when compared to a panel **22** with openings **26**). As another example, the predetermined amount of pressure may be less if the panel **22** is a panel with less openings **26** (and/or with smaller openings **26**) than if the panel **22** includes more openings **26** (and/or has bigger openings **26**). In such an example, a panel **22** with less openings **26** (when compared to a panel **22** with more openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** with less openings **26** at a lower amount of pressure (when compared to a panel **22** with more openings **26**).

In particular embodiments, the connectors **40** may be configured to uncouple the panel **22** from the frame if the predetermined amount of pressure is applied to any side of the panel **22**. For example, the connectors **40** may be configured to uncouple the panel **22** from the frame if the predetermined amount of pressure is applied to side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**), thereby causing the frame **10** to be uncoupled from the structure **17** and be carried by the fluids, for example, outside of the structure **17**, as is illustrated in FIGS. **4**A-**4**C. In particular embodiments, this may cause the frame **10** to be uncoupled from the structure **17** when flooding fluids, for example, enter the flood vent **8** from inside the structure **17**. As another example, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to side **24***a* the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), thereby causing the frame **10** to be uncoupled from the structure **17** and be carried by the fluids, for example, inside of the structure **17** (e.g., in a direction from left-to-right in FIGS. **4**A-**4**C). In particular embodiments, this may cause the frame **10** to be uncoupled from the structure **17** when flooding fluids, for example, enter the flood vent **8** from outside the structure **17**. Furthermore, in such embodiments, the frame **10** may not include rails **12** that may prevent the frame **10** from being carried inside of the structure **17**. As a further example, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to either the side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**) or the side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), as is illustrated in FIG. **4**D. In particular embodiments, this may cause the frame **10** to be uncoupled from the structure **17** when flooding fluids, for example, enter the flood vent **8** from either inside the structure **17** or outside the structure **17**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **4**A-**4**C without departing from the scope of the disclosure. For example, the flood vent **8** of FIGS. **4**A-**4**C may include one or more components of the flood vent **8** of FIGS. **3**A-**3**C. In such an example, the flood vent **8** may include one or more connectors **30** that may be configured to uncouple the panel **22** from the frame **10** (and/or the structure **17**) when a first predetermined amount of pressure is applied to the panel **22** (as is discussed above with regard to FIGS. **3**A-**3**C), and may further include one or more connectors **40** that may be configured to uncouple the frame **10** from the structure **17** when a second predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The first predetermined amount of pressure (which may uncouple the panel **22** from the frame **10** and/or structure **17**) may be less than the second predetermined amount of pressure (which may uncouple the frame **10** from the structure **17**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above) while the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, the panel **22** may be uncoupled from the frame **10** and/or the structure (which may reduce the amount of blockage of the fluid passageway provided by the panel **22**). Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the frame **10** (and/or the remainder of the panel **22**, if any), the frame **10** may be uncoupled from the structure **17** (which may further reduce the amount of blockage of the fluid). As such, the flood vent **8** may be able to further provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

FIGS. **5**A-**6**C illustrate the flood vent **8** of FIGS. **1**-**2** with a panel **22** having example perforations **60**. Perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8**. For example, the perforations **60** may be configured to uncouple at least a portion of the panel

22 from the flood vent 8 when a predetermined amount of pressure is applied to the panel 22, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel 22 of flood vent 8 may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent 8 until a predetermined amount of pressure is applied to the panel 22, and after the predetermined amount of pressure is applied to the panel 22, the at least a portion of the panel 22 may be uncoupled from the flood vent 8 and may no longer prevent objects and/or fluids from passing through the flood vent 8 (or the amount of blockage of the fluid passageway provided by the panel 22 may be reduced). This may, in particular embodiments, allow the flood vent 8 to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings 26 in the panel 22, when the openings 26 in the panel 22 are too small to allow sufficient fluids to pass through the flood vent 8, when the openings 26 in the panel are closed, and/or when the panel 22 does not include any openings 26.

As is discussed above with regard to FIGS. 1-2, the flood vent 8 includes a frame 10 and a panel 22. The frame 10 may be configured to be inserted into an opening 18 in a structure 17, and may be further configured to form a fluid passageway through the opening 18 in the structure 17, thereby allowing the flooding fluids to enter and/or exit the structure 17. The panel 22 may be configured to be coupled to the frame 10. Furthermore, the panel 22 may be configured to be coupled to the frame 10 in the fluid passageway formed by the frame 10. Additionally, when coupled to the frame 10, the panel 22 may at least partially block the fluid passageway formed by the frame 10, an example of which is seen in FIG. 5C. The panel 22 may be coupled to the frame 10 in any manner. For example, the panel 22 may be formed integral with the frame 10, welded to the frame 10, coupled to the frame 10 using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame 10 using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame 10, attached to the frame 10 using one or more rivets, nails, and/or any other connector, attached to the structure 17 (and thus the frame 10) using one or more rivets, nails, and/or any other connector, coupled to the frame 10 in any other manner, or any combination of the preceding. The panel 22 may be any type of panel. For example, as is illustrated in FIGS. 5A-5E, the panel 22 may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel 22, as well as prevent (or substantially prevent) objects (such as small animals) from passing through the panel 22. As another example, as is illustrated in FIGS. 6A-6B, the panel 22 may include one or more openings 26 configured to allow fluids (such as water and/or air) to pass through the panel 22, but prevent objects (such as small animals) from passing through the panel 22.

As illustrated, the panel 22 includes one or more perforations 60 configured to uncouple at least a portion of the panel 22 from the flood vent 8 when, for example, a predetermined amount of pressure is applied to the panel 22, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. A perforation 60 may be any type of characteristic or feature of the panel 22 that may uncouple at least a portion of the panel 22 from the flood vent 8 when, for example, a predetermined amount of pressure is applied to the panel 22. For example, a perforation 60 may be any type of reduction in the thickness 25 (or any other dimension) of the panel 22 at one or more points on the panel 22, which may cause the panel 22 to break or fail at the perforation 60 when, for example, a predetermined amount of pressure is applied to the panel 22. In such an example, a perforation 60 may be a cut-out of the material of the panel 22 (as is illustrated in FIG. 5B), a stamp in the material of the panel 22, one or more channels in the panel 22, any other feature that may reduce the thickness 25 (or any other dimension) of the panel 22 at one or more points on the panel 22, or any combination of the preceding. As another example, a perforation 60 may be one or more holes (or one or more rows of holes) in the panel 22, which may cause the panel 22 to break or fail at the perforation 60 when, for example, a predetermined amount of pressure is applied to the panel 22. As a further example, a perforation 60 may be a pre-stressed portion (or weak portion) of the panel 22, which may cause the panel 22 to break or fail at the perforation 60 when, for example, a predetermined amount of pressure is applied to the panel 22. As another example, a perforation 60 may be a pre-cut portion of the panel 22, which may cause the panel 22 to break or fail at the perforation 60 when, for example, a predetermined amount of pressure is applied to the panel 22. As a further example, a perforation 60 may be a combination of one or more (or all of) a reduction in the thickness 25 (or any other dimension) of the panel 22 at one or more points on the panel 22, one or more holes (or one or more rows of holes) in the panel 22, a pre-stressed portion (or weak portion) of the panel 22, a pre-cut portion of the panel 22, or any other characteristic or feature of the panel 22 that may uncouple at least a portion of the panel 22 from the flood vent 8.

The perforations 60 may be configured to uncouple any portion of the panel 22 from the flood vent 8. As a first example, the perforations 60 may be positioned so as uncouple the entire panel 22 from the frame 10. In such an example, the perforations 60 may positioned at any location that couples the panel 22 to the frame 10, such as at the edges 23 of the panel 22. The perforations 60 may couple the panel 22 to the frame 10 until a predetermined amount of pressure is applied to the panel 22 by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel 22, the perforations 60 may break or fail. This may uncouple the panel 22 from the frame 10, causing the panel 22 to be completely separated from the frame 10, and be carried away from the frame 10. As such, in particular embodiments, the flood vent 8 may no longer prevent objects and/or fluids from passing through the opening 18 in the structure 17 (or the amount of blockage of the fluid passageway provided by the panel 22 may be reduced).

As a second example, the perforations 60 may be positioned so as uncouple a portion of the panel 22 from another portion of the panel 22. For example, as is illustrated in FIGS. 5A-5E, the panel 22 may include a first portion 62 of the panel 22 and a second portion 64 of the panel 22. Furthermore, perforations 60 may be located in-between the first portion 62 and the second portion 64. As such, the perforations 60 (and/or the area that includes the perforations 60) may couple the second portion 64 to the first portion 62 of the panel 22 until a predetermined amount of pressure is applied to the panel 22 (such as the second portion 64 of the panel) by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel 22, the perforations 60 may break or fail. This break or failure may uncouple the second portion 64 of the panel 22 from the first portion 62 of the panel 22, causing the second portion 64 to be completely separated from the first portion 62, and be carried away from the first

portion **62**, as is illustrated in FIGS. **5**C-**5**E. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

The first portion **62** of the panel **22** may include any area of the panel **22**, and the second portion **64** of the panel **22** may include any area of the panel. As one example, the first portion **62** of the panel **22** may be an outer area of the panel **22**, and the second portion of the panel **22** may be an inner area of the panel **22** that is surrounded (at least partially) be the outer area of the panel **22**, as is illustrated in FIGS. **5**A-**5**B. As another example, the first portion **62** of the panel **22** may be an inner area of the panel **22**, and the second portion of the panel **22** may be an outer area of the panel **22** that surrounds (at least partially) the inner area of the panel **22**. As another example, the first portion **62** of the panel **22** may be a left-side area (or a right-side area, or a top-side area, or a bottom-side area) of the panel **22**, and the second portion of the panel **22** may be a right-side area (or a left-side area, or a top-side area, or a bottom-side area) of the panel **22**. The first portion **62** of the panel **22** may be any type of panel, and the second portion **64** of the panel **22** may be any type of panel. For example, the first portion **62** of the panel **22** may be a solid panel, and the second portion **64** of the panel **22** may include one or more openings **26**, as is illustrated in FIGS. **6**A-**6**B. As another example, the first portion **62** of the panel **22** may be a solid panel, and the second portion **64** of the panel **22** may be a screen. As a further example, both the first portion **62** and the second portion **64** of the panel **22** may be solid panels, screens, or panels with one or more openings **26**.

The perforations **60** may be located at any position on the panel **22**. In particular embodiments, the location of the perforations **60** may be based on the edges **23** of the panel **22**. For example, the perforations **60** (or the portions of a perforation **60**) may be located a perforation distance **66** from the respective edges **23**. The perforation distance **66** may be any distance, such as 0.15", 0.25", 0.5", 0.75", 1", 1.5", 2", 3", 4", less than 0.5", less than 0.75", less than 1", less than 1.5", less than 2", less than 3", less than 4", or any other distance. The perforation distance **66** may be the same for each perforation **60** (or for each portion of a perforation **60**), or the perforation distance **66** may be different for one or more of the perforations **60** (or for one or more portions of a perforation **60**).

The flood vent **8** may include any number of perforations **60**. For example, the flood vent **8** may include one perforation **60**, two perforations **60**, three perforations **60**, four perforations **60**, six perforations **60**, eight perforations **60**, ten perforations **60**, or any other number of perforations **60**. The perforations **60** may be included on a single side of the panel **22** (such as side **24***a* of the panel **22** or side **24***b* of the panel **22**) or may be included on both sides of the panel **22** (such as on both sides **24***a* and **24***b* of the panel **22**). Furthermore, when perforations **60** are included on both sides of the panel **22**, the perforations **60** may be located in the same location of the panel **22** on both sides of the panel **22** (as is illustrated in FIGS. **5**B and **6**B), or the perforations **60** may be located in different locations of the panel **22** (or otherwise be off-center from each other), as is illustrated in FIG. **6**C. The perforations **60** may be positioned in any pattern on the panel **22**. For example, the perforations **60** may completely surround the portion of the panel **22** that is uncoupled from the flood vent **8**, as is illustrated in FIGS. **5**A-**5**E. As another example, the perforations **60** may at least substantially surround the portion of the panel **22** that is uncoupled from the flood vent **8** (i.e., the perforations **60** may surround at least 90% of the portion of the panel **22** that is uncoupled from the flood vent **8**). As a further example, the perforations **60** may surround any other amount of the portion of the panel **22**, so as to cause the portion of the panel **22** to be uncoupled from the flood vent **8** when a predetermined amount of pressure is applied to the panel **22**.

The perforations **60** may have any size and/or shape that may allow the perforations **60** to uncouple at least a portion of the panel **22** when a predetermined amount of pressure is applied to the panel **22**. For example, the perforations **60** may be sized and/or shaped to reduce the thickness **25** of the panel **22** at one or more points of the panel **22** to a thickness that is less than the other portions of the panel **22**. For example, if the thickness **25** of the panel **22** is, for example, 1 inch, the perforations **60** may have a reduced thickness, such as, for example, 0.75 inches, 0.5 inches, 0.4 inches, 0.33 inches, 0.3 inches, 0.25 inches, 0.2 inches. 0.1 inches, approximately 0.75 inches (i.e., 0.75 inches+/−0.1 inches), approximately 0.5 inches, approximately 0.4 inches, approximately 0.33 inches, approximately 0.3 inches, approximately 0.25 inches, approximately 0.2 inches, or any other thickness less than 1 inch. In particular embodiments, the reduction in the thickness **25** of the panel **22** at one or more points of the panel **22** may be selected to cause at least a portion of the panel **22** to uncouple from the flood vent **8** when a predetermined amount of pressure is applied to the panel **22**.

As is discussed above, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+/−0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8**. For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22**, the perforations **60** may not uncouple at least a portion of the panel **22** from the flood vent **8**. On the other hand, if an amount of pressure equal to

the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22**, the perforations **60** may uncouple at least a portion of the panel **22** from the flood vent **8**.

In particular embodiments, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to any portion of the panel **22**. For example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to a bottom portion of the panel **22** (or a bottom portion of second portion **64**), a top portion of the panel **22** (or a top portion of second portion **64**), a left and/or right side portion of the panel **22** (or a left and/or right side portion of second portion **64**), any other portion of the panel **22**, or any combination of the preceding. In particular embodiments, the predetermined amount of pressure for causing the perforations **60** to uncouple at least a portion of the panel **22** from the flood vent **8** may change based on (or be a function of) the portion of the panel **22** to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel **22** (or a bottom portion of second portion **64**) (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel **22** (or a top portion of second portion **64**) (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the perforations **60** to uncouple at least a portion of the panel **22** from the flood vent **8** may change based on (or be a function of) the type of panel **22** included in the flood vent **8**. For example, the predetermined amount of pressure may be less if the panel **22** is a panel without any openings **26** (or with openings that may be closed, using louvers, for example) than if the panel includes openings **26** that may not be closed (or if the panel **22** is a screen). In such an example, a panel **22** without openings **26** (when compared to a panel **22** with openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** without openings **26** at a lower amount of pressure (when compared to a panel **22** with openings **26**). As another example, the predetermined amount of pressure may be less if the panel **22** is a panel with less openings **26** (and/or with smaller openings **26**) than if the panel **22** includes more openings **26** (and/or has bigger openings **26**). In such an example, a panel **22** with less openings **26** (when compared to a panel **22** with more openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** with less openings **26** at a lower amount of pressure (when compared to a panel **22** with more openings **26**).

In particular embodiments, the perforations **60** may be configured to uncouple the at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to any side of the panel **22**. For example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**), thereby causing at least a portion of the panel **22** to be uncoupled from the flood vent **8** and be carried by the fluids, for example, outside of the structure **17**, as is illustrated in FIGS. **5**C-**5**E. In particular embodiments, this may cause the at least a portion of the panel **22** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from inside the structure **17**. As another example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to side **24***a* the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), thereby causing at least a portion of the panel **22** to be uncoupled from the flood vent **8** and be carried by the fluids, for example, inside of the structure **17** (e.g., in a direction from left-to-right in FIGS. **5**C-**5**E). In particular embodiments, this may cause at least a portion of the panel **22** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from outside the structure **17**. As a further example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to either the side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**) or the side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**). In particular embodiments, this may cause at least a portion of panel **22** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from either inside the structure **17** or outside the structure **17**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **5**A-**6**C without departing from the scope of the disclosure. For example, the flood vent **8** of FIGS. **5**A-**6**C may include one or more components of the flood vent **8** of FIGS. **3**A-**3**C and/or FIGS. **4**A-**4**C. In such an example, the flood vent **8** may include a panel **22** having one or more perforations **60** that may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** when a first predetermined amount of pressure is applied to the panel **22**, may further include one or more connectors **30** that may be configured to uncouple the panel **22** from the frame **10** (and/or the structure **17**) when a second predetermined amount of pressure is applied to the panel **22** (as is discussed above with regard to FIGS. **3**A-**3**C), and/or may further include one or more connectors **40** that may be configured to uncouple the frame **10** from the structure **17** when a third predetermined amount of pressure is applied to the panel **22** and/or the frame **10** (as is discussed above with regard to FIGS. **4**A-**4**C). The first predetermined amount of pressure (which may uncouple at least a portion of the panel **22** from the flood vent **8**) may be less than the second predetermined amount of pressure (which may uncouple the remainder of the panel **22** from the frame **10**), and the second predetermined amount of pressure may be less than the third predetermined amount of pressure (which may uncouple the frame **10** from the structure **17**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above), the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure), and the third predetermined amount of pressure may be a pressure range of 2.5 PSI-9 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the second predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, at least a portion of the panel **22** may be uncoupled from the flood vent **8** (which may reduce the amount of blockage

of the fluid passageway provided by the panel **22**). Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the remainder of the panel **22**, the remainder of the panel **22** may be uncoupled from the frame **10** (which may further reduce the amount of blockage of the fluid). Additionally, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the third predetermined amount of pressure to the frame **10**, the frame **10** may be uncoupled from the structure **17** (which may further reduce the amount of blockage of the fluid). As such, the flood vent **8** may be able to further provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

As another example, the flood vent **8** of FIGS. **5**A-**6**C may include a panel **22** having more than one portion of the panel **22** that may be uncoupled from the flood vent **8**. In such an example, the panel **22** may include three or more portions separated by two or more perforations **60**. For example, the panel **22** may have a first portion separated from a second portion by a first perforation **60** configured to uncouple the second portion from the first portion when a second predetermined amount of pressure is applied to the panel **22** (or to the second portion of the panel **22**). Furthermore, the second portion of the panel **22** may be separated from a third portion of the panel **22** by a second perforation configured to uncouple the third portion from the second portion when a first predetermined amount of pressure is applied to the panel **22** (or to the third portion of the panel **22**). The first predetermined amount of pressure (which may uncouple the third portion of the panel **22** from the flood vent **8**) may be less than the second predetermined amount of pressure (which may uncouple the second portion of the panel **22** from the flood vent **8**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above) while the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, the third portion may be uncoupled from the flood vent **8** (which may reduce the amount of blockage of the fluid passageway provided by the panel **22**). Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the remainder of the panel **22**, the second portion of the panel **22** may be uncoupled from the flood vent **8** (which may further reduce the amount of blockage of the fluid passageway provided by the panel **22**). As such, the flood vent **8** may be able to further provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

As a further example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**.

FIGS. **7**A-**7**H illustrate the flood vent **8** of FIGS. **1**-**2** with a panel **22** having a plurality of insulation pieces **70** and one or more insulation piece connectors **80**. The insulation pieces **70** may be configured to form the panel **22**, so as to at least partially block the fluid passageway formed by the frame **10**. The insulation piece connectors **80** may be configured to couple the insulation pieces **70** together to form the panel **22**. Furthermore, the insulation piece connectors **80** may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22**. For example, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel **22** of flood vent **8** may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent **8** until a predetermined amount of pressure is applied to the panel **22**, and after the predetermined amount of pressure is applied to the panel **22**, one or more of the insulation pieces **70** of the panel **22** may be uncoupled from the panel **22** and may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced). This may, in particular embodiments, allow the flood vent **8** to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings **26** in the panel **22**, when the openings **26** in the panel **22** are too small to allow sufficient fluids to pass through the flood vent **8**, when the openings **26** in the panel **22** are closed, and/or when the panel **22** does not include any openings **26**.

As is discussed above with regard to FIGS. **1**-**2**, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing the flooding fluids to enter and/or exit the structure **17**. The panel **22** may be configured to be coupled to the frame **10**. Furthermore, the panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIG. **7**C. The panel **22** may be coupled to the frame **10** in any manner. For example, the panel **22** may be coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, attached to the frame **10** using one or more rivets, nails, and/or any other connector, attached to the structure **17** (and thus the frame **10**) using one or more rivets, nails, and/or any other connector, coupled to the frame **10** in any other manner, or any combination of the preceding. The panel **22** may be any type of panel. For example, as is illustrated in FIGS. **7**A-**7**F, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as prevent (or substantially prevent) objects (such as small animals) from passing through the panel **22**. As another example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**.

The panel **22** includes a plurality of insulation pieces **70** configured to be coupled together to form the panel **22**, so as to at least partially block the fluid passageway formed by the frame **10**. An insulation piece **70** may be any type of object or piece that may be coupled together with other objects or pieces in order to form a panel **22**, and that may

be configured to at least partially prevent fluids (such as water and/or air) from passing through the insulation piece **70**. An insulation piece **70** may be formed from (or include) any type of material configured to at least partially prevent fluids (such as water and/or air) from passing through the insulation piece **70**. For example, insulation piece **70** may be formed from (or include) rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized material, any other metal, or any combination of the preceding), any other insulating material, any other material configured to at least partially prevent fluids (such as water and/or air) from passing through insulation piece **70**, or any combination of the preceding. In particular embodiments, insulation piece **70** may be formed from (or include) a foam insulation, such as polyurethane, polyisocyanurate, polystyrene, polyethylene (such as cross linked polyethylene), icynene, air krete, teflon (PTFE), polyester, synthetic rubber, any other foam insulation, or any combination of the preceding. In particular embodiments, insulation piece **70** may be formed from (or include) a rubber or polymer, such as butyl, natural rubber, nitrile, ethylene propylene, polyurethane, silicone, any other rubber or polymer, or any combination of the preceding.

The panel **22** may include any number of insulation pieces **70**. For example, the panel **22** may include two insulation pieces **70**, three insulation pieces **70**, four insulation pieces **70**, ten insulation pieces **70**, twenty insulation pieces **70**, forty insulation pieces **70**, fifty insulation pieces **70**, 64 insulation pieces **70**, 75 insulation pieces **70**, 98 insulation pieces **70**, 100 insulation pieces **70**, 128 insulation pieces **70**, 150 insulation pieces, 200 insulation pieces, 256 insulation pieces, or any other number of insulation pieces **70**. As another example, the panel **22** may include at least two insulation pieces **70** (i.e., two or more insulation pieces **70**), at least three insulation pieces **70**, at least four insulation pieces **70**, at least ten insulation pieces **70**, at least twenty insulation pieces **70**, at least forty insulation pieces **70**, at least fifty insulation pieces **70**, at least 64 insulation pieces **70**, at least 75 insulation pieces **70**, at least 100 insulation pieces **70**, at least 128 insulation pieces **70**, at least 150 insulation pieces, at least 200 insulation pieces, or at least 256 insulation pieces. As another example, the panel **22** may include a range of insulation pieces **70**, such as 2-10 insulation pieces **70**, 10-20 insulation pieces **70**, 10-50 insulation pieces **70**, 50-100 insulation pieces **70**, 64-128 insulation pieces **70**, 100-256 insulation pieces **70**, or any other range of insulation pieces **70**.

An insulation piece **70** may have any size and/or shape. For example, an insulation piece **70** may have a height **72** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other height **72**. As another example, an insulation piece **70** may have a length **74** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other length **74**. As a further example, an insulation piece **70** may have a thickness **76** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other thickness **76**. As another example, an insulation piece **70** may have a cross section that is rectangular-shaped, square-shaped (as is illustrated in FIG. **7**A), circular-shaped, polygon-shaped, irregular shaped, or any other shape. In particular embodiments, the insulation piece **70** may have a height **72** and length **74** of 0.5" squared, 1.5" squared, 1.5" squared, 2" squared, 2.5" squared, 3" squared, 3.5" squared, or any other height **72** and length **74**. In particular embodiments, the insulation piece **70** may have a height **72** and length **74** of approximately 0.5" squared (i.e., 0.5" squared+/−0.1" squared), approximately 1" squared, approximately 1.5" squared, approximately 2" squared, approximately 2.5" squared, approximately 3" squared, approximately 3.5" squared, or approximately any other height **72** and length **74**. In particular embodiments, the insulation piece **70** may have a volume (e.g., height **72**, length **74**, and thickness **76**) of 0.5" cubed, 1" cubed, 1.5" cubed, 2" cubed, 2.5" cubed, 3" cubed, 3.5" cubed, or any other volume. In particular embodiments, the insulation piece **70** may have a volume of approximately 0.5" cubed (i.e., 0.5" cubed+/−0.1" cubed), approximately 1" cubed, approximately 1.5" cubed, approximately 2" cubed, approximately 2.5" cubed, approximately 3" cubed, approximately 3.5" cubed, or approximately any other volume. In particular embodiments, the size and/or shape of the insulation piece **70** may assist flood vent **8** in providing for equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. For example, the size and/or shape of the insulation piece **70** may allow the insulation piece **70** to uncouple from the panel **22** and be carried away from the flood vent **8** by the fluid without, for example, the insulation piece **70** becoming stuck in a portion of the flood vent **8**, a portion of an adjacent flood vent **8** (e.g., the uncoupled insulation pieces **70** may float underneath an open panel **22** or other door in an adjacent flood vent **8** installed in the same opening **18** in the structure **17**), and/or the opening **18** in the structure **17**. As such, the flood vent **8**, the adjacent flood vent **8**, and/or the opening **18** in the structure **17** may not be clogged (or otherwise blocked) by the uncoupled insulation pieces **70**, which may allow the flood vent **8** to further provide for equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

The panel **22** further includes one or more insulation piece connectors **80**. An insulation piece connector **80** may include any type of one or more connectors configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As a first example, an insulation piece connector **80** may be one or more pieces of lamination in contact with the insulation pieces **70**. The one or more pieces of lamination may be configured to couple the insulation pieces **70** together to form the panel **22**, and may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The pieces of lamination may include any type of laminate, such as one or more pieces of a plastic film, one or more pieces of a polymer film, any other laminate or film that may couple the insulation pieces **70** together to form the panel **22**, or any combination of the preceding. Furthermore, the one or more pieces of lamination may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the one or more pieces of lamination may be configured to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the one or more pieces of lamination may be engineered and/or modified to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. As one example, the one or more pieces of lamination may include rows of holes (or perforations) that may weaken the one or more pieces of

lamination so as to break when a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of material used in the lamination may be selected to cause the one or more pieces of lamination to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**.

The pieces of lamination may be laminated to (or otherwise in contact) with each of the insulation pieces **70**. For example, the insulation pieces **70** may be arranged together in the shape of the panel **22**, and then the one or more pieces of lamination may be laminated to (or otherwise be put in contact with) each of the insulation pieces **70** on the side **24***a* of the panel **22**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. As a further example, the insulation pieces **70** may be arranged together in the shape of the panel **22**, and then the one or more pieces of lamination may be laminated to (or otherwise be put in contact with) each of the insulation pieces **70** on the side **24***b* of the panel **22** (as is illustrated in FIG. **7**B), thereby coupling the insulation pieces **70** to each other and forming the panel **22**. As another example, the insulation pieces **70** may be arranged together in the shape of the panel **22**, and then the one or more pieces of lamination may be laminated to (or otherwise be put in contact with) each of the insulation pieces **70** on both side **24***a* and side **24***b* of the panel **22**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**.

The pieces of lamination may couple the insulation pieces **70** together (thereby forming the panel **22**, as is seen in FIG. **7**B) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the pieces of lamination may peel off, break, or otherwise uncouple from the insulation pieces **70** and/or panel **22**, thereby uncoupling one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**, as is illustrated in FIGS. **7**C-**7**F. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a second example, an insulation piece connector **80** may be an adhesive configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The adhesive may include any adhesive substance that may adhere the insulation pieces **70** together to form the panel **22**, such as glue, cement, Lexel® adhesive, any other adhesive substance that may adhere the insulation pieces **70** together to form the panel **22**, or any combination of the preceding. Furthermore, the adhesive may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the adhesive may be configured to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the adhesive may be engineered and/or modified to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of adhesive used to couple the insulation pieces **70** together to form the panel **22** may be selected to cause the adhesive to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

The adhesive may include one or more portions of the adhesive coupled to each of the insulation pieces **70**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. The one or more portions of the adhesive may be coupled to any area of the insulation pieces **70**, such one or more (or all of the) edges (or sides) of the insulation pieces **70**, the side **24***a* of the panel **22**, the side **24***b* of the panel **22**, both the sides **24***a* and **24***b* of the panel **22**, or any combination of the preceding. The portions of the adhesive may couple the insulation pieces **70** together (thereby forming the panel **22**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the adhesive may peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a third example, an insulation piece connector **80** may be one or more mechanical fasteners configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The mechanical fasteners may include any one or more devices and/or objects that may mechanically fasten the insulation pieces **70** together, such as one or more nails, screws, rivets, nuts and bolts, rods and studs, anchors, pins, retaining rings and/or clips, any other devices and/or objects that may mechanically fasten the insulation pieces **70** together, or any combination of the preceding. Furthermore, the mechanical fasteners may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the mechanical fasteners may be configured to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the mechanical fasteners may be engineered and/or modified to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**.

The mechanical fasteners may include one or more mechanical fasteners coupled to each of the insulation pieces **70**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. The mechanical fasteners may be coupled to any area of the insulation pieces **70**, such one or more (or all of the) edges (or sides) of the insulation pieces **70**, the side **24***a* of the panel **22**, the side **24***b* of the panel **22**, both the sides **24***a* and **24***b* of the panel **22**, or any combination of the preceding. The mechanical fasteners may couple the insulation pieces **70** together (thereby forming the panel **22**) until a predetermined amount of pressure is

applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the mechanical fasteners may break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a fourth example, an insulation piece connector **80** may be one or more integral connectors configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The integral connectors may be portions of the insulation pieces **70**, themselves, that couple the insulation pieces **70** together. For example, the insulation pieces **70** may be formed or otherwise manufactured in the form of the panel **22**, with connector segments integrally formed in (or on) the insulation pieces **70** so as to protrude from the insulation pieces **70** and attach the insulation pieces **70** together (as is illustrated in FIG. **7**G). As another example, the panel **22** may be formed as a single solid piece, and the insulation pieces **70** and integral connectors may be formed from the solid piece (such as by stamping the solid piece, cutting-out portions of the solid piece, or any other means of removing material). As an example of this, a steel rule die (e.g., a steel rule die having one or more divots in the blade) may be used to stamp the solid-piece (such as a solid-piece of polyethylene foam), for example. Such stamping may cut through almost the entire thickness (or other dimension) of the panel **22** in order to form the individual insulation pieces **70** in the panel **22**, but may leave one or more un-cut connections or strands (e.g., hair-like strands) in-between each of the individual insulation pieces **70**. These un-cut connections or strands may be the integral connectors configured to couple the insulation pieces **70** together to form the panel **22**. Furthermore, the integral connectors may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the integral connectors may be configured to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the integral connectors may be sized (e.g., by the one or more divots in the blade of the steel rule die, for example) (or otherwise modified) to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**.

The integral connectors may include one or more integral connectors coupled to (or formed in) each of the insulation pieces **70**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. The integral connectors may be coupled to (or formed in) any area of the insulation pieces, such one or more (or all of the) edges (or sides) of the insulation pieces **70**, the side **24***a* of the panel **22**, the side **24***b* of the panel **22**, both the sides **24***a* and **24***b* of the panel **22**, or any combination of the preceding. The integral connectors may couple the insulation pieces **70** together (thereby forming the panel **22**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the integral connectors may break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

The flood vent **8** may include any number of insulation piece connectors **80**. For example, the flood vent **8** may include one insulation piece connector **80**, two insulation piece connectors **80**, three insulation piece connectors **80**, four insulation piece connectors **80**, six insulation piece connectors **80**, eight insulation piece connectors **80**, ten insulation piece connectors **80**, twenty insulation piece connectors **80**, fifty insulation piece connectors **80**, 64 insulation piece connectors **80**, 100 insulation piece connectors **80**, 128 insulation piece connectors **80**, 256 insulation piece connectors **80**, one insulation piece connector **80** for each insulation piece **70**, two insulation piece connectors **80** for each insulation piece **70**, or any other number of insulation piece connectors **80**. The insulation piece connectors **80** may have any size and/or shape that may allow the insulation piece connectors **80** to uncouple one or more of the insulation pieces **70** from the panel **22** when a predetermined amount of pressure is applied to the panel **22**.

As is discussed above, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+/−0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22**. For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22**, the insulation piece connectors **80** may not uncouple one or more of the insulation pieces **70** from the panel **22**. On the other hand,

if an amount of pressure equal to the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22**, the insulation piece connectors **80** may uncouple one or more of the insulation pieces **70** from the panel **22**.

In particular embodiments, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** if the predetermined amount of pressure is applied to any portion of the panel **22**. For example, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** if the predetermined amount of pressure is applied to a bottom portion of the panel **22**, a top portion of the panel **22**, a left and/or right side portion of the panel **22**, any other portion of the panel **22**, or any combination of the preceding. Furthermore, the one or more insulation pieces **70** uncoupled from the panel **22** may be associated with the portion of the panel **22** to which the predetermined amount of pressure is applied. For example, if the predetermined amount of pressure is applied to a bottom portion of the panel **22**, the one or more insulation pieces **70** uncoupled from the panel **22** may be insulation pieces **70** that were located in (and/or near) the bottom portion of the panel **22**. Furthermore, in such an example, the insulation pieces **70** not located in (and/or near) the bottom portion of the panel **22** may not be uncoupled from the panel **22**. Instead, the insulation pieces **70** not located in (and/or near) the bottom portion of the panel **22** may remain coupled to the panel **22** (and/or the remaining insulation pieces **70** in the panel **22**) until the predetermined amount of pressure is applied to the portion of the panel **22** in which those insulation pieces **70** are located (and/or near where those insulation pieces **70** are located). Alternatively, in particular embodiments, once one or more insulation pieces **70** are uncoupled from the panel **22**, the uncoupling may create a cascading effect that may uncouple all or a substantial portion (i.e., 90% of the insulation pieces **70**) from the panel **22**.

In particular embodiments, the predetermined amount of pressure for causing the insulation piece connectors **80** to uncouple one or more of the insulation pieces **70** from the panel **22** may change based on (or be a function of) the portion of the panel **22** to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel **22** (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel **22** (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the insulation piece connectors **80** to uncouple one or more of the insulation pieces **70** from the panel **22** may change based on (or be a function of) the type of panel **22** included in the flood vent **8**. For example, the predetermined amount of pressure may be less if the panel **22** is a panel without any openings **26** (or with openings that may be closed, using louvers, for example) than if the panel includes openings **26** that may not be closed. In such an example, a panel **22** without openings **26** (when compared to a panel **22** with openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** without openings **26** at a lower amount of pressure (when compared to a panel **22** with openings **26**). As another example, the predetermined amount of pressure may be less if the panel **22** is a panel **22** with less openings **26** (and/or with smaller openings **26**) than if the panel **22** includes more openings **26** (and/or has bigger openings **26**). In such an example, a panel **22** with less openings **26** (when compared to a panel **22** with more openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** with less openings **26** at a lower amount of pressure (when compared to a panel **22** with more openings **26**).

In particular embodiments, the insulation piece connectors **80** may be configured to uncouple the one or more of the insulation pieces **70** from the panel **22** if the predetermined amount of pressure is applied to any side of the panel **22**. For example, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** if the predetermined amount of pressure is applied to side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**), thereby causing the one or more insulation pieces **70** to be uncoupled from the flood vent **8** and be carried by the fluids, for example, outside of the structure **17**, as is illustrated in FIGS. **7**C-**7**F. In particular embodiments, this may cause the one or more insulation pieces **70** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from inside the structure **17**. As another example, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** if the predetermined amount of pressure is applied to side **24***a* the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), thereby causing the one or more insulation pieces **22** to be uncoupled from the flood vent **8** and be carried by the fluids, for example, inside of the structure **17** (e.g., in a direction from left-to-right in FIGS. **7**C-**7**F). In particular embodiments, this may cause the one or more insulation pieces **70** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from outside the structure **17**. As a further example, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** if the predetermined amount of pressure is applied to either the side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**) or the side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**). In particular embodiments, this may cause the one or more insulation pieces **70** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from either inside the structure **17** or outside the structure **17**.

The panel **22** may further have a frame **84**, as is illustrated in FIG. **7**H. The frame **84** may be a portion of the panel **22** that surrounds the insulation pieces **70** and the insulation piece connectors **80**. In particular embodiments, the frame **84** may be a portion of the panel **22** that does not uncouple from the panel **22**. For example, although the insulation pieces **70** may be uncoupled from the panel **22**, the frame **84** may remain a portion of the panel **22**. In such an example, the insulation pieces **70** may uncouple from the frame **84** (and the panel **22**) when the predetermined amount of the pressure is applied to the insulation pieces **70**. In particular embodiments, all of the insulation pieces **70** may be uncoupled from the frame **84** of the panel **22**, leaving an opening in the panel **22** having the shape of the frame **84**. Insulation pieces **70** may be coupled to the frame **84** by one or more insulation piece connectors **80**.

The frame **84** may have any size and/or shape. For example, the frame **84** may have an edge sizing **88** of 0.15",

0.25", 0.375", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other edge sizing **88**. As another example, the frame **84** may be rectangular-shaped (as is illustrated in FIG. **7**H), square-shaped, circular-shaped, polygon-shaped, irregular shaped, or any other shape. The frame **84** may be formed from (or include) any type of material configured to at least partially prevent fluids (such as water and/or air) from passing through the frame **84**. For example, frame **84** may be formed from (or include) rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized material, any other metal, or any combination of the preceding), any other insulating material, any other material configured to at least partially prevent fluids (such as water and/or air) from passing through frame **84**, or any combination of the preceding. In particular embodiments, frame **84** may be formed from (or include) a foam insulation, such as polyurethane, polyisocyanurate, polystyrene, polyethylene (such as cross linked polyethylene), icynene, air krete, teflon (PTFE), polyester, synthetic rubber, any other foam insulation, or any combination of the preceding. In particular embodiments, frame **84** may be formed from (or include) a rubber or polymer, such as butyl, natural rubber, nitrile, ethylene propylene, polyurethane, silicone, any other rubber or polymer, or any combination of the preceding. In particular embodiments, frame **84** may be formed for the same material as insulation pieces **70**, or may be formed from a different material. In particular embodiments, the frame **84** may be formed simultaneously (or substantially simultaneously) with the insulation pieces **70** and insulation piece connectors **80**. For example, the panel **22** may be formed as a single solid piece, and the frame **84**, the insulation pieces **70**, and the insulation piece connectors **80** may be formed from the solid piece (such as by stamping the solid piece, cutting-out portions of the solid piece, or any other means of removing material). As an example of this, a steel rule die (e.g., a steel rule die having one or more divots in the blade) may be used to stamp the solid-piece (such as a solid-piece of polyethylene foam), for example. Such stamping may cut through almost the entire thickness (or other dimension) of the panel **22** in order to form the frame **84** and the individual insulation pieces **70** in the panel **22**, but may leave one or more un-cut connections or strands (e.g., hair-like strands) in-between each of the individual insulation pieces **70** and the frame **84**. These un-cut connections or strands may be the insulation piece connectors **80** configured to couple the insulation pieces **70** together to form the panel **22**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **7**A-**7**G without departing from the scope of the disclosure. For example, the flood vent **8** of FIGS. **7**A-**7**G may include one or more components of the flood vent **8** of FIGS. **4**A-**4**C. In such an example, the flood vent **8** may include a panel **22** having a plurality of insulation pieces **70** and one or more insulation piece connectors **80** configured to couple the insulation pieces **70** together (thereby forming panel **22**), and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when a first predetermined amount of pressure is applied to the panel **22**, and may further include one or more connectors **40** that may be configured to uncouple the frame **10** from the structure **17** when a second predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The first predetermined amount of pressure (which may uncouple one or more of the insulation pieces **70** from the panel **22**) may be less than the second predetermined amount of pressure (which may uncouple the frame **10** from the structure **17**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above) while the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, one or more insulation pieces **70** may be uncoupled from the panel **22** (which may reduce the amount of blockage of the fluid passageway by the panel **22**).

Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the frame **10**, the frame **10** may be uncoupled from the structure **17** (which may further reduce the amount of blockage of the fluid). As such, the flood vent **8** may be able to further provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

As another example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**.

Modifications, additions, or omissions may be made to the flood vents **8** of FIGS. **1**-**7** without departing from the scope of the disclosure. For example, the panel **22** may be replaceable without, for example, replacing the entire flood vent **8**. In particular, after all or a portion of the panel **22** has been uncoupled from the flood vent **8** (as a result of a predetermined amount of pressure being applied to the panel **22**, for example), the panel **22** may be replaced by a new panel **22** (with the same features and capabilities discussed above with regard to FIGS. **1**-**7**) that may be re-welded to the frame **10**, re-coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), re-attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, re-attached to the frame **10** using one or more rivets, nails, and/or any other connector, re-attached to the structure **17** (and thus the frame **10**) using one or more rivets, nails, and/or any other connect, re-coupled to the frame **10** in any other manner, or any combination of the preceding. As such, the flood vent **8** may continue to operate, without replacing the entire flood vent **8**. As another example, the disclosure of each of FIGS. **1**-**7** may be combined with one or more (or all) of any of the other disclosures of FIGS. **1**-**7**. As one example of this, an opening **18** in a structure **17** may have a first flood vent (such as a flood vent **8** of FIGS. **7**A-**7**H) installed on a first side of the structure **17** (such as the interior side of the structure **17**) and may further have a second flood vent (such as a flood vent **8** of any of FIGS. **1**-**6**, or any other flood vent, such as any flood vent included in U.S. Pat. No. 6,692,187 entitled "Flood Gate For Door") installed on a second side of the structure **17** (such as the exterior side of the structure **17**).

This specification has been written with reference to various non-limiting and non-exhaustive embodiments or examples. However, it will be recognized by persons having ordinary skill in the art that various substitutions, modifications, or combinations of any of the disclosed embodiments or examples (or portions thereof) may be made within the scope of this specification. Thus, it is contemplated and understood that this specification supports additional embodiments or examples not expressly set forth in this specification. Such embodiments or examples may be

obtained, for example, by combining, modifying, or reorganizing any of the disclosed steps, components, elements, features, aspects, characteristics, limitations, and the like, of the various non-limiting and non-exhaustive embodiments or examples described in this specification. In this manner, Applicant reserves the right to amend the claims during prosecution to add features as variously described in this specification.

The invention claimed is:

1. A flood vent, comprising:

a frame configured to form a fluid passageway through an opening in a structure;

a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure;

one or more first connectors configured to couple the panel to the frame, the one or more first connectors further configured to uncouple the panel from the frame when a first predetermined amount of pressure is applied to a portion of the panel on a first side of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel, the one or more first connectors further configured to uncouple the panel from the frame when the first predetermined amount of pressure is applied to a portion of the panel on a second side of the panel opposite of the first side of the panel by the one or more of the fluid or the object carried by the fluid, so as to reduce the amount of blockage of the fluid passageway provided by the panel; and

one or more second connectors configured to couple the frame to the structure, the one or more second connectors further configured to uncouple the frame from the structure when a second predetermined amount of pressure is applied to the frame on a first side of the frame by the one or more of the fluid or the object carried by the fluid, the one or more second connectors further configured to uncouple the frame from the structure when the second predetermined amount of pressure is applied to the frame on a second side of the frame opposite of the first side of the fame by the one or more of the fluid or the object carried by the fluid.

2. The flood vent of claim **1**, wherein the one or more first connectors comprise one or more portions of adhesive.

3. The flood vent of claim **1**, wherein the one or more first connectors comprise one or more bumps positioned on an inner perimeter of the frame.

4. The flood vent of claim **1**, wherein the one or more first connectors comprise one or more pieces of velcro.

5. The flood vent of claim **1**, wherein the one or more first connectors comprise one or more mechanical fasteners.

6. The flood vent of claim **1**, wherein the one or more second connectors comprise one or more portions of adhesive.

7. A flood vent, comprising:

a frame configured to form a fluid passageway through an opening in a structure;

a metal panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure; and

one or more connectors configured to couple the metal panel to the frame, wherein the one or more connectors are further configured to uncouple the metal panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to a portion of the metal panel on a first side of the metal panel by the one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the metal panel, wherein the one or more connectors are further configured to uncouple the metal panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to a portion of the metal panel on a second side of the metal panel opposite of the first side of the metal panel by the one or more of the fluid or the object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the metal panel.

8. The flood vent of claim **7**, wherein the metal panel is a solid metal panel configured to be coupled to the frame in the fluid passageway so as to completely block the fluid passageway through the opening in the structure.

9. The flood vent of claim **7**, wherein the metal panel has one or more openings configured to allow a fluid to pass through the fluid passageway.

10. The flood vent of claim **7**, wherein the metal panel is a screen.

11. The flood vent of claim **7**, wherein the one or more connectors comprise one or more of:

one or more mechanical fasteners configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more portions of adhesive configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more pieces of velcro configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more pressure-based connectors configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more permanent attachments configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid; or

one or more raised bumps positioned on an inner perimeter of the frame and configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid.

12. A flood vent, comprising:

a frame configured to form a fluid passageway through an opening in a structure;

a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure; and

one or more connectors configured to couple the frame to the structure, the one or more connectors further configured to uncouple the frame from the structure when a first predetermined amount of pressure is applied to one or more of a portion of the panel on a first side of the panel or a portion of the frame on a first side of the frame by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the

fluid passageway, the one or more connectors further configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to one or more of a portion of the panel on a second side of the panel opposite of the first side of the panel or a portion of the frame on a second side of the frame opposite of the first side of the frame by one or more of the fluid or the object carried by the fluid, so as to reduce the amount of blockage of the fluid passageway.

13. The flood vent of claim **12**, wherein the panel is formed integral with the frame.

14. The flood vent of claim **12**, wherein the panel is welded to the frame.

15. The flood vent of claim **12**, wherein the panel is a solid panel configured to be coupled to the frame in the fluid passageway so as to completely block the fluid passageway through the opening in the structure.

16. The flood vent of claim **12**, wherein the panel has one or more openings configured to allow a fluid to pass through the fluid passageway.

17. The flood vent of claim **12**, wherein the panel is a screen.

18. The flood vent of claim **12**, wherein the one or more connectors comprise one or more of:

one or more mechanical fasteners configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid;

one or more portions of adhesive configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid;

one or more pieces of velcro configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid;

one or more pressure-based connectors configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid; or

one or more raised bumps positioned on an inner perimeter of the opening in the structure and configured to uncouple the frame from the structure when the first predetermined amount of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid.

* * * * *

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Shook

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(45) **Date of Patent: Nov. 13, 2012**

(54) **FLOOD VENT**

(76) Inventor: **Ted Shook**, Galveston, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 147 days.

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(51) **Int. Cl.**
E02B 7/40 (2006.01)

(52) **U.S. Cl.** **405/100**; 405/94; 52/169.5

(58) **Field of Classification Search** 405/80, 405/87, 88, 89, 90, 91, 92, 94, 95, 99, 100; 52/169.5

See application file for complete search history.

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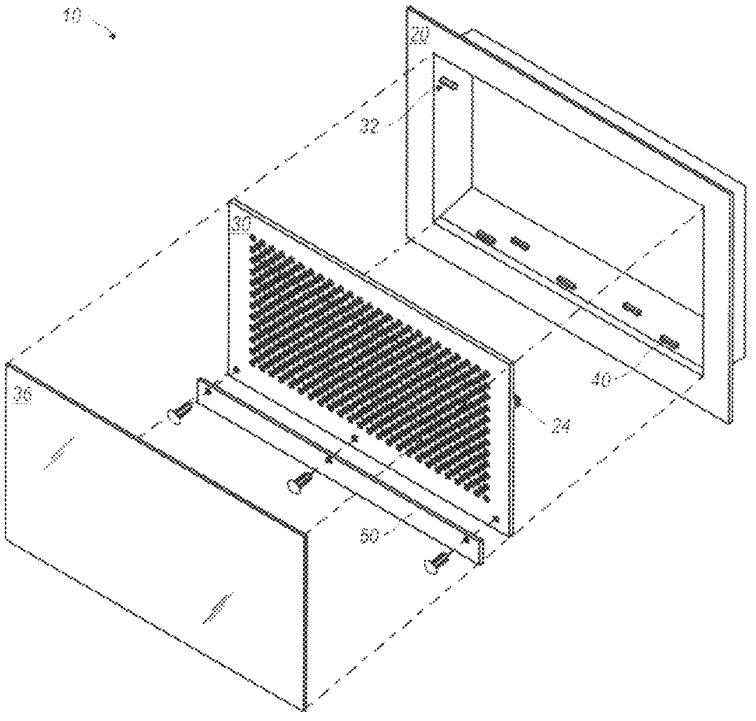
(57) **ABSTRACT**

A flood vent is provided that allows the unimpeded flow of floodwater in a shuttered duct formed in a housing installed in a structure such as a building. A lower region of the duct is angled down between two and eight degrees from a horizontal plane to form a sill that sheds water to an exterior of the structure, and an upper region of the duct is pivotally fixed to a shutter positioned within the duct. The shutter is capable of swinging between a closed position and an open position in response to the presence of floodwater within at least a portion of the duct. Movement of the shutter to, from or through a closed position is hampered by a releasable coupling of the shutter to the sill by a fin.

2 Claims, 7 Drawing Sheets



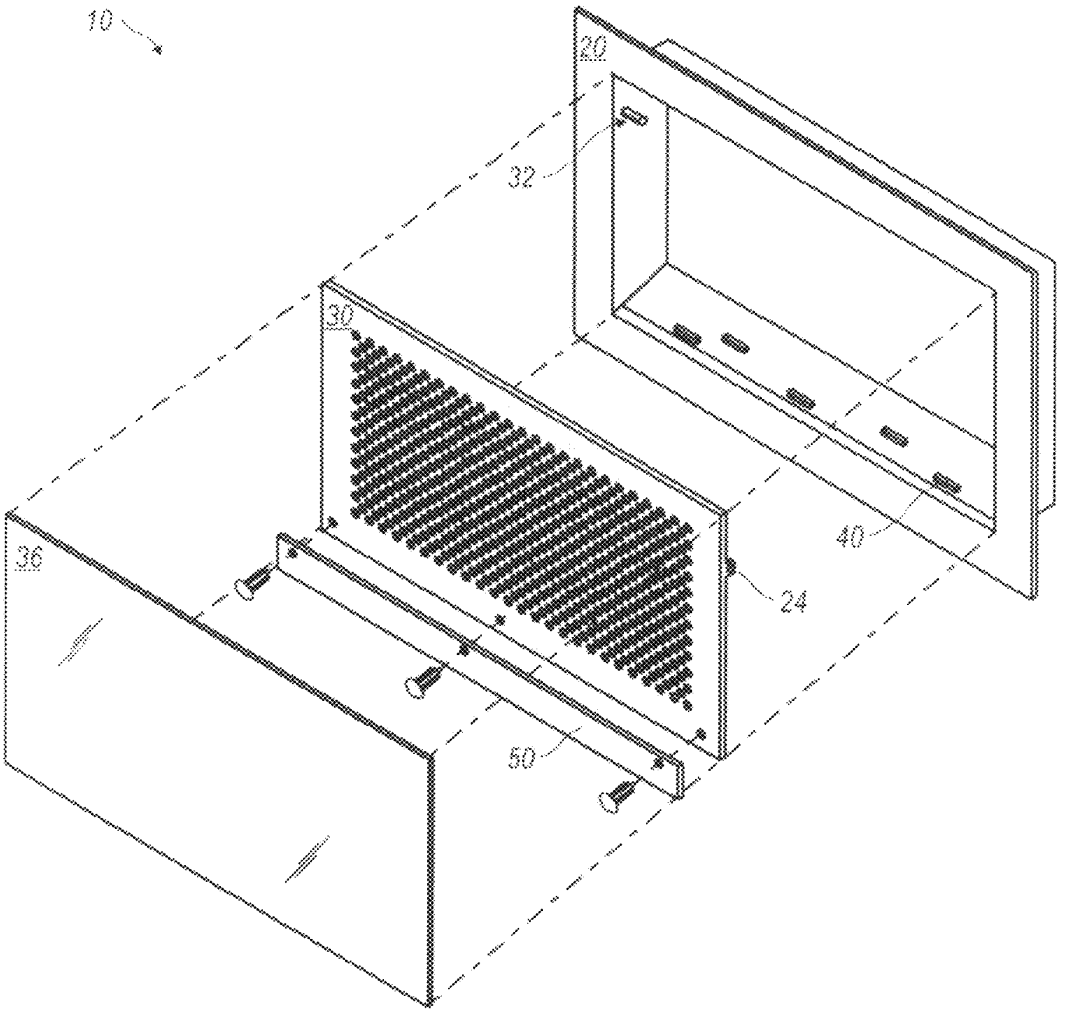


FIG. 1

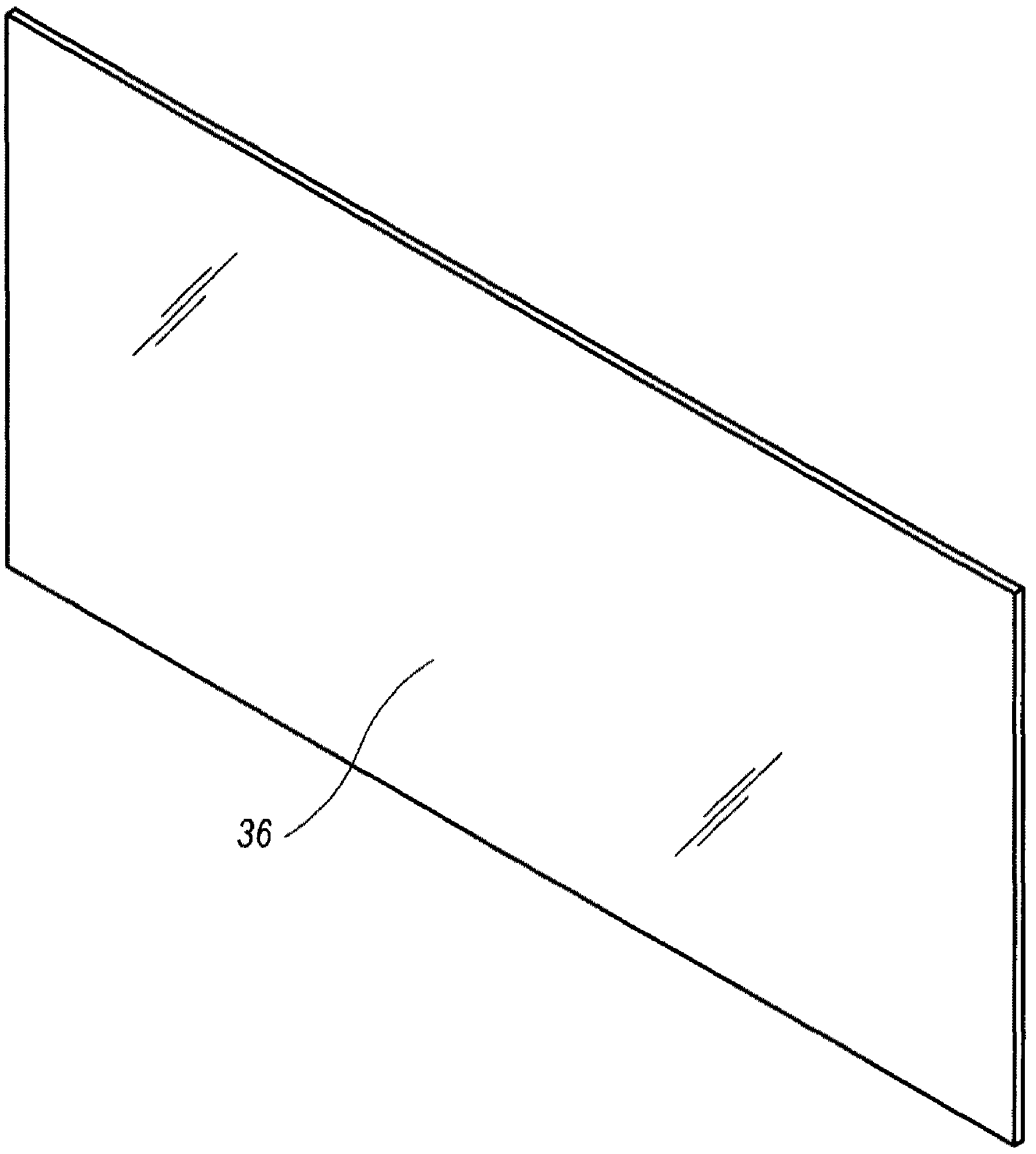


FIG. 2

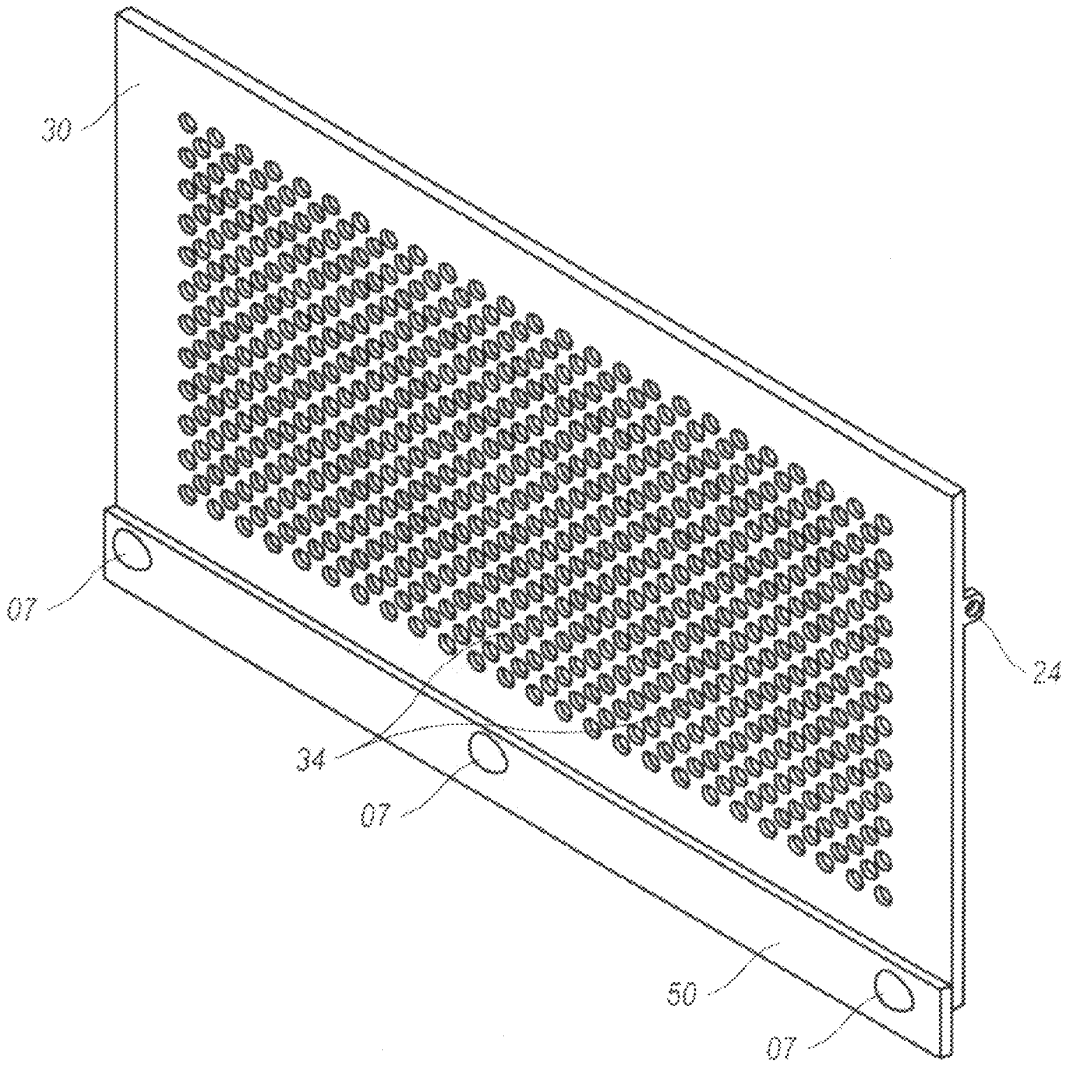


FIG. 3

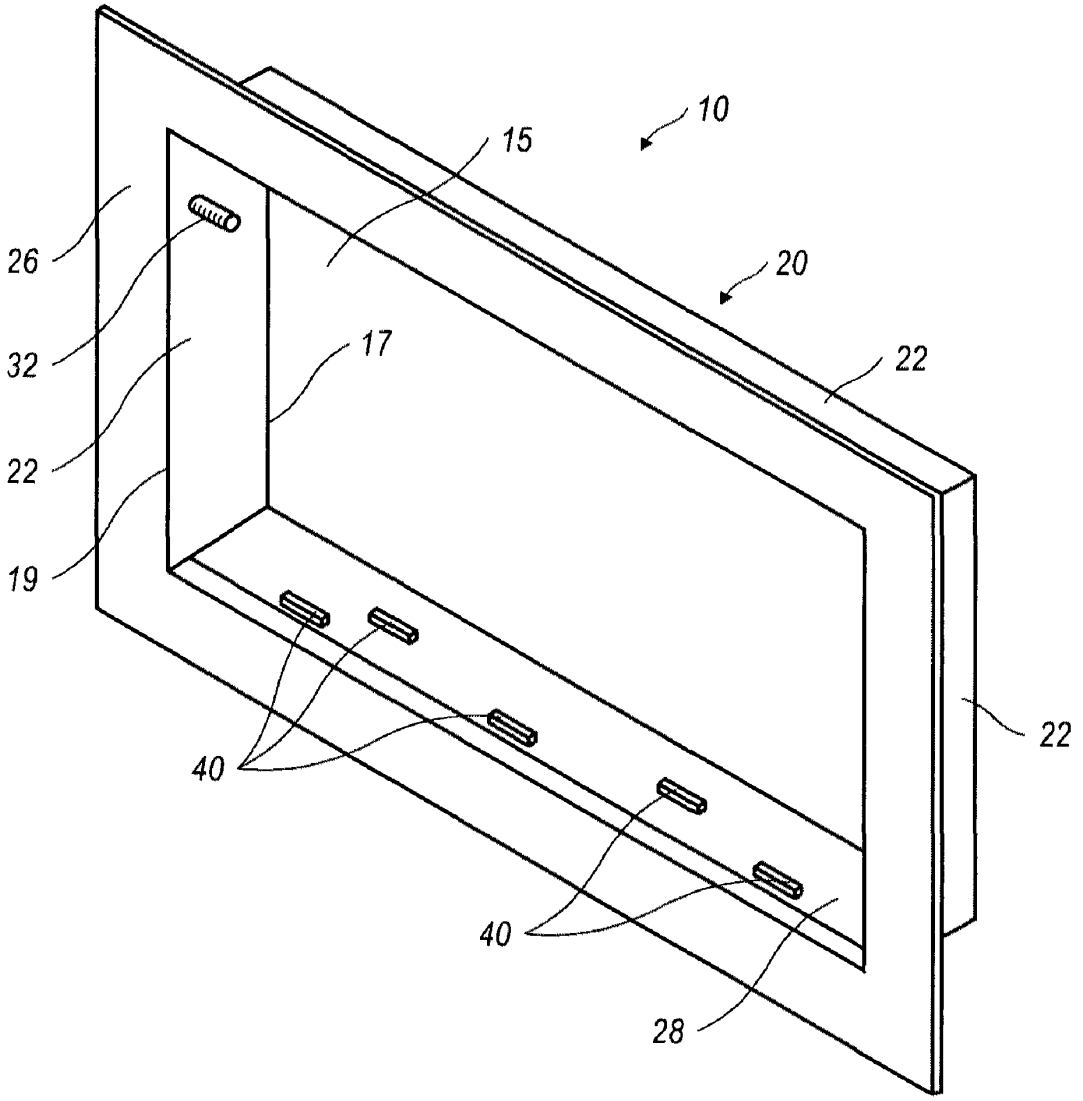


FIG. 4

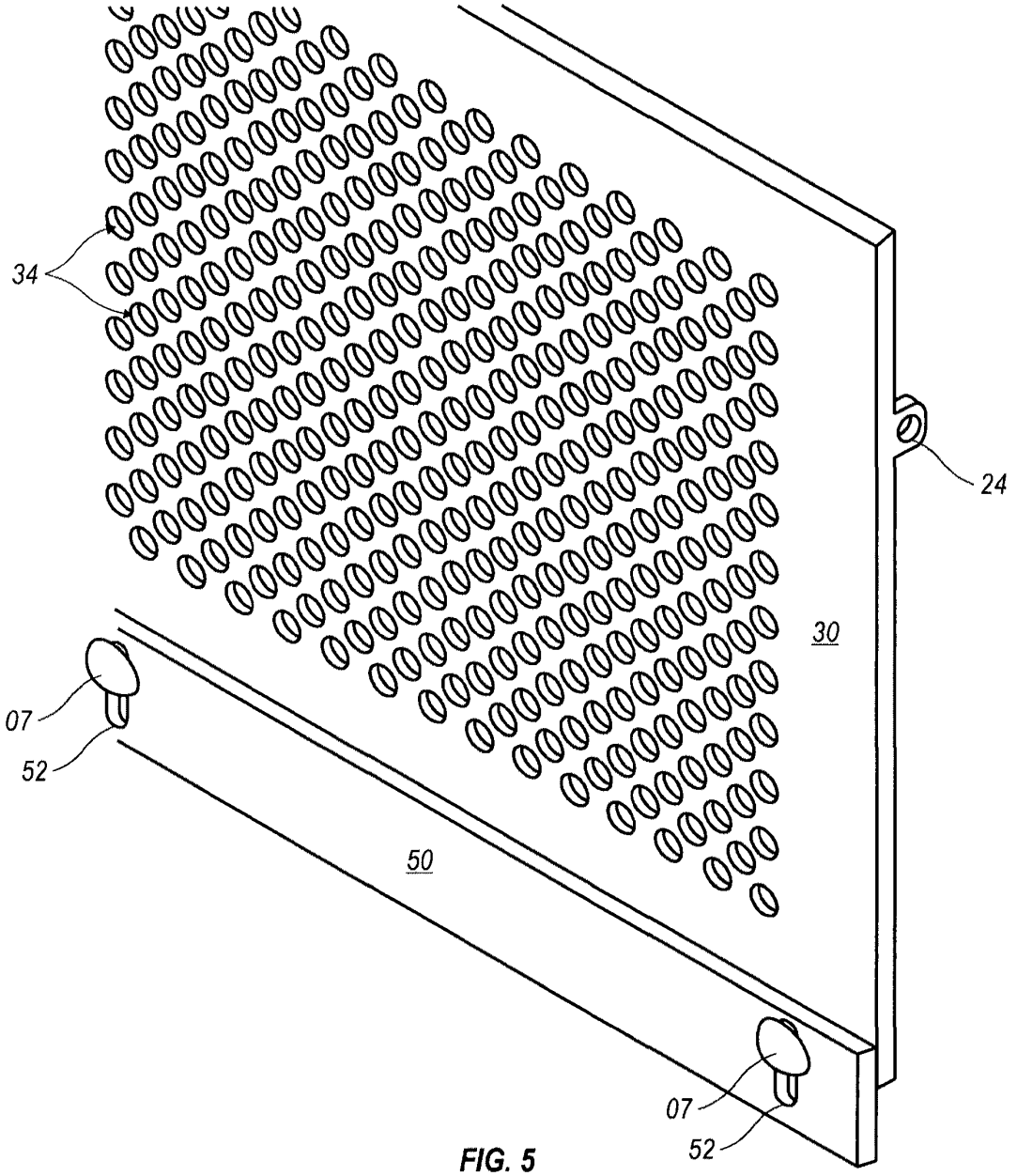


FIG. 5

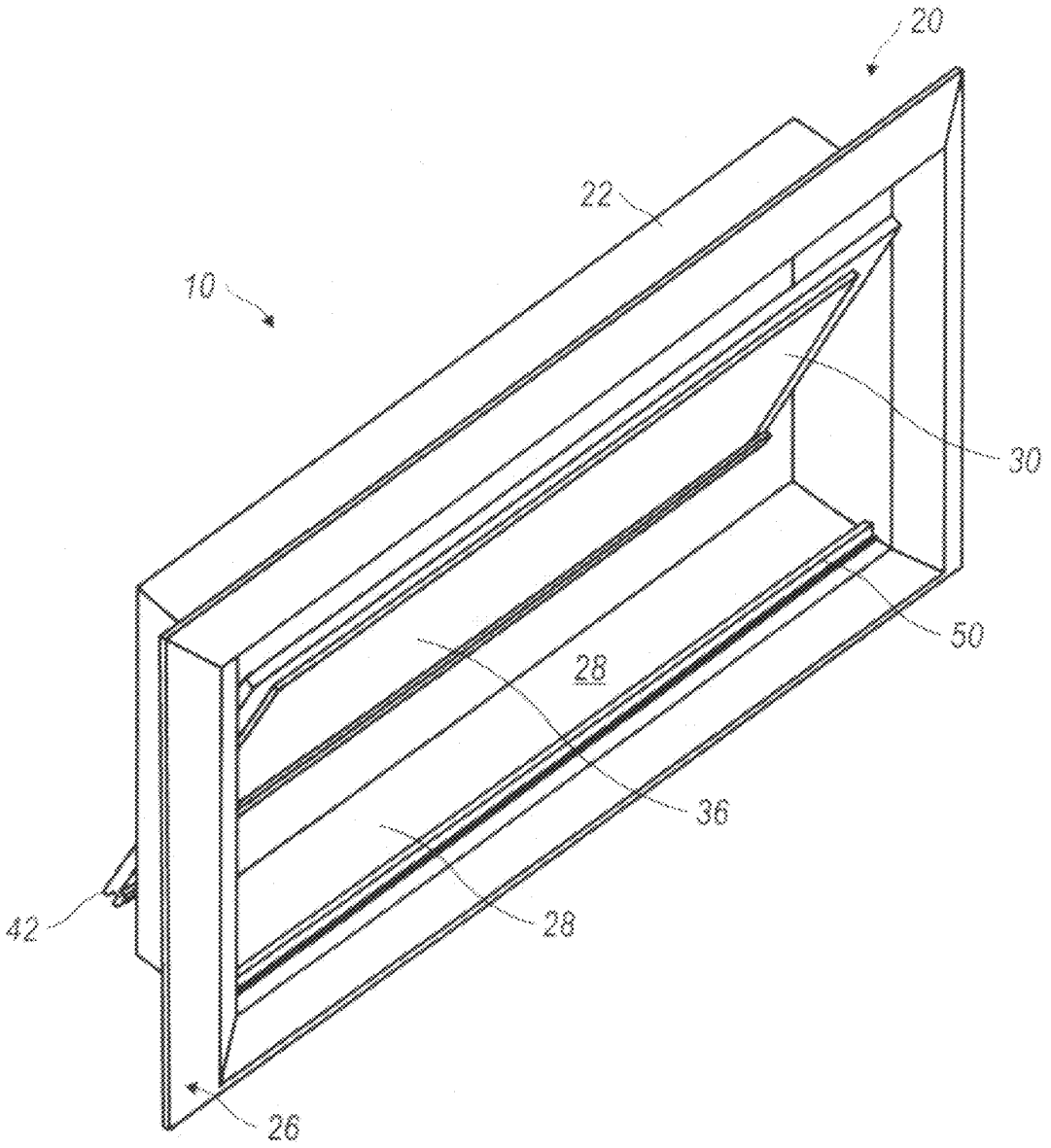


FIG. 6

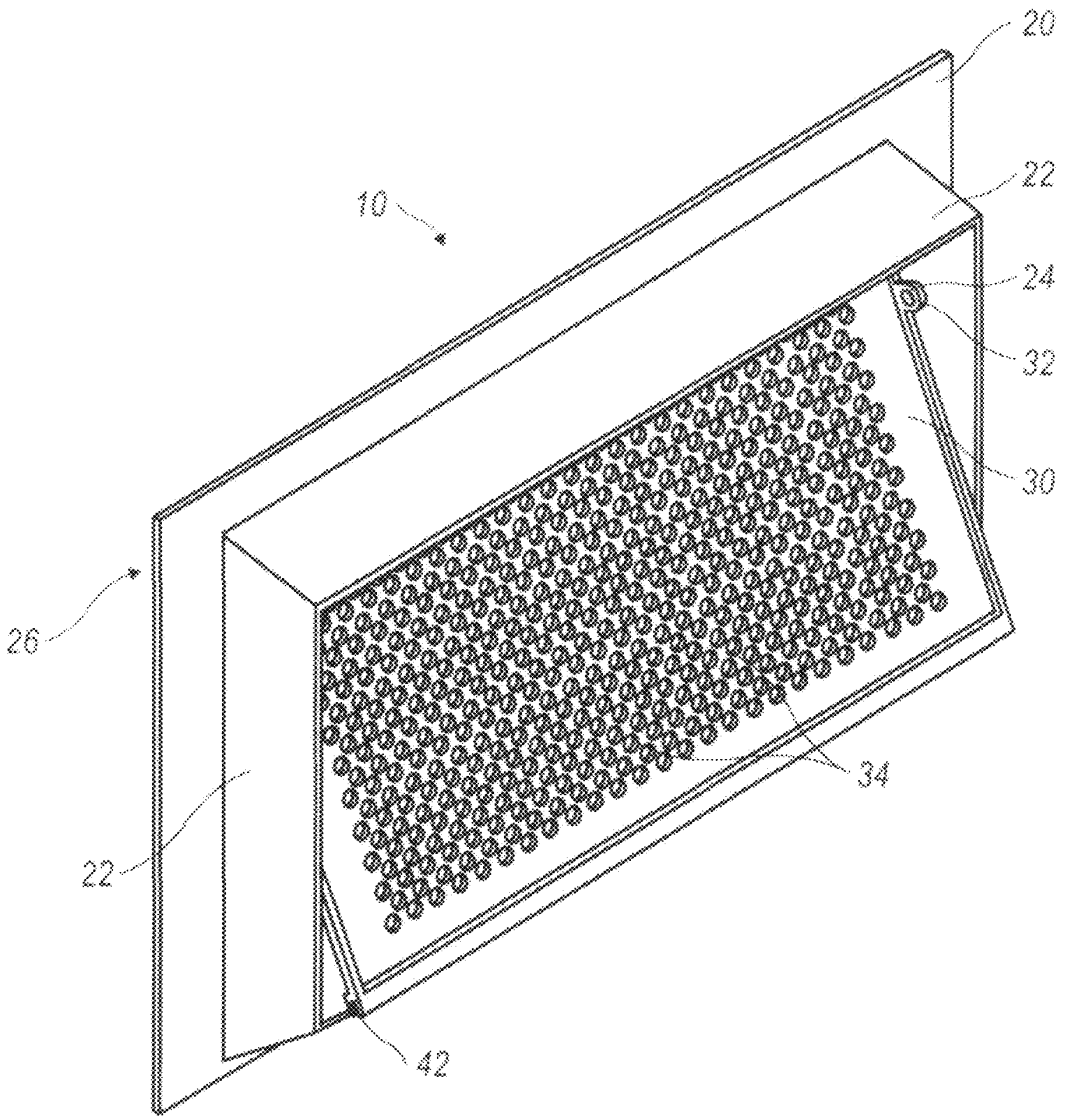


FIG. 7

FLOOD VENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to structure venting, in particular, to a flood vent that opens to permit the flow of water in or out of a structure, such a house or garage, when the water level rises thereby avoiding an excessive pressure differential to develop between the interior and exterior of the structure as well as damage or failure of the structure.

2. Description of the Related Art

To eliminate or at least reduce damage due to flooding, several building code entities as well as the federal government have developed rules and regulations requiring structures with enclosed spaces located below defined flood plain levels to include automatic equalization of interior and exterior hydrostatic pressure caused by floodwaters. The rules and regulations require structures to be designed and built to allow floodwaters to move in and out of a structure freely. The Federal Emergency Management Agency (FEMA) requires compliance with FEMA Technical Bulletin 1-93. Other governmental agencies required compliance with the International Building Code and/or ASME 24-05 and 24-98.

A number of devices have been developed to reduce or eliminate the pressure differential that may develop between the interior and exterior of a structure. In 1935, Hodge developed and was issued in 1938, U.S. Pat. No. 2,105,735 for a device that would relieve pressure that may develop within a closed chamber. The device focused upon the release of gas pressure from within the structure but provided for no means to reduce the pressure differential that could develop when the internal pressure of the closed chamber was less than the surrounding pressure. In 1954, Wolverton filed an application for a double acting relief valve and was issued a U.S. Pat. No. 2,774,116 in 1956. Wolverton's double acting relief valve addressed the shortfall for Hodge's device by double hinging a plate mounted in a structure's door that would activate to equalize the pressure differential, if any, between a storm door and main door. The Wolverton device did not address the issues associated with pressure differentials created by floodwaters, nor did the Wolverton device address ventilation.

In 1993, Wagedes filed an application for an improved louvered basement vent and was issued U.S. Pat. No. 5,293,920 in 1994. Wagedes' improved louvered basement vent included a frame and a screened opening. The louvers could be held open by engaging louver detents against frame tabs. The louvers open automatically to relieve excessive pressure in the structure and would remain open if the louvers engaged the frame tabs. While the Wagedes improved louvered basement vent was screened—where the prior discussed patents were not, it was limited to addressing only one type of pressure differentials—namely over pressurization of the structure. Furthermore, the Wagedes improved louvered basement vent required human intervention to reset the louvers in a closed position if the detents were engaged.

In 1994, Schedegger and others filed a patent application for a plastic foundation vent and were issued U.S. Pat. No. 5,487,701 in 1996. The Schedegger device is similar in construction to the Wagedes device, in that it comprised independent louvers that could be held in an open position as well as a screened opening. Like Wagedes' device, Schedegger's device was limited to addressing only one type of pressure differential and required human intervention to release opened louvers.

In 1999, Montgomery filed a patent application for a device and method for relieving flooding from an enclosed space. He

was issued U.S. Pat. No. 5,944,445 in 1999. The Montgomery device includes a swinging door capable of swinging both in and out of the structure to permit tidal water flow in and out of the structure. The swinging door has a spring loaded hinge and is held in a closed position by a catch assembly. The catch assembly includes an adjustable screw, a catch spring, a ball bearing and threaded sleeve. The automatic opening of the device in response to floodwaters pressing against the door is a function of adjusting the catch assembly. Improper adjustment of the catch assembly could range from a premature door opening (by animals) to failure of the door to open. Furthermore the manufacturing and assembly of such a device require skilled labor. In the same year, Montgomery and other filed a patent application for a foundation flood gate with ventilation. U.S. Pat. No. 6,287,050 was issued in 2001 for the device. Like his previous device, the foundation flood gate with ventilation included a swinging door capable of swinging in both directions to allow water to flow in or out of the structure. Automatic activation of the door is performed by a catching assembly. The catching assembly included a float for sensing the level of the water and releasing the door when the level exceeds a preset height. Automatic opening of the door requires an intact and freely movable float within the device. While requiring fewer parts than his previous device, the catching assembly still requires skilled labor to manufacture and assemble. In 2001, Montgomery and others filed a similar application for a foundation flood gate with ventilation but the latch assembly senses fluid force acting upon the door rather than relying upon a float to sense water level. In 2002, the United States Patent and Trademark Office issued U.S. Pat. No. 6,485,231 for the device. The device included a latching assembly which requires skilled labor to manufacture and assemble for proper operation.

Sprengle and other filed an application in 2002 for a flood gate for a door. In 2004, U.S. Pat. No. 6,692,187 was issued for the device. The Sprengle device incorporated both the pressure and float sensing features of Montgomery's devices and further allowed for the gate to be used in an overhead door application without the door automatically swinging open when the overhead door is opened. Like the Montgomery devices, the Sprengle device requires skilled labor to manufacture and assemble for proper operation.

Finally, in 2007 Albanese was issued U.S. Pat. No. 7,270,498 for a flood vent which relies upon a door with floatation slideably mounted to a frame which automatically opens (or closes) based upon the level of the floodwaters. While Albanese reduces the number of moving parts and thereby reduces the need for skilled labor, the device still requires proper manufacturing tolerances and assembly to ensure free sliding movement of the door within its tracks. Furthermore the Albanese device has no means to automatically open in response to force upon the door.

As can be seen above the need for a flood vent that can open automatically, provide ventilation, yet have a minimal number of moving parts is desirable.

SUMMARY OF THE INVENTION

The present invention is directed to a flood vent **10** comprising a shuttered duct **15**, with an upper and lower region, formed in a housing **20** fixed in a structure, such as a house, building, wall, door or overhead door at an elevation above ground level. See FIGS. **1**, **4**, and **6**. A lower region of duct **15** is angled down between two degrees)(2°) and eight degrees (8°) from a horizontal plane to form a sill **28** that sheds water to an exterior of the structure. See FIGS. **1**, **4**, and **6**. The present flood vent **10** includes a shutter **30** which is pivotally

fixed in duct **15**. Duct **15**, sill **28** and shutter **30** are configured to allow the unimpeded movement of floodwaters in and out of the structure, when present; and further deter animals from using the flood vent **10** as a passageway in and out of the structure. Among those benefits and improvements that have been disclosed, other objects and advantages of this invention will become apparent from the following description taken in conjunction with the accompanying drawings. The drawings constitute a part of this specification and include exemplary embodiments of the present invention and illustrate various objects and features thereof.

BRIEF DESCRIPTION OF DRAWINGS

The present invention is further described in connection with the accompanying drawings, in which:

FIG. **1** is an exploded isometric view of an embodiment of the flood vent.

FIG. **2** is an isometric view of a hood for said flood vent.

FIG. **3** is an isometric view of an embodiment of a flood vent shutter.

FIG. **4** is an isometric view of an embodiment of a flood vent housing.

FIG. **5** is an isometric detail view of another embodiment of a flood vent shutter.

FIG. **6** is an isometric view of an embodiment of a flood vent.

FIG. **7** is an isometric view of an embodiment of a flood vent.

DETAILED DESCRIPTION OF THE INVENTION

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative forms. The figures are not necessarily to scale; some features may be exaggerated to show details of particular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention.

Certain terminology will be used in the following description for convenience and reference only and not for purposes of limitation. For example, the words "rightwardly", "leftwardly", "upwardly" and "downwardly" will refer to directions in the drawings to which reference is made. The words "inwardly" and "outwardly" refer to directions toward and away from, respectively, the geometric center of the structure being referred to. This terminology includes these words, specifically mentioned derivatives thereof, and words of similar import. Furthermore, elements may be recited as being "coupled"; this terminology's use anticipates elements being connected together in such a way that there may be other components interstitially located between the specified elements, and that the elements may be connected in fixed or movable relation one to the other. Certain components may be described as being adjacent to one another. In these instances, it is expected that such a relationship so described shall be interpreted to mean that the components are located proximate to one another, by not necessarily in contact with each other. Normally there will be an absence of other components positioned there between, but this is not a requirement. Still further, some structural relationships or orientations may be designated with the word "substantially". In those cases, it is meant that the relationship or orientation is as described, with allowances for variations that do not effect the cooperation of the so described component or components.

The present flood vent **10** comprises a bezel **26** connected to two opposing walls **22**, an upper wall **22** and a sill **28** to form a duct **15** within a housing **20**. See FIGS. **1**, **4** and **6**. The flood vent **10** has an interior duct opening **17** on the inside of the structure and an exterior duct opening **19** on the outside of the structure. See FIG. **4**. Duct **15** allows fluid communication between the interior and exterior of the structure when floodwaters rise above sill **28**.

Bezel **26** surrounds a periphery of an exterior duct opening **19** and serves to attach housing **20** to structure by fasteners or adhesive. Housing **20** can have outer dimensions that correspond with the nominal dimensions of concrete masonry units (CMU). In a preferred embodiment, housing **20** has outer nominal dimensions that correspond to a CMU-8, namely eight inches (8") high, sixteen inches (16") long and eight (8") wide (all nominal dimensions). Housing **20**, walls **22**, bezel **26**, and sill **28** can be constructed of materials such as metal, plastic, concrete, cement, composites or a combination thereof.

A shutter **30** is pivotally fixed to an upper region of duct **15** so that shutter **30** is capable of swinging in two directions, namely in and out of the structure. It is contemplated that shutter **30** can move about a swing arc that can be approximately one hundred and sixty degrees)(160°) to approximately two hundred and twenty five degrees (225°).

A lower region of shutter **30** is releasably coupled to a portion of sill **28** by a fin **50**. A coupling region is that portion of shutter **30** swing arc where fin **50** is in contact with a portion of sill **28**, at least one tab **40** fixed to and projecting away from sill **28**, or a combination of both. Movement of shutter **30** to, from or through a coupling region is hampered by the releasable coupling of shutter **30** to sill **28** by fin **50**. The presence of at least one tab **40** fixed to and projecting away from sill **28** hampers movement of shutter **30** to, from, or through a coupling region. The size of a coupling region varies with the width of fin **50**, angle of sill **28** and the presence of at least one tab **28**. It is contemplated in one embodiment, that when fin **50** is within a coupling region, shutter **50** is in a closed position that substantially obstructs duct **15** and deters animal use of flood vent **10** as a passage through the structure. Movement of shutter **30** about a swing arc can be in response to a floodwater pressure differential in or across duct **15**, movement of floodwater against shutter **30**, floatation of shutter **30**, or a combination thereof.

Shutter **30** can be pivotally fixed to an upper region of duct **15** by a variety of pivoting mechanism known to those skilled in the art of flood vents. In a preferred embodiment, a pair of opposing pin holes **24** is formed in an upper region of shutter **30** to receive a corresponding pin **32** fixed and projecting away from an upper region of duct **15**. See FIGS. **1**, **3**, **4**, **5**, and **7**. This arrangement allows a shutter **30** to rotate freely about a substantially horizontal axis above sill **28**.

Fin **50** can be fixed to shutter **30**, sill **28** or neither as set forth in the following descriptions. In a first embodiment, fasteners **07** fix fin **50** to a lower region of shutter **30** so that it projects away from a lower region of shutter **30**. See FIGS. **1** and **3**. In such an embodiment, fin **50** can be fixed to a lower region of shutter **30** by fasteners **07** or slidably fixed to a lower region of shutter **30** by fasteners **07** passing through corresponding slots **52** formed in fin **50**. See FIGS. **3** and **5**. As the reader can appreciate, a slideably fixation of fin **50** to a lower region of shutter **30** alters the coupling region without altering the width of fin **50**. In a preferred embodiment, at least one tab **40** is fixed to and projects away from sill **28** to releasably couple with fin **50** to hamper movement of shutter **30** to, from

or through a closed position or a coupling region. See FIGS. **1** and **4**. In a second embodiment, fin **50** is fixed to and extends away from sill **28** to releasably couple with a receiver **42** formed in a lower region of shutter **30**. See FIGS. **6** and **7**. In such an embodiment, the size of a coupling region is a function of the cross sections of fin **50** and receiver **42** as well as the angle of sill **28**. In a third embodiment, fin **50** is releasably coupled to both shutter **30** and sill **28** by a first receiver **42** formed in a lower region of shutter **30** and a second receiver **42** formed in sill **28**. It is contemplated that such an embodiment would require a user to couple or re-couple shutter **30** with sill **28** after movement of shutter **30** beyond a coupling region.

It is contemplated that duct **15** and shutter **30** can be circular, arcuate, polygonal or a combination thereof in shape when viewed from a duct opening **17** or **19**.

In another embodiment, a plurality of holes **34** is formed in shutter **30** to allow movement of fluid through shutter **30**. Such holes **34** allow ventilation between the interior and exterior of the structure when shutter **30** is in a closed position. It is further contemplated that a hood **36** can be removably fixed to shutter **30** to impede the movement of fluid through shutter **30**.

It is contemplated that shutter **30** and hood **36** can be constructed from metal, plastic, composites or a combination thereof. Furthermore, shutter **30** can be constructed with material(s) with a low density such that at least a portion of shutter **30** is buoyant in floodwater of a sufficient depth within said duct **15**.

In any of the embodiments described above, the presence of a substantial amount of floodwater within at least a portion of duct **15** causes shutter **30** to move about its swing arc and allows the flow of floodwater between an interior and exterior of the structure. In the absence of a substantial amount of floodwater within duct **15**, shutter **30** is in a closed position or within a coupling region to substantially obstruct duct **15** and deter animal use of flood vent **10** as a passage through the structure. Finally, the number of parts used in the different embodiments of the present flood vent **10** is greatly reduced over existing devices which in turn reduces the cost of manufacturing and assembly. Likewise, the reduction in parts eliminates or reduces the likelihood of failure.

A flood vent **10** and its components have been described herein. These and other variations, which will be appreciated by those skilled in the art, are within the intended scope of this invention as claimed below. As previously stated, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various forms.

The invention claimed is:

1. A flood vent for a structure comprising:

a shuttered duct with an upper and lower region formed in a housing fixed in the structure to allow the unimpeded movement of floodwaters through the structure, wherein said lower region of said duct is angled down between two and eight degrees from a horizontal plane to form a sill that sheds water to an exterior of the structure;

said upper region of said duct is pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position and an open position in response to a floodwater pressure differential in said duct; and

a lower region of said shutter releasably coupled to a portion of said sill by a fin, wherein width of said fin and angle of said sill defines a coupling region along said sill wherein said shutter substantially obstructs said duct to prevent animal passage along said duct and wherein said fin is slideably fixed to said lower region of said shutter to alter said coupling region between said shutter and said sill.

2. A flood vent for a structure comprising:

a shuttered duct with an upper and lower region formed in a housing fixed in the structure to allow the unimpeded movement of floodwaters through the structure, wherein said lower region of said duct is angled down between two and eight degrees from a horizontal plane to form a sill that sheds water to an exterior of the structure;

said upper region of said duct is pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position and an open position in response to a floodwater pressure differential in said duct; and

a lower region of said shutter releasably coupled to a portion of said sill by a fin, wherein width of said fin and angle of said sill defines a coupling region along said sill wherein said shutter substantially obstructs said duct to prevent animal passage along said duct and

wherein an upper region of said fin is releasably coupled with a first receiver formed in said lower region of said shutter and a lower region of said fin is releasably coupled with a second receiver formed in said sill.

* * * * *

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(54) **FLOOD VENT**

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E04F 17/04	(2006.01)
E04F 17/00	(2006.01)
E02B 7/00	(2006.01)

(52) **U.S. Cl.** **52/169.5**; 405/87

(57) **ABSTRACT**

A structurally adaptive flood vent device disposed to allow the passage of both air and flood fluid through and existent structure, in order to relieve buildup of excess water around a structure, while concurrently affording protection from intrusion of foreign matter. The instant design features constant aeration properties, in conjunction with automatic operation toward relief upon the onset of external structural flooding. Use of a door assembly which is entirely removed in an automated process upon flooding is featured.

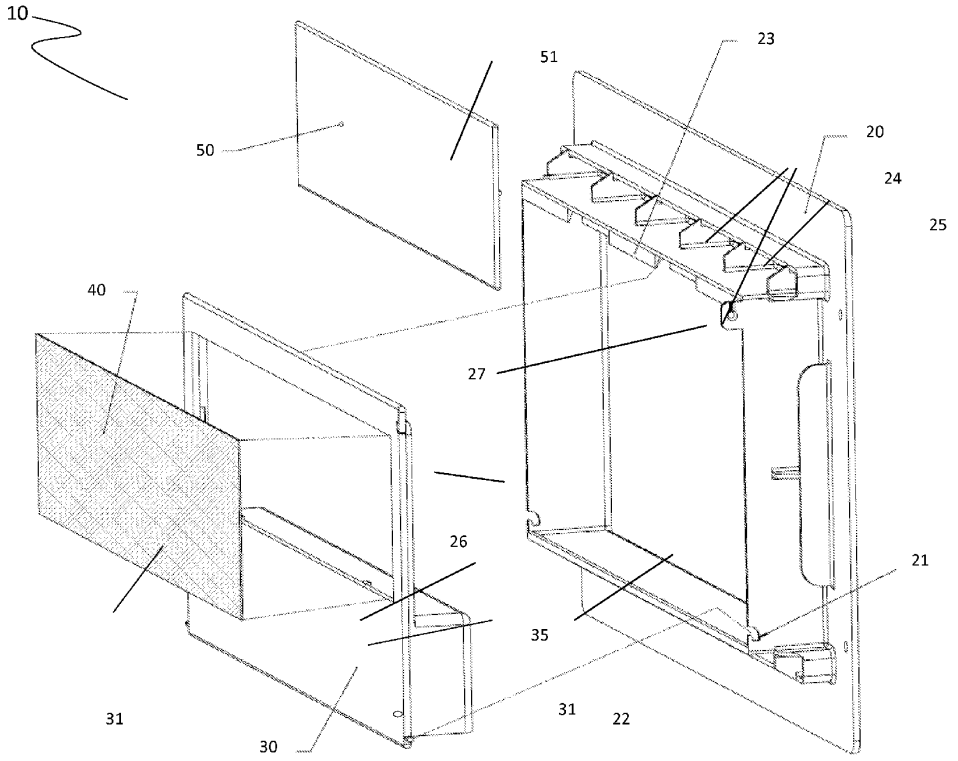


FIG. 1

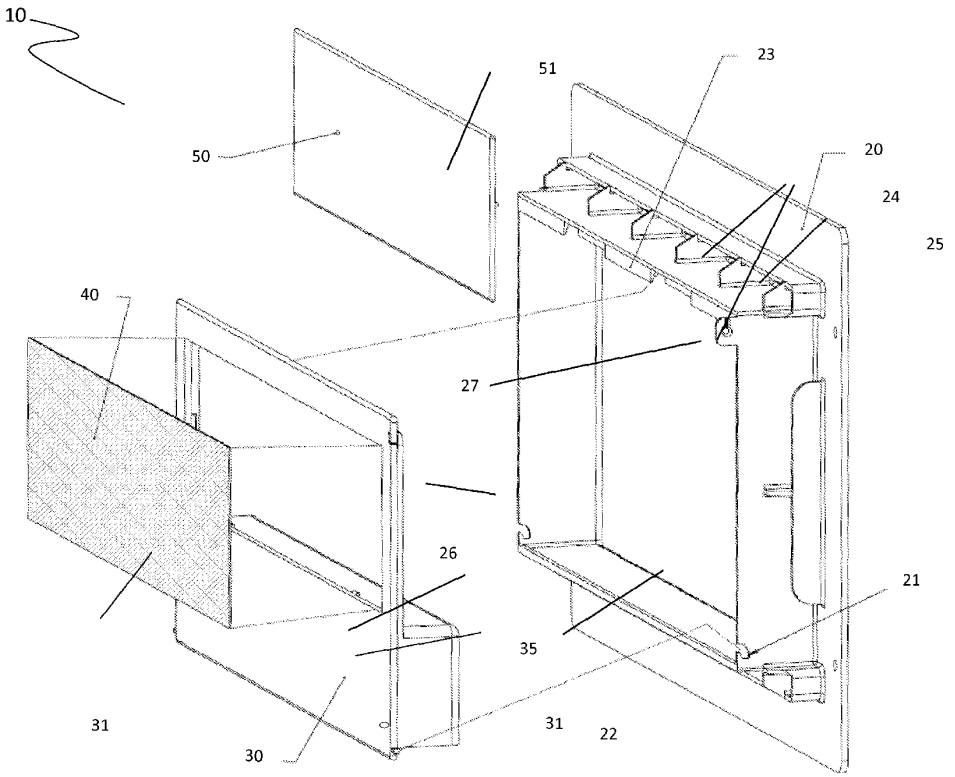
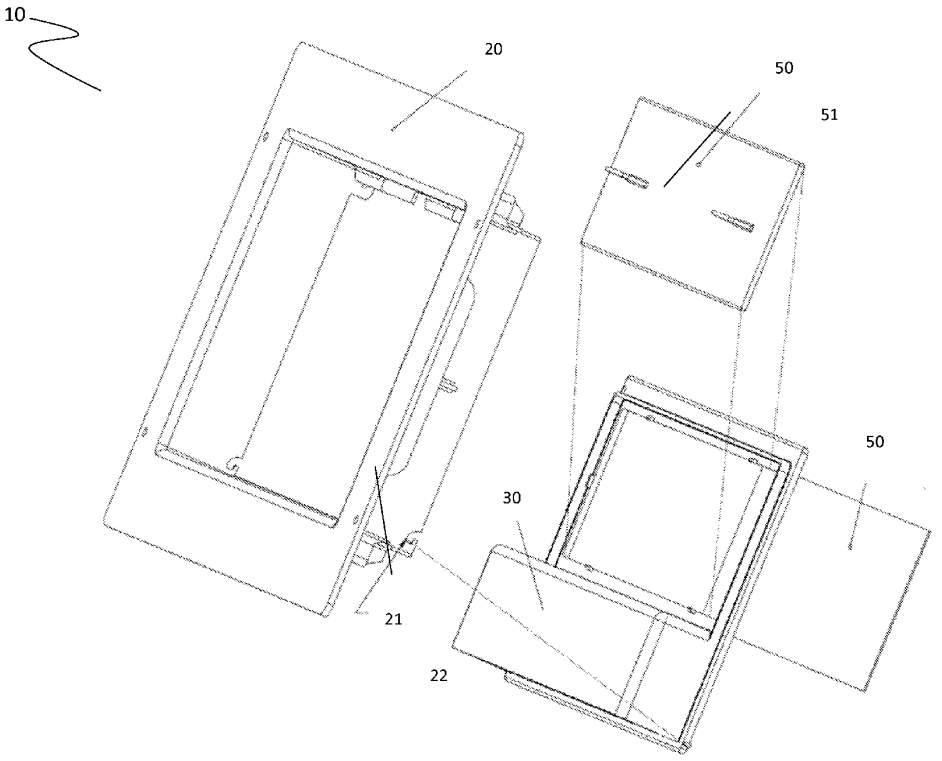


FIG. 2



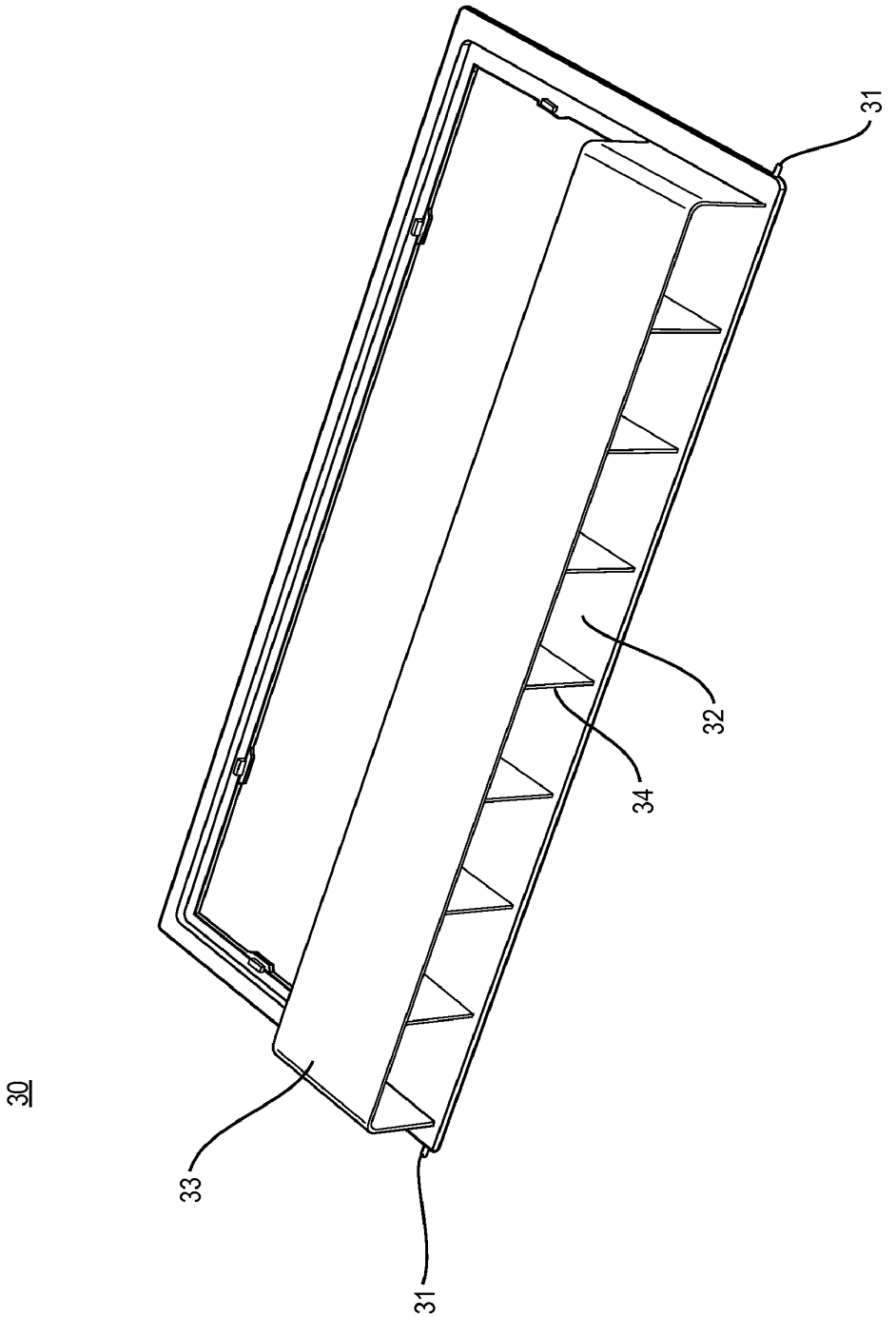


FIG. 3

FLOOD VENT

FIELD OF THE INVENTION

[0001] The present invention, defined in several embodiments, relates generally to multi-purpose vents for household and industrial usage. Specifically, the present invention relates to vents that allow the passage of both air and flood water, in order to relieve buildup of excess water around a structure, while concurrently affording intrusion protection.

BACKGROUND OF THE INVENTION

[0002] The utilization of venting systems for directing a buildup of external fluid surrounding the lower particulars of an enclosed structure, into the aforementioned structure, in order to relieve stress from the foundation and allow for proper drainage and removal of the fluid through an internal drainage system. As illustrated in the state of the art, systems regularly include apparatuses with moving parts, such as hinged or rotating elements.

[0003] With the advent of major flooding issues throughout many areas of the United States, national agencies such as Federal Emergency Management Administration (FEMA) and National Flood Insurance Program (NFIP), a flood insurance division of FEMA, have set out to that building codes mandate that new and existing structures install flood and air ventilation systems within the foundations.

[0004] To date, within FEMA defined flood zones, in order to obtain building permits and flood insurance for structures, whether newly constructed or substantially renovated that incorporate crawl spaces and/or unfinished basements, FEMA and the NFIP now require the installation of flood vents. However, current designs in the art either fail to operate automatically with the onset of flood water or fail to allow for a fully cleared opening after the vent function has occurred.

[0005] Within the state of the art, the concept behind the utilization of flood vents finds basis in the reaching equilibrium between the water pressure upon the exterior and the interior of the foundation walls of the existent structure. In operation, as flood water rises around the foundation of the structure, the flood vent is designed to allow flood fluids to enter into the foundation/crawlspace, so as to equalize water pressure on the exterior and the interior of the foundation walls. In much the same theory as an in-ground pool, if the fluid were to be evacuated from the pool, the pressure of the surrounding underground area, against the structure of the sides of the pool, may cause severe damage to the structure of the pool walls, and in some cases total catastrophic failure. Thus, the existence of the fluid within the pool equalizes the pressure of the surrounding ground and the pool water against the walls of the pool.

[0006] Therefore, it is understandably vital that flood water is allowed to flow freely into and out of a foundation, crawl space or other functional equivalent, in times of flooding, as if this condition is not afforded for, the constant, unidirectional pressure will eventually create great structural damage and given time, even catastrophic failure.

[0007] Many concurrent designs of flood vents are disposed to allow for the flow of flood water out of the existing structure.

[0008] However, such systems inherently fail when flood water surrounding the edifice rise to the level wherein the internal and external water levels reach equilibrium. Thus, in such an equilibrium state, water can no longer be evacuated from the space through the vent and the foundation area will become completely flooded. Additionally, many systems incorporate screen mechanisms which, upon operation in flood mode, allow for the accumulation of debris and subsequent blockage of flow.

[0009] Thus, the ability to provide proper aeration and flood relief, without creating restrictions to flow is tantamount.

BRIEF SUMMARY OF THE INVENTION

[0010] The instant invention, as illustrated herein, is clearly not anticipated, rendered obvious, or even present in any of the prior art mechanisms, either alone or in any combination thereof.

[0011] Briefly stated, in one aspect of the present design, an apparatus disposed to allow the flow of fluids, particularly air and water, into a structure. Under normal circumstances, the instant system allows a flow of air which properly aerates the lower portion of an edifice in order to maintain structural integrity of the edifice. Under exigent circumstances, particularly structural flooding, the instant apparatus allows for the flow of water surrounding a structure, into a designated area within the structure, for evacuation to a proper drainage system.

[0012] Additionally illustrated is a structural fluid control system adapted for mounting within an exiting structure, or a newly fabricated structure, particularly with the foundation thereof, comprising a favorable lack of permanently connected moving parts, to prevent blockage of flow. The instant apparatus and accompanying design prevents failure through seizing by not incorporating any rotational mechanical parts.

[0013] In one embodiment of the present invention, a system for installation within a foundation wall for air ventilation and passage of flood water is provided, wherein the system comprises a frame assembly disposed for straightforward installation into a foundation wall, wherein the foundation wall comprises a pre fabricated assembly receptacle area.

[0014] Furthermore, the instant system may comprise a door assembly, wherein the door assembly is design to be removably attached to the frame assembly. The door assembly may include an area disposed to house a screen in order to allow for air flow and may be easily released in order to allow water into the structure. The door assembly may also comprise one or many blowout panels.

[0015] The instant system may comprise a substantially "boxlike" construction and may be manufactured from many materials including polymers, metals and composites thereof.

[0016] Moreover, the instant system strives to comply with, or be adaptable to, the following standards, including but not limited to:

[0017] FEMA/FIA Technical Bulletin TB 1-93 "Engineered Opening Requirements";

[0018] American Society of Construction Engineers (ASCE) 24-05 "Flood Resistant Design and Construction"; and

[0019] FEMA National Flood Insurance Program Regulations 44 CFR 60.3;

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

[0020] The foregoing summary, as well as the following detailed description of preferred embodiments of the invention, will be better understood when read in conjunction with

the appended drawings. For the purpose of illustrating the invention, there is shown in the drawings embodiments which are presently preferred. It should be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown. In the drawings:

[0021] FIG. **1** is a front assembly view of the system in accordance with one embodiment of the present invention;

[0022] FIG. **2** is a rear assembly view of the system in accordance with one embodiment of the present invention;

[0023] FIG. **3** is a front perspective view of the removable door assembly, illustrating the screen assembly with the cover in place and the door post retaining devices in accordance with one embodiment of the present invention; and, chambers to trap air or other buoyant material.

DETAILED DESCRIPTION OF THE INVENTION

[0024] The present invention comprises a dynamic foundation and flood vent, disposed to allow a controlled flow of air for ventilation purposes, and fluid, for drainage of flood waters and such matter which may surround a commercial or residential structure.

[0025] In one embodiment, the vent may include a dynamically operational system comprising a frame assembly, designed to be embedded into the side wall of the lower portion of a structure, preferably a concrete or other such load bearing foundation. Additionally, the system may comprise a dynamic door assembly, wherein the door assembly comprises features which allow for both airflow and relief of flooding around the lower portion or foundation of an edifice. In operation, the lower portion of the door assembly should enclose air or a similar gas, which is lighter than water, or be substantially buoyant, such that upon flooding, a slight amount of water should be allowed to lift the door assembly in order to initiate the lift off process.

[0026] Referring to FIGs and particularly FIGS. **1** and **2**, the dynamically operational structural fluid control apparatus **10** comprises a frame assembly **20** in communication a lower portion of a structure, a door assembly **30**, wherein the entirety of door assembly is fully dynamic and wherein the door assembly **30** is in removable communication with the frame assembly **20** and wherein the door assembly **30** further comprises a screen assembly **40** and a removably attached screen assembly cover **50**; and wherein the frame is disposed to be attached to a foundation of a structure and wherein said dynamically operational structural fluid control apparatus allows for a flow of fluids through the foundation. The screen assembly **40** may be press fit, molded or inserted in to the door assembly **30** and also may be composed of stainless steel.

[0027] The screen assembly **40** will allow airflow while preventing intake of unwanted items such as waste mater traveling in the air, animals, insects and other foreign matter, unwanted within the interior of a structure. Furthermore, the instant design provides great merit as the screen assembly **40** is attached to the door assembly **30** and thus, when the door assembly **30** is automatically jettisoned under flood conditions, the screen assembly **40** goes with the door assembly **30**. In this manner, blockage by foreign matter during flooding conditions is vitiated, allowing continual, free flow to the pumping area.

[0028] Thus the instant system allows for airflow to provide aeration for the lower portion of the structure in order to maintain a dry environment, in conjunction with affording the passage of flood waters into the internal space in order to create an equilibrium state and relieve stress on the structure. The door assembly **30** further comprises at least two door post retaining devices **31**. The frame assembly comprises at least two cam latches **21** disposed to retain the corresponding post retaining devices **31** and fixedly retain the two door post retaining devices **31** in normal operation mode. In additional embodiments, greater than two door post retaining devices and corresponding cam latches may be utilized.

[0029] The door assembly may also include a lower portion **32** comprising a series of chambers **33**, retaining compartments **33** or air chambers **33** in which air, other materials or other fluids which are lighter than water, may be housed. Further, either in cooperation or independently, the lower portion **32** chambers **33** may be composed of buoyant materials or compositions, including but not limited to such polymer based products as Styrofoam®, and thus allow for a floating affect.

[0030] The chambers **33** may be divided by a series of baffles **34** or fins **34** and the chambers **33** and the baffles **34** may also be intentional manufactured from a buoyant material.

[0031] Further discussing the operational modes of the instant design, the vent door is disposed to be in the closed position at all times, until a flood occurs. In this mode, as discussed above, the screen assembly **40** There is a screened area on the door itself with a with the screen assembly cover **50** that will allow airflow to pass through while the flood door remains closed.

[0032] Next, in the event of a flood, as the flood water rises, it will eventually rise to the level of the chambers **33** contained in the lower portion **32** of the door assembly **30**. As the flood water continues to rise, the air in chambers **33** is unable to escape as the flood water seals off the bottom openings in the chambers **33**. By design, an amount of the water will be able to flow and escape through the bottom area of the door assembly **30** but the water will continue to rise and begin to rise over the outside of the flood vent door at a faster pace than the water that escapes through the crevices between the door assembly **30** and the frame assembly **20**.

[0033] As air is lighter than water and will have nowhere to displace, the door assembly **30** will be forced to rise vertically with the continued rising of the flood waters. As the water level rises, the entrained air will be displaced in between baffles or fins **34**. The rise of fluid will inherently cause the door assembly **30** to rise within the cam latches **21**. As illustrated in FIGS. **1** and **2**, each of cam latches **21** comprises a release opening **22**. With the onset of rising fluid, the release openings **22** are disposed to allow the door post retaining devices **31** to break free of the confines of the cam latches **21**.

[0034] In operation, the door post retaining devices **31**, and of course the entirety of the door assembly **30** first move in vertical component until door post retaining devices **31** reach the area of the release opening **22**. Thus, the door assembly **30** will rise in the track of the cam latches **21** on each side of the frame assembly **20** and will move and inward as the flood water flows. This will continue until the door assembly breaks free of the frame assembly **20** on the bottom. At this time, a horizontal component of motion begins to be exhibited as the door post retaining devices **31** are allowed to exit the release opening **22**.

[0035] This will allow for free flow of flood waters into the crawl space/foundation achieving the goal of allowing water to flow into the crawl space/foundation. There will be no obstructions in the opening as the entire door assembly **30** will wash into the crawl space/foundation.

[0036] Thus, each of the individual cam latches **21** comprises a release opening **22** wherein the release opening **22** is disposed to allow the at least two door post retaining devices to move first vertically and second horizontally through said release opening **22** upon flood operation mode.

[0037] The frame assembly may further comprise a set of opposing ribs **23**, located on the upper internal portion of the frame assembly and disposed to removably retain the door assembly **30** via physical contact with the upper portion of the door assembly **30**. The set of opposing ribs **23** may comprise at least three rearward ribs and at least two forward ribs.

[0038] Addressing the retention of the upper portion of the door assembly **30**, the series of alternating or opposing ribs **23**, retain the upper portion of the door assembly during static mode. Subsequently, with the onset of rising flood fluids and simultaneous with the end of the horizontal component of motion wherein the door post retaining devices **31** are allowed to exit the release opening **22**, the door assembly begins to fall away from the opposing ribs **23**, and thus free of the entirety of the frame assembly. The door assembly will thus completely detach from the frame and float freely, allow fluid to pass through the frame and into the interior of the structure. In order to retain control of the door assembly **30**, the door assembly may be tether to the frame in such a way as to allow the door assembly to freely release, but not float away and become lost.

[0039] In daily or non-flooding operation, the door assembly **30** is locked into place with the cam latches **21** in the bottom of the frame assembly **20** and door assembly **30** and there is a small lip **26** at the very rear of the frame assembly **20**, disposed to work in conjunction with the opposing ribs **23**, to keep the door assembly **30** from being pushed into the foundation by small animals or rodents, until the occurrence of a flooding event. Additionally, the water pressure will not allow the small lip **26** at the back of the frame assembly **20** to interfere with the door assembly **30** operation. Thus, the door assembly **30** cannot be pushed in as it must rise vertically at a slight angle and falls away from top in order to release.

[0040] Additionally, to enhance secure mounting of the frame assembly into the structure, the frame assembly may possess a series of press fittings **24** which compress upon insertion into the mechanical opening in the structure wall and expand in order to retain the frame assembly within the mechanical opening. The frame assembly may further comprise a series of apertures **25** disposed on a left side portion and a right side portion of the frame assembly and wherein the series of apertures **25** are disposed for affixing or fastening the frame assembly **20** to a foundation and through the given hole. Each side of the frame assembly **20** may further comprise at least two apertures **25**. Te frame may also comprise at least one aperture **27** for receiving a tethering line. Consequently, the door assembly **30** may also comprise at least one aperture **35**, disposed to receive the opposing side of the tethering line. Ergo, as the door will be tethered, subsequent to the flooding event, the door assembly may be recovered and reinstalled. Additionally, the tethering device will be stainless steel.

[0041] As the flood waters recede, the water will be free to flow out of the structure until the level of the water reaches the lowest level of the opening of the frame. After that, the rest of the flood water in the foundation may be pumped out and removed from the structure. Also, the screen cover assembly may comprise at least two latching mechanisms **51** for mating with the door assembly.

[0042] Finally, the instant system may be made of many materials including polymers, metals and composites thereof. In one embodiment, the system may comprise a material with a rodent resistant additive, as is particularly suited for polymeric materials or plastics, which will deter rodents from chewing on the door assembly **30**, frame assembly **20** or constituent parts thereof. Products made of metals will not have a rodent resistant additive. The system may also be UV resistant.

[0043] It will be appreciated by those skilled in the art that changes could be made to the embodiments described above without departing from the broad inventive concept thereof. It is understood, therefore, that this invention is not limited to the particular embodiments disclosed, but it is intended to cover modifications within the spirit and scope of the present invention as defined by the appended claims.

[0044] The Figures and the following description relate to preferred embodiments by way of illustration only. It should be noted that from the following discussion, alternative embodiments of the structures and methods disclosed herein will be readily recognized as viable alternatives that may be employed without departing from the principles of what is claimed. For purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the invention. It will be apparent, however, to one skilled in the art that the invention can be practiced without these specific details. In other instances, structures and devices are shown in block diagram form in order to avoid obscuring the invention.

[0045] Reference in the specification to "one embodiment," "an embodiment" or "some embodiments" means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the invention. The appearances of the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment.

[0046] Some embodiments may be described using the expression "coupled" and "connected" along with their derivatives. It should be understood that these terms are not intended as synonyms for each other. For example, some embodiments may be described using the term "connected" to indicate that two or more elements are in direct physical or electrical contact with each other. In another example, some embodiments may be described using the term "coupled" to indicate that two or more elements are in direct physical or electrical contact. The term "coupled," however, may also mean that two or more elements are not in direct contact with each other, but yet still co-operate or interact with each other. The embodiments are not limited in this context.

[0047] As used herein, the terms "comprises," "comprising," "includes," "including," "has," "having" or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a process, method, article, or apparatus that comprises a list of elements is not necessarily limited to only those elements but may include other elements not expressly listed or inherent to such process, method, article, or apparatus. Further, unless expressly stated to the contrary, "or" refers to an inclusive or and not to an exclusive or. For example, a condition A or B is satisfied by any one of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present) and both A and B are true (or present).

[0048] In addition, use of the "a" or "an" are employed to describe elements and components of the invention. This is

done merely for convenience and to give a general sense of the invention. This description should be read to include one or at least one and the singular also includes the plural unless it is obvious that it is meant otherwise.

[0049] The figures and/or displays presented herein are not inherently related to any particular computer or other apparatus. Various general-purpose systems may be used with programs in accordance with the teachings herein, or it may prove convenient to construct a more specialized apparatus to perform the required method steps. The required structure for a variety of these systems will be apparent from the description below. In addition, the present invention is not described with reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings of the invention as described herein.

[0050] Reference will now be made in detail to several embodiments, examples of which are illustrated in the accompanying figures. It is noted that wherever practicable similar or like reference numbers may be used in the figures and may indicate similar or like functionality. The figures depict embodiments of the disclosed system (or method) for purposes of illustration only. One skilled in the art will readily recognize from the following description that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the principles described herein.

1. A dynamically operational structural fluid control apparatus comprising:
- a frame assembly in communication a lower portion of a structure;
- a door assembly, wherein the entirety of door assembly is fully dynamic and wherein the door assembly is in removable communication with the frame assembly and wherein the door assembly further comprises:
  - a screen assembly and a removably attached screen assembly cover; and wherein the frame is disposed to be attached to a foundation of a structure and wherein said dynamically operational structural fluid control apparatus allows for a flow of fluids through the foundation; and,
  - a lower portion comprising a series of chambers disposed to trap air for displacement of the door assembly upon the rising of liquid around the frame assembly and door assembly.

2. The dynamically operational structural fluid control apparatus of claim **1** wherein the lower portion of the door assembly further comprises at least one baffle mechanism to divide the series of chambers.

3. The dynamically operational structural fluid control apparatus of claim **2** wherein the lower portion comprises a buoyant material.

4. The dynamically operational structural fluid control apparatus of claim **1** wherein the door assembly further comprises at least two door post retaining devices.

5. The dynamically operational structural fluid control apparatus of claim **4** wherein the frame assembly comprises at least two cam latches, wherein the at least two cam latches are disposed to retain the at least two door post retaining devices.

6. The dynamically operational structural fluid control apparatus of claim **5** wherein the at least two cam latches fixedly retain the at least two door post retaining devices upon normal operation mode.

7. The dynamically operational structural fluid control apparatus of claim **5** wherein the each of the at least two cam latches comprises a release opening wherein said release opening is disposed to allow the at least two door post retaining devices to move first vertically and second horizontally through said release opening upon flood operation mode.

8. The dynamically operational structural fluid control apparatus of claim **1** wherein the frame assembly further comprises a set of opposing ribs.

9. The dynamically operational structural fluid control apparatus of claim **8** wherein the frame assembly further comprises a set of opposing ribs located on the upper internal portion of said frame assembly.

10. The dynamically operational structural fluid control apparatus of claim **8** wherein the set of opposing ribs comprises at least three rearward ribs and at least two forward ribs.

11. The dynamically operational structural fluid control apparatus of claim **8** wherein the set of opposing ribs is disposed to retain the door assembly via physical contact with the upper portion of the door assembly.

12. The dynamically operational structural fluid control apparatus of claim **1** wherein the frame assembly further comprises a series of apertures disposed on a left side portion and a right side portion of the frame assembly and wherein the series of apertures are disposed for receiving a tethering mechanism.

13. The dynamically operational structural fluid control apparatus of claim **1** wherein the screen cover assembly comprises at least two latching mechanisms for mating with the door assembly.

14. The dynamically operational structural fluid control apparatus of claim **1** wherein the screen assembly is molded to the door assembly.

15. A foundation venting system comprising:
- a frame assembly in communication a lower portion of a structure and comprising:
  - a set of opposing ribs;
  - a series of press fittings disposed to compress and receive an engineered hole in foundation; and,
  - a series of apertures disposed for receipt of a tethering line;
- a door assembly, wherein the entirety of door assembly is fully dynamic and wherein the door assembly is in removable communication with the frame assembly and wherein the door assembly further comprises:
  - a screen assembly;
  - a removably attached screen assembly cover;
  - a set of door post retaining devices; and,
  - a set of baffle defined air retaining compartments composed of a buoyant material wherein the frame is disposed to be attached to a foundation of a structure and wherein said dynamically operational structural fluid control apparatus allows for a flow of fluids through the foundation.

16. A structural drainage apparatus comprising:
- a support structure comprising an outer frame disposed to be fitted substantially within a foundation of an existing edifice, the outer frame member comprising:
  - an upper portion;
  - a left side in communication with the upper portion;
  - a right side in communication with the upper portion;
  - and a lower portion in communication with the left side portion and the right side portion; wherein the left side

portion and the right side portion comprise apertures for affixing to the existing edifice;

a door member comprising a screen member and a screen cover member wherein the outer frame member is disposed to removably receive the door mechanism and wherein the door mechanism is disposed to receive the screen cover device and wherein the lower portion of the door member is buoyant.

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US009719249B2

(12) **United States Patent**
Anderson, Jr. et al.

(10) **Patent No.: US 9,719,249 B2**
(45) **Date of Patent: Aug. 1, 2017**

(54) **FLOOD VENT HAVING A PANEL**

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(73) Assignee: **Smart Vent Products, Inc.**, Pitman, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) Filed: **Dec. 10, 2015**

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(51) **Int. Cl.**
E02B 7/20 (2006.01)
E04B 1/70 (2006.01)

(52) **U.S. Cl.**
CPC ***E04B 1/7076*** (2013.01)

(58) **Field of Classification Search**
CPC E04B 1/7076; E06B 2009/007
USPC 49/10; 52/169.5; 405/92
See application file for complete search history.

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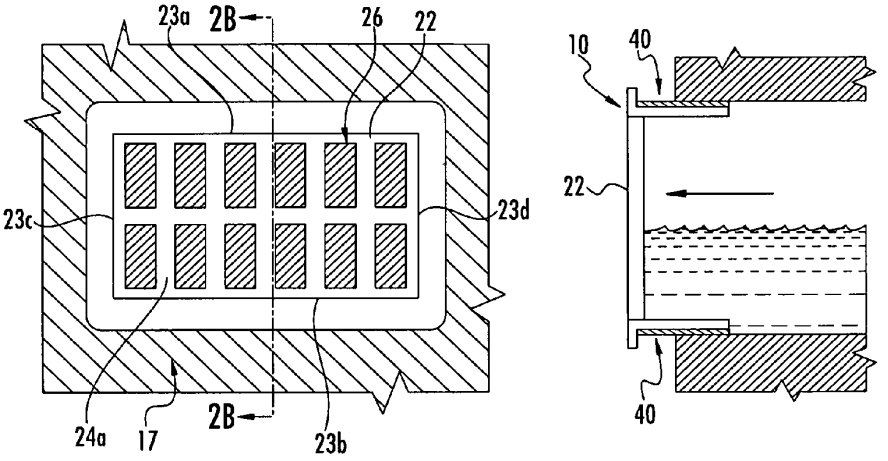
(57) **ABSTRACT**

According to one embodiment, a flood vent includes a frame configured to form a fluid passageway through an opening in a structure. The flood vent further includes a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. The flood vent also includes one or more connectors configured to couple the panel to the frame. The one or more connectors are further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch (PSI) of pressure is applied to a portion of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel.

16 Claims, 9 Drawing Sheets



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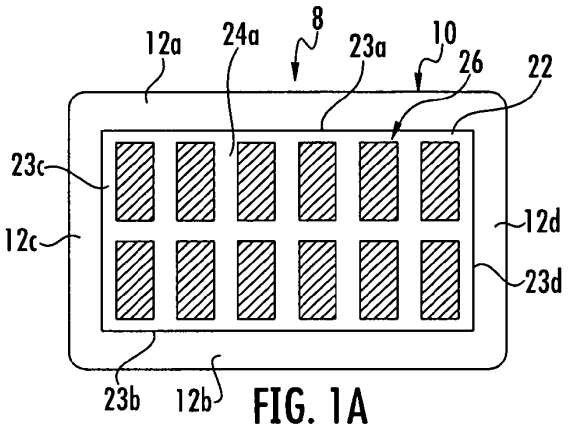

FIG. 1A

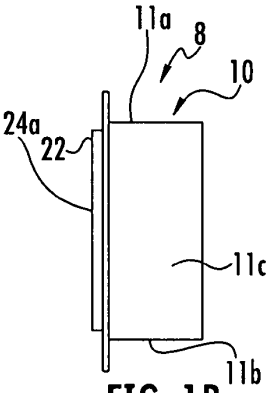

FIG. 1B

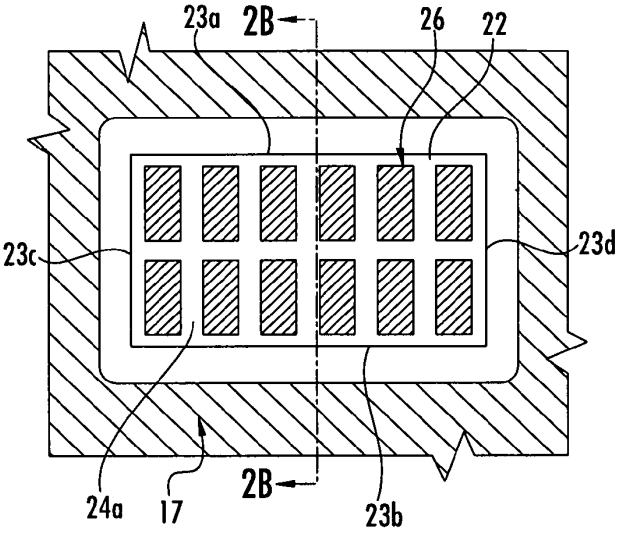

FIG. 2A

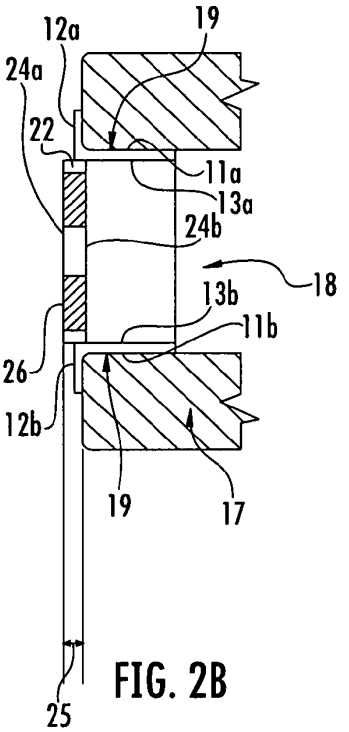

FIG. 2B

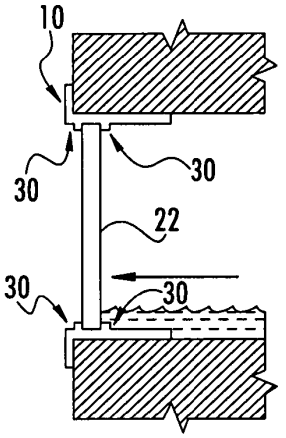

FIG. 3A

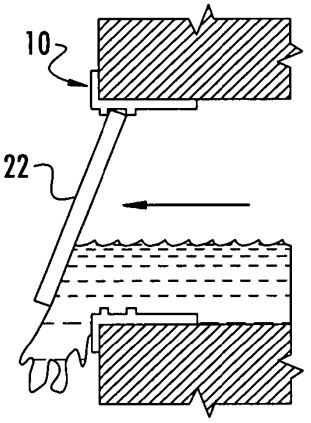

FIG. 3B

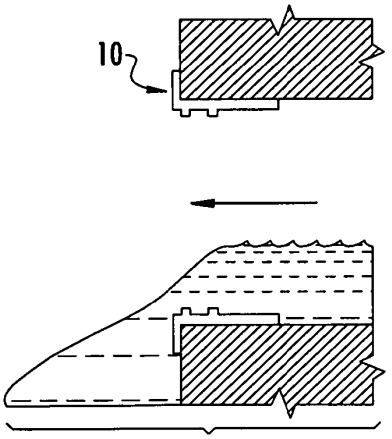

FIG. 3C

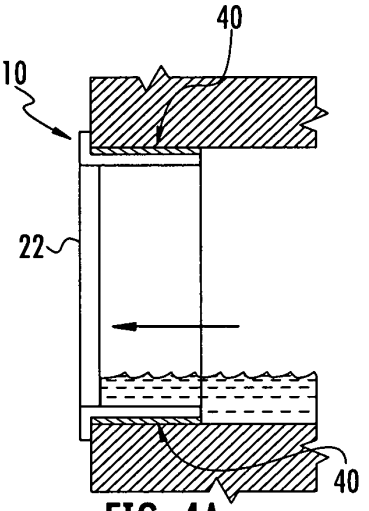

FIG. 4A

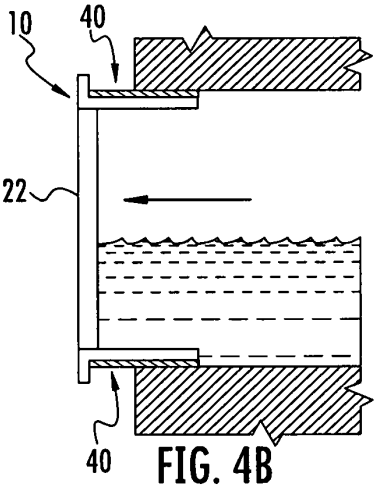

FIG. 4B

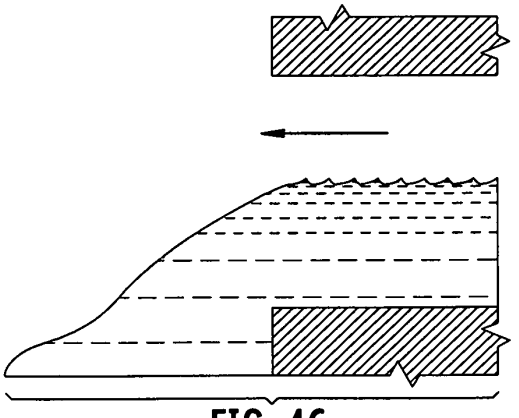

FIG. 4C

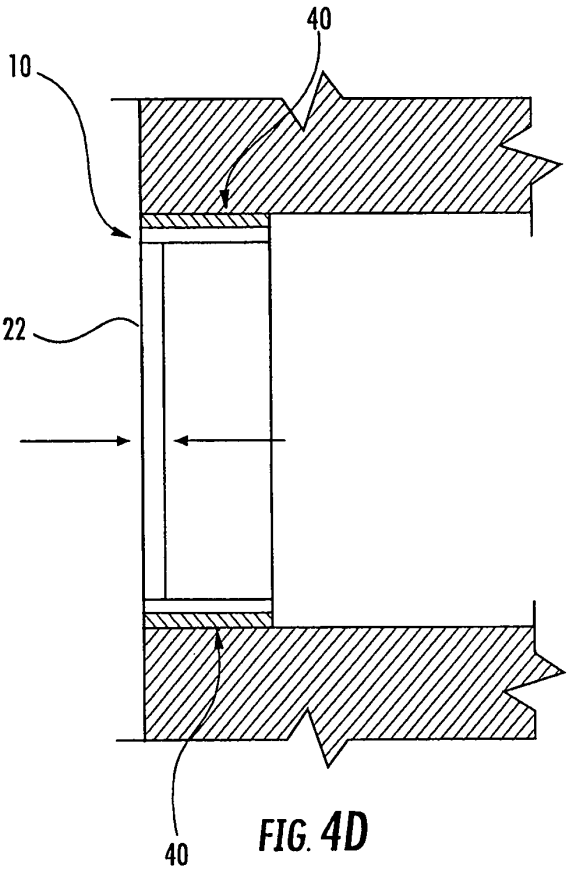

FIG. 4D

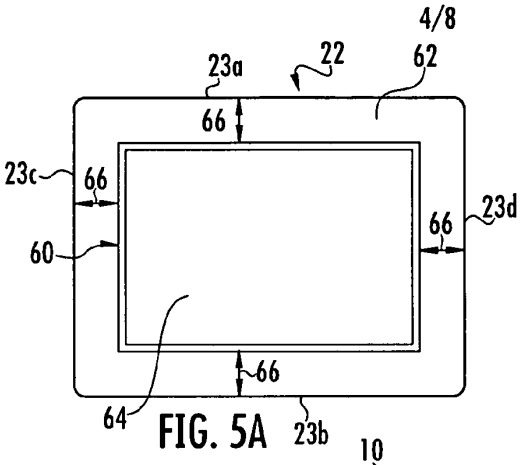

FIG. 5A

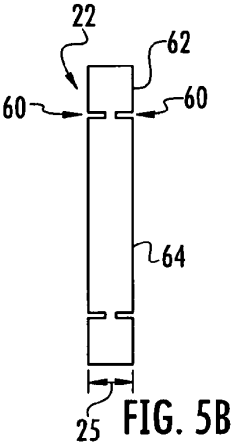

FIG. 5B

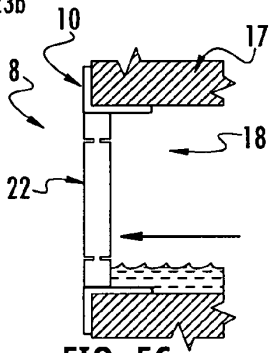

FIG. 5C

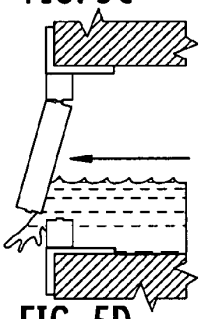

FIG. 5D

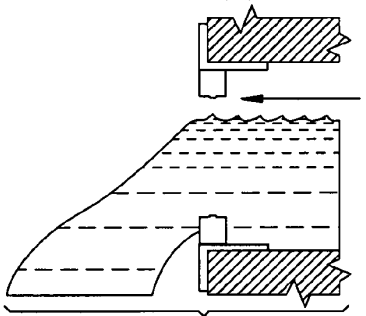

FIG. 5E

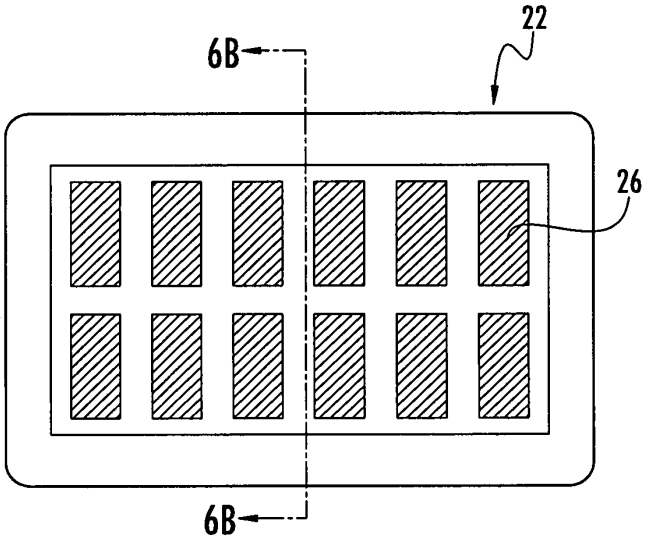

FIG. 6A

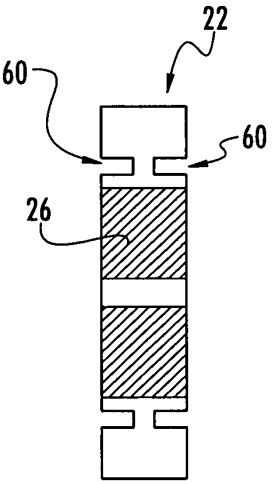

FIG. 6B

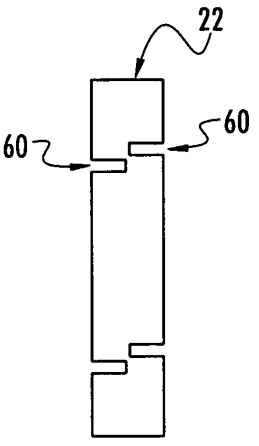

FIG. 6C

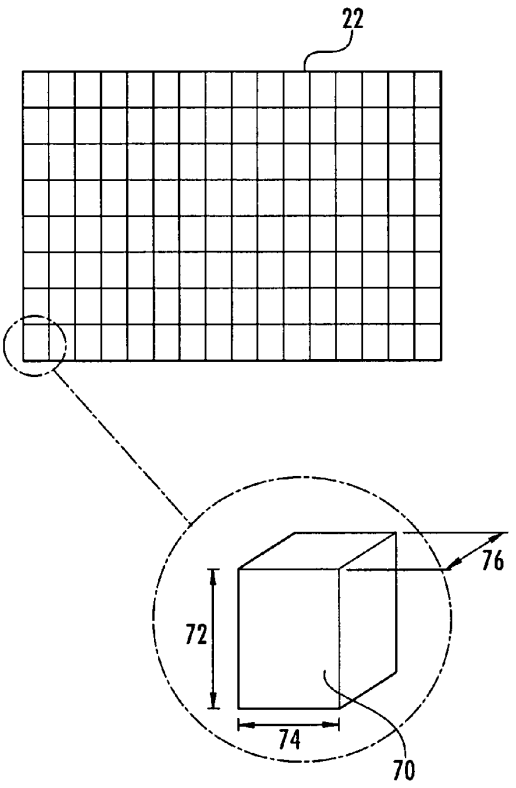

FIG. 7A

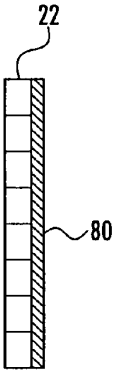

FIG. 7B

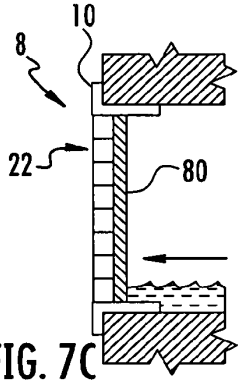

FIG. 7C

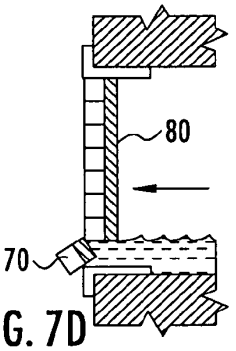

FIG. 7D

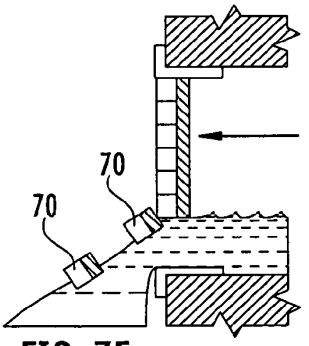

FIG. 7E

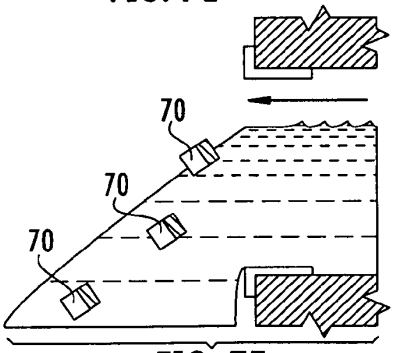

FIG. 7F

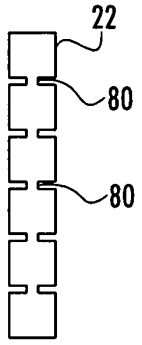

FIG. 7G

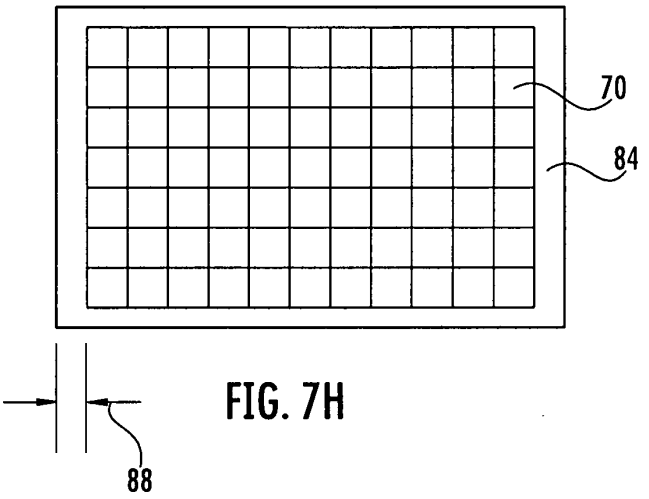

FIG. 7H

FLOOD VENT HAVING A PANEL

TECHNICAL FIELD

This disclosure relates generally to flood water control devices and more particularly to a flood vent having a panel.

BACKGROUND

Typically, one or more flood vents may be installed into an opening in a structure (such as a building) in order to provide for equalization of interior and exterior hydrostatic forces caused by flooding fluids, such as water. Such typical flood vents may include a screen or grille that may allow flooding fluids to pass into or out of the structure through the flood vent, but that may prevent animals or other pests from entering or exiting the structure through the flood vent. These typical flood vents, however, may be deficient.

SUMMARY

According to one embodiment, a flood vent includes a frame configured to form a fluid passageway through an opening in a structure. The flood vent further includes a panel, configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. The flood vent also includes one or more connectors configured to couple the panel to the frame. The one or more connectors are further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch (PSI) of pressure is applied to a portion of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes one or more connectors configured to uncouple the panel from the frame when a predetermined amount of pressure is applied to the panel, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel, and after the predetermined amount of pressure is applied to the panel, the panel may be uncoupled from the flood vent and may no longer prevent objects and/or fluids from passing through the flood vent (or the amount of blockage of the fluid passageway provided by the panel may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

According to another embodiment, a flood vent includes a frame configured to form a fluid passageway through an opening in a structure. The flood vent further includes a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure. The flood vent also includes one or more connectors configured to couple the frame to the structure. The one or more connectors are further configured to uncouple the frame from the structure when 0.5-5.0 PSI of pressure is applied to one or more of a portion of the panel or a portion of the frame by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes one or more connectors configured to uncouple the frame from the structure when a predetermined amount of pressure is applied to the panel and/or the frame, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel and/or the frame, and after the predetermined amount of pressure is applied to the panel and/or the frame, the frame (along with the panel) may be uncoupled from the structure and the panel may no longer prevent objects and/or fluids from passing through the opening in the structure (or the amount of blockage of the fluid passing through the opening may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

According to a further embodiment, a flood vent panel includes a first area, a second area, and a first set of one or more perforations positioned on a first side of the flood vent panel in a location in-between the first area and the second area of the flood vent panel. The first set of one or more perforations are configured to break when at least a predetermined amount of pressure is applied to a portion of the second area of the flood vent panel. The flood vent panel is configured to be coupled, at least indirectly, to a structure so as to at least partially block a fluid passageway through an opening in the structure. The break is configured to completely separate the second area of the flood vent panel from the first area of the flood vent panel so as to reduce an amount of blockage of the fluid passageway provided by the flood vent panel.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes one or more perforations configured to uncouple at least a portion of the panel from the flood vent when a predetermined amount of pressure is applied to the panel, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel, and after the predetermined amount of pressure is applied to the panel, the at least a portion of the panel may be uncoupled from the flood vent and may no longer prevent objects and/or fluids from passing through the flood vent (or the amount of blockage of the fluid passageway provided by the panel may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

According to a further embodiment, a flood vent panel includes a plurality of insulation pieces coupled together to form at least a portion of the flood vent panel. The flood vent panel further includes one or more insulation piece connectors coupled to the plurality of insulation pieces. The one or more insulation piece connectors are configured to couple the plurality of insulation pieces together to form the at least the portion of the panel. The flood vent panel is configured to be coupled, at least indirectly, to a structure, so as to at least partially block a fluid passageway through an opening in the structure. The one or more insulation piece connectors are further configured to uncouple one or more of the plurality of insulation pieces from the panel when at least a predetermined amount of pressure is applied to a portion of the flood vent panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the flood vent panel.

Certain embodiments of the disclosure may provide one or more technical advantages. For example, the flood vent includes a plurality of insulation pieces configured to form at least a portion of the panel, and one or more insulation piece connectors configured to uncouple one or more of the insulation pieces from the panel when a predetermined amount of pressure is applied to the panel, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel of the flood vent may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent until a predetermined amount of pressure is applied to the panel, and after the predetermined amount of pressure is applied to the panel, one or more of the insulation pieces of the panel may be uncoupled from the panel and may no longer prevent objects and/or fluids from passing through the flood vent (or the amount of blockage of the fluid passageway provided by the panel may be reduced). This may, in particular embodiments, allow the flood vent to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings in the panel, when the openings in the panel are too small to allow sufficient fluids to pass through the flood vent, when the openings in the panel are closed, and/or when the panel does not include any openings.

Certain embodiments of the disclosure may include none, some, or all of the above technical advantages. One or more other technical advantages may be readily apparent to one skilled in the art from the figures, descriptions, and claims included herein.

BRIEF DESCRIPTION OF THE FIGURES

For a more complete understanding of the present disclosure and its features and advantages, reference is now made to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. **1**A illustrates a front view of a door of an example flood vent.

FIG. **1**B illustrates a side view of the door of FIG. **1**A.

FIG. **2**A illustrates a front view of an example flood vent inserted into an opening of a structure.

FIG. **2**B illustrates a cross-sectional view of an example flood vent inserted into an opening of a structure, taken along section line **2-2** of FIG. **2**A.

FIGS. **3**A-**3**C illustrate the flood vent of FIGS. **1-2** having a first example of connectors.

FIGS. **4**A-**4**D illustrate the flood vent of FIGS. **1-2** having a second example of connectors.

FIGS. **5**A-**6**C illustrate the flood vent of FIGS. **1-2** with a panel having example perforations.

FIGS. **7**A-**7**H illustrate the flood vent of FIGS. **1-2** with a panel having a plurality of insulation pieces and one or more insulation piece connectors.

DETAILED DESCRIPTION

Embodiments of the present disclosure are best understood by referring to FIGS. **1-7** of the drawings, like numerals being used for like and corresponding parts of the various drawings.

FIGS. **1-2** illustrate an example of a flood vent **8**. The flood vent **8** may be inserted (or otherwise installed) into an opening **18** in a structure **17**, such as an opening in a building, a wall, a foundation, a basement, a garage, a garage door, a foyer, an entry, any structure located below base flood plain levels, any other structure, or any combination of the preceding. The flood vent **8** may provide an entry point and/or exit point in the structure for flooding fluids, such as water. As such, the flood vent **8** may provide equalization of interior and exterior hydrostatic forces caused by the flooding fluids. In particular embodiments, the flood vent **8** may comply with various building code and federal government regulations that mandate that buildings with enclosed spaces located below base flood plain levels, such as crawl spaces, must provide for automatic equalization of interior and exterior hydrostatic forces caused by flooding fluids. According to these regulations, flooding fluids must be permitted to enter and exit the enclosed spaces freely using flood venting.

As illustrated, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing fluids to enter and/or exit the structure **17**. The frame **10** includes a top edge **11***a*, a bottom edge **11***b*, and two side edges **11***c* and **11** *d* (not shown). The edges **11** may define an outer perimeter of the frame **10**. The frame **10** further includes a top rail **12***a*, a bottom rail **12***b*, and two side rails **12***c* and **12***d*. When the flood vent **8** is inserted (or otherwise installed) in the opening **18** in the structure **17**, the edges **11** of the frame **10** may be positioned (entirely or partially) within the opening **18** of the structure **17** (as is seen in FIG. **2**B), and the rails **12** may be positioned (entirely or partially) outside the opening **18** of the structure **17** (as is further seen in FIG. **2**B). The frame **10** also includes a top interior edge **13***a*, a bottom interior edge **13***b*, and two side interior edges **13***c* and **13***d* (not shown). The interior edges **13** of the frame **10** may define an inner perimeter of the frame **10**. Furthermore, although the flood vent **8** is illustrated as including a single frame **10** and a single panel **22**, the flood vent **8** may include multiple frames **10** and/or multiple panels **22**. For example, the flood vent **8** may include two frames **10** (or two or more frames **10**) stacked on top of each other (and coupled together), along with one or more panels **22** attached to each frame **10** (or a single panel **22** attached to multiple frames **10**). As another example, the flood vent **8** may include two frames **10** (or two or more frames **10**) positioned horizontally next to each other (and coupled together), along with one or more panels **22** attached to each frame **10** (or a single panel **22** attached to multiple frames **10**). As a further example, the flood vent **8** may include two frames **10** (or two or more frames **10**) stacked on top of each other and two frames **10** (or two or more frames **10**) positioned horizontally next to each other (and these four or more frames **10**

may be coupled together), along with one or more panels **22** attached to each frame **10** (or a single panel **22** attached to multiple frames **10**).

The frame **10** may have any shape. For example, the frame **10** may be rectangular-shaped. The frame **10** may also have any dimensions. For example, the top and bottom edges **11***a* and **11***b* may be approximately 16" long (16"+/−0.2"), and the side edges **11***c* and **11***d* may be approximately 8" long, thereby forming an 8"×16" rectangular outer perimeter. Furthermore, the top and bottom rails **12***a* and **12***b* may be approximately 17 11/16" long, and the side rails **12***c* and **12***d* may be approximately 9 11/16" long. Additionally, when two or more frames **10** are coupled together (as is discussed above), the flood vent **8** may have an outer perimeter of, for example, approximately 16"×16", 8"×32", 16"×32", or any other dimensions. The frame **10** may be formed (or made) of any material. For example, the frame **10** may be formed of a corrosion resistant material, such as stainless steel, spring steel, plastic, a polymer, cement, brick, any other corrosion resistant material, or any combination of the preceding.

The frame **10** may be configured to be inserted (or otherwise installed) into an opening **18** in any side of the structure **17**. For example, the opening **18** in the structure **17** may extend from the exterior of the structure **17** to the interior of the structure **17** (such as the interior of a building), thereby allowing fluids to enter and/or exit the structure **17**. The frame **10** of the air vent **8** may be inserted (or otherwise installed) on the exterior side of the structure **17** (for an exterior frame **10** for an exterior flood vent **8**, for example) or on the interior side of the structure **17** (for an interior frame **10** for an interior flood vent **8**, for example). As illustrated in FIGS. **1-2**, frame **10** is inserted on the exterior side of the structure **17**. Furthermore, frames **10** may be inserted (or otherwise installed) on both the exterior side of the structure **17** (for exterior frames **10**, for example) and the interior side of the structure **17** (for interior frames **10**, for example). Additionally, in particular embodiments, a sleeve may be positioned in-between an interior frame **10** and an exterior frame **10**. The sleeve may be configured to connect to the exterior frame **10** at a first end of the sleeve, extend through the opening **18** in the structure **17** to the interior frame **10**, and connect to the interior frame **10** at a second end of the sleeve. The sleeve may form a portion of the fluid passageway through the opening **18** in the structure **17**. For example, fluid such as water may enter the opening **18** in the structure **17** through exterior flood vent **8**, flow through the sleeve, and exit the opening **18** into the interior of the structure **17** (or vice versa). The sleeve may have any shape. For example, the sleeve may be a hollow rectangular sleeve. The sleeve may have any dimensions. For example, the sleeve may be sized to fit entirely within the opening **18**, connecting the exterior frame **10** to the interior frame **10**. The sleeve may be formed (or made) of any material. For example, the sleeve may be formed of a corrosion resistant material, such as stainless steel, spring steel, plastic, a polymer, cement, brick, any other corrosion resistant material, or any combination of the preceding.

The flood vent **8** further includes a panel **22**. The panel **22** may be configured to be coupled to the frame **10** (thereby coupling the panel **22** to the structure **17** indirectly). The panel **22** may be coupled to the frame **10** in any manner. For example, the panel **22** may be formed integral with the frame **10**, welded to the frame **10**, coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, attached to the frame **10** using one or more rivets, nails, and/or any other connector, attached to the structure **17** (and thus the frame **10**) using one or more rivets, nails, and/or any other connecter, coupled to the frame **10** in any other manner, or any combination of the preceding. The panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIGS. **2**A-**2**B. The panel **22** may block any portion of the fluid passageway formed by the frame **10**. For example, the panel **22** may block all of the fluid passageway (or completely block the fluid passageway) formed by the frame **10**, thereby preventing all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as preventing objects (such as small animals) from passing through the panel **22**. As another example, the panel may block only a portion of the fluid passageway, thereby preventing (or substantially preventing) objects (such as small animals) from passing through the panel **22**, but allowing fluids (such as water and/or air) to pass through the panel **22**.

The panel **22** may be any type of panel. For example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**. In such an example, the panel **22** may be a mesh grille panel, a grate, any other panel with one or more openings **26**, or any combination of the preceding. The openings **26** may have any size and/or shape. In particular embodiments, the size of the openings **26** may be sufficiently small to prevent (or substantially prevent) objects, such as small animals, from passing through the panel **22**. The panel **22** may include any number of openings **26**, such as one opening **24**, two openings **26**, three openings **26**, four openings **26**, eight openings **26**, ten openings **26**, or any other number of openings **26**. The openings **26** may be completely open, or the openings **26** may be screened to prevent (or substantially prevent) penetration by small animals and/or insects.

As another example, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as preventing (or substantially preventing) objects (such as small animals) from passing through the panel **22**. As a further example, the panel **22** may be a screen (such as a fine mesh screen) configured to prevent (or substantially prevent) penetration by small animals and/or insects. As another example, the panel **22** may include one or more louvers (such as, for example, four louvers, or any other number of louvers) that may be opened to allow air to pass through the panel **22** (e.g., during warmer temperatures), and closed to prevent (or substantially prevent) air from passing through the panel **22** (e.g., during colder temperatures). Additionally, the louvered panel **22** may be screened to prevent (or substantially prevent) penetration by small animals and/or insects. Further details regarding louvers (and the operation of such louvers) is included in U.S. Pat. No. 6,692,187 entitled "Flood Gate For Door," which is incorporated herein by reference.

The panel **22** includes a top edge **23***a*, a bottom edge **23***b*, and two side edges **23***c* and **23***d*. The edges **23** may define an outer perimeter of the panel **22**. The panel **22** further includes a first side **24***a* and a second side **24***b* positioned opposite of the first side **24***a*. As is illustrated, the first side **24***a* may be positioned to face the exterior of the structure **17**, and the second side **24***b* may be positioned to face the interior of the structure **17**. However, the first side **24***a* may

face either the exterior of the structure **17** or the interior of the structure **17**, and the second side **24***b* may face either the exterior of the structure **17** or the interior of the structure **17**. The panel **22** may have any shape, and may also have any dimensions. For example, the panel **22** may have the same (or substantially the same) shape and/or dimensions as the inner perimeter of the frame **10**. As such, in particular embodiments, the panel **22** may be flush against the inner perimeter of the frame **10**. As another example, the panel **22** may have larger dimensions (or a different shape) than the inner perimeter of the frame **10**. As such, in particular embodiments, the panel **22** may be coupled to the exterior of the frame **10** (such as coupled to the rails **12**) or to the structure **17**. As a further example, the panel **22** may have smaller dimensions (or a different shape) than the inner perimeter of the frame **10**. As another example, the panel **22** may have an outer perimeter of, for example, approximately 7⅝"×15¾". The panel **22** may also have any thickness **25**. For example, panel **22** may have a thickness **25** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0", 4.0", or any other thickness **25**. The panel **22** may be formed (or made) of any material. For example, the panel **22** may be formed of a corrosion resistant material, such as stainless steel, spring steel, plastic, a polymer, cement, brick, any other corrosion resistant material, or any combination of the preceding.

As is discussed above, the flood vent **8** may be inserted (or otherwise installed) into an opening **18** in a structure **17**. The structure **17** may be any structure. For example, the structure may be a building, a wall, a foundation, a basement, a garage, a garage door, a foyer, an entry, any structure located below base flood plain levels, any other structure, or any combination of the preceding. The structure **17** may include one or more edges **19** that form an inner perimeter of the opening **18** in the structure **17**. The opening **18** may have any shape and/or dimensions for receiving the frame **10** (or frames **10**) of the flood vent **8**. For example, when the frame **10** has a rectangular outer perimeter of 8"×16", the opening **18** may have a rectangular inner perimeter of 8¼"×16¼". As another example, when the flood vent **8** has multiple frames **10** (as is discussed above) and a rectangular outer perimeter of 16"×32", the opening **18** may have a rectangular inner perimeter of 16⅜"×33". As such, the flood vent **8** may be inserted (or otherwise installed) into the opening **18** of the structure **17**. The opening **18** may be added to the structure **17** in any manner. For example, the opening **18** may be added (or cut into) the structure **17** after the structure **17** is already built. As another example, the opening **18** may be left in (or built into) the structure **17** as the structure **17** is being built. In such an example, the frame **10** of the flood vent **8** (or the entire flood vent **8**) may be built into the opening **18** of the structure **17** as the structure **17** is being built.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **1-2** without departing from the scope of the disclosure. For example, although the frame **10** of the flood vent **8** has been described above as including rails **12**, in particular embodiments, the frame **10** may not include any rails **12**. As another example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**. Furthermore, in such embodiments, the opening **18** (itself) may form the fluid passageway through the structure **17**.

As is discussed above, a flood vent may typically include a screen or grille that may allow flooding fluids to pass into or out of the structure through the flood vent, but that may prevent animals or other pests from entering or exiting the structure through the flood vent. Unfortunately, such typical flood vents may be deficient. For example, although the screen or grille of the flood vent may prevent objects from entering the flood vent, the screen or grille may also prevent fluids from sufficiently passing through the flood vent. In particular, during a flood event, a large quantity of water may attempt to pass through the flood vent. If openings in the screen or grille are not large enough (or if the flood vent does not have any openings or if the openings in the flood vent are not open), the water may be prevented from quickly passing through the flood vent, which may disrupt the equalization of interior and exterior hydrostatic forces caused by flooding waters. Furthermore, the water may be carrying various pieces of debris (such as tree limbs and dirt) that may clog the openings, preventing the flood vent from allowing any (or most) of the water to pass through the flood vent. Conversely, if the openings are too large, the openings may not prevent objects (such as small animals) from entering the flood vent. Contrary to these typical flood vents, FIGS. **3-7** illustrate examples of flood vents that may provide one or more advantages.

FIGS. **3A-3C** illustrate the flood vent **8** of FIGS. **1-2** having example connectors **30**. Connectors **30** may be configured to couple the panel **22** to the frame **10**. Furthermore, the connectors **30** may be further configured to uncouple the panel **22** from the frame **10**. For example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** when a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel **22** of flood vent **8** may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent **8** until a predetermined amount of pressure is applied to the panel **22**, and after the predetermined amount of pressure is applied to the panel **22**, the panel **22** may be uncoupled from the flood vent **8** and may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced). This may, in particular embodiments, allow the flood vent **8** to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings **26** in the panel **22**, when the openings **26** in the panel **22** are too small to allow sufficient fluids to pass through the flood vent **8**, when the openings **26** in the panel are closed, and/or when the panel **22** does not include any openings **26**.

As is discussed above with regard to FIGS. **1-2**, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing the flooding fluids to enter and/or exit the structure **17**. The panel **22** may be configured to be coupled to the frame **10**. Furthermore, the panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIG. **3A**. The panel **22** may be coupled to the frame **10** by one or more connectors **30**. The panel **22** may be any type of panel. For example, as is illustrated in FIGS. **3A-3C**, the panel **22** may be a solid panel that may prevent all (or

substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as prevent (or substantially prevent) objects (such as small animals) from passing through the panel **22**. As another example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**.

A connector **30** may be any type of connector that may couple the panel **22** to the frame **10**, and that may further uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. As a first example, a connector **30** may be one or more raised bumps (or raised lips), as is illustrated in FIGS. **3**A-**3**C. The raised bumps may allow a panel **22** to be installed in the frame **10**, thereby coupling the panel **22** to the frame **10**, as is seen in FIG. **3**A. For example, an installer (such as a person) may push the panel **22** into the frame **10** with enough force to cause the panel **22** to move past the first set of raised bumps. In such an example, the panel **22** may then rest in a gap (or be sandwiched) in-between the first set of bumps and a second set of bumps (as is seen in FIG. **3**A), thereby coupling the panel **22** to the frame **10**. Furthermore, the raised bumps may continue to couple the panel **22** to the frame **10** until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the panel **22** may be forced past a set of the raised bumps, as is seen in FIG. **3**B. This may uncouple the panel **22** from the frame **10**, causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**, as is seen in FIG. **3**C. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a second example, a connector **30** may be one or more pieces of velcro configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The pieces of velcro may include, for example, one or more first pieces of velcro that are coupled to the frame **10** and/or the structure **17**, and one or more second pieces of velcro that are coupled to the panel **22**. The first pieces of velcro may be further coupled to the second pieces of velcro, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the pieces of velcro may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the coupling between the pieces of velcro may be broken. This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a third example, a connector **30** may be one or more mechanical fasteners configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The mechanical fasteners may include any one or more devices and/or objects that may mechanically fasten the panel **22** to the frame **10** (and/or the structure **17**), such as one or more nails, screws, rivets, nuts and bolts, rods and studs, anchors, pins, retaining rings and/or clips, any other devices that may mechanically fasten the panel **22** to the frame **10** (and/or the structure **17**), or any combination of the preceding. Furthermore, the mechanical fasteners may be configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the mechanical fasteners may be configured to break or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the mechanical fasteners may be engineered and/or modified to break or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**.

The mechanical fasteners may include one or more mechanical fasteners coupled to the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the mechanical fasteners may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the mechanical fasteners may break or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a fourth example, a connector **30** may be an adhesive configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The adhesive may include any adhesive substance that may adhere the panel **22** to the frame **10** (and/or the structure **17**), such as glue, cement, Lexel® adhesive, any other adhesive substance that may adhere the panel **22** to the frame **10** (and/or the structure **17**), or any combination of the preceding. Furthermore, the adhesive may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the adhesive may be configured to peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the adhesive may be engineered and/or modified to peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of adhesive used to adhere the panel **22** to the frame **10** (and/or frame **10** and/or structure **17**) may be selected to cause the adhesive to peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**.

The adhesive may include one or more portions of the adhesive coupled to the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the portions of the

adhesive may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the adhesive may peel off, break, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a fifth example, a connector **30** may be one or more pressure-based connectors configured to couple the panel **22** to the frame **10**, and that may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The pressure-based connectors may include any type of connector that may apply pressure (or otherwise utilize pressure) to couple the panel **22** to the frame **10** (and/or the structure **17**). As an example, the pressure-based connectors may be a pressure-based clip (such as a spring clip) configured to fit in-between the edges **23** of the panel **22** and the inner edges **13** of the frame **10**. In such an example, when the panel **22** is installed into the frame **10** (or the opening **18**), the pressure-based connectors may be compressed by the edge **23** of the panel **22** and the edge **13** of the frame **10** (or the edge **19** of the opening **18**), thereby causing the pressure-based connectors to push outward against the edge **13** of the frame **10** and inward against the edge **23** of the panel **22**. Such pressure applied by the pressure-based connectors (along with friction, in particular embodiments) may at least couple the panel **22** to the frame **10**. Furthermore, although the pressure-based connectors have been described above as being a separate component from the panel **22**, in particular embodiments, the pressure-based connectors may be the panel **22** (or part of the panel **22**), itself. For example, the panel **22** may have dimensions larger than the inner perimeter of the frame **10**. In such an example, inserting the panel **22** may cause the edges **23** and/or corners of the panel **22** to be bent in (or out) against the frame **10**, thereby applying pressure that may couple the panel **22** to the frame **10** (or the structure **17**). The pressure-based connectors may be further configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the pressure-based connectors may be configured to break, slip off, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of pressure applied by the pressure-based connectors may be configured to be overcome by the predetermined amount of pressure applied to the panel **22** by, for example, the fluid.

The pressure-based connectors may include one or more pressure-based connectors coupled to (and/or applying pressure to) the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the pressure-based connectors may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the pressure-based connectors may break, slip off, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a sixth example, a connector **30** may be one or more permanent attachments configured to couple the panel **22** to the frame **10**, and that may be further configured to break (or otherwise fail) so as to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. The permanent attachment may include any one or more attachments that may permanently couple (and/or fixedly couple and/or couple in a manner that requires a break or a failure in order to uncouple) the panel **22** to the frame **10** (and/or the structure **17**), such as a weld, the panel **22** being formed integral with the frame **10**, any other attachment, or any combination of the preceding. Furthermore, the permanent attachments may be configured to uncouple the panel **22** from the frame **10** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the permanent attachments may be configured to break, fail, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the permanent attachments may be engineered and/or modified to break, fail, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the permanent attachments (such as a weld) may include one or more engineered defects that may cause them to break or fail. As another example, a pressure (or stress) may be constantly applied to the permanent attachments, thereby causing the additional predetermined amount of pressure to cause the permanent attachments to break or fail.

The permanent attachments may include one or more permanent attachments coupled to the panel **22**, the frame **10**, and/or the structure **17**, thereby coupling the panel **22** to the frame **10** (and/or the structure **17**). Furthermore, the permanent attachments may continue to couple the panel **22** to the frame **10** (and/or the structure **17**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the permanent attachments may break, fail, or otherwise uncouple from the panel **22** (and/or frame **10** and/or structure **17**). This may uncouple the panel **22** from the frame **10** (and/or the structure **17**), causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

The flood vent **8** may include any number of connectors **30**. For example, the flood vent **8** may include one connector **30**, two connectors **30**, three connectors **30**, four connectors **30**, six connectors **30**, eight connectors **30**, ten connectors **30**, or any other number of connectors **30**. The connectors **30** may be attached or otherwise coupled to any portion of the panel **22**, frame **10**, and/or structure **17**. For example, the connectors **30** may be attached to the edges **23** of the panel **22** and/or the edges **13** of the frame **10**. As another example, the connectors **30** (such as screws) may be positioned

through one or more holes (such as one or more screw holes) in side **24***a* (for example) of the panel **22**, and inserted into one or more holes in the frame **10** and/or the structure **17**, thereby coupling the panel **22** to the frame **10** and/or the structure **17**. The connectors **30** may be added to (or otherwise coupled) to the panel **22** (and/or frame **10** and/or structure **17**), the connectors **30** may be formed integral with (or formed as a part of) the panel **22** (and/or frame **10** and/or structure **17**), or any combination of the preceding.

The connectors **30** may have any size and/or shape that may allow the connectors **30** to uncouple the panel **22** when a predetermined amount of pressure is applied to the panel **22**. For example, the length of the connectors **30** (such as one or more mechanical fasteners) may be selected to cause the connectors **30** to break, fail, or otherwise uncouple the panel **22** when the predetermined amount of pressure is applied to the panel **22**. The connectors **30** may be formed from any material that may allow the connectors **30** to uncouple the panel **22** when a predetermined amount of pressure is applied to the panel **22**. For example, the connectors **30** may be formed from rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized material, any other metal, or any combination of the preceding), any other material that may allow the connectors **30** to uncouple the panel **22** when a predetermined amount of pressure is applied to the panel **22**, or any combination of the preceding. In particular, the connectors **30** (such as one or more mechanical fasteners) may be formed from a particular plastic (for example) that causes the mechanical fasteners to break or fail when the predetermined amount of pressure is applied to the panel **22**.

As is discussed above, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+/−0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**). For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22**, the connectors **30** may not uncouple the panel **22** from the frame **10** (and/or structure). On the other hand, if an amount of pressure equal to the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22**, the connectors **30** may uncouple the panel **22** from the frame **10** (and/or structure **17**).

In particular embodiments, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to any portion of the panel **22**. For example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to a bottom portion of the panel **22**, a top portion of the panel **22**, a left and/or right side portion of the panel **22**, any other portion of the panel **22**, or any combination of the preceding. In particular embodiments, the predetermined amount of pressure for causing the connectors **30** to uncouple the panel **22** from the frame **10** (and/or structure **17**) may change based on (or be a function of) the portion of the panel **22** to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel **22** (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel **22** (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the connectors **30** to uncouple the panel **22** from the frame **10** (and/or structure **17**) may change based on (or be a function of) the type of panel **22** included in the flood vent **8**. For example, the predetermined amount of pressure may be less if the panel **22** is a panel without any openings **26** (or with openings that may be closed, using louvers, for example) than if the panel **22** includes openings **26** that may not be closed (or if the panel **22** is a screen). In such an example, a panel **22** without openings **26** (when compared to a panel **22** with openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** without openings **26** at a lower amount of pressure (when compared to a panel **22** with openings **26**). As another example, the predetermined amount of pressure may be less if the panel **22** is a panel with less openings **26** (and/or with smaller openings **26**) than if the panel **22** includes more openings **26** (and/or has bigger openings **26**). In such an example, a panel **22** with less openings **26** (when compared to a panel **22** with more openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** with less openings **26** at a lower amount of pressure (when compared to a panel **22** with more openings **26**).

In particular embodiments, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to any side of the panel **22**. For example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**), thereby causing the panel **22** to be uncoupled from the frame **10** and be carried by the fluids, for example, outside of the structure **17**, as is illustrated in FIGS. **3**A-**3**C. In particular embodiments, this may cause panel **22** to be uncoupled from the frame **10** (and/or structure **17**) when

flooding fluids, for example, enter the flood vent **8** from inside the structure **17**. As another example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), thereby causing the panel **22** to be uncoupled from the frame **10** and be carried by the fluids, for example, inside of the structure **17** (e.g., in a direction from left-to-right in FIGS. **3**A-**3**C). In particular embodiments, this may cause panel **22** to be uncoupled from the frame **10** (and/or structure **17**) when flooding fluids, for example, enter the flood vent **8** from outside the structure **17**. As a further example, the connectors **30** may be configured to uncouple the panel **22** from the frame **10** (and/or structure **17**) if the predetermined amount of pressure is applied to either the side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**) or the side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**). In particular embodiments, this may cause panel **22** to be uncoupled from the frame **10** (and/or structure **17**) when flooding fluids, for example, enter the flood vent **8** from either inside the structure **17** or outside the structure **17**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **3**A-**3**C without departing from the scope of the disclosure. For example, although the panel **22** has been described above as being entirely uncoupled from the frame **10** (and/or structure **17**), in particular embodiments, only a portion of the panel **22** may be uncoupled from the frame **10** (and/or structure **17**). In such an example, a first portion of the panel **22** (e.g., an inner area of the panel **22**) may be uncoupled from the frame **10** (and/or structure **17**) when the predetermined amount of pressure is applied to the panel **22** (and/or the first portion of the panel **22**), while the second portion of the panel **22** (e.g., an outer area of the panel **22**) may remain coupled to the frame **10** (and/or structure **17**). Furthermore, in such an example, connectors **30** may be configured to couple the first portion of the panel **22** to the second portion of the panel **22** (and/or the frame **10** and/or the structure **17**). As another example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**, and the connector(s) **30** may couple the panel **22** directly to the structure **17**.

FIGS. **4**A-**4**D illustrate the flood vent **8** of FIGS. **1**-**2** having example connectors **40**. Connectors **40** may be configured to couple the frame **10** to the structure **17**. Furthermore, the connectors **40** may be further configured to uncouple the frame **10** from the structure **17**. For example, the connectors **40** may be configured uncouple the frame **10** from the structure **17** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel **22** of flood vent **8** may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent **8** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, and after the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the frame **10** (along with the panel **22**) may be uncoupled from the structure **17** and the panel **22** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced). This may, in particular embodiments, allow the flood vent **8** to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings **26** in the panel **22**, when the openings **26** in the panel **22** are too small to allow sufficient fluids to pass through the flood vent **8**, when the openings **26** in the panel are closed, and/or when the panel **22** does not include any openings **26**.

As is discussed above with regard to FIGS. **1**-**2**, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing the flooding fluids to enter and/or exit the structure **17**. The frame **10** may be coupled to the structure **18** using one or more connectors **40**. The flood vent **8** further includes the panel **22**. The panel **22** may be configured to be coupled to the frame **10**. Furthermore, the panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIGS. **4**A-**4**B. The panel **22** may be coupled to the frame **10** in any manner. For example, the panel **22** may be formed integral with the frame **10**, welded to the frame **10**, coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, attached to the frame **10** using one or more rivets, nails, and/or any other connector, coupled to the frame **10** in any other manner, or any combination of the preceding. The panel **22** may be any type of panel. For example, as is illustrated in FIGS. **4**A-**4**B, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as preventing (or substantially preventing) objects (such as small animals) from passing through the panel **22**. As another example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**.

A connector **40** may be any type of connector that may couple the frame **10** to the structure **17**, and that may further uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or frame **10**. As a first example, a connector **40** may be an adhesive configured to couple the frame **10** to the structure **17**, and that may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The adhesive may include any adhesive substance that may adhere the frame **10** to the structure **17**, such as glue, cement, Lexel® adhesive, any other adhesive substance that may adhere the frame **10** to the structure **17**, or any combination of the preceding. Furthermore, the adhesive may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the adhesive may be configured to peel off, break, or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the adhesive may be engineered and/or modified to peel off, break, or

otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the amount of adhesive used to adhere the frame **10** to the structure **17** may be selected to cause the adhesive to peel off, break, or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

The adhesive may include one or more portions of the adhesive coupled to the frame **10** and/or the structure **17**, thereby coupling the frame **10** to the structure **17**, as is illustrated in FIG. **4**A. Furthermore, the portions of the adhesive may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the adhesive may peel off, break, or otherwise uncouple from the panel **22** and/or the structure **17**, as is seen in FIG. **4**B. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**, as is seen in FIG. **4**C. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a second example, a connector **40** may be one or more raised bumps (or raised lips) in the opening **18** of the structure **17**. The raised bumps may allow a frame **10** to be installed in the opening **18**, thereby coupling frame **10** to the structure **17**. For example, an installer (such as a person) may push the frame **10** into the opening **18** with enough force to cause the frame **10** to move past the first set of raised bumps. In such an example, the frame **10** may then rest in a gap in-between (or sandwiched by) the first set of bumps and a second set of bumps, thereby coupling the frame **10** to the structure **17**. Furthermore, the raised bumps may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the frame **10** may be forced past a set of the raised bumps. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a third example, a connector **40** may be one or more pieces of velcro configured to couple the frame **10** to the structure **17**, and that may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The pieces of velcro may include, for example, one or more first pieces of velcro that are coupled to the frame **10**, and one or more second pieces of velcro that are coupled to the structure **17**. The first pieces of velcro may be coupled to the second pieces of velcro, thereby coupling the frame **10** to the structure **17**. Furthermore, the pieces of velcro may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the coupling between the pieces of velcro may be broken. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a fourth example, a connector **40** may be one or more mechanical fasteners configured to couple the frame **10** to the structure **17**, and that may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The mechanical fasteners may include one or more devices that may mechanically fasten the frame **10** to the structure **17**, such as one or more nails, screws, rivets, nuts and bolts, rods and studs, anchors, pins, retaining rings and/or clips, any other devices that may mechanically fasten the frame **10** to the structure **17**, or any combination of the preceding. Furthermore, the mechanical fasteners may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the mechanical fasteners may be configured to break or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the mechanical fasteners may be engineered and/or modified to break or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

The mechanical fasteners may include one or more mechanical fasteners coupled to the frame **10** and/or the structure **17**, thereby coupling the frame **10** to the structure **17**. Furthermore, the mechanical fasteners may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the mechanical fasteners may break or otherwise uncouple from the frame **10** and/or structure **17**. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

As a fifth example, a connector **40** may be one or more pressure-based connectors configured to couple the frame **10** to the structure **17**, and that may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The pressure-based connectors may include any type of connector that may apply pressure (or otherwise utilize pressure) to couple the frame **10** to the structure **17**. As an example, the pressure-based connectors may be a pressure-based clip (such as a spring clip) configured to fit in-between the outer edges **11** of the frame **10** and the edges **19** of the opening **18**. In such an example, when the frame **10** is installed into the opening **18**, the pressure-based connectors may be compressed by the outer edges **11** of the frame **10** and the edges **19** of the opening **18**, thereby causing the pressure-based connectors

to push outward against the edges **19** of the opening **18** and inward against the outer edges **11** of the frame **10**. Such pressure applied by the pressure-based connectors (along with friction, in particular embodiments) may at least couple the frame **10** to the structure **17**. Furthermore, although the pressure-based connectors have been described above as being a separate component from the frame **10**, in particular embodiments, the pressure-based connectors may be a part of the frame **10**, itself. For example, the pressure-based connectors may be formed integral with (or as a portion of) the frame **10**.

The pressure-based connectors may be further configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the pressure-based connectors may be configured to break, slip off, or otherwise uncouple from the frame **10** and/or structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the amount of pressure applied by the pressure-based connectors may be configured to be overcome by the predetermined amount of pressure applied to the panel **22** and/or the frame **10** by, for example, the fluid.

The pressure-based connectors may include one or more pressure-based connectors coupled to (and/or applying pressure to) the frame **10** and/or the structure **17**, thereby coupling the frame **10** to the structure **17**. Furthermore, the pressure-based connectors may continue to couple the frame **10** to the structure **17** until a predetermined amount of pressure is applied to the panel **22** and/or the frame **10** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the pressure-based connectors may break, slip off, or otherwise uncouple from the frame **10** and/or structure **17**. This may uncouple the frame **10** from the structure **17**, causing the frame **10** to be completely separated from the structure **17**, and be carried away from the structure **17**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passing through the opening **18** may be reduced).

The flood vent **8** may include any number of connectors **40**. For example, the flood vent **8** may include one connector **40**, two connectors **40**, three connectors **40**, four connectors **40**, six connectors **40**, eight connectors **40**, ten connectors **40**, or any other number of connectors **40**. The connectors **40** may be attached or otherwise coupled to any portion of the frame **10** and/or structure **17** (and/or the panel **22**). For example, the connectors **40** may be attached to the edges **11** of the frame **10** and/or the edges **19** of the opening **18** of the structure **17**. As another example, the connectors **40** (such as screws) may be positioned through one or more holes (such as one or more screw holes) in rails **12** (for example) of the frame **10**, and inserted into one or more holes in the structure **17**, thereby coupling the frame **10** to the structure **17**. The connectors **40** may be added to (or otherwise be coupled to) the frame **10** (and/or structure **17** and/or the panel **22**), the connectors **40** may be formed integral with (or formed as a part of) the frame **10** (and/or the panel **22**), or any combination of the preceding.

The connectors **40** may have any size and/or shape that may allow the connectors **40** to uncouple the frame **10** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the length of the connectors **40** (such as one or more mechanical fasteners) may be selected to cause the connectors **40** to break, fail, or otherwise uncouple the frame **10** when the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The connectors **40** may be formed from any material that may allow the connectors **40** to uncouple the frame **10** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. For example, the connectors **40** may be formed from rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized material, any other metal, or any combination of the preceding), an adhesive, any other material that may allow the connectors **40** to uncouple the frame **10** when a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, or any combination of the preceding. In particular, the connectors **40** (such as one or more mechanical fasteners) may be formed from a particular plastic (for example) that causes the mechanical fastener to break or fail when the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

As is discussed above, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+/−0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the connectors **40** may be configured to uncouple the frame **10** from the structure **17**. For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22** and/or the frame **10**, the connectors **40** may not uncouple the frame **10** from the structure **17**. On the other hand, if an amount of pressure equal to the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22** and/or the frame **10**, the connectors **40** may uncouple the frame **10** from the structure **17**.

In particular embodiments, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to any portion of the panel **22** and/or frame **10**. For example, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to a bottom portion of the panel **22** (and/or the frame **10**), a top portion of the panel **22** (and/or the frame

10), a left and/or right side portion of the panel **22** (and/or the frame **10**), any other portion of the panel **22** (and/or the frame **10**), or any combination of the preceding. In particular embodiments, the predetermined amount of pressure for causing the connectors **40** to uncouple the frame **10** from the structure **17** may change based on (or be a function of) the portion of the panel **22** (and/or the frame **10**) to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel **22** (and/or the frame **10**) (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel **22** (and/or the frame **10**) (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the connectors **40** to uncouple the frame **10** from the structure **17** may change based on (or be a function of) the type of panel **22** included in the flood vent **8**. For example, the predetermined amount of pressure may be less if the panel **22** is a panel without any openings **26** (or with openings **26** that may be closed, using louvers, for example) than if the panel **22** includes openings **26** that may not be closed (or if the panel **22** is a screen). In such an example, a panel **22** without openings **26** (when compared to a panel **22** with openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** without openings **26** at a lower amount of pressure (when compared to a panel **22** with openings **26**). As another example, the predetermined amount of pressure may be less if the panel **22** is a panel with less openings **26** (and/or with smaller openings **26**) than if the panel **22** includes more openings **26** (and/or has bigger openings **26**). In such an example, a panel **22** with less openings **26** (when compared to a panel **22** with more openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** with less openings **26** at a lower amount of pressure (when compared to a panel **22** with more openings **26**).

In particular embodiments, the connectors **40** may be configured to uncouple the panel **22** from the frame if the predetermined amount of pressure is applied to any side of the panel **22**. For example, the connectors **40** may be configured to uncouple the panel **22** from the frame if the predetermined amount of pressure is applied to side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**), thereby causing the frame **10** to be uncoupled from the structure **17** and be carried by the fluids, for example, outside of the structure **17**, as is illustrated in FIGS. **4**A-**4**C. In particular embodiments, this may cause the frame **10** to be uncoupled from the structure **17** when flooding fluids, for example, enter the flood vent **8** from inside the structure **17**. As another example, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to side **24***a* the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), thereby causing the frame **10** to be uncoupled from the structure **17** and be carried by the fluids, for example, inside of the structure **17** (e.g., in a direction from left-to-right in FIGS. **4**A-**4**C). In particular embodiments, this may cause the frame **10** to be uncoupled from the structure **17** when flooding fluids, for example, enter the flood vent **8** from outside the structure **17**. Furthermore, in such embodiments, the frame **10** may not include rails **12** that may prevent the frame **10** from being carried inside of the structure **17**. As a further example, the connectors **40** may be configured to uncouple the frame **10** from the structure **17** if the predetermined amount of pressure is applied to either the side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**) or the side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), as is illustrated in FIG. **4**D. In particular embodiments, this may cause the frame **10** to be uncoupled from the structure **17** when flooding fluids, for example, enter the flood vent **8** from either inside the structure **17** or outside the structure **17**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **4**A-**4**C without departing from the scope of the disclosure. For example, the flood vent **8** of FIGS. **4**A-**4**C may include one or more components of the flood vent **8** of FIGS. **3**A-**3**C. In such an example, the flood vent **8** may include one or more connectors **30** that may be configured to uncouple the panel **22** from the frame **10** (and/or the structure **17**) when a first predetermined amount of pressure is applied to the panel **22** (as is discussed above with regard to FIGS. **3**A-**3**C), and may further include one or more connectors **40** that may be configured to uncouple the frame **10** from the structure **17** when a second predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The first predetermined amount of pressure (which may uncouple the panel **22** from the frame **10** and/or structure **17**) may be less than the second predetermined amount of pressure (which may uncouple the frame **10** from the structure **17**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above) while the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, the panel **22** may be uncoupled from the frame **10** and/or the structure (which may reduce the amount of blockage of the fluid passageway provided by the panel **22**). Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the frame **10** (and/or the remainder of the panel **22**, if any), the frame **10** may be uncoupled from the structure **17** (which may further reduce the amount of blockage of the fluid). As such, the flood vent **8** may be able to further provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

FIGS. **5**A-**6**C illustrate the flood vent **8** of FIGS. **1**-**2** with a panel **22** having example perforations **60**. Perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8**. For example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** when a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel **22** of flood vent **8** may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent **8** until a predetermined amount of pressure is applied to the panel **22**, and after the predetermined amount of pressure is applied to the panel **22**, the at least a portion of the panel **22** may be uncoupled from the flood vent **8** and may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced). This may, in particular embodiments,

allow the flood vent **8** to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings **26** in the panel **22**, when the openings **26** in the panel **22** are too small to allow sufficient fluids to pass through the flood vent **8**, when the openings **26** in the panel are closed, and/or when the panel **22** does not include any openings **26**.

As is discussed above with regard to FIGS. **1-2**, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing the flooding fluids to enter and/or exit the structure **17**. The panel **22** may be configured to be coupled to the frame **10**. Furthermore, the panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIG. **5**C. The panel **22** may be coupled to the frame **10** in any manner. For example, the panel **22** may be formed integral with the frame **10**, welded to the frame **10**, coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, attached to the frame **10** using one or more rivets, nails, and/or any other connector, attached to the structure **17** (and thus the frame **10**) using one or more rivets, nails, and/or any other connector, coupled to the frame **10** in any other manner, or any combination of the preceding. The panel **22** may be any type of panel. For example, as is illustrated in FIGS. **5**A-**5**E, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as prevent (or substantially prevent) objects (such as small animals) from passing through the panel **22**. As another example, as is illustrated in FIGS. **6**A-**6**B, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**.

As illustrated, the panel **22** includes one or more perforations **60** configured to uncouple at least a portion of the panel **22** from the flood vent **8** when, for example, a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. A perforation **60** may be any type of characteristic or feature of the panel **22** that may uncouple at least a portion of the panel **22** from the flood vent **8** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, a perforation **60** may be any type of reduction in the thickness **25** (or any other dimension) of the panel **22** at one or more points on the panel **22**, which may cause the panel **22** to break or fail at the perforation **60** when, for example, a predetermined amount of pressure is applied to the panel **22**. In such an example, a perforation **60** may be a cut-out of the material of the panel **22** (as is illustrated in FIG. **5**B), a stamp in the material of the panel **22**, one or more channels in the panel **22**, any other feature that may reduce the thickness **25** (or any other dimension) of the panel **22** at one or more points on the panel **22**, or any combination of the preceding. As another example, a perforation **60** may be one or more holes (or one or more rows of holes) in the panel **22**, which may cause the panel **22** to break or fail at the perforation **60** when, for example, a predetermined amount of pressure is applied to the panel **22**. As a further example, a perforation **60** may be a pre-stressed portion (or weak portion) of the panel **22**, which may cause the panel **22** to break or fail at the perforation **60** when, for example, a predetermined amount of pressure is applied to the panel **22**. As another example, a perforation **60** may be a pre-cut portion of the panel **22**, which may cause the panel **22** to break or fail at the perforation **60** when, for example, a predetermined amount of pressure is applied to the panel **22**. As a further example, a perforation **60** may be a combination of one or more (or all of) a reduction in the thickness **25** (or any other dimension) of the panel **22** at one or more points on the panel **22**, one or more holes (or one or more rows of holes) in the panel **22**, a pre-stressed portion (or weak portion) of the panel **22**, a pre-cut portion of the panel **22**, or any other characteristic or feature of the panel **22** that may uncouple at least a portion of the panel **22** from the flood vent **8**.

The perforations **60** may be configured to uncouple any portion of the panel **22** from the flood vent **8**. As a first example, the perforations **60** may be positioned so as uncouple the entire panel **22** from the frame **10**. In such an example, the perforations **60** may positioned at any location that couples the panel **22** to the frame **10**, such as at the edges **23** of the panel **22**. The perforations **60** may couple the panel **22** to the frame **10** until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the perforations **60** may break or fail. This may uncouple the panel **22** from the frame **10**, causing the panel **22** to be completely separated from the frame **10**, and be carried away from the frame **10**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a second example, the perforations **60** may be positioned so as uncouple a portion of the panel **22** from another portion of the panel **22**. For example, as is illustrated in FIGS. **5**A-**5**E, the panel **22** may include a first portion **62** of the panel **22** and a second portion **64** of the panel **22**. Furthermore, perforations **60** may be located in-between the first portion **62** and the second portion **64**. As such, the perforations **60** (and/or the area that includes the perforations **60**) may couple the second portion **64** to the first portion **62** of the panel **22** until a predetermined amount of pressure is applied to the panel **22** (such as the second portion **64** of the panel) by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the perforations **60** may break or fail. This break or failure may uncouple the second portion **64** of the panel **22** from the first portion **62** of the panel **22**, causing the second portion **64** to be completely separated from the first portion **62**, and be carried away from the first portion **62**, as is illustrated in FIGS. **5**C-**5**E. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

The first portion **62** of the panel **22** may include any area of the panel **22**, and the second portion **64** of the panel **22** may include any area of the panel. As one example, the first portion **62** of the panel **22** may be an outer area of the panel **22**, and the second portion of the panel **22** may be an inner area of the panel **22** that is surrounded (at least partially) be the outer area of the panel **22**, as is illustrated in FIGS.

5A-5B. As another example, the first portion **62** of the panel **22** may be an inner area of the panel **22**, and the second portion of the panel **22** may be an outer area of the panel **22** that surrounds (at least partially) the inner area of the panel **22**. As another example, the first portion **62** of the panel **22** may be a left-side area (or a right-side area, or a top-side area, or a bottom-side area) of the panel **22**, and the second portion of the panel **22** may be a right-side area (or a left-side area, or a top-side area, or a bottom-side area) of the panel **22**. The first portion **62** of the panel **22** may be any type of panel, and the second portion **64** of the panel **22** may be any type of panel. For example, the first portion **62** of the panel **22** may be a solid panel, and the second portion **64** of the panel **22** may include one or more openings **26**, as is illustrated in FIGS. **6**A-**6**B. As another example, the first portion **62** of the panel **22** may be a solid panel, and the second portion **64** of the panel **22** may be a screen. As a further example, both the first portion **62** and the second portion **64** of the panel **22** may be solid panels, screens, or panels with one or more openings **26**.

The perforations **60** may be located at any position on the panel **22**. In particular embodiments, the location of the perforations **60** may be based on the edges **23** of the panel **22**. For example, the perforations **60** (or the portions of a perforation **60**) may be located a perforation distance **66** from the respective edges **23**. The perforation distance **66** may be any distance, such as 0.15", 0.25", 0.5", 0.75", 1", 1.5", 2", 3", 4", less than 0.5", less than 0.75", less than 1", less than 1.5", less than 2", less than 3", less than 4", or any other distance. The perforation distance **66** may be the same for each perforation **60** (or for each portion of a perforation **60**), or the perforation distance **66** may be different for one or more of the perforations **60** (or for one or more portions of a perforation **60**).

The flood vent **8** may include any number of perforations **60**. For example, the flood vent **8** may include one perforation **60**, two perforations **60**, three perforations **60**, four perforations **60**, six perforations **60**, eight perforations **60**, ten perforations **60**, or any other number of perforations **60**. The perforations **60** may be included on a single side of the panel **22** (such as side **24***a* of the panel **22** or side **24***b* of the panel **22**) or may be included on both sides of the panel **22** (such as on both sides **24***a* and **24***b* of the panel **22**). Furthermore, when perforations **60** are included on both sides of the panel **22**, the perforations **60** may be located in the same location of the panel **22** on both sides of the panel **22** (as is illustrated in FIGS. **5**B and **6**B), or the perforations **60** may be located in different locations of the panel **22** (or otherwise be off-center from each other), as is illustrated in FIG. **6**C. The perforations **60** may be positioned in any pattern on the panel **22**. For example, the perforations **60** may completely surround the portion of the panel **22** that is uncoupled from the flood vent **8**, as is illustrated in FIGS. **5**A-**5**E. As another example, the perforations **60** may at least substantially surround the portion of the panel **22** that is uncoupled from the flood vent **8** (i.e., the perforations **60** may surround at least 90% of the portion of the panel **22** that is uncoupled from the flood vent **8**). As a further example, the perforations **60** may surround any other amount of the portion of the panel **22**, so as to cause the portion of the panel **22** to be uncoupled from the flood vent **8** when a predetermined amount of pressure is applied to the panel **22**.

The perforations **60** may have any size and/or shape that may allow the perforations **60** to uncouple at least a portion of the panel **22** when a predetermined amount of pressure is applied to the panel **22**. For example, the perforations **60** may be sized and/or shaped to reduce the thickness **25** of the panel **22** at one or more points of the panel **22** to a thickness that is less than the other portions of the panel **22**. For example, if the thickness **25** of the panel **22** is, for example, 1 inch, the perforations **60** may have a reduced thickness, such as, for example, 0.75 inches, 0.5 inches, 0.4 inches, 0.33 inches, 0.3 inches, 0.25 inches, 0.2 inches. 0.1 inches, approximately 0.75 inches (i.e., 0.75 inches+/−0.1 inches), approximately 0.5 inches, approximately 0.4 inches, approximately 0.33 inches, approximately 0.3 inches, approximately 0.25 inches, approximately 0.2 inches, or any other thickness less than 1 inch. In particular embodiments, the reduction in the thickness **25** of the panel **22** at one or more points of the panel **22** may be selected to cause at least a portion of the panel **22** to uncouple from the flood vent **8** when a predetermined amount of pressure is applied to the panel **22**.

As is discussed above, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+/−0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8**. For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22**, the perforations **60** may not uncouple at least a portion of the panel **22** from the flood vent **8**. On the other hand, if an amount of pressure equal to the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22**, the perforations **60** may uncouple at least a portion of the panel **22** from the flood vent **8**.

In particular embodiments, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to any portion of the panel **22**. For example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to a bottom portion of the panel **22** (or a bottom portion of second portion **64**), a top portion of the panel **22** (or a top portion of second

portion **64**), a left and/or right side portion of the panel **22** (or a left and/or right side portion of second portion **64**), any other portion of the panel **22**, or any combination of the preceding. In particular embodiments, the predetermined amount of pressure for causing the perforations **60** to uncouple at least a portion of the panel **22** from the flood vent **8** may change based on (or be a function of) the portion of the panel **22** to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel **22** (or a bottom portion of second portion **64**) (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel **22** (or a top portion of second portion **64**) (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the perforations **60** to uncouple at least a portion of the panel **22** from the flood vent **8** may change based on (or be a function of) the type of panel **22** included in the flood vent **8**. For example, the predetermined amount of pressure may be less if the panel **22** is a panel without any openings **26** (or with openings that may be closed, using louvers, for example) than if the panel includes openings **26** that may not be closed (or if the panel **22** is a screen). In such an example, a panel **22** without openings **26** (when compared to a panel **22** with openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** without openings **26** at a lower amount of pressure (when compared to a panel **22** with openings **26**). As another example, the predetermined amount of pressure may be less if the panel **22** is a panel with less openings **26** (and/or with smaller openings **26**) than if the panel **22** includes more openings **26** (and/or has bigger openings **26**). In such an example, a panel **22** with less openings **26** (when compared to a panel **22** with more openings **26**) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel **22** with less openings **26** at a lower amount of pressure (when compared to a panel **22** with more openings **26**).

In particular embodiments, the perforations **60** may be configured to uncouple the at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to any side of the panel **22**. For example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**), thereby causing at least a portion of the panel **22** to be uncoupled from the flood vent **8** and be carried by the fluids, for example, outside of the structure **17**, as is illustrated in FIGS. **5**C-**5**E. In particular embodiments, this may cause the at least a portion of the panel **22** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from inside the structure **17**. As another example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to side **24***a* the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**), thereby causing at least a portion of the panel **22** to be uncoupled from the flood vent **8** and be carried by the fluids, for example, inside of the structure **17** (e.g., in a direction from left-to-right in FIGS. **5**C-**5**E). In particular embodiments, this may cause at least a portion of the panel **22** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from outside the structure **17**. As a further example, the perforations **60** may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** if the predetermined amount of pressure is applied to either the side **24***b* of the panel **22** (e.g., the side of the panel **22** facing the interior of the structure **17**) or the side **24***a* of the panel **22** (e.g., the side of the panel **22** facing the exterior of the structure **17**). In particular embodiments, this may cause at least a portion of panel **22** to be uncoupled from the flood vent **8** when flooding fluids, for example, enter the flood vent **8** from either inside the structure **17** or outside the structure **17**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **5**A-**6**C without departing from the scope of the disclosure. For example, the flood vent **8** of FIGS. **5**A-**6**C may include one or more components of the flood vent **8** of FIGS. **3**A-**3**C and/or FIGS. **4**A-**4**C. In such an example, the flood vent **8** may include a panel **22** having one or more perforations **60** that may be configured to uncouple at least a portion of the panel **22** from the flood vent **8** when a first predetermined amount of pressure is applied to the panel **22**, may further include one or more connectors **30** that may be configured to uncouple the panel **22** from the frame **10** (and/or the structure **17**) when a second predetermined amount of pressure is applied to the panel **22** (as is discussed above with regard to FIGS. **3**A-**3**C), and/or may further include one or more connectors **40** that may be configured to uncouple the frame **10** from the structure **17** when a third predetermined amount of pressure is applied to the panel **22** and/or the frame **10** (as is discussed above with regard to FIGS. **4**A-**4**C). The first predetermined amount of pressure (which may uncouple at least a portion of the panel **22** from the flood vent **8**) may be less than the second predetermined amount of pressure (which may uncouple the remainder of the panel **22** from the frame **10**), and the second predetermined amount of pressure may be less than the third predetermined amount of pressure (which may uncouple the frame **10** from the structure **17**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above), the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure), and the third predetermined amount of pressure may be a pressure range of 2.5 PSI-9 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the second predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, at least a portion of the panel **22** may be uncoupled from the flood vent **8** (which may reduce the amount of blockage of the fluid passageway provided by the panel **22**). Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the remainder of the panel **22**, the remainder of the panel **22** may be uncoupled from the frame **10** (which may further reduce the amount of blockage of the fluid). Additionally, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the third predetermined amount of pressure to the frame **10**, the frame **10** may be uncoupled from the structure **17** (which may further reduce the amount of blockage of the fluid). As such, the flood vent **8** may be able to further

provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

As another example, the flood vent **8** of FIGS. **5**A-**6**C may include a panel **22** having more than one portion of the panel **22** that may be uncoupled from the flood vent **8**. In such an example, the panel **22** may include three or more portions separated by two or more perforations **60**. For example, the panel **22** may have a first portion separated from a second portion by a first perforation **60** configured to uncouple the second portion from the first portion when a second predetermined amount of pressure is applied to the panel **22** (or to the second portion of the panel **22**). Furthermore, the second portion of the panel **22** may be separated from a third portion of the panel **22** by a second perforation configured to uncouple the third portion from the second portion when a first predetermined amount of pressure is applied to the panel **22** (or to the third portion of the panel **22**). The first predetermined amount of pressure (which may uncouple the third portion of the panel **22** from the flood vent **8**) may be less than the second predetermined amount of pressure (which may uncouple the second portion of the panel **22** from the flood vent **8**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above) while the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, the third portion may be uncoupled from the flood vent **8** (which may reduce the amount of blockage of the fluid passageway provided by the panel **22**). Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the remainder of the panel **22**, the second portion of the panel **22** may be uncoupled from the flood vent **8** (which may further reduce the amount of blockage of the fluid passageway provided by the panel **22**). As such, the flood vent **8** may be able to further provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

As a further example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**.

FIGS. **7**A-**7**H illustrate the flood vent **8** of FIGS. **1**-**2** with a panel **22** having a plurality of insulation pieces **70** and one or more insulation piece connectors **80**. The insulation pieces **70** may be configured to form the panel **22**, so as to at least partially block the fluid passageway formed by the frame **10**. The insulation piece connectors **80** may be configured to couple the insulation pieces **70** together to form the panel **22**. Furthermore, the insulation piece connectors **80** may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22**. For example, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As such, in particular embodiments, the panel **22** of flood vent **8** may prevent (or substantially prevent) objects and/or fluids from passing through the flood vent **8** until a predetermined amount of pressure is applied to the panel **22**, and after the predetermined amount of pressure is applied to the panel **22**, one or more of the insulation pieces **70** of the panel **22** may be uncoupled from the panel **22** and may no longer prevent objects and/or fluids from passing through the flood vent **8** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced). This may, in particular embodiments, allow the flood vent **8** to provide for equalization of hydrostatic forces caused by, for example, flooding fluids, even when the flooding fluids carry objects (such as debris) that may clog the openings **26** in the panel **22**, when the openings **26** in the panel **22** are too small to allow sufficient fluids to pass through the flood vent **8**, when the openings **26** in the panel **22** are closed, and/or when the panel **22** does not include any openings **26**.

As is discussed above with regard to FIGS. **1**-**2**, the flood vent **8** includes a frame **10** and a panel **22**. The frame **10** may be configured to be inserted into an opening **18** in a structure **17**, and may be further configured to form a fluid passageway through the opening **18** in the structure **17**, thereby allowing the flooding fluids to enter and/or exit the structure **17**. The panel **22** may be configured to be coupled to the frame **10**. Furthermore, the panel **22** may be configured to be coupled to the frame **10** in the fluid passageway formed by the frame **10**. Additionally, when coupled to the frame **10**, the panel **22** may at least partially block the fluid passageway formed by the frame **10**, an example of which is seen in FIG. **7**C. The panel **22** may be coupled to the frame **10** in any manner. For example, the panel **22** may be coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, attached to the frame **10** using one or more rivets, nails, and/or any other connector, attached to the structure **17** (and thus the frame **10**) using one or more rivets, nails, and/or any other connector, coupled to the frame **10** in any other manner, or any combination of the preceding. The panel **22** may be any type of panel. For example, as is illustrated in FIGS. **7**A-**7**F, the panel **22** may be a solid panel that may prevent all (or substantially all) fluids (such as water and/or air) from passing through the panel **22**, as well as prevent (or substantially prevent) objects (such as small animals) from passing through the panel **22**. As another example, the panel **22** may include one or more openings **26** configured to allow fluids (such as water and/or air) to pass through the panel **22**, but prevent objects (such as small animals) from passing through the panel **22**.

The panel **22** includes a plurality of insulation pieces **70** configured to be coupled together to form the panel **22**, so as to at least partially block the fluid passageway formed by the frame **10**. An insulation piece **70** may be any type of object or piece that may be coupled together with other objects or pieces in order to form a panel **22**, and that may be configured to at least partially prevent fluids (such as water and/or air) from passing through the insulation piece **70**. An insulation piece **70** may be formed from (or include) any type of material configured to at least partially prevent fluids (such as water and/or air) from passing through the insulation piece **70**. For example, insulation piece **70** may be formed from (or include) rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized material, any other metal, or any combination of the preceding), any other insulating material, any other material configured to at least partially prevent fluids (such as water and/or air) from passing through insulation piece **70**, or any combination of the preceding. In particular

embodiments, insulation piece **70** may be formed from (or include) a foam insulation, such as polyurethane, polyisocyanurate, polystyrene, polyethylene (such as cross linked polyethylene), icynene, air krete, teflon (PTFE), polyester, synthetic rubber, any other foam insulation, or any combination of the preceding. In particular embodiments, insulation piece **70** may be formed from (or include) a rubber or polymer, such as butyl, natural rubber, nitrile, ethylene propylene, polyurethane, silicone, any other rubber or polymer, or any combination of the preceding.

The panel **22** may include any number of insulation pieces **70**. For example, the panel **22** may include two insulation pieces **70**, three insulation pieces **70**, four insulation pieces **70**, ten insulation pieces **70**, twenty insulation pieces **70**, forty insulation pieces **70**, fifty insulation pieces **70**, 64 insulation pieces **70**, 75 insulation pieces **70**, 98 insulation pieces **70**, 100 insulation pieces **70**, 128 insulation pieces **70**, 150 insulation pieces, 200 insulation pieces, 256 insulation pieces, or any other number of insulation pieces **70**. As another example, the panel **22** may include at least two insulation pieces **70** (i.e., two or more insulation pieces **70**), at least three insulation pieces **70**, at least four insulation pieces **70**, at least ten insulation pieces **70**, at least twenty insulation pieces **70**, at least forty insulation pieces **70**, at least fifty insulation pieces **70**, at least 64 insulation pieces **70**, at least 75 insulation pieces **70**, at least 100 insulation pieces **70**, at least 128 insulation pieces **70**, at least 150 insulation pieces, at least 200 insulation pieces, or at least 256 insulation pieces. As another example, the panel **22** may include a range of insulation pieces **70**, such as 2-10 insulation pieces **70**, 10-20 insulation pieces **70**, 10-50 insulation pieces **70**, 50-100 insulation pieces **70**, 64-128 insulation pieces **70**, 100-256 insulation pieces **70**, or any other range of insulation pieces **70**.

An insulation piece **70** may have any size and/or shape. For example, an insulation piece **70** may have a height **72** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other height **72**. As another example, an insulation piece **70** may have a length **74** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other length **74**. As a further example, an insulation piece **70** may have a thickness **76** of 0.15", 0.25", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other thickness **76**. As another example, an insulation piece **70** may have a cross section that is rectangular-shaped, square-shaped (as is illustrated in FIG. **7**A), circular-shaped, polygon-shaped, irregular shaped, or any other shape. In particular embodiments, the insulation piece **70** may have a height **72** and length **74** of 0.5" squared, 1.5" squared, 1.5" squared, 2" squared, 2.5" squared, 3" squared, 3.5" squared, or any other height **72** and length **74**. In particular embodiments, the insulation piece **70** may have a height **72** and length **74** of approximately 0.5" squared (i.e., 0.5" squared+/−0.1" squared), approximately 1" squared, approximately 1.5" squared, approximately 2" squared, approximately 2.5" squared, approximately 3" squared, approximately 3.5" squared, or approximately any other height **72** and length **74**. In particular embodiments, the insulation piece **70** may have a volume (e.g., height **72**, length **74**, and thickness **76**) of 0.5" cubed, 1" cubed, 1.5" cubed, 2" cubed, 2.5" cubed, 3" cubed, 3.5" cubed, or any other volume. In particular embodiments, the insulation piece **70** may have a volume of approximately 0.5" cubed (i.e., 0.5" cubed+/−0.1" cubed), approximately 1" cubed, approximately 1.5" cubed, approximately 2" cubed, approximately 2.5" cubed, approximately 3" cubed, approximately 3.5" cubed, or approximately any other volume. In particular embodiments, the size and/or shape of the insulation piece **70** may assist flood vent **8** in providing for equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. For example, the size and/or shape of the insulation piece **70** may allow the insulation piece **70** to uncouple from the panel **22** and be carried away from the flood vent **8** by the fluid without, for example, the insulation piece **70** becoming stuck in a portion of the flood vent **8**, a portion of an adjacent flood vent **8** (e.g., the uncoupled insulation pieces **70** may float underneath an open panel **22** or other door in an adjacent flood vent **8** installed in the same opening **18** in the structure **17**), and/or the opening **18** in the structure **17**. As such, the flood vent **8**, the adjacent flood vent **8**, and/or the opening **18** in the structure **17** may not be clogged (or otherwise blocked) by the uncoupled insulation pieces **70**, which may allow the flood vent **8** to further provide for equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

The panel **22** further includes one or more insulation piece connectors **80**. An insulation piece connector **80** may include any type of one or more connectors configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**, such as by a fluid or an object (such as a tree limb or dirt) carried by the fluid. As a first example, an insulation piece connector **80** may be one or more pieces of lamination in contact with the insulation pieces **70**. The one or more pieces of lamination may be configured to couple the insulation pieces **70** together to form the panel **22**, and may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The pieces of lamination may include any type of laminate, such as one or more pieces of a plastic film, one or more pieces of a polymer film, any other laminate or film that may couple the insulation pieces **70** together to form the panel **22**, or any combination of the preceding. Furthermore, the one or more pieces of lamination may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the one or more pieces of lamination may be configured to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the one or more pieces of lamination may be engineered and/or modified to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. As one example, the one or more pieces of lamination may include rows of holes (or perforations) that may weaken the one or more pieces of lamination so as to break when a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of material used in the lamination may be selected to cause the one or more pieces of lamination to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**.

The pieces of lamination may be laminated to (or otherwise in contact) with each of the insulation pieces **70**. For example, the insulation pieces **70** may be arranged together in the shape of the panel **22**, and then the one or more pieces of lamination may be laminated to (or otherwise be put in contact with) each of the insulation pieces **70** on the side **24***a*

of the panel **22**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. As a further example, the insulation pieces **70** may be arranged together in the shape of the panel **22**, and then the one or more pieces of lamination may be laminated to (or otherwise be put in contact with) each of the insulation pieces **70** on the side **24***b* of the panel **22** (as is illustrated in FIG. **7**B), thereby coupling the insulation pieces **70** to each other and forming the panel **22**. As another example, the insulation pieces **70** may be arranged together in the shape of the panel **22**, and then the one or more pieces of lamination may be laminated to (or otherwise be put in contact with) each of the insulation pieces **70** on both side **24***a* and side **24***b* of the panel **22**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**.

The pieces of lamination may couple the insulation pieces **70** together (thereby forming the panel **22**, as is seen in FIG. **7**B) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the pieces of lamination may peel off, break, or otherwise uncouple from the insulation pieces **70** and/or panel **22**, thereby uncoupling one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**, as is illustrated in FIGS. **7**C-**7**F. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a second example, an insulation piece connector **80** may be an adhesive configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The adhesive may include any adhesive substance that may adhere the insulation pieces **70** together to form the panel **22**, such as glue, cement, Lexel® adhesive, any other adhesive substance that may adhere the insulation pieces **70** together to form the panel **22**, or any combination of the preceding. Furthermore, the adhesive may be further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the adhesive may be configured to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the adhesive may be engineered and/or modified to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the amount of adhesive used to couple the insulation pieces **70** together to form the panel **22** may be selected to cause the adhesive to peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22** and/or the frame **10**.

The adhesive may include one or more portions of the adhesive coupled to each of the insulation pieces **70**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. The one or more portions of the adhesive may be coupled to any area of the insulation pieces **70**, such one or more (or all of the) edges (or sides) of the insulation pieces **70**, the side **24***a* of the panel **22**, the side **24***b* of the panel **22**, both the sides **24***a* and **24***b* of the panel **22**, or any combination of the preceding. The portions of the adhesive may couple the insulation pieces **70** together (thereby forming the panel **22**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the adhesive may peel off, break, or otherwise uncouple one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a third example, an insulation piece connector **80** may be one or more mechanical fasteners configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The mechanical fasteners may include any one or more devices and/or objects that may mechanically fasten the insulation pieces **70** together, such as one or more nails, screws, rivets, nuts and bolts, rods and studs, anchors, pins, retaining rings and/or clips, any other devices and/or objects that may mechanically fasten the insulation pieces **70** together, or any combination of the preceding. Furthermore, the mechanical fasteners may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the mechanical fasteners may be configured to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the mechanical fasteners may be engineered and/or modified to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**.

The mechanical fasteners may include one or more mechanical fasteners coupled to each of the insulation pieces **70**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. The mechanical fasteners may be coupled to any area of the insulation pieces **70**, such one or more (or all of the) edges (or sides) of the insulation pieces **70**, the side **24***a* of the panel **22**, the side **24***b* of the panel **22**, both the sides **24***a* and **24***b* of the panel **22**, or any combination of the preceding. The mechanical fasteners may couple the insulation pieces **70** together (thereby forming the panel **22**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the mechanical fasteners may break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

As a fourth example, an insulation piece connector **80** may be one or more integral connectors configured to couple the insulation pieces **70** together to form the panel **22**, and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. The integral connectors may be portions of the insulation pieces **70**, themselves, that couple the insulation pieces **70** together. For example, the insulation pieces **70** may be formed or otherwise manufactured in the form of the panel **22**, with connector segments integrally formed in (or on) the insulation pieces **70** so as to protrude from the insulation pieces **70** and attach the insulation pieces **70** together (as is illustrated in FIG. **7**G). As another example, the panel **22** may be formed as a single solid piece, and the insulation pieces **70** and integral connectors may be formed from the solid piece (such as by stamping the solid piece, cutting-out portions of the solid piece, or any other means of removing material). As an example of this, a steel rule die (e.g., a steel rule die having one or more divots in the blade) may be used to stamp the solid-piece (such as a solid-piece of polyethylene foam), for example. Such stamping may cut through almost the entire thickness (or other dimension) of the panel **22** in order to form the individual insulation pieces **70** in the panel **22**, but may leave one or more un-cut connections or strands (e.g., hair-like strands) in-between each of the individual insulation pieces **70**. These un-cut connections or strands may be the integral connectors configured to couple the insulation pieces **70** together to form the panel **22**. Furthermore, the integral connectors may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. For example, the integral connectors may be configured to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the integral connectors may be sized (e.g., by the one or more divots in the blade of the steel rule die, for example) (or otherwise modified) to break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**.

The integral connectors may include one or more integral connectors coupled to (or formed in) each of the insulation pieces **70**, thereby coupling the insulation pieces **70** to each other and forming the panel **22**. The integral connectors may be coupled to (or formed in) any area of the insulation pieces, such one or more (or all of the) edges (or sides) of the insulation pieces **70**, the side **24***a* of the panel **22**, the side **24***b* of the panel **22**, both the sides **24***a* and **24***b* of the panel **22**, or any combination of the preceding. The integral connectors may couple the insulation pieces **70** together (thereby forming the panel **22**) until a predetermined amount of pressure is applied to the panel **22** by, for example, a fluid (such as flooding water). Once the predetermined amount of pressure is applied to the panel **22**, the integral connectors may break or otherwise uncouple one or more of the insulation pieces **70** from the panel **22**. This may cause one or more of the insulation pieces **70** to be completely separated from the panel **22** (and/or the remaining insulation pieces **70**), and be carried away from the flood vent **8**. As such, in particular embodiments, the flood vent **8** may no longer prevent objects and/or fluids from passing through the opening **18** in the structure **17** (or the amount of blockage of the fluid passageway provided by the panel **22** may be reduced).

The flood vent **8** may include any number of insulation piece connectors **80**. For example, the flood vent **8** may include one insulation piece connector **80**, two insulation piece connectors **80**, three insulation piece connectors **80**, four insulation piece connectors **80**, six insulation piece connectors **80**, eight insulation piece connectors **80**, ten insulation piece connectors **80**, twenty insulation piece connectors **80**, fifty insulation piece connectors **80**, 64 insulation piece connectors **80**, 100 insulation piece connectors **80**, 128 insulation piece connectors **80**, 256 insulation piece connectors **80**, one insulation piece connector **80** for each insulation piece **70**, two insulation piece connectors **80** for each insulation piece **70**, or any other number of insulation piece connectors **80**. The insulation piece connectors **80** may have any size and/or shape that may allow the insulation piece connectors **80** to uncouple one or more of the insulation pieces **70** from the panel **22** when a predetermined amount of pressure is applied to the panel **22**.

As is discussed above, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** when, for example, a predetermined amount of pressure is applied to the panel **22**. In particular embodiments, the predetermined amount of pressure may refer to the lowest amount of pressure (or approximately the lowest amount of pressure) that would cause the panel **22** to prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As an example, the predetermined amount of pressure may be 0.5 PSI, 1 PSI, 1.5 PSI, 2 PSI, 2.5 PSI, 3 PSI, 3.5 PSI, 4 PSI, 4.5 PSI, 5 PSI, 6 PSI, 7 PSI, 10 PSI, approximately 0.5 PSI (i.e., 0.5 PSI+1-0.2 PSI), approximately 1 PSI, approximately 1.5 PSI, approximately 2 PSI, approximately 2.5 PSI, approximately 3 PSI, approximately 3.5 PSI, approximately 4 PSI, approximately 4.5 PSI, approximately 5 PSI, approximately 6 PSI, approximately 7 PSI, approximately 10 PSI, or any other amount of pressure that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**. As a further example, the predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI, 0.5-5.0 PSI, 0.5-4.0 PSI, 0.5-3.0 PSI, 1.0-7.0 PSI, 1.0-5.0 PSI, 1.0-4.0 PSI, 1.0-3.0 PSI, 1.5-7.0 PSI, 1.5-5.0 PSI, 1.5-4.0 PSI, 1.5-3.0 PSI, 2.0-7.0 PSI, 2.0-5.0 PSI, 2.0-4.0 PSI, 2.0-3.0 PSI, or any other pressure range that may prevent the equalization of interior and exterior hydrostatic forces caused by a fluid (such as flooding water) attempting to flow through the flood vent **8**.

In particular embodiments, the predetermined amount of pressure may be the lowest pressure at which the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22**. For example, if an amount of pressure below the predetermined amount of pressure is applied to the panel **22**, the insulation piece connectors **80** may not uncouple one or more of the insulation pieces **70** from the panel **22**. On the other hand, if an amount of pressure equal to the predetermined amount of pressure (or above the predetermined amount of pressure) is applied to the panel **22**, the insulation piece connectors **80** may uncouple one or more of the insulation pieces **70** from the panel **22**.

In particular embodiments, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces **70** from the panel **22** if the predetermined amount of pressure is applied to any portion of the panel **22**. For example, the insulation piece connectors **80** may be configured to uncouple one or more of the insulation pieces

70 from the panel 22 if the predetermined amount of pressure is applied to a bottom portion of the panel 22, a top portion of the panel 22, a left and/or right side portion of the panel 22, any other portion of the panel 22, or any combination of the preceding. Furthermore, the one or more insulation pieces 70 uncoupled from the panel 22 may be associated with the portion of the panel 22 to which the predetermined amount of pressure is applied. For example, if the predetermined amount of pressure is applied to a bottom portion of the panel 22, the one or more insulation pieces 70 uncoupled from the panel 22 may be insulation pieces 70 that were located in (and/or near) the bottom portion of the panel 22. Furthermore, in such an example, the insulation pieces 70 not located in (and/or near) the bottom portion of the panel 22 may not be uncoupled from the panel 22. Instead, the insulation pieces 70 not located in (and/or near) the bottom portion of the panel 22 may remain coupled to the panel 22 (and/or the remaining insulation pieces 70 in the panel 22) until the predetermined amount of pressure is applied to the portion of the panel 22 in which those insulation pieces 70 are located (and/or near where those insulation pieces 70 are located). Alternatively, in particular embodiments, once one or more insulation pieces 70 are uncoupled from the panel 22, the uncoupling may create a cascading effect that may uncouple all or a substantial portion (i.e., 90% of the insulation pieces 70) from the panel 22.

In particular embodiments, the predetermined amount of pressure for causing, the insulation piece connectors 80 to uncouple one or more of the insulation pieces 70 from the panel 22 may change based on (or be a function of) the portion of the panel 22 to which the predetermined amount of pressure is applied. For example, the predetermined amount of pressure may be greater if the predetermined amount of pressure is applied to the bottom portion of the panel 22 (which may be indicative of a less amount of flooding fluids, for example) than if the predetermined amount of pressure is applied to the top portion of the panel 22 (which may be indicative of a greater amount of flooding fluids, for example). In particular embodiments, the predetermined amount of pressure for causing the insulation piece connectors 80 to uncouple one or more of the insulation pieces 70 from the panel 22 may change based on (or be a function of) the type of panel 22 included in the flood vent 8. For example, the predetermined amount of pressure may be less if the panel 22 is a panel without any openings 26 (or with openings that may be closed, using louvers, for example) than if the panel includes openings 26 that may not be closed. In such an example, a panel 22 without openings 26 (when compared to a panel 22 with openings 26) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel 22 without openings 26 at a lower amount of pressure (when compared to a panel 22 with openings 26). As another example, the predetermined amount of pressure may be less if the panel 22 is a panel 22 with less openings 26 (and/or with smaller openings 26) than if the panel 22 includes more openings 26 (and/or has bigger openings 26). In such an example, a panel 22 with less openings 26 (when compared to a panel 22 with more openings 26) may more easily (or quickly) prevent equalization of interior and exterior hydrostatic forces caused by a fluid, and therefore it may be advantageous to uncouple the panel 22 with less openings 26 at a lower amount of pressure (when compared to a panel 22 with more openings 26).

In particular embodiments, the insulation piece connectors 80 may be configured to uncouple the one or more of the insulation pieces 70 from the panel 22 if the predetermined amount of pressure is applied to any side of the panel 22. For example, the insulation piece connectors 80 may be configured to uncouple one or more of the insulation pieces 70 from the panel 22 if the predetermined amount of pressure is applied to side 24*b* of the panel 22 (e.g., the side of the panel 22 facing the interior of the structure 17), thereby causing the one or more insulation pieces 70 to be uncoupled from the flood vent 8 and be carried by the fluids, for example, outside of the structure 17, as is illustrated in FIGS. 7C-7F. In particular embodiments, this may cause the one or more insulation pieces 70 to be uncoupled from the flood vent 8 when flooding fluids, for example, enter the flood vent 8 from inside the structure 17. As another example, the insulation piece connectors 80 may be configured to uncouple one or more of the insulation pieces 70 from the panel 22 if the predetermined amount of pressure is applied to side 24*a* the panel 22 (e.g., the side of the panel 22 facing the exterior of the structure 17), thereby causing the one or more insulation pieces 22 to be uncoupled from the flood vent 8 and be carried by the fluids, for example, inside of the structure 17 (e.g., in a direction from left-to-right in FIGS. 7C-7F). In particular embodiments, this may cause the one or more insulation pieces 70 to be uncoupled from the flood vent 8 when flooding fluids, for example, enter the flood vent 8 from outside the structure 17. As a further example, the insulation piece connectors 80 may be configured to uncouple one or more of the insulation pieces 70 from the panel 22 if the predetermined amount of pressure is applied to either the side 24*b* of the panel 22 (e.g., the side of the panel 22 facing the interior of the structure 17) or the side 24*a* of the panel 22 (e.g., the side of the panel 22 facing the exterior of the structure 17). In particular embodiments, this may cause the one or more insulation pieces 70 to be uncoupled from the flood vent 8 when flooding fluids, for example, enter the flood vent 8 from either inside the structure 17 or outside the structure 17.

The panel 22 may further have a frame 84, as is illustrated in FIG. 7H. The frame 84 may be a portion of the panel 22 that surrounds the insulation pieces 70 and the insulation piece connectors 80. In particular embodiments, the frame 84 may be a portion of the panel 22 that does not uncouple from the panel 22. For example, although the insulation pieces 70 may be uncoupled from the panel 22, the frame 84 may remain a portion of the panel 22. In such an example, the insulation pieces 70 may uncouple from the frame 84 (and the panel 22) when the predetermined amount of the pressure is applied to the insulation pieces 70. In particular embodiments, all of the insulation pieces 70 may be uncoupled from the frame 84 of the panel 22, leaving an opening in the panel 22 having the shape of the frame 84. Insulation pieces 70 may be coupled to the frame 84 by one or more insulation piece connectors 80.

The frame 84 may have any size and/or shape. For example, the frame 84 may have an edge sizing 88 of 0.15", 0.25", 0.375", 0.50", 1.0" 1.50", 2.0", 3.0" 4.0", or any other edge sizing 88. As another example, the frame 84 may be rectangular-shaped (as is illustrated in FIG. 7H), square-shaped, circular-shaped, polygon-shaped, irregular shaped, or any other shape. The frame 84 may be formed from (or include) any type of material configured to at least partially prevent fluids (such as water and/or air) from passing through the frame 84. For example, frame 84 may be formed from (or include) rubber, plastic, a polymer, a foam, a metal (such as aluminum, stainless steel, spring steel, a galvanized

material, any other metal, or any combination of the preceding), any other insulating material, any other material configured to at least partially prevent fluids (such as water and/or air) from passing through frame **84**, or any combination of the preceding. In particular embodiments, frame **84** may be formed from (or include) a foam insulation, such as polyurethane, polyisocyanurate, polystyrene, polyethylene (such as cross linked polyethylene), icynene, air krete, teflon (PTFE), polyester, synthetic rubber, any other foam insulation, or any combination of the preceding. In particular embodiments, frame **84** may be formed from (or include) a rubber or polymer, such as butyl, natural rubber, nitrile, ethylene propylene, polyurethane, silicone, any other rubber or polymer, or any combination of the preceding. In particular embodiments, frame **84** may be formed for the same material as insulation pieces **70**, or may be formed from a different material. In particular embodiments, the frame **84** may be formed simultaneously (or substantially simultaneously) with the insulation pieces **70** and insulation piece connectors **80**. For example, the panel **22** may be formed as a single solid piece, and the frame **84**, the insulation pieces **70**, and the insulation piece connectors **80** may be formed from the solid piece (such as by stamping the solid piece, cutting-out portions of the solid piece, or any other means of removing material). As an example of this, a steel rule die (e.g., a steel rule die having one or more divots in the blade) may be used to stamp the solid-piece (such as a solid-piece of polyethylene foam), for example. Such stamping may cut through almost the entire thickness (or other dimension) of the panel **22** in order to form the frame **84** and the individual insulation pieces **70** in the panel **22**, but may leave one or more un-cut connections or strands (e.g., hair-like strands) in-between each of the individual insulation pieces **70** and the frame **84**. These un-cut connections or strands may be the insulation piece connectors **80** configured to couple the insulation pieces **70** together to form the panel **22**.

Modifications, additions, or omissions may be made to the flood vent **8** of FIGS. **7**A-**7**G without departing from the scope of the disclosure. For example, the flood vent **8** of FIGS. **7**A-**7**G may include one or more components of the flood vent **8** of FIGS. **4**A-**4**C. In such an example, the flood vent **8** may include a panel **22** having a plurality of insulation pieces **70** and one or more insulation piece connectors **80** configured to couple the insulation pieces **70** together (thereby forming panel **22**), and further configured to uncouple one or more of the insulation pieces **70** from the panel **22** when a first predetermined amount of pressure is applied to the panel **22**, and may further include one or more connectors **40** that may be configured to uncouple the frame **10** from the structure **17** when a second predetermined amount of pressure is applied to the panel **22** and/or the frame **10**. The first predetermined amount of pressure (which may uncouple one or more of the insulation pieces **70** from the panel **22**) may be less than the second predetermined amount of pressure (which may uncouple the frame **10** from the structure **17**). For example, the first predetermined amount of pressure may be a pressure range of 0.5 PSI-7 PSI (or any of the pressures or pressure ranges discussed above) while the second predetermined amount of pressure may be a pressure range of 1.5 PSI-8 PSI (or any of the pressures or pressure ranges discussed above and further being greater than the first predetermined amount of pressure). As such, if a fluid (such as flooding water) applies a first predetermined amount of pressure to the panel **22**, one or more insulation pieces **70** may be uncoupled from the panel **22** (which may reduce the amount of blockage of the fluid passageway by the panel **22**). Furthermore, in an example where the fluid (such as the flooding water) continues to rise and apply additional force, if the fluid applies the second predetermined amount of pressure to the frame **10**, the frame **10** may be uncoupled from the structure **17** (which may further reduce the amount of blockage of the fluid). As such, the flood vent **8** may be able to further provide for equalization of interior and exterior hydrostatic forces caused by flooding waters.

As another example, although the flood vent **8** has been described above as including a frame **10**, in particular embodiments, the flood vent **8** may not include a frame **10**. In such embodiments, the panel **22** may be configured to be coupled directly to the structure **17**. As such, in particular embodiments, the panel **22** may be inserted into (or installed on) the structure **17** (such as the opening **18** in the structure **17**) without the use of a frame **10**.

Modifications, additions, or omissions may be made to the flood vents **8** of FIGS. **1**-**7** without departing from the scope of the disclosure. For example, the panel **22** may be replaceable without, for example, replacing the entire flood vent **8**. In particular, after all or a portion of the panel **22** has been uncoupled from the flood vent **8** (as a result of a predetermined amount of pressure being applied to the panel **22**, for example), the panel **22** may be replaced by a new panel **22** (with the same features and capabilities discussed above with regard to FIGS. **1**-**7**) that may be re-welded to the frame **10**, re-coupled to the frame **10** using an adhesive (such as glue, cement, and/or Lexel®), re-attached to the frame **10** using one or more pins that may be inserted or snapped into one or more channels or hooks in the frame **10**, re-attached to the frame **10** using one or more rivets, nails, and/or any other connector, re-attached to the structure **17** (and thus the frame **10**) using one or more rivets, nails, and/or any other connect, re-coupled to the frame **10** in any other manner, or any combination of the preceding. As such, the flood vent **8** may continue to operate, without replacing the entire flood vent **8**. As another example, the disclosure of each of FIGS. **1**-**7** may be combined with one or more (or all) of any of the other disclosures of FIGS. **1**-**7**. As one example of this, an opening **18** in a structure **17** may have a first flood vent (such as a flood vent **8** of FIGS. **7**A-**7**H) installed on a first side of the structure **17** (such as the interior side of the structure **17**) and may further have a second flood vent (such as a flood vent **8** of any of FIGS. **1**-**6**, or any other flood vent, such as any flood vent included in U.S. Pat. No. 6,692,187 entitled "Flood Gate For Door") installed on a second side of the structure **17** (such as the exterior side of the structure **17**).

This specification has been written with reference to various non-limiting and non-exhaustive embodiments or examples. However, it will be recognized by persons having ordinary skill in the art that various substitutions, modifications, or combinations of any of the disclosed embodiments or examples (or portions thereof) may be made within the scope of this specification. Thus, it is contemplated and understood that this specification supports additional embodiments or examples not expressly set forth in this specification. Such embodiments or examples may be obtained, for example, by combining, modifying, or reorganizing any of the disclosed steps, components, elements, features, aspects, characteristics, limitations, and the like, of the various non-limiting and non-exhaustive embodiments or examples described in this specification. In this manner, Applicant reserves the right to amend the claims during prosecution to add features as variously described in this specification.

The invention claimed is:

1. A flood vent, comprising:

a frame configured to form a fluid passageway through an opening in a structure, the opening being located below base flood plain levels;

a solid panel configured to be coupled to the frame in the fluid passageway so as to completely block the fluid passageway through the opening in the structure;

one or more first connectors configured to couple the panel to the frame, the one or more first connectors further configured to uncouple the panel from the frame when 0.5-7.0 pounds per square inch of pressure is applied to a portion of the panel on a first side of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel, the one or more first connectors further configured to uncouple the panel from the frame when 0.5-7.0 pounds per square inch of pressure is applied to a portion of the panel on a second side of the panel opposite of the first side of the panel by the one or more of the fluid or the object carried by the fluid, so as to reduce the amount of blockage of the fluid passageway provided by the panel; and

one or more second connectors configured to couple the frame to the structure, the one or more second connectors further configured to uncouple the frame from the structure when 1.5-8.0 pounds per square inch of pressure is applied to the frame on a first side of the frame by the one or more of the fluid or the object carried by the fluid, the one or more second connectors further configured to uncouple the frame from the structure when 1.5-8.0 pounds per square inch of pressure is applied to the frame on a second side of the frame opposite of the first side of the fame by the one or more of the fluid or the object carried by the fluid.

2. The flood vent of claim 1, wherein the one or more first connectors comprise one or more portions of adhesive.

3. The flood vent of claim 1, wherein the one or more first connectors comprise one or more bumps positioned on an inner perimeter of the frame.

4. The flood vent of claim 1, wherein the one or more first connectors comprise one or more pieces of velcro.

5. The flood vent of claim 1, wherein the one or more first connectors comprise one or more mechanical fasteners.

6. The flood vent of claim 1, wherein the one or more second connectors comprise one or more portions of adhesive.

7. A flood vent, comprising:

a frame configured to form a fluid passageway through an opening in a structure;

a solid metal panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure; and

one or more connectors configured to couple the panel to the frame, the one or more connectors further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to a portion of the panel by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway provided by the panel;

wherein the one or more connectors are further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to a portion of the panel on a first side of the panel by the one or more of the fluid or the object carried by the fluid; and

wherein the one or more connectors are further configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to a portion of the panel on a second side of the panel opposite of the first side of the panel by the one or more of the fluid or the object carried by the fluid.

8. The flood vent of claim 7, wherein the solid metal panel is configured to be coupled to the frame in the fluid passageway so as to completely block the fluid passageway through the opening in the structure.

9. The flood vent of claim 7, wherein the one or more connectors comprise one or more of:

one or more mechanical fasteners configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more portions of adhesive configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more pieces of velcro configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more pressure-based connectors configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid;

one or more permanent attachments configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid; or

one or more raised bumps positioned on an inner perimeter of the frame and configured to uncouple the panel from the frame when 0.5-5.0 pounds per square inch of pressure is applied to the portion of the panel by the one or more of the fluid or the object carried by the fluid.

10. A flood vent, comprising:

a frame configured to form a fluid passageway through an opening in a structure;

a panel configured to be coupled to the frame in the fluid passageway so as to at least partially block the fluid passageway through the opening in the structure; and

one or more connectors configured to couple the frame to the structure, the one or more connectors further configured to uncouple the frame from the structure when 0.5-5.0 pounds per square inch of pressure is applied to one or more of a portion of the panel on a first side of the panel or a portion of the frame on a first side of the frame by one or more of a fluid or an object carried by the fluid, so as to reduce an amount of blockage of the fluid passageway, the one or more connectors further configured to uncouple the frame from the structure when 0.5-5.0 pounds per square inch of pressure is applied to one or more of a portion of the panel on a second side of the panel opposite of the first side of the panel or a portion of the frame on a second side of the frame opposite of the first side of the frame by one or

more of the fluid or the object carried by the fluid, so as to reduce the amount of blockage of the fluid passageway.

11. The flood vent of claim **10**, wherein the panel is formed integral with the frame.

12. The flood vent of claim **10**, wherein the panel is welded to the frame.

13. The flood vent of claim **10**, wherein the panel is a solid panel configured to be coupled to the frame in the fluid passageway so as to completely block the fluid passageway through the opening in the structure.

14. The flood vent of claim **10**, wherein the panel has one or more openings configured to allow a fluid to pass through the fluid passageway.

15. The flood vent of claim **10**, wherein the panel is a screen.

16. The flood vent of claim **10**, wherein the one or more connectors comprise one or more of:

one or more mechanical fasteners configured to uncouple the frame from the structure when 0.5-5.0 pounds per square inch of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid;

one or more portions of adhesive configured to uncouple the frame from the structure when 0.5-5.0 pounds per square inch of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid;

one or more pieces of velcro configured to uncouple the frame from the structure when 0.5-5.0 pounds per square inch of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid;

one or more pressure-based connectors configured to uncouple the frame from the structure when 0.5-5.0 pounds per square inch of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid; or

one or more raised bumps positioned on an inner perimeter of the opening in the structure and configured to uncouple the frame from the structure when 0.5-5.0 pounds per square inch of pressure is applied to the one or more of the portion of the panel on the first side of the panel or the portion of the frame on the first side of the frame by the one or more of the fluid or the object carried by the fluid.

* * * * *

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT4834910

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
TED SHOOK	02/05/2018

RECEIVING PARTY DATA

Name:	SMART VENT PRODUCTS, INC.
Street Address:	430 ANDBRO DRIVE, UNIT 1
City:	PITMAN
State/Country:	NEW JERSEY
Postal Code:	08071

PROPERTY NUMBERS Total: 1

Property Type	Number
Patent Number:	8308396

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 8568530055
Email: ajd@dimarinolaw.com
Correspondent Name: ANTHONY J. DIMARINO
Address Line 1: 41 GROVE ST.
Address Line 4: HADDONFIELD, NEW JERSEY 08033

ATTORNEY DOCKET NUMBER:	SV AFV
NAME OF SUBMITTER:	ANTHONY J. DIMARINO
SIGNATURE:	/Anthony J. DiMarino/
DATE SIGNED:	02/22/2018
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 3
source=Patent Assignment Agreement 18 02 22 SIGNED#page1.tif
source=Patent Assignment Agreement 18 02 22 SIGNED#page2.tif
source=Patent Assignment Agreement 18 02 22 SIGNED#page3.tif

PATENT ASSIGNMENT AGREEMENT

This PATENT ASSIGNMENT AGREEMENT ("Patent Assignment"), effective as of August 10, 2017, is made by Ted Shook ("Seller"), an individual doing business as American Floodvent, located at 11 Mariner Pass, Galveston, Texas, 77554, in favor of Smart Vent Products, Inc. ("Buyer"), a corporation organized under the laws of the State of Florida and having a principal place of business at 430 Andbro Drive, Unit 1, Pitman, New Jersey, 08071, pursuant to an agreement between Buyer and Seller, effective as of August 10, 2017 (the "Agreement").

WHEREAS, under the terms of the Agreement, Seller has conveyed, transferred, and assigned to Buyer, among other assets, certain intellectual property of Seller, and has agreed to execute and deliver this Patent Assignment, for recording with the United States Patent and Trademark Office;

NOW THEREFORE, the parties agree as follows:

1. Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Seller hereby irrevocably conveys, transfers, and assigns to Buyer, and Buyer hereby accepts, all of Seller's right, title, and interest in and to the following (the "Assigned Patent"):

(a) the patent set forth in Schedule 1 hereto and all issuances, divisions, continuations, continuations-in-part, reissues, extensions, reexaminations, and renewals thereof;

(b) all rights of any kind whatsoever of Seller accruing under any of the foregoing provided by applicable law of any jurisdiction, by international treaties and conventions, and otherwise throughout the world;

(c) any and all royalties, fees, income, payments, and other proceeds now or hereafter due or payable with respect to any and all of the foregoing; and

(d) any and all claims and causes of action with respect to any of the foregoing, whether accruing before, on, or after the date hereof, including all rights to and claims for damages, restitution, and injunctive and other legal and equitable relief for past, present, and future infringement, misappropriation, violation, misuse, breach, or default, with the right but no obligation to sue for such legal and equitable relief and to collect, or otherwise recover, any such damages.

2. Recordation and Further Actions. Seller hereby authorizes the Commissioner for Patents in the United States Patent and Trademark Office, and the officials of corresponding entities or agencies in any applicable jurisdictions, to record and register this Patent Assignment upon request by Buyer. Following the date hereof, Seller shall take such steps and actions, and provide such cooperation and assistance to Buyer and its successors, assigns, and legal representatives, including the execution and delivery of any affidavits, declarations, oaths, exhibits, assignments,

powers of attorney, or other documents, as may be necessary to effect, evidence, or perfect the assignment of the Assigned Patent to Buyer, or any assignee or successor thereto.

3. Successors and Assigns. This Patent Assignment shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF, Seller has duly executed and delivered this Patent Assignment as of the date below written.

Date: 2/5/18

By: _____
Name: Ted Shook
Title: Individual doing business as American Floodvent
Address for Notices: 1 Mariner Pass
Galveston, Texas, 77554

AGREED TO AND ACCEPTED:

SMART VENT PRODUCTS, INC.

Date: 2/9/18

By: _____
Name: Michael J Graham
Title: President & CEO
Address for Notices: 430 Andbro Drive, Unit 1
Pitman, New Jersey, 08071

SCHEDULE 1

ASSIGNED PATENT

Patents

Title	Jurisdiction	Patent Number	Issue Date
Flood Vent		US 8,308,396 B2	11/13/2012

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/657,535	11/13/2012	8308396	4763.56293	1312

48170 7590 10/24/2012

ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 147 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Ted A. Shook, Galveston, TX;

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

48170 7590 07/18/2012
ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

WILLIAM P. GLENN JR.	(Depositor's name)
William P Glenn Jr	(Signature)
08 OCT 12	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/657,535	01/22/2010	Ted A. Shook	4763.56293	1312

TITLE OF INVENTION: FLOOD VENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	10/18/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
LAGMAN, FREDERICK LYNDON	3672	405-100000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☒ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
2 WILLIAM P. GLENN JR.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 501523 (enclose an extra copy of this form)

Change in Entity Status (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature William P Glenn Jr. Date 08 OCT 12

Typed or printed name WILLIAM P. GLENN JR. Registration No. 36,526

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

For the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PTO/SB/47 (03-09)
Approved for use through 05/31/2015. OMB 0651-0016
U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE

"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop M Correspondence
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

- OR -

Fax to:
571-273-6500

INSTRUCTIONS: The issue fee must have been paid for application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. **When to check the first box below**: If you have a Customer Number to represent the fee address. **When to check the second box below**: If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:

☐ Customer Number: _____

OR

☑ The attached Request for Customer Number (PTO/SB/125) form.

PATENT NUMBER (if known)	APPLICATION NUMBER
	12/657,535

Completed by (check one):

☐ Applicant/Inventor

Signature

☑ Attorney or Agent of record 36526 (Reg. No.)

William P Glenn Jr
Typed or printed name

☐ Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

409-763-1623
Requester's telephone number

☐ Assignee recorded at Reel _____ Frame_____

8 OCT 12
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more that one signature is required, see below*.

☑ * **Total of** One **forms are submitted.**

PTO/SB/125A (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Request for Customer Number	**Address to:** Mail Stop CN Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

☑ Although the Requester acknowledges that Internet communications are not secure, the Requester hereby authorizes the USPTO to send the assigned customer number by e-mail to the email address listed below.

To the Commissioner for Patents:
Please assign a Customer Number to the address indicated below:

Firm *or* Individual Name	Ted A. Shook				
Address	P.O. Box 16502				
City	Galveston	State	Texas	Zip	77550
Country	USA				
Telephone	409-682-4096	Email	floodvents@gmail.com		

Please associate the following practitioner registration number(s) with the Customer Number assigned to the address cited above.

☐ Additional practitioner registration numbers are listed on supplemental sheet(s) attached hereto.

Request Submitted by:

Firm Name (if applicable)	Royston Rayzor Vickery & Williams LLP		
Signature			
Name of person submitting request	William P Glenn Jr.	Date	8 OCT 12
Registration Number, if applicable	36,526	Telephone Number	409-763-1623

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop CN, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	12657535
Filing Date:	22-Jan-2010
Title of Invention:	FLOOD VENT
First Named Inventor/Applicant Name:	Ted A. Shook
Filer:	William P. Glenn
Attorney Docket Number:	4763.56293

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	885	885
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1185**

Electronic Acknowledgement Receipt	
EFS ID:	13931374
Application Number:	12657535
International Application Number:	
Confirmation Number:	1312
Title of Invention:	FLOOD VENT
First Named Inventor/Applicant Name:	Ted A. Shook
Customer Number:	48170
Filer:	William P. Glenn
Filer Authorized By:	
Attorney Docket Number:	4763.56293
Receipt Date:	08-OCT-2012
Filing Date:	22-JAN-2010
Time Stamp:	15:48:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1185
RAM confirmation Number	19002
Deposit Account	501523
Authorized User	GLENN, WILLIAM P
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	20121008141543.pdf	119331 2917469ea01be6e87864d52f21bb3d65dc077d41	no	1
Warnings:					
Information:					
2	Post Allowance Communication - Incoming	20121008141556.pdf	80930 498f1547f0a30ddba4bd6117c4ba2e64bdfce7d2	no	1
Warnings:					
Information:					
3	Post Allowance Communication - Incoming	20121008141610.pdf	59078 a03c9719b0e72ce56fe59b51252734114aee73eb	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	31508 f6b68f5cf4e470844893fbeca47c7c01ad3b8dfa	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	290847		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

48170 7590 07/18/2012

ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550

EXAMINER
LAGMAN, FREDERICK LYNDON

ART UNIT	PAPER NUMBER
3672	

DATE MAILED: 07/18/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/657,535	01/22/2010	Ted A. Shook	4763.56293	1312

TITLE OF INVENTION: FLOOD VENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	10/18/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

48170 7590 07/18/2012
ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/657,535	01/22/2010	Ted A. Shook	4763.56293	1312

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nonprovisional	YES	$870	$300	$0	$1170	10/18/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
LAGMAN, FREDERICK LYNDON	3672	405-100000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/657,535	01/22/2010	Ted A. Shook	4763.56293	1312

48170 7590 07/18/2012

ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550

EXAMINER	
LAGMAN, FREDERICK LYNDON	
ART UNIT	**PAPER NUMBER**
3672	

DATE MAILED: 07/18/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 147 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 147 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.	Applicant(s)	
	12/657,535	SHOOK, TED A.	
	Examiner	Art Unit	
	FREDERICK L. LAGMAN	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *5/14/12*.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *4 and 6*.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/FREDERICK L LAGMAN/
Primary Examiner, Art Unit 3672

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12657535	SHOOK, TED A.
	Examiner	Art Unit
	FREDERICK L LAGMAN	3672

ORIGINAL		INTERNATIONAL CLASSIFICATION									
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED				
405	100	E	0	2	B	7 / 40 (2006.01.01)					

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
405	94				
52	169.5				

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	2	
/FREDERICK L LAGMAN/ Primary Examiner.Art Unit 3672	7/11/12	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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BIB DATA SHEET

CONFIRMATION NO. 1312

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/657,535	01/22/2010	405	3672	4763.56293

APPLICANTS
Ted A. Shook, Galveston, TX;

** **CONTINUING DATA** **********

** **FOREIGN APPLICATIONS** **********

** **IF REQUIRED, FOREIGN FILING LICENSE GRANTED** ** SMALL ENTITY **
02/12/2010

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /FREDERICK LYNDON LAGMAN/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		TX	7	19	3

ADDRESS

ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550
UNITED STATES

TITLE

Flood vent

FILING FEE RECEIVED	FEES: Authority has been given in Paper	☐ All Fees
545	No._____ to charge/credit DEPOSIT ACCOUNT	☐ 1.16 Fees (Filing)
	No._____ for following:	☐ 1.17 Fees (Processing Ext. of time)
		☐ 1.18 Fees (Issue)
		☐ Other _____
		☐ Credit

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	1	(flood$3 and vent and (duct or port or passage$3) and (shutter$2 or gate or door) and pivot$4 and sill and (fin or seal) and (connect$4 or coupl$4) and slid$5).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2012/07/11 12:58
L4	1	(flood$3 and vent and (duct or port or passage$3) and (shutter$2 or gate or door) and pivot$4 and sill and (fin or seal) and (connect$4 or coupl$4) and receiver$1).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2012/07/11 12:59

7/11/2012 12:59:47 PM

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12657535	SHOOK, TED A.
	Examiner	Art Unit
	FREDERIC L LAGMAN	3672

SEARCHED			
Class	Subclass	Date	Examiner
405	80, 87, 88, 89, 90, 91, 92, 94, 95, 99, 100	11/6/11	FLL
52	169.5	11/6/11	FLL
405	updated	7/11/12	FLL
52	updated	7/11/12	FLL

SEARCH NOTES		
Search Notes	Date	Examiner
east search	11/6/11	FLL

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	interference search history printout	7/11/12	FLL

<table>
<tr><td rowspan="4">RESPONSE TO
NON-FINAL OFFICE
DATED 11/14/2011</td><td colspan="3">Application for: FLOOD VENT</td></tr>
<tr><td>Filed:

01/22/2010</td><td colspan="2">Applicant(s)

Ted A. Shook</td></tr>
<tr><td>Application No.

12/657,535</td><td colspan="2"></td></tr>
<tr><td>Examiner:

Fredrick Lyndon Lagman</td><td>Art Unit:

3672</td><td>Attny Ref:

4763.56293</td></tr>
</table>

TABLE OF CONTENTS

AMENDMENT TO CLAIMS

1. (CANCELED)

2. (CANCELED)

3. (CANCELED)

4. (AMENDED) A flood vent for a structure comprising:

a shuttered duct with an upper and lower region formed in a housing fixed in the structure to allow the unimpeded movement of floodwaters through the structure, wherein said lower region of said duct is angled down between two and eight degrees from a horizontal plane to form a sill that sheds water to an exterior of the structure;

said upper region of said duct is pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position and an open position in response to a floodwater pressure differential in said duct; and

a lower region of said shutter releasably coupled to a portion of said sill by a fin, wherein width of said fin and angle of said sill defines a coupling region along said sill wherein said shutter substantially obstructs said duct to prevent animal passage along said duct and ~~A flood vent as claimed in claim 1,~~ wherein said fin is slideably fixed to said lower region of said shutter to alter said coupling region between said shutter and said sill.

5. (CANCELED)

6. (AMENDED) A flood vent for a structure comprising:

a shuttered duct with an upper and lower region formed in a housing fixed in the structure to allow the unimpeded movement of floodwaters through the structure, wherein said lower region of said duct is angled down between two and eight degrees from a horizontal plane to form a sill that sheds water to an exterior of the structure;

said upper region of said duct is pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position and an open position in response to a floodwater pressure differential in said duct; and

a lower region of said shutter releasably coupled to a portion of said sill by a fin, wherein width of said fin and angle of said sill defines a coupling region along said sill wherein said shutter substantially obstructs said duct to prevent animal passage along said duct and

~~A flood vent as claimed in claim 1,~~ wherein an upper region of said fin is releasably coupled with a first receiver formed in said lower region of said shutter and a lower region of said fin is releasably coupled with a second receiver formed in said sill.

7. (CANCELED)

8. (CANCELED)

9. (CANCELED)

10. (CANCELED)

11. (CANCELED)

12. (CANCELED)

13. (CANCELED)

14. (CANCELED)

15. (CANCELED)

16. (CANCELED)

17. (CANCELED)

18. (CANCELED)

19. (CANCELED)

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RESPONSE TO 11/14/2011 NON-FINAL OFFICE ACTION

Summary of Non-Final Office Action

The Examiner's Non-Final Office Action mailed 11/14/2011 rejected the Applicant's claims 17 through 19 under 35 U.S.C. §112, second paragraph. More specifically, the Examiner determined that:

a. claim 17 recited the limitation "said door" without sufficient antecedent basis; and

b. the recitations of "said shutter distal" and "said pivotable fixation" in claim 17 does not make sense and is confusing.

Claims 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bergaglio 2008/0236062 in view of Albanese 7,270,498.

Claims 12 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bergaglio 2008/0236062 in view of Albanese 7,270,498 in further view of Fowler 2006/0289127.

Claims 4 and 6 were objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Non-Final Office Action

Claims 1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19 are withdrawn. Claims 4 and 6 have been amended and rewritten in independent form including all of the limitations of the base claim and any intervening claims

to be allowed as suggested by the Examiner. As such, Applicant respectfully requests that claim 4 and 6 as amended be allowed.

Respectfully submitted,

DATE:__14 MAY 12____

___/WPG/_____

William P. Glenn, Jr.
Reg. No. 36,526
Attorney for Applicant
Royston, Rayzor, Vickery & Williams L.L.P.
306 - 22nd Street, Suite 301
Galveston, TX 77550-1589
409-763-1623
409-763-3853 (fax)

Electronic Patent Application Fee Transmittal

Application Number:	12657535
Filing Date:	22-Jan-2010
Title of Invention:	Flood vent
First Named Inventor/Applicant Name:	Ted A. Shook
Filer:	William P. Glenn
Attorney Docket Number:	4763.56293

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with $0 paid	2253	1	635	635

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
		Total in USD ($)		**635**

Electronic Acknowledgement Receipt	
EFS ID:	12776677
Application Number:	12657535
International Application Number:	
Confirmation Number:	1312
Title of Invention:	Flood vent
First Named Inventor/Applicant Name:	Ted A. Shook
Customer Number:	48170
Filer:	William P. Glenn
Filer Authorized By:	
Attorney Docket Number:	4763.56293
Receipt Date:	14-MAY-2012
Filing Date:	22-JAN-2010
Time Stamp:	23:14:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$635
RAM confirmation Number	8273
Deposit Account	501523
Authorized User	GLENN,WILLIAM P
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	10125435_1.pdf	70631 dd6155eefe89f0e6c01175a857c73a8658d4b978	no	6
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	29458 423494cf72ecad5e8a0a564c00c84d63d6db2b8b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	100089		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/657,535	Filing Date 01/22/2010	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	19 minus 20 =	* 0	X $26 =	0	OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	* 0	X $110 =	0		X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	0		TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	05/14/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 2	Minus	** 20	= 0	X $30 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $125 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/GLENN BURNS JR/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/657,535	01/22/2010	Ted A. Shook	4763.56293	1312

48170 7590 11/14/2011

ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550

EXAMINER	
LAGMAN, FREDERICK LYNDON	
ART UNIT	PAPER NUMBER
3672	
MAIL DATE	DELIVERY MODE
11/14/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/657,535	SHOOK, TED A.	
	Examiner	Art Unit	
	FREDERICK L. LAGMAN	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-19* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-3, 5, and 7-19* is/are rejected.

8)☒ Claim(s) *4 and 6* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 17 recites the limitation "said door" in line 8. There is insufficient antecedent basis for this limitation in the claim.

4. Claim 17, lines 14 and 15, the recitations of “said shutter distal” and “said pivotable fixation" does not make sense and is thus confusing.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergaglio 2008/0236062 in view of Albanese 7,270,498. Bergaglio discloses a flood vent comprising a shuttered duct 12, a shutter 14, and a fin 20 coupled to the lower region of the shutter. Bergaglio does not disclose the lower region of the duct being angled. Albanese, col. 3, lines 6-10, discloses a

shutter comprising a sloped sill 110. It would have been obvious to one of ordinary skill in the art to angle a sill, since Albanese teaches that doing so facilitates drainage of water. Furthermore, the provision of a tab would have been an obvious matter of design choice, since the use of tabs as a catch type device is well known. The size and shape also being considered an obvious matter of design choice.

7. Claims 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergaglio 2008/0236062 in view of Albanese 7,270,498 as applied to claims 9 and 17 above, and further in view of Fowler 2006/0289127. Bergaglio in view of Alabanese discloses all that is claimed except for the hood. Fowler discloses a hood 20 to cover a vent having holes (see paragraph [0016]). It would have been obvious to one of ordinary skill in the art to provide a cover, since Fowler teaches that a vent may be covered.

Allowable Subject Matter

8. Claims 4 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FREDERICK L. LAGMAN whose telephone number is (571)272-7043. The examiner can normally be reached on Monday-Thursday 8:00AM-6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/FREDERICK L LAGMAN/
Primary Examiner, Art Unit 3672

FLL

Notice of References Cited	Application/Control No. 12/657,535	Applicant(s)/Patent Under Reexamination SHOOK, TED A.	
	Examiner FREDERICK L. LAGMAN	Art Unit 3672	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-3,918,187 A	11-1975	Vogele, Robert E.	405/94
*	B	US-5,809,731 A	09-1998	Reiss, David R.	52/169.5
*	C	US-2006/0289127 A1	12-2006	Fowler, Darrell	160/180
*	D	US-2008/0236062 A1	10-2008	Bergaglio, John	52/169.5
*	E	US-7,484,286 B2	02-2009	Fowler, Darrell	29/401.1
*	F	US-2009/0208289 A1	08-2009	Flury, Terry A.	405/94
*	G	US-7,600,944 B1	10-2009	Keating, John J.	405/96
*	H	US-7,926,539 B1	04-2011	Hurst et al.	405/92
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

PTO/SB/08a (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	
Filing Date	22 JAN 2010
First Named Inventor	SHOOK, Ted
Art Unit	
Examiner Name	
Attorney Docket Number	4763.56293

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US- 2105735	10/10/1936	J.P. Hodge	All
		US- 2774116	08/11/1954	P.B. Wolverton	All
		US- 4754696	07/05/1988	P.M. Sarazen et al	All
		US- 5293920	03/15/1994	M. Vagedes	All
		US- 5487701	01/30/1996	C.E. Schedegger et al	All
		US- 6287050 B1	09/11/2001	M.J. Montgomery et al	All
		US- 6485231 B2	11/06/2002	M.J. Montgomery et al	All
		US- 5944445	08/31/1999	M.J. Montgomery	All
		US- 6692187 B2	02/17/2004	E.C. Sprengle et al	All
		US- 7270498 B1	09/18/2007	A. Albanese	All
		US-			
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/Frederick Lagman/	Date Considered	10/18/2011

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /FL/

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12657535	SHOOK, TED A.
	Examiner	Art Unit
	FREDERIC L LAGMAN	3672

SEARCHED			
Class	Subclass	Date	Examiner
405	80, 87, 88, 89, 90, 91, 92, 94, 95, 99, 100	11/6/11	FLL
52	169.5	11/6/11	FLL

SEARCH NOTES		
Search Notes	Date	Examiner
east search	11/6/11	FLL

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12657535	SHOOK, TED A.
	Examiner	**Art Unit**
	FREDERIC L LAGMAN	3672

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/06/2011								
	1	✓								
	2	✓								
	3	✓								
	4	O								
	5	✓								
	6	O								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	10	("2105735" | "2774116" | "4754696" | "5293920" | "5487701" | "5944445" | "6287050" | "6485231" | "6692187" | "7270498").PN.	US-PGPUB; USPAT	OR	OFF	2011/11/06 11:01
S1	508	52/169.5.ccls.	US-PGPUB; USPAT	OR	OFF	2011/10/18 13:14
S2	529	(flood with vent$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:26
S3	214741	(door or shutter or window) same (pivot $4 or swing$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:27
S4	31	S2 and S3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:27
S5	20	("0523606" | "20020021941" | "20030082008" | "2105735" | "2774116" | "3668714" | "3939505" | "4112526" | "4494257" | "4754696" | "5293920" | "5487701" | "5729935" | "5944445" | "6485231" |	US-PGPUB; USPAT; USOCR	OR	OFF	2011/10/18 13:29

		"6692187" | "7270498").PN. OR ("7600944").URPN.				
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S7	61	("0073159" | "0100623" | "0314865" | "0735053" | "0911290" | "1382589" | "2105735" | "2118535" | "2565122" | "2611310" | "2754747" | "2774116" | "2798422" | "3123867" | "3425175" | "3614844" | "3680329" | "3753353" | "3939863" | "4048771" | "4073147" | "4091624" | "4116213" | "4174913" | "4227266" | "4349296" | "4669371" | "4699045" | "4754696" | "5253804" | "5293920" |	US-PGPUB; USPAT; USOCR	OR	OFF	2011/10/18 13:33

		"5460572" | "5487701" | "5944445" | "5984575" | "6287050").PN. OR ("6485231").URPN.				
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S9	0	S4 and S8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:36
S10	0	S3 and S9	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:36
S11	1537	S3 and S8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:37
S12	3157	405/80-100.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:38
S13	0	S11 and S12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:38
S14	349751	(door or shutter or window or gate or panel) same (pivot$4 or swing$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:39

S15	327	S12 and S14	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:39
S16	1	S8 and S15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:40
S17	0	S1 and S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:41
S18	582	S3 same S8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/18 13:42
S19	89	405/94.ccls.	US-PGPUB; USPAT	OR	OFF	2011/10/18 13:48
S20	180	405/100.ccls.	US-PGPUB; USPAT	OR	OFF	2011/10/18 13:48
S21	31	405/95.ccls.	US-PGPUB; USPAT	OR	OFF	2011/10/18 13:51
S22	10	("2105735" | "2774116" | "4754696" | "5293920" | "5487701" | "5944445" | "6287050" | "6485231" | "6692187" | "7270498").PN.	US-PGPUB; USPAT	OR	OFF	2011/10/18 13:56

11/6/11 11:29:58 AM
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/657,535	01/22/2010	Ted A. Shook	4763.56293

CONFIRMATION NO. 1312

48170
ROYSTON RAYZOR VICKERY & WILLIAMS L.L.P.
306 - 22ND STREET
SUITE 301
GALVESTON, TX 77550

PUBLICATION NOTICE

Title: Flood vent

Publication No.US-2011-0182669-A1
Publication Date:07/28/2011

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/657,535	01/22/2010	3749	545	4763.56293	19	3

CONFIRMATION NO. 1312

48170
WILLIAM P. GLENN, JR.
ROYSTON, RAYZOR, VICKERY & WILLIAMS, L.L.P.
2102 MECHANIC STREET, SUITE 205
GALVESTON, TX 77550

FILING RECEIPT

OC000000040082733

Date Mailed: 02/16/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Ted A. Shook, Galveston, TX;

Power of Attorney: The patent practitioners associated with Customer Number 48170

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 02/12/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/657,535**

Projected Publication Date: 07/28/2011

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****

Title

Flood vent

Preliminary Class

454

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/657,535	01/22/2010	Ted A. Shook	4763.56293

CONFIRMATION NO. 1312

48170
WILLIAM P. GLENN, JR.
ROYSTON, RAYZOR, VICKERY & WILLIAMS, L.L.P.
2102 MECHANIC STREET, SUITE 205
GALVESTON, TX 77550

POA ACCEPTANCE LETTER

OC000000040082606

Date Mailed: 02/16/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/22/2010.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/atesfai/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

U.S. PTO
12/657535
01/22/2010

025701
012210
U.S. PTO

PTO/SB/05 (08-08)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	4763.56293
First Inventor	SHOOK, Ted
Title	Flood Vent
Express Mail Label No.	EB 801471524 US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✓] **Fee Transmittal Form** (e.g., PTO/SB/17)
2. [✓] **Applicant claims small entity status.** See 37 CFR 1.27.
3. [✓] **Specification** [*Total Pages* 19]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. [✓] **Drawing(s)** (*35 U.S.C. 113*) [*Total Sheets* 7]
5. **Oath or Declaration** [*Total Sheets* 1]
   a. [✓] Newly executed (original or copy)
   b. [ ] A copy from a prior application (37 CFR 1.63(d))
   (for continuation/divisional with Box 18 completed)
   i. [ ] DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. [✓] **Application Data Sheet.** See 37 CFR 1.76
7. [ ] **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   [ ] Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission**
   (if applicable, items a. – c. are required)
   a. [ ] Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

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ACCOMPANYING APPLICATION PARTS

9. [ ] **Assignment Papers** (cover sheet & document(s))
   Name of Assignee _____
10. [ ] **37 CFR 3.73(b) Statement** *(when there is an assignee)* [✓] **Power of Attorney**
11. [ ] **English Translation Document** *(if applicable)*
12. [✓] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [✓] Copies of citations attached
13. [ ] **Preliminary Amendment**
14. [✓] **Return Receipt Postcard** (MPEP 503)
    (Should be specifically itemized)
15. [ ] **Certified Copy of Priority Document(s)**
    (if foreign priority is claimed)
16. [ ] **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. [ ] Other: _____

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*

[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No.: .....

Prior application information: *Examiner* _____ *Art Unit:* _____

19. CORRESPONDENCE ADDRESS

[✓] The address associated with Customer Number: 48170 *OR* [ ] Correspondence address below

Name	William P Glenn Jr.				
Address	Royston Rayzor Vickery & Williams L.L.P. 306 - 22nd Street Suite 301				
City	Galveston	State	Texas	Zip Code	77550
Country	USA	Telephone	409-763-1623	Email	bill.glenn@roystonlaw.com

Signature	William P Glenn	Date	22 JAN 2010
Name (Print/Type)	William P. Glenn, Jr.	Registration No. (Attorney/Agent)	36526

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2009

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 545.00

Complete if Known	
Application Number	
Filing Date	22 JAN 2010
First Named Inventor	SHOOK, Ted
Examiner Name	
Art Unit	
Attorney Docket No.	4763.56293

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 501523 Deposit Account Name: Royston Rayzor

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☑ Credit any overpayments

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fees Paid ($)
Utility	330	165	540	270	220	110	$545.00
Design	220	110	100	50	140	70	
Plant	220	110	330	165	170	85	
Reissue	330	165	540	270	650	325	
Provisional	220	110	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	52	26
Each independent claim over 3 (including Reissues)	220	110
Multiple dependent claims	390	195

Total Claims		Extra Claims	Fee ($)		Fee Paid ($)
_____	- 20 or HP =	0	x _____	=	0

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		Extra Claims	Fee ($)		Fee Paid ($)
_____	- 3 or HP =	0	x _____	=	0

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	
Fee ($)	Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof	Fee ($)		Fee Paid ($)
_____	- 100 =	0	/ 50 =	_____ (round up to a whole number)	x _____	=	0

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	0
Other (e.g., late filing surcharge): _____	0

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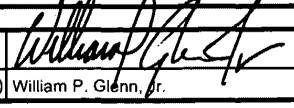
Signature		Registration No. (Attorney/Agent) 36526	Telephone 409-763-1623
Name (Print/Type)	William P. Glenn, Jr.		Date 22 JAN 2010

NON-PROVISIONAL APPLICATION	Application for: FLOOD VENT		
	Filed: 22 JAN 2010	Applicant(s) TED SHOOK	
	Application No.		
	Examiner:	Art Unit:	Attny Ref: 4763.56293

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CERTIFICATE OF MAILING BY "EXPRESS MAIL"

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22 Jan 2010 — Date

William P. Glenn Jr. — Signature of Person Mailing

WILLIAM P. GLENN JR.
Printed Name of Person Mailing

U.S. PTO
12/657535
01/22/2010

025701
012210
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Country	USA	Telephone	409-763-1623	Email	bill.glenn@roystonlaw.com

Signature	William P Glenn Jr.	Date	22 JAN 2010
Name (Print/Type)	William P. Glenn, Jr.	Registration No. (Attorney/Agent)	36526

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Complete if Known	
Application Number	
Filing Date	22 JAN 2010
First Named Inventor	SHOOK, Ted
Examiner Name	
Art Unit	
Attorney Docket No.	4763.56293

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 501523 Deposit Account Name: Royston Rayzor

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	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	0
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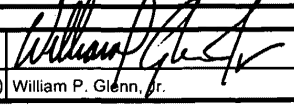
SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 36526	Telephone 409-763-1623
Name (Print/Type)	William P. Glenn, Jr.		Date 22 JAN 2010

NON-PROVISIONAL APPLICATION	Application for: FLOOD VENT		
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22 Jan 2010 — Date

William P. Glenn Jr. — Signature of Person Mailing

WILLIAM P. GLENN JR. — Printed Name of Person Mailing

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates to structure venting, in particular, to a flood vent that opens to permit the flow of water in or out of a structure, such a house or garage, when the water level rises thereby avoiding an excessive pressure differential to develop between the interior and exterior of the structure as well as damage or failure of the structure.

DESCRIPTION OF THE RELATED ART

To eliminate or at least reduce damage due to flooding, several building code entities as well as the federal government have developed rules and regulations requiring structures with enclosed spaces located below defined flood plain levels to include automatic equalization of interior and exterior hydrostatic pressure caused by floodwaters. The rules and regulations require structures to be designed and built to allow floodwaters to move in and out of a structure freely. The Federal Emergency Management Agency (FEMA) requires compliance with FEMA Technical Bulletin 1-93. Other governmental agencies required compliance with the International Building Code and/or ASME 24-05 and 24-98.

A number of devices have been developed to reduce or eliminate the pressure differential that may develop between the interior and exterior of a structure. In 1935, Hodge developed and was issued in 1938, U.S. Patent No. 2,105,735 for a device that would relieve pressure that may develop within a closed chamber. The device focused upon the release of gas pressure from

within the structure but provided for no means to reduce the pressure differential that could develop when the internal pressure of the closed chamber was less than the surrounding pressure. In 1954, Wolverton filed an application for a double acting relief valve and was issued a U.S. Patent No. 2,774,116 in 1956. Wolverton's double acting relief valve addressed the shortfall for Hodge's device by double hinging a plate mounted in a structure's door that would activate to equalize the pressure differential, if any, between a storm door and main door. The Wolverton device did not address the issues associated with pressure differentials created by floodwaters, nor did the Wolverton device address ventilation.

In 1993, Wagedes filed an application for an improved louvered basement vent and was issued U.S. Patent No. 5,293,920 in 1994. Wagedes' improved louvered basement vent included a frame and a screened opening. The louvers could be held open by engaging louver detents against frame tabs. The louvers open automatically to relieve excessive pressure in the structure and would remain open if the louvers engaged the frame tabs. While the Wagedes improved louvered basement vent was screened – where the prior discussed patents were not, it was limited to addressing only one type of pressure differentials – namely over pressurization of the structure. Furthermore, the Wagedes improved louvered basement vent required human intervention to reset the louvers in a closed position if the detents were engaged.

In 1994, Schedegger and others filed a patent application for a plastic foundation vent and were issued U.S. Patent No. 5,487,701 in 1996. The Schedegger device is similar in construction to the Wagedes device, in that it comprised independent louvers that could be held in an open position as well as a screened opening. Like Wagedes' device, Schedegger's device was limited to addressing only one type of pressure differential and required human intervention to release opened louvers.

In 1999, Montgomery filed a patent application for a device and method for relieving flooding from an enclosed space. He was issued U.S. Patent No. 5,944,445 in 1999. The Montgomery device includes a swinging door capable of swinging both in and out of the structure to permit tidal water flow in and out of the structure. The swinging door has a spring loaded hinge and is held in a closed position by a catch assembly. The catch assembly includes an adjustable screw, a catch spring, a ball bearing and threaded sleeve. The automatic opening of the device in response to floodwaters pressing against the door is a function of adjusting the catch assembly. Improper adjustment of the catch assembly could range from a premature door opening (by animals) to failure of the door to open. Furthermore the manufacturing and assembly of such a device require skilled labor. In the same year, Montgomery and other filed a patent application for a foundation flood gate with ventilation. U.S. Patent No. 6,287,050 was issued in 2001 for the device. Like his previous device, the foundation flood gate with ventilation included a swinging door capable of swinging in both

directions to allow water to flow in or out of the structure. Automatic activation of the door is performed by a catching assembly. The catching assembly included a float for sensing the level of the water and releasing the door when the level exceeds a preset height. Automatic opening of the door requires an intact and freely movable float within the device. While requiring fewer parts than his previous device, the catching assembly still requires skilled labor to manufacture and assemble. In 2001, Montgomery and others filed a similar application for a foundation flood gate with ventilation but the latch assembly senses fluid force acting upon the door rather than relying upon a float to sense water level. In 2002, the United States Patent and Trademark Office issued Patent No. 6,485,231 for the device. The device included a latching assembly which requires skilled labor to manufacture and assemble for proper operation.

Sprengle and other filed an application in 2002 for a flood gate for a door. In 2004, U.S. Patent No. 6,692,187 was issued for the device. The Sprengle device incorporated both the pressure and float sensing features of Montgomery's devices and further allowed for the gate to be used in an overhead door application without the door automatically swinging open when the overhead door is opened. Like the Montgomery devices, the Sprengle device requires skilled labor to manufacture and assemble for proper operation.

Finally, in 2007 Albanese was issued U.S. Patent No. 7,270,498 for a flood vent which relies upon a door with floatation slideably mounted to a frame which automatically opens (or closes) based upon the level of the floodwaters.

While Albanese reduces the number of moving parts and thereby reduces the need for skilled labor, the device still requires proper manufacturing tolerances and assembly to ensure free sliding movement of the door within its tracks. Furthermore the Albanese device has no means to automatically open in response to force upon the door.

As can be seen above the need for a flood vent that can open automatically, provide ventilation, yet have a minimal number of moving parts is desirable.

SUMMARY OF THE INVENTION

The present invention is directed to a flood vent 10 comprising a shuttered duct 15, with an upper and lower region, formed in a housing 20 fixed in a structure, such as a house, building, wall, door or overhead door at an elevation above ground level. See Figs. 1, 4, and 6. A lower region of duct 15 is angled down between two degrees (2°) and eight degrees (8°) from a horizontal plane to form a sill 28 that sheds water to an exterior of the structure. See Figs. 1, 4, and 6. The present flood vent 10 includes a shutter 30 which is pivotally fixed in duct 15. Duct 15, sill 28 and shutter 30 are configured to allow the unimpeded movement of floodwaters in and out of the structure, when present; and further deter animals from using the flood vent 10 as a passageway in and out of the structure. Among those benefits and improvements that have been disclosed, other objects and advantages of this invention will become apparent from the following description taken in conjunction with the accompanying drawings. The

drawings constitute a part of this specification and include exemplary embodiments of the present invention and illustrate various objects and features thereof.

BRIEF DESCRIPTION OF DRAWINGS

The present invention is further described in connection with the accompanying drawings, in which:

FIG. 1 is an exploded isometric view of an embodiment of the flood vent.

FIG. 2 is an isometric view of a hood for said flood vent.

FIG. 3 is an isometric view of an embodiment of a flood vent shutter.

FIG. 4 is an isometric view of an embodiment of a flood vent housing.

FIG. 5 is an isometric detail view of another embodiment of a flood vent shutter.

FIG. 6 is an isometric view of an embodiment of a flood vent.

FIG. 7 is an isometric view of an embodiment of a flood vent.

DETAILED DESCRIPTION OF THE INVENTION

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative forms. The figures are not necessarily to scale; some features may be exaggerated to show details of particular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention.

Certain terminology will be used in the following description for convenience and reference only and not for purposes of limitation. For example, the words "rightwardly", "leftwardly", "upwardly" and "downwardly" will refer to directions in the drawings to which reference is made. The words "inwardly" and "outwardly" refer to directions toward and away from, respectively, the geometric center of the structure being referred to. This terminology includes these words, specifically mentioned derivatives thereof, and words of similar import. Furthermore, elements may be recited as being "coupled"; this terminology's use anticipates elements being connected together in such a way that there may be other components interstitially located between the specified elements, and that the elements may be connected in fixed or movable relation one to the other. Certain components may be described as being adjacent to one another. In these instances, it is expected that such a relationship so described shall be

interpreted to mean that the components are located proximate to one another, by not necessarily in contact with each other. Normally there will be an absence of other components positioned there between, but this is not a requirement. Still further, some structural relationships or orientations may be designated with the word "substantially". In those cases, it is meant that the relationship or orientation is as described, with allowances for variations that do not effect the cooperation of the so described component or components.

The present flood vent 10 comprises a bezel 26 connected to two opposing walls 22, an upper wall 22 and a sill 28 to form a duct 15 within a housing 20. See Figs. 1, 4 and 6. The flood vent 10 has an interior duct opening 17 on the inside of the structure and an exterior duct opening 19 on the outside of the structure. See Fig. 4. Duct 15 allows fluid communication between the interior and exterior of the structure when floodwaters rise above sill 28.

Bezel 26 surrounds a periphery of an exterior duct opening 19 and serves to attach housing 20 to structure by fasteners or adhesive. Housing 20 can have outer dimensions that correspond with the nominal dimensions of concrete masonry units (CMU). In a preferred embodiment, housing 20 has outer nominal dimensions that correspond to a CMU-8, namely eight inches (8") high, sixteen inches (16") long and eight (8") wide (all nominal dimensions). Housing 20, walls 22, bezel 26, and sill 28 can be constructed of materials such as metal, plastic, concrete, cement, composites or a combination thereof.

A shutter 30 is pivotally fixed to an upper region of duct 15 so that shutter 30 is capable of swinging in two directions, namely in and out of the structure. It is contemplated that shutter 30 can move about a swing arc that can be approximately one hundred and sixty degrees (160°) to approximately two hundred and twenty five degrees (225°).

A lower region of shutter 30 is releasably coupled to a portion of sill 28 by a fin 50. A coupling region is that portion of shutter 30 swing arc where fin 50 is in contact with a portion of sill 28, at least one tab 40 fixed to and projecting away from sill 28, or a combination of both. Movement of shutter 30 to, from or through a coupling region is hampered by the releasable coupling of shutter 30 to sill 28 by fin 50. The presence of at least one tab 40 fixed to and projecting away from sill 28 hampers movement of shutter 30 to, from, or through a coupling region. The size of a coupling region varies with the width of fin 50, angle of sill 28 and the presence of at least one tab 28. It is contemplated in one embodiment, that when fin 50 is within a coupling region, shutter 50 is in a closed position that substantially obstructs duct 15 and deters animal use of flood vent 10 as a passage through the structure. Movement of shutter 30 about a swing arc can be in response to a floodwater pressure differential in or across duct 15, movement of floodwater against shutter 30, floatation of shutter 30, or a combination thereof.

Shutter 30 can be pivotally fixed to an upper region of duct 15 by a variety of pivoting mechanism known to those skilled in the art of flood vents. In a

preferred embodiment, a pair of opposing pin holes 24 is formed in an upper region of shutter 30 to receive a corresponding pin 32 fixed and projecting away from an upper region of duct 15. See Figs. 1, 3, 4, 5, and 7. This arrangement allows a shutter 30 to rotate freely about a substantially horizontal axis above sill 28.

Fin 50 can be fixed to shutter 30, sill 28 or neither as set forth in the following descriptions. In a first embodiment, fasteners 07 fix fin 50 to a lower region of shutter 30 so that it projects away from a lower region of shutter 30. See Figs. 1 and 3. In such an embodiment, fin 50 can be fixed to a lower region of shutter 30 by fasteners 07 or slidably fixed to a lower region of shutter 30 by fasteners 07 passing through corresponding slots 52 formed in fin 50. See Figs. 3 and 5. As the reader can appreciate, a slideably fixation of fin 50 to a lower region of shutter 30 alters the coupling region without altering the width of fin 50. In a preferred embodiment, at least one tab 40 is fixed to and projects away from sill 28 to releasably couple with fin 50 to hamper movement of shutter 30 to, from or through a closed position or a coupling region. See Figs. 1 and 4. In a second embodiment, fin 50 is fixed to and extends away from sill 28 to releasably couple with a receiver 42 formed in a lower region of shutter 30. See Figs. 6 and 7. In such an embodiment, the size of a coupling region is a function of the cross sections of fin 50 and receiver 42 as well as the angle of sill 28. In a third embodiment, fin 50 is releasably coupled to both shutter 30 and sill 28 by a first receiver 42 formed in a lower region of shutter 30 and a second receiver 42

formed in sill 28. It is contemplated that such an embodiment would require a user to couple or re-couple shutter 30 with sill 28 after movement of shutter 30 beyond a coupling region.

It is contemplated that duct 15 and shutter 30 can be circular, arcuate, polygonal or a combination thereof in shape when viewed from a duct opening 17 or 19.

In another embodiment, a plurality of holes 34 is formed in shutter 30 to allow movement of fluid through shutter 30. Such holes 34 allow ventilation between the interior and exterior of the structure when shutter 30 is in a closed position. It is further contemplated that a hood 36 can be removably fixed to shutter 30 to impede the movement of fluid through shutter 30.

It is contemplated that shutter 30 and hood 36 can be constructed from metal, plastic, composites or a combination thereof. Furthermore, shutter 30 can be constructed with material(s) with a low density such that at least a portion of shutter 30 is buoyant in floodwater of a sufficient depth within said duct 15.

In any of the embodiments described above, the presence of a substantial amount of floodwater within at least a portion of duct 15 causes shutter 30 to move about its swing arc and allows the flow of floodwater between an interior and exterior of the structure. In the absence of a substantial amount of floodwater within duct 15, shutter 30 is in a closed position or within a coupling region to substantially obstruct duct 15 and deter animal use of flood vent 10 as a passage through the structure. Finally, the number of parts used in the different

embodiments of the present flood vent 10 is greatly reduced over existing devices which in turn reduces the cost of manufacturing and assembly. Likewise, the reduction in parts eliminates or reduces the likelihood of failure.

A flood vent 10 and its components have been described herein. These and other variations, which will be appreciated by those skilled in the art, are within the intended scope of this invention as claimed below. As previously stated, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various forms.

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CLAIMS

1. A flood vent for a structure comprising:

a shuttered duct with an upper and lower region formed in a housing fixed in the structure to allow the unimpeded movement of floodwaters through the structure, wherein said lower region of said duct is angled down between two and eight degrees from a horizontal plane to form a sill that sheds water to an exterior of the structure;

said upper region of said duct is pivotally fixed to a shutter positioned within said duct, wherein said shutter swings between a closed position and an open position in response to a floodwater pressure differential in said duct; and

a lower region of said shutter releasably coupled to a portion of said sill by a fin, wherein width of said fin and angle of said sill defines a coupling region along said sill wherein said shutter substantially obstructs said duct to prevent animal passage along said duct.

2. A flood vent as claimed in claim 1, wherein said fin is fixed to and projects away from said lower region of said shutter.

3. A flood vent as claimed in claim 2, wherein at least one tab is fixed to and projects away from said sill to releasably couple with said fin to hamper movement of said shutter to, from, or through a said closed position.

4. A flood vent as claimed in claim 1, wherein said fin is slideably fixed to said lower region of said shutter to alter said coupling region between said shutter and said sill.

5. A flood vent as claimed in claim 1, wherein said fin is fixed to and projects away from said sill to releaseably couple with a receiver formed in said lower region of said shutter.

6. A flood vent as claimed in claim 1, wherein an upper region of said fin is releasably coupled with a first receiver formed in said lower region of said shutter and a lower region of said fin is releasably coupled with a second receiver formed in said sill.

7. A flood vent as claimed in claim 1, wherein a plurality of holes are formed in said shutter to allow the movement of fluid across said shutter.

8. A flood vent as claimed in claim 7, wherein a hood is removably fixed to said shutter to impede the movement of fluid through said shutter.

9. A flood vent for a structure comprising:

a bezel connected to two opposing walls, an upper wall and a sill to form a housing which is inserted into the structure at an elevation above ground to form a duct with an interior duct opening on the inside of the structure and an exterior duct opening to the outside of the structure, said bezel surrounds a periphery of said exterior duct opening and attaches said housing to the structure by fasteners, resulting in fluid communication between the interior and exterior of the structure when floodwater rises above said sill;

said sill being angled between approximately 2 to 8 degrees to shed water away from said inner duct opening .

a shutter with an upper and lower region, wherein said upper region of said shutter is pivotally fixed to an upper portion of said housing resulting in said shutter to rotate about a substantially horizontal axis to define a swing arc ranging between approximately 160 degrees to approximately 225 degrees;

a fin fixed by fasteners to a lower region of said shutter and projecting away from said lower region of said shutter; and

at least one tab fixed to and projecting away from said sill to releaseably couple with said fin to impede rotation of said shutter along a portion of said swing arc defined as a coupling region, wherein the presence of a substantial amount of floodwater within at least a portion of said duct causes said shutter to move out of said

coupling region to allow the flow of the floodwater between the interior and exterior of the structure and in the absence of a substantial amount of floodwater within said duct.

10. A flood vent as claimed in claim 9 wherein said fin releasably couples with a portion of said sill to hinder movement of said shutter about said swing arc when in a substantially vertical position.

11. A flood vent as claimed in claim 9 wherein a plurality of holes are formed in said shutter to allow the passage of fluid.

12. A flood vent as claimed in claim 11, wherein a hood is mounted to said shutter to cover said plurality of holes.

13. A flood vent as claimed in Claim 9, wherein said duct and shutter are polygonal in shape when viewed from a said duct opening.

14. A flood vent as claimed in claim 9, wherein said duct and shutter are circular in shape when viewed from a said duct opening.

15. A flood vent as claimed in claim 9, wherein outer dimensions of said housing correspond to an eight inch customary masonry unit.

16. A flood vent as claimed in claim 9, wherein said shutter is buoyant.

17. A flood vent for a structure comprising:

a bezel connected to two opposing walls, an upper wall and a sill to form a housing which is inserted into the structure to form a duct with an interior duct opening and an exterior duct opening, said bezel surrounds a periphery of said exterior duct opening and attaches said housing to the structure by fasteners;

a shutter pivotally fixed in and at an upper portion of said housing, wherein said door is capable of moving between at least two open positions and a closed position region, wherein said shutter is in a substantially vertical orientation when in said closed position region resulting in substantially obstructing said duct and when said shutter is in said open positions, floodwater is able to travel unimpeded through said duct;

a receiver formed in a periphery of said shutter distal to said pivotal fixation;

a fin fixed to and projecting away from said sill to releaseably couple with said receiver when said shutter is in said closed position region; and

said sill being angled between approximately 2 to 8 degrees to shed water away from said inner duct opening.

18. A flood vent as claimed in claim 17, wherein a plurality of holes are formed in said shutter to allow the passage of fluid.

19. A flood vent as claimed in claim 18, wherein a hood is mounted to said shutter to cover said plurality of holes.

ABSTRACT

A flood vent is provided that allows the unimpeded flow of floodwater in a shuttered duct formed in a housing installed in a structure such as a building. A lower region of the duct is angled down between two and eight degrees from a horizontal plane to form a sill that sheds water to an exterior of the structure, and an upper region of the duct is pivotally fixed to a shutter positioned within the duct. The shutter is capable of swinging between a closed position and an open position in response to the presence of floodwater within at least a portion of the duct. Movement of the shutter to, from or through a closed position is hampered by a releasable coupling of the shutter to the sill by a fin.

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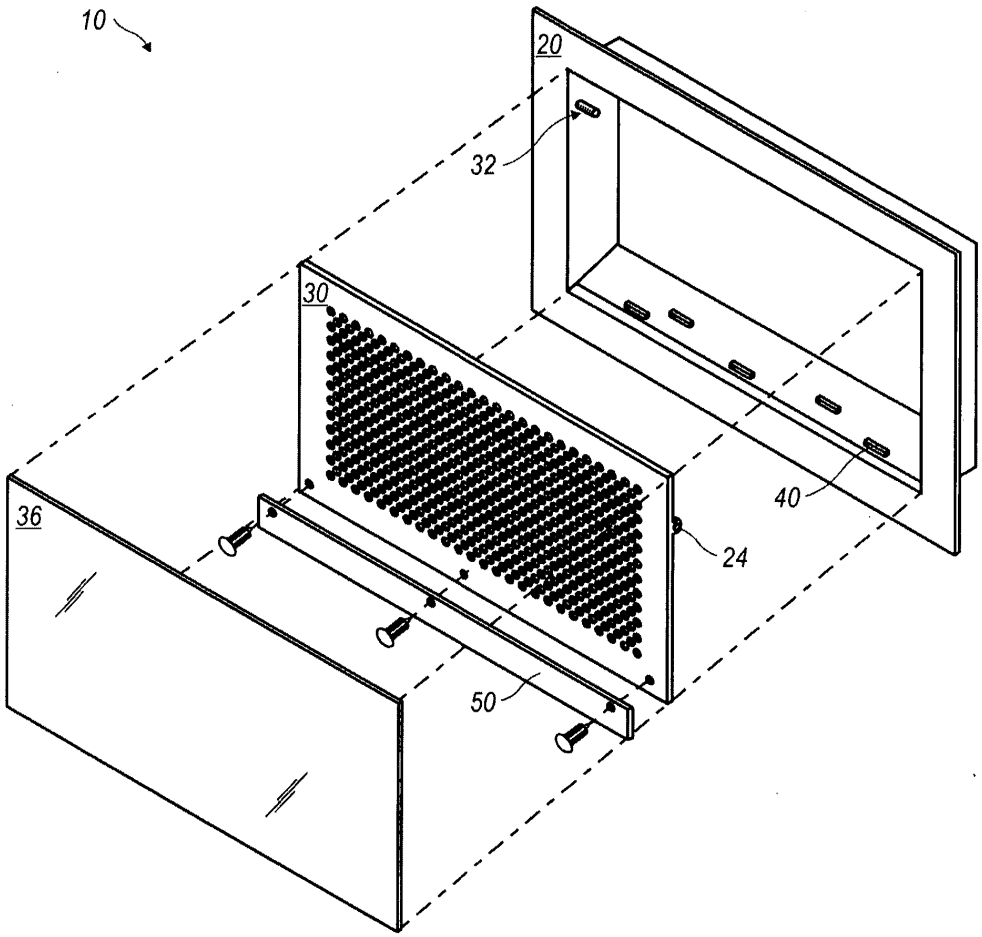

FIG. 1

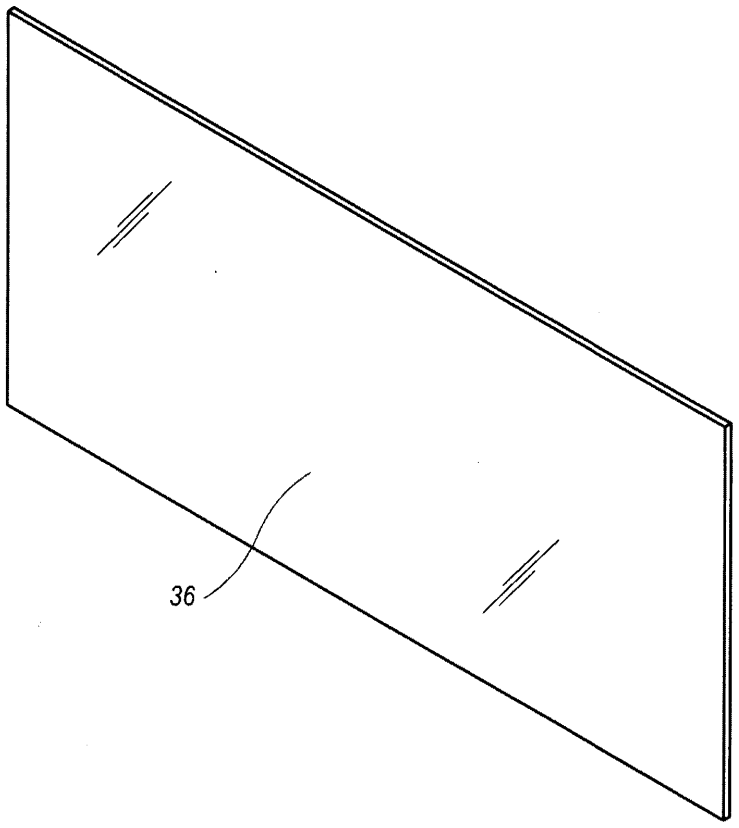

FIG. 2

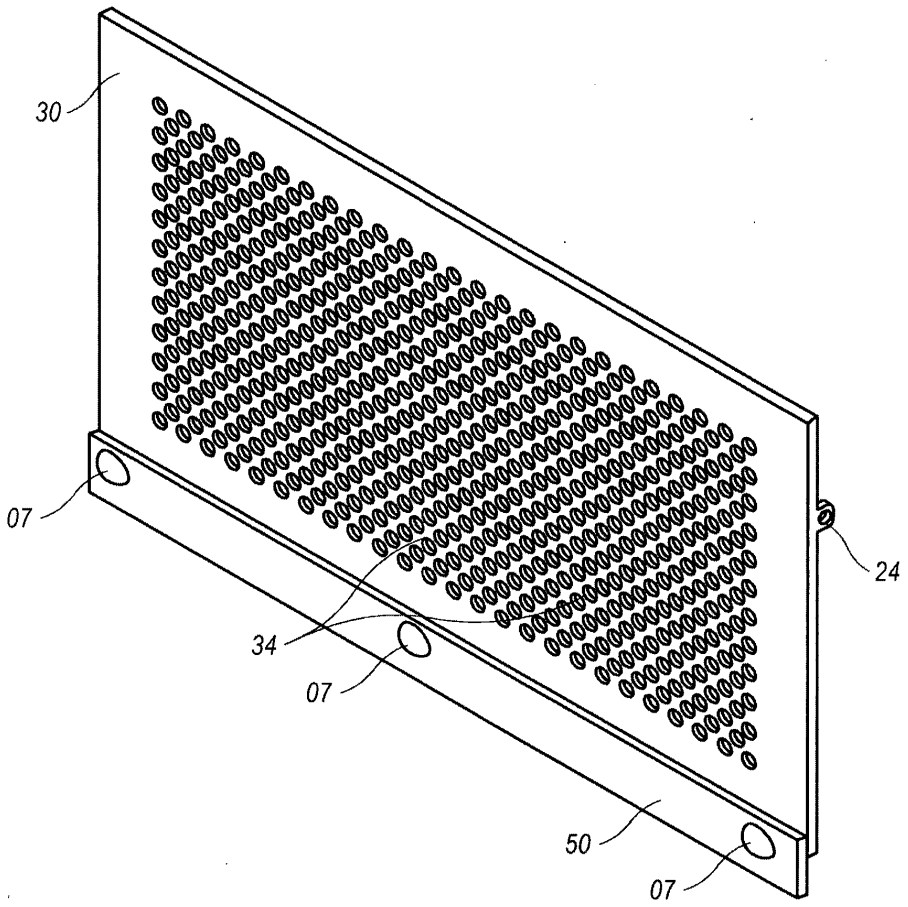

FIG. 3

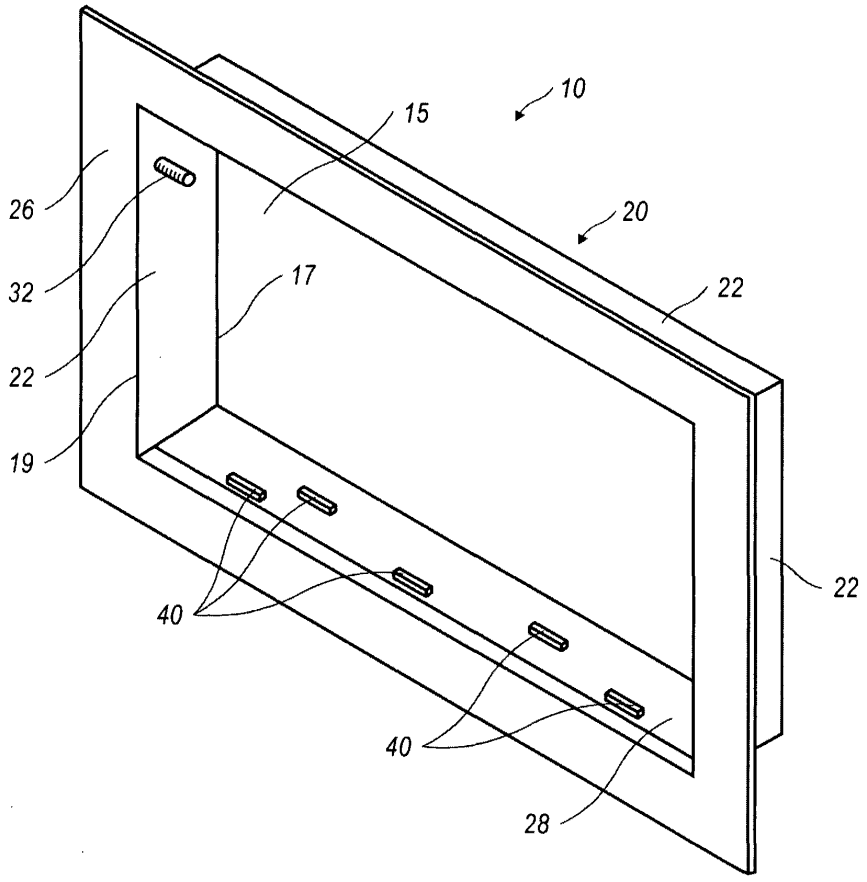

FIG. 4

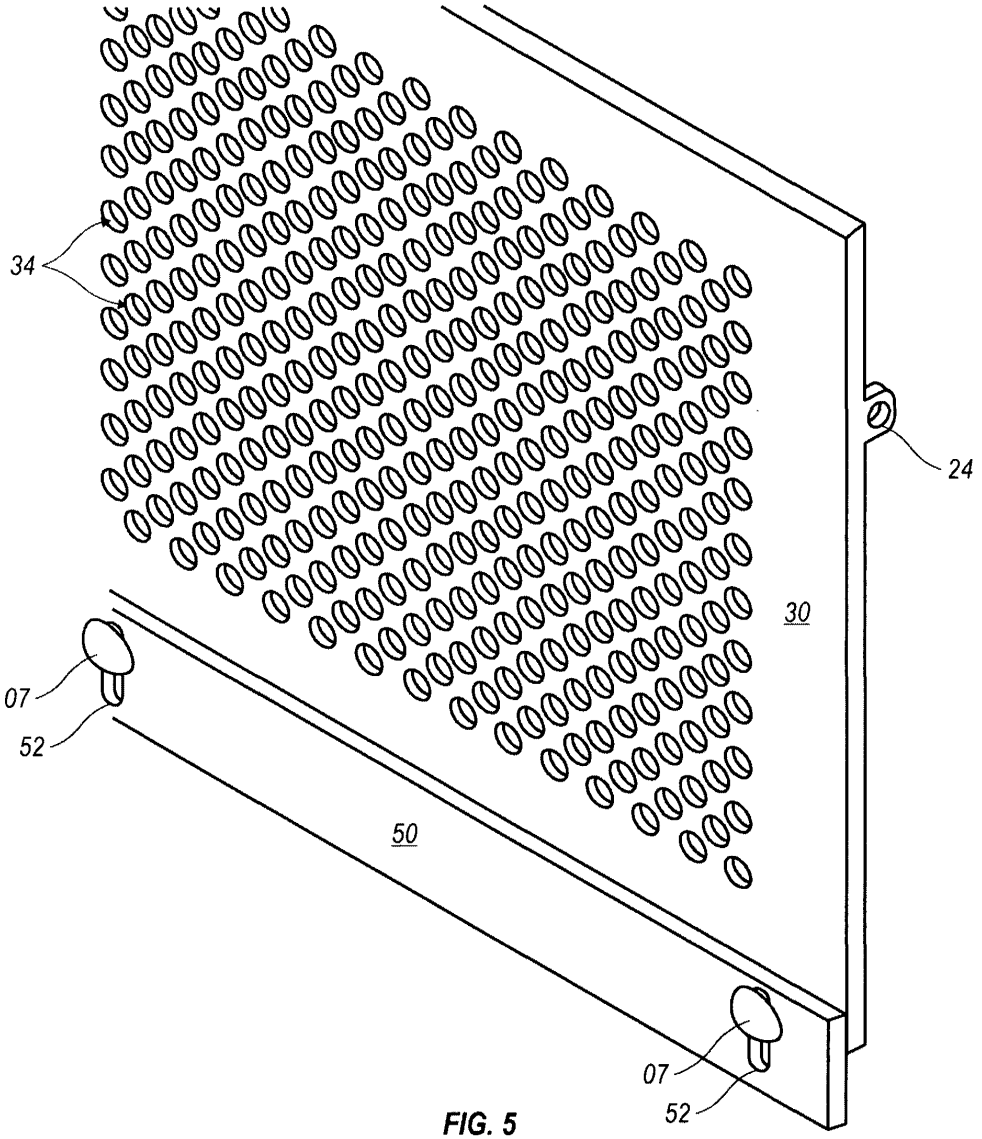

FIG. 5

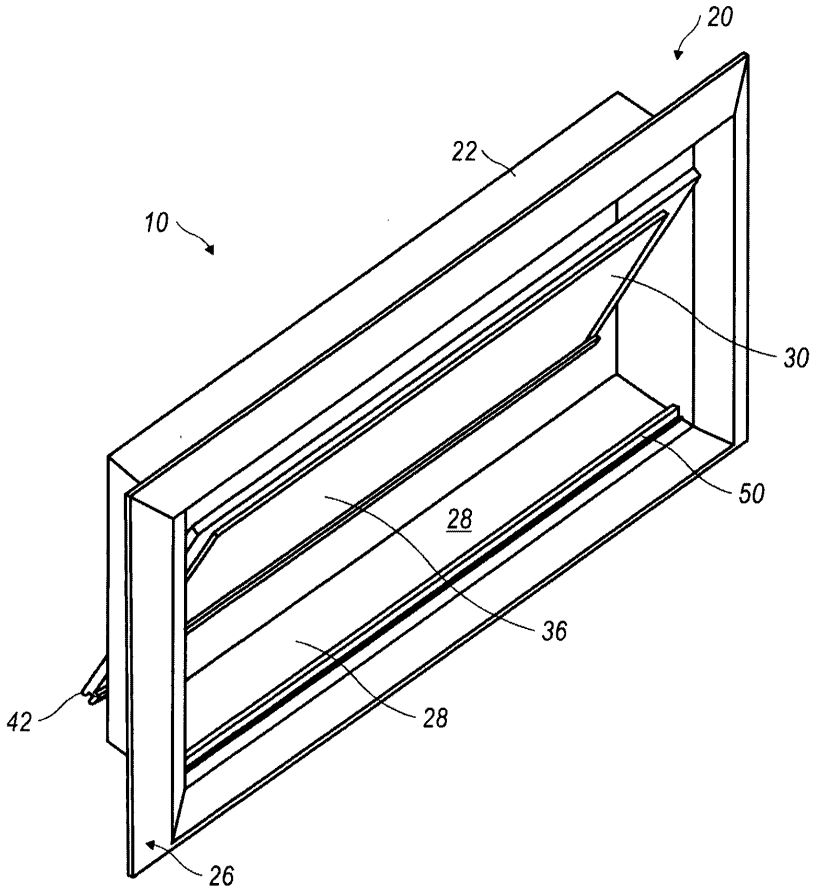

FIG. 6

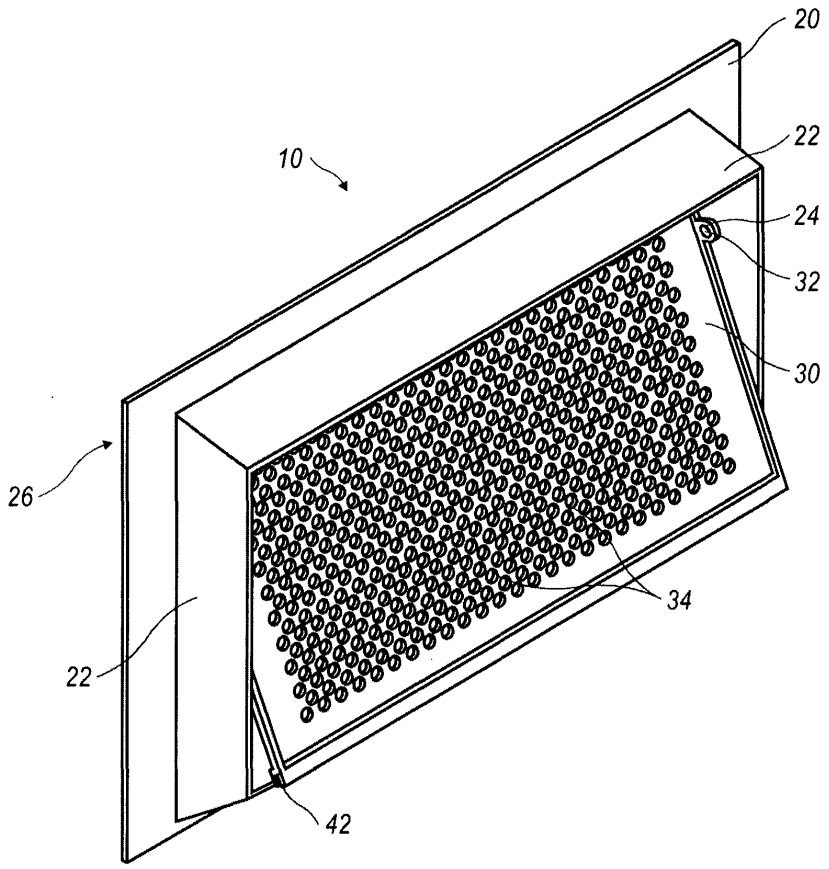

FIG. 7

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	FLOOD VENT

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☒ The attached application, or

☐ Application No. _____ filed on _____

☐ As amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)

Inventor one: Ted D. Shook Date: 1/15/08

Signature: Ted A. Shook Citizen of: _____

Inventor two: _____ Date: _____

Signature: _____ Citizen of: _____

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

PTO/SB/14 (11-08)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4763.56293
	Application Number	
Title of Invention	FLOOD VENT	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Ted		Shook	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Galveston	State/Province	TX	Country of Residence	US

Citizenship under 37 CFR 1.41(b) US

Mailing Address of Applicant:

Address 1	P.O. Box 16502		
Address 2			
City	Galveston	State/Province	TX
Postal Code	77550	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	48170		
Email Address	bill.glenn@roystonlaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	FLOOD VENT		
Attorney Docket Number	4763.56293	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)	405	Sub Class (if any)	92
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	1

PTO/SB/14 (11-08)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4763.56293
	Application Number	
Title of Invention	FLOOD VENT	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	48170		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

		Remove	
Application Number	Country[1]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			◉ Yes ○ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4763.56293
	Application Number	
Title of Invention	FLOOD VENT	

If the Assignee is an Organization check here. ☐				
Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:			
Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button.

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature				Date (YYYY-MM-DD)	2010-01-22
First Name	William	Last Name	Glenn, Jr.	Registration Number	36526

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Application Number	
Filing Date	22 JAN 2010
First Named Inventor	SHOOK, TED
Title	FLOOD VENT
Art Unit	
Examiner Name	
Attorney Docket Number	4763.56293

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 48170

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

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I am the:

☒ Applicant/Inventor.

OR

☐ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____.

SIGNATURE of Applicant or Assignee of Record

Signature	Ted A. Shook	Date	1/15/10
Name	Ted A. Shook	Telephone	
Title and Company			

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/08a (07-09)
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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	
Filing Date	22 JAN 2010
First Named Inventor	SHOOK, Ted
Art Unit	
Examiner Name	
Attorney Docket Number	4763.56293

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US- 2105735	10/10/1936	J.P. Hodge	All
		US- 2774116	08/11/1954	P.B. Wolverton	All
		US- 4754696	07/05/1988	P.M. Sarazen et al	All
		US- 5293920	03/15/1994	M. Vagedes	All
		US- 5487701	01/30/1996	C.E. Schedegger et al	All
		US- 6287050 B1	09/11/2001	M.J. Montgomery et al	All
		US- 6485231 B2	11/06/2002	M.J. Montgomery et al	All
		US- 5944445	08/31/1999	M.J. Montgomery	All
		US- 6692187 B2	02/17/2004	E.C. Sprengle et al	All
		US- 7270498 B1	09/18/2007	A. Albanese	All
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English language Translation is attached.

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DocCode - SCORE

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Application Number: **12657535** Document Date: **01/22/2010**

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Form Revision Date: December 8, 2006

PATENT APPLICATION SERIAL NO._____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

01/25/2010 CNGUYEN2 00000111 12657535

01 FC:2011		165.00 OP
02 FC:2111		270.00 OP
03 FC:2311		110.00 OP

PTO-1556
(5/87)

*U.S. Government Printing Office: 2002- 489-267/69033

PTO/SB/06 (10-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number: 12657535

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	$165		N/A	$330
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	$270		N/A	$540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	$110		N/A	$220
TOTAL CLAIMS (37 CFR 1.16(i))	19 minus 20 =	*	X $26 =		OR	X $52 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	X $110 =			X $220 =	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).		$135			$270	
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			$195			$390	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	545		TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $26 =		OR	X $52 =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $110 =		OR	X $220 =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					$195		OR	$390	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $26 =		OR	X $52 =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $110 =		OR	X $220 =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					$195		OR	$390	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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