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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) A venting device

(57) A venting device (10) comprising an annular wall (11), an annular flange (14) connected to the annular wall (11) and extending away from the annular wall (11) in the radial direction, and a cup-shaped member (16) connected to the annular wall (11). The cup-shaped member (16) defines a cavity with a peripheral edge (19) facing away from the flange (14) in the axial direction. The cup-shaped member (16) having a venting hole (20) allowing air to pass through the venting hole (20). the cup-shaped member (16) is invertible so that when inverted the peripheral edge (19) faces towards the flange (14) and so that a sheet material (100) such as an underroof can be accommodated between the flange (14) and the peripheral edge (19) with the peripheral edge (19) in sealing contact with the sheet material (100).

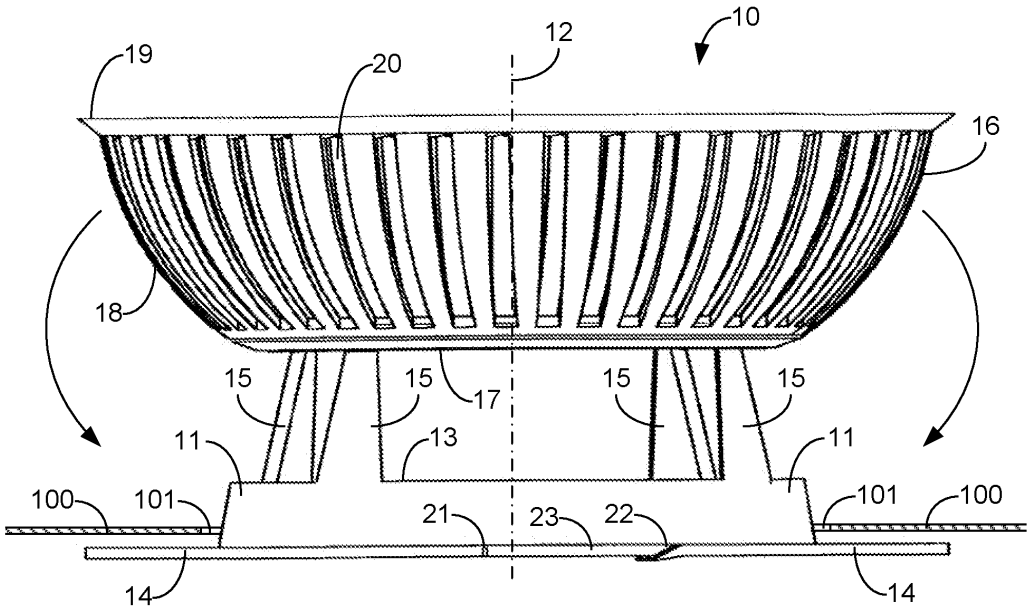

Fig. 1

EP 2 253 772 A1

Description

FIELD OF THE INVENTION

[0001] This invention relates to venting devices for venting a space in a building at least partly defined by a sheet material such as an underroof.

BACKGROUND OF THE INVENTION

[0002] Under certain weather conditions water in the form of rain and drifting snow may inadvertently leak in behind an outer roof e.g. of tiles. Underroofs are impermeable to water and are arranged under or behind an outer roof e.g. of tiles in order to prevent such water to enter the building structure and the rooms of the building. However, it is desirable to vent the space behind the underroof in order to prevent excessive humidity to accumulate in such space. Therefore venting devices are arranged in the underroof allowing air to pass through the venting devices.

[0003] EP 1 149 216 discloses such a venting device for mounting in an opening in an underroof. That device comprises several parts to be assembled from both sides of the underroof and which therefore requires access to both sides of the underroof.

[0004] It is an object of the invention to provide a venting device which can be mounted in an underroof from one side of the underroof.

SUMMARY OF THE INVENTION

[0005] The invention provides a venting device with an annular wall and an annular flange connected to the annular wall and extending away from the annular wall in the radial direction. A cup-shaped member having a venting hole allowing air to pass through the venting hole is connected to the annular wall, the cup-shaped member defines a cavity with an opening and a peripheral edge around the opening, where the periphery of the opening faces away from the flange in the axial direction. The cup-shaped member is invertible so that when inverted the periphery of the opening faces towards the flange and so that a sheet material such as an underroof can be accommodated between the flange and the periphery of the opening with the periphery of the opening in sealing contact with the sheet material.

[0006] This allows the venting device to be received and mounted in an opening of an underroof from one side of the underroof. For mounting the venting device in an underroof either the cup-shaped member or the annular flange is put through the opening in the underroof so that the cup-shaped member is on one side of the underroof and the annular flange is on the other side. The cup-shaped member is then caused to be inverted. This can be done by pressing the cup-shaped member against a rigid structure such as the tiles or other parts of the roof structure, or the cup-shaped member can be so constructed that by manipulation of the cup-shaped member it will invert.

[0007] The venting device may be moulded in one piece or it may be composed of two or more parts that are assembled. Thus e.g. the annular wall and the annular flange may be moulded in one piece of a first material, and the cup-shaped member may be of a second material with properties allowing it to be inverted. Preferably, the first material should be relatively rigid and the second material should be relatively soft. These pats are assembled to form a single unit that can be easily handled when mounting in the opening of the underroof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Figure 1 is a side view of a venting device according to the invention in a state in which it is ready for being mounted in a an opening in a sheet material such as an underroof, and

Figure 2 is an axial section through the venting device when mounted in an opening in a sheet material such as an underroof.

DETAILED DESCRIPTION OF THE INVENTION

[0009] In the figures is shown a venting device 10 that is suitable for mounting in an opening in a sheet material such as an underroof where it is used for venting a space in a building at least partly defined by a sheet material. The venting device 10 has an annular wall 11 with an axis 12 with an axial direction and a radial direction transverse to the axial direction. The annular wall 11 has a central opening 13 in the axial direction. An annular flange 14 is connected to the annular wall 11 on its outer side and extends away from the annular wall 11 in the radial direction. Supporting members 15 connected to the annular wall 11 extend in the axial direction and support a cup-shaped member 16. The cup-shaped member 16 has a bottom wall 17 and a peripheral wall 18 defining a cavity of the cup-shaped member 16. The free edge of the peripheral wall 18 defines an opening with a peripheral edge 19 around the opening. The cup-shaped member 16 has a plurality of through-going holes, here in the form of elongate slits 20 in the peripheral wall 18. Holes may also be present in the bottom wall 17.

[0010] In order to facilitate mounting of the venting device 10 in an opening in a sheet material such as an underroof the annular flange 14 may have a discontinuity, here in the form of a tongue 23 connected to the rest of the annular flange 14 through a hinge 21 extending in the radial direction of the flange 14. The tongue 23 can pivot about the hinge 21 so as to provide an opening or discontinuity in the flange 14 of a size corresponding to the length of the tongue 23. The free end 22 of the tongue 23 can rest against a corresponding portion of the flange

to form a continuous annular surface of the flange 14.

[0011] The figures also show a sheet material such as an underroof 100 with an opening 101. When the venting device 10 is to be mounted in the opening 101 of the underroof 100 the tongue 23 is first lifted to provide a discontinuity in the flange of a size allowing the flange to be inserted through the opening 101 in the underroof 100. Alternatively, the cup-shaped member 16 may be inserted through the opening 101 in the underroof 100. In order to facilitate this, the cup-shaped member 16 is flexible and can be manipulated to assume a shape allowing it to pass through the opining 101 in the underroof 100. Thus, the venting device 10 can be mounted from either side of the underroof 100 and with either the annular flange 14 or the cup-shaped member 16 being put through the opening 101 in the underroof 100.

[0012] Figure 1 shows the venting device 10 after either the annular flange 14 or the cup-shaped member 16 has been put through the opening 101 in the underroof 100.

[0013] After having been arranged in the opening 101 in the underroof 100 as illustrated in figure 1 the flexible cup-shaped member 16 is manipulated to invert as indicated by two curved arrows to assume the configuration shown in figure 2. If the cup-shaped member 16 is accessible by hand or by a suitable tool it can be manipulated to assume its inverted configuration. In some cases the underroof 100 will be located in a building construction where access to the cup-shaped member 16 is restricted or impossible, e.g. under a roof with only a short distance between the underroof and the roof. If the underroof 100 is a flexible sheet, the venting device 10 can be pressed from the inside by pressing the annular flange 14 and moving the venting device and the underroof 100 to contact the inner side of the roof, whereby the roof will exert a force on the cup-shaped member 16 that causes it to invert. The cup-shaped member 16 may also have a configuration that makes it possible to manipulate it from the side of the annular flange 14, e.g. through the opening in the annular wall 11. Such manipulation can include pressing the bottom wall 17, or the cup-shaped member 16 can have, at its side facing outwards in figure 1, members (not shown) such as strings, cords or tabs that are accessible through the opening in the annular wall 11, and by pulling these members the cup-shaped member 16 can be caused to invert.

[0014] Figure 2 shows the venting device with the cup-shaped member 16 inverted. The peripheral edge 19 is in sealing contact with the underroof 100 which in turn lies against the annular flange 14.

[0015] When used in a building construction the underroof 100 will often be raised at an angle relative to horizontal and the cup-shaped member 16 will be at the upper, outward facing side of the underroof 100. Water at the upper/outer side of the underroof 100 is prevented from reaching the inner side due to the sealing contact of the peripheral edge 19 with the underroof 100. The space behind the underroof is vented through the central opening defined by the annular wall 11 and the slits 20 in the wall of the cup-shaped member 16. The total opening area of the slits 20 in series with the central opening 13 in the annular wall 11 and the flow resistance are chosen to allow adequate venting to prevent accumulation of excessive humidity in the space behind the underroof 100. Further, the width of the slits 18 is chosen so as to prevent insects and other objects from passing therethrough.

[0016] The cup-shaped member 16 is made of a material with mechanical and physical properties such as flexibility that makes it suitable for being inverted and performing a long-term sealing contact with the sheet material 100. The annular wall 11, the annular flange 14 and the supporting members 15 may be of the same material as the cup-shaped member 16 or of a different material. Usable materials include rubber-based materials such as TPV, polymer materials such as TPE, possibly modified with other materials such as PP to obtain desired properties such as mechanical properties, resistance and durability.

Claims

1. A venting device (10) comprising
an annular wall (11) having an axis (12) with an axial direction and a radial direction transverse to the axial direction,
an annular flange (14) connected to the annular wall (11) and extending away from the annular wall (11) in the radial direction,
a cup-shaped member (16) connected to the annular wall (11), the cup-shaped member (16) defining a cavity having an opening and a peripheral edge (19) around the opening, the peripheral edge (19) facing away from the flange (14) in the axial direction, the cup-shaped member (16) having a venting hole (20) allowing air to pass through the venting hole (20),
the cup-shaped member (16) being invertible so that when inverted the peripheral edge (19) faces towards the flange (14) and so that a sheet material (100) such as an underroof can be accommodated between the flange (14) and the peripheral edge (19) with the peripheral edge (19) in sealing contact with the sheet material (100).

2. A venting device according to claim 1 including a plurality of venting holes (20) each having dimensions to prevent insects from passing therethrough.

3. A venting device according to any one of the preceding claims further including a member accessible through the opening (13) in the annular wall (11) to be manipulated to cause the cup-shaped member (16) to invert.

4. A venting device according to any one of the preced-

ing claims wherein supporting members (15) connected to the annular wall (11) support the cup-shaped member (16).

Amended claims in accordance with Rule 137(2) EPC.

1. A venting device (10) comprising
an annular wall (11) having an axis (12) with an axial direction and a radial direction transverse to the axial direction,
an annular flange (14) connected to the annular wall (11) and extending away from the annular wall (11) in the radial direction,
a cup-shaped member (16) connected to the annular wall (11), the cup-shaped member (16) defining a cavity having an opening and a peripheral edge (19) around the opening and a venting hole (20) allowing air to pass through the venting hole (20), the cup-shaped member (16) having a first position in which the peripheral edge (19) and the opening of the cavity face towards the flange (14) so that a sheet material (100) such as an underroof can be accommodated between the flange (14) and the peripheral edge (19) with the peripheral edge (19) in sealing contact with the sheet material (100),
characterized in that the cup-shaped member (16) has a second position in which the peripheral edge (19) and the opening of the cavity face away from the flange (14) in the axial direction, and that the cup-shaped member (16) is flexible so as to allow it to be inverted to assume the first position.

2. A venting device according to claim 1 including a plurality of venting holes (20) each having dimensions to prevent insects from passing therethrough.

3. A venting device according to any one of the preceding claims further including a member accessible through the opening (13) in the annular wall (11) to be manipulated to cause the cup-shaped member (16) to invert.

4. A venting device according to any one of the preceding claims wherein supporting members (15) connected to the annular wall (11) support the cup-shaped member (16).

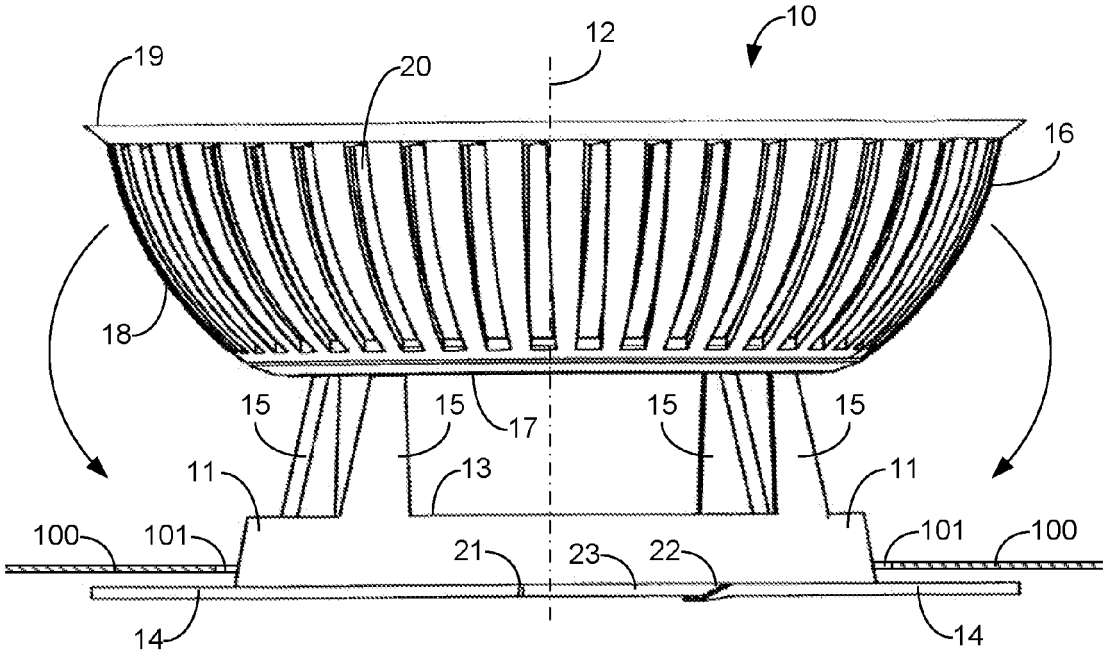
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Fig. 1

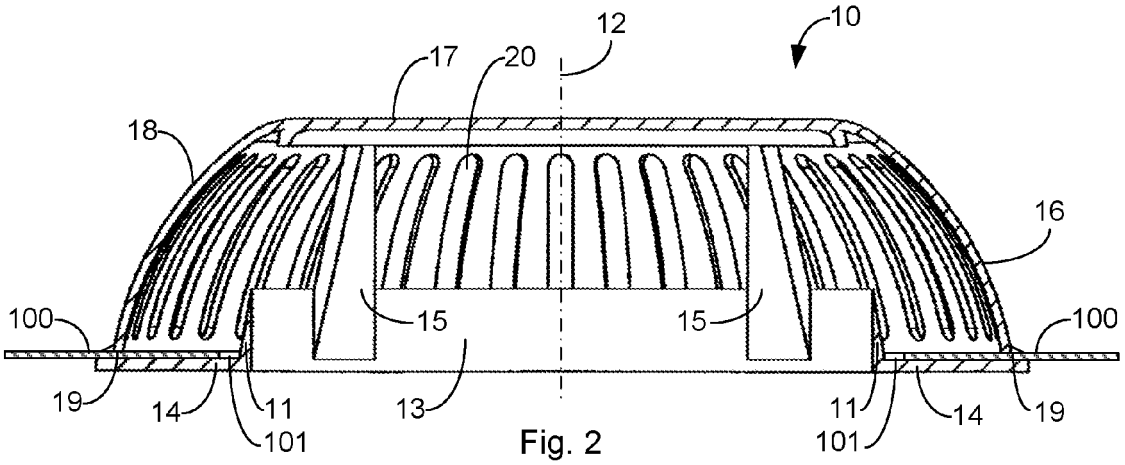
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Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 0024

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
D,X	WO 00/34600 A (MONARFLEX A S [DK]; MIKKELSEN KELD [DK]) 15 June 2000 (2000-06-15) * page 4, line 11 - line 26; figures 1,2,4 * * page 5, line 2 - line 27 * * page 6, line 14 - line 21 *	1-4	INV. E04D13/17 E04D13/14
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A	US 2006/059813 A1 (FROETER CRAIG J [US] ET AL) 23 March 2006 (2006-03-23) * the whole document *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC) E04D F24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 October 2009	Valenta, Ivar

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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19-10-2009

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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