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(54) **Sealing device for a roof terminal through a flat roof**

Abdichtungselement zur Flachdachdurchführung

Elément d'étanchéité pour sortie d'une toiture plane

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Description

[0001] The invention relates to a sealing device for a roof terminal, such as a flue gas discharge pipe or a ventilation pipe, through a flat roof, according to the preamble of claim 5. The invention further relates to an assembly of such a sealy device and a discharge structure accommodated in a flat roof, according to the preamble of claim 1.

[0002] such a sealing device and such an assembly are known from DE-A-1.509.132, DE-203224 and US-3098 663.

[0003] minal is led through a flat roof, warm air will be able to escape from the space below the roof along the pipe, through the (circumferential) slits or slots which are formed between the pipe and the passage opening in the roof. Said warm air may then end up in areas adjacent or above the heat insulation layer arranged on the roof, which are upwardly closed off by a roofing attachment plate for the roof cover layer placed on the insulation layer extending about the roof terminal, such as a bitumen layer. In those areas the temperature can be considerably lower, so that condensation will take place against the bitumen layer, and/or against the lower side of the roofing attachment plate, after which condensate can fall back and end up on the surface of the insulation layer in the clear opening - and will initiate the formation of fungi -, and/or on (wooden) parts of the roof construction which are prone to the action of moisture.

[0004] The invention has the object to improve on this and to that end provides - from one aspect - a sealing device for a roof terminal, such as a flue gas discharge pipe or a ventilation pipe, comprising a disc-shaped placement member, provided with a passage opening for the roof terminal, and attached to the placement member at the location of the passage opening a sealing annulus or sealing ring extending in the passage opening, made from flexible material for sealingly abutting the roof terminal, as described in claim 5.

[0005] By including such a sealing device in a roof at the location of a roof terminal on the one hand a chimney effect is prevented and the transport of warm air to the cold areas is counteracted to a large extent and on the other hand falling condensate is prevented from contacting parts of the roof construction and the space below the roof that are moisture sensitive, in a simple way and with limited use of material. The sealing device can furthermore be a continuation of a vapour proof layer, so that when applying a vapour proof layer in a roof construction this layer is also present at the location of the roof terminal due to the sealing device according to the invention. The sleeve stands upright from the disc, and is in line with the passage opening. Said sleeve promotes the aligning of the sealing device and also ensures a stiffening of the disc, so that -when necessary- it can fixed flat on a roof also without additional attachment means, such as nails, for instance by a layer of heat insulating material extending over the disc. The sleeve, moreover,

screens off the clear in the hole of the insulation layer (additionally) against (warm) air coming from the inside. The sleeve can further -when of sufficient length - be used as means for attaching the roof cover layer.

[0006] Preferably the annulus or ring is attached in a boundary edge of the passage opening.

[0007] Limitation of the construction height to be accommodated between the construction layers of the roof is obtained when the placement member is formed by a flat ring disc. Said disc can also be used as means for the fixation of the sealing device in the roof.

[0008] Preferably the sleeve is designed such that it tapers a little in a direction away from the placement member.

[0009] Preferably the annulus is attached to the sleeve itself, preferably in its end.

[0010] Preferably the annulus can be bent to at least the side of the sealing device which faces away from the sleeve, so that the sleeve will not impede the wanted deformation of the annulus and the diameter of the sleeve can be kept limited.

[0011] Preferably the annulus is detachably connected to the placement member, so that the placement member can possibly be used in the usual manner as a roofing attachment plate.

[0012] From another aspect the invention provides an assembly as described in claim 1. The slit around the pipe is then closed off at the warm side of the insulation layer, whereas moreover the insulation layer can be used for holding the sealing device.

[0013] Preferably the sleeve extends through the insulation layer, preferably a length beyond it top surface.

[0014] Preferably the sealing device connects with the placement member to a vapour proof layer which is arranged between the insulation layer and the support and sealing layer. Other preferred embodiment are described in the claims.

[0015] The invention will now be elucidated on the basis of the exemplary embodiments shown in the attached drawings, in which:

Figure 1 is a side view on a first embodiment of the sealing device according to the invention;

Figure 2 is a view obliquely from below on the sealing device of figure 1;

Figure 3 is the sealing device of the figures 1 and 2 accommodated in a flat roof;

Figure 4 is a representation in accordance with figure 3, but now with a second embodiment of the sealing device according to the invention; and

Figure 4A is a cross-section through the sealing device of figure 4.

[0016] The sealing device 1 shown in figures 1-3 is

substantially shaped like a hat, however without the upper wall. The sealing device 1 - preferably made of plastic - comprises a flat annular disc 2 and an upright sleeve 3, which are formed as one unity. The annular disc 2 and the sleeve 3 limit a passage 14 for a ventilation pipe or flue gas discharge pipe. In or at the inner edge of the annular disc 2 a ring 4 is attached - preferably in a detachable manner (such as by snapping) - which forms a flexible circumferential lip and to that end can be made from TPE.

[0017] In the situation of use, shown in figure 3, the sealing device 1 of the figures 1 and 2 is situated at the location of a vertical hole 13 through a flat roof 5. The flat roof construction is built up from a concrete plate 6, which upwardly screens off the space B below the roof. On the concrete plate 6 a layer of insulation material 7 is arranged, and on it a layer of bitumen 8. This regards a so-called hot-roof construction.

[0018] The layer of bitumen 8 is sealingly attached with the edge to the upper surface of the ring 12 of the usual roofing attachment plate 10, which is further provided with an upright sleeve 11, which close-fittingly engages about a pipe 9, which extends through the hole 13 and at its upper side is covered by a precipitation screening ring 15.

[0019] As can be seen, the diameter of the roof terminal 9 is smaller than the one of the hole 13. As a result the warm inside air may end up within the roof construction by means of rising in direction A. Because the temperature of the outside air C is lower than the one of the inside air condensation may occur against the inner surface of the sleeve portion 11 of the roofing attachment plate 10 and against the layer of insulation material 7, at least when a sealing device 1 would not have been placed.

[0020] Because of the sealing device 1 with the flexible ring 4 a chimney effect is prevented so that an air flow A will no longer occur, at least cannot reach relatively cold construction parts. Pressure levelling via the hole 13, along the outer side of pipe 9 can no longer occur. The flexible circumferential lip 4 sealingly abuts the outer surface of the pipe 9. Moreover the sleeve 3 of the sealing device 1 screens off the clear of the hole in the layer of insulation material 7. It is advantageous here when the sleeve 3 extends until at the top of the layer of insulation material 7 and almost connects to the roofing attachment plate 10. It is also possible that the sleeve 3 further extends upwards until the ring 15, so that possibly the layer of bitumen 8 can be attached to it and a separate roofing attachment plate can be left out.

[0021] Alternatively the sealing device - after removal of the ring 4 - can be used as roofing attachment plate, for instance like the roofing attachment plate 10 in this example.

[0022] The sealing device 1 is placed flat on the top surface of the concrete plate 6 without attachment means such as nails. The thickness of the annular disc 2 is kept as small as possible here, for instance 1 to 2 mm, in order that the layer of insulation material remains lying practi-

cally flat at the location of the sealing device 1. The flatness of the annular disc 2 is guaranteed here by the stiffening influence of the sleeve 3.

[0023] In figure 4 a cross-section through a flat roof 105 is shown, which just like the flat roof construction of figure 3 is a "hot-roof construction". Corresponding parts have similar reference numbers, increased by one hundred.

[0024] The flat roof construction 105 is built up from a concrete construction layer 6, a vapour inhibiting or vapour proof layer 116 arranged thereon, an insulation layer 107 arranged thereon and a bitumen layer arranged thereon.

[0025] In the roof construction 105 a passage 114 is made, in which a roof terminal 109 can be included. In order to prevent transport of warm air from inside to the outside, from warmer construction parts to colder construction parts, and thus condensation, the sealing device 101 according to the invention is included in the roof construction 105, in a shape substantially corresponding to the one of the sealing device 1 of the figures 1-3. In this case the disc 102 is placed contiguously to the vapour inhibiting layer 116, and as shown in figure 4A, the sleeve portion 103 tapers upwards. Another difference is that the sealing, flexible sealing annulus or sealing lip 104 is now attached to the end of upright sleeve 103, to which end the upper edge of the sleeve 103 is provided with a double circumferential ring 117, which rings define an upwardly opening receiving space 118 for attachment portion 119 of the annulus or lip 104 provided with integrally formed barb lips. The lip or annulus 104 is furthermore provided with a sealing lip 120 extending to the inside and downwards over the inner ring 117, which sealing lip 120 sealingly abuts the surface of the pipe 109. In the arrangement of figure 4 the wall of the sleeve 103 and the annulus or lip 104 thus forms a continuation of the vapour inhibiting layer until against the outer surface of the pipe 109.

Claims

1. Assembly of roof terminal, a flat roof (5) provided with an opening for a roof terminal (9), which roof comprises a support and sealing layer (6) of for instance concrete, a heat insulating layer (7) and a roof cover layer (8) which is attached near the roof terminal to a roofing attachment plate (10) of the usual shape, the assembly further comprising a sealing device (1) for the roof terminal comprising a disc-shaped placement member (2), provided with a passage opening (14) for the roof terminal (9), and attached to the placement member at the location of the passage opening a sealing annulus or sealing ring (4) extending in the passage opening, made from flexible material for sealingly abutting the roof terminal, **characterized in that** the insulating layer (7) is placed at the outside of the support and sealing

layer (6) and the roof cover layer (8) is placed on the insulating layer, wherein the sealing device (1) with placement member is situated between the support and sealing layer and the insulation layer.

2. Assembly according to claim 1, wherein on the disc a sleeve (3) is formed which extends perpendicular upright from the disc (2) through the insulation layer, and is in line with the passage opening (14).
3. Assembly according to claim 2, in which the sleeve (3) extends a length beyond the insulation layer (7).
4. Assembly according to claim 1, 2 or 3, in which a vapour proof layer is arranged between the insulation layer and the support and sealing layer and connects to the placement member of the sealing device (1).
5. Sealing device (1) for a roof terminal, such as a flue gas discharge pipe or a ventilation pipe (9), comprising a disc-shaped placement member (2), provided with a passage opening (14) for the roof terminal, and attached to the placement member at the location of the passage opening a sealing annulus or sealing ring (4) extending in the passage opening, made from flexible material for sealingly abutting the roof terminal, **characterized in that** on the disc (2) a sleeve (3) is formed which extends perpendicular upright from the disc, and is in line with the passage opening, wherein the sealing ring or sealing annulus (4) is arranged at the end of the sleeve (3) that is proximal to the disc (2).
6. Sealing device according to claim 5, in which the annulus or ring (4) is attached in a boundary edge of the passage opening (14).
7. Sealing device according to claim 5 or 6, in which the placement member is formed by a flat ring disc.
8. Sealing device according to claim 7, in which the sleeve (3) is designed such that it tapers a little in a direction away from the placement member (2).
9. Sealing device according to claim 6, 7 or 8, in which the sealing ring (4) can be bent to at least the side of the sealing device which faces away from the sleeve (3).
10. Sealing device according to any one of the claims 6-9, in which the sealing ring (4) is detachably connected to the placement member (2).

Patentansprüche

1. Anordnung eines Dachdurchgangsrohrs, eines

Flachdachs (5), das mit einer Öffnung für ein Dachdurchgangsrohr (9) versehen ist, welches Dach eine Trag- und eine Dichtungsschicht (6) aus beispielsweise Beton, eine Wärmeisolationsschicht (7) und eine Dachabdeckschicht (8) umfasst, die nahe dem Dachdurchgangsrohr an einer Dachhautbefestigungsplatte (10) von üblicher Form angebracht ist, wobei die Anordnung darüber hinaus eine Dichtungsvorrichtung (1) für das Dachdurchgangsrohr umfasst, die ein scheibenförmiges Platzierungselement (2) umfasst, versehen mit einer Durchgangsöffnung (14) für das Dachdurchgangsrohr (9) und angebracht am Platzierungselement an der Stelle der Durchgangsöffnung mit einem Dichtungskranz oder Dichtungsring (4), der sich in die Durchgangsöffnung erstreckt und aus einem flexiblen Material zum dichtenden Anliegen an das Dachdurchgangsrohr gefertigt ist, **dadurch gekennzeichnet, dass** die Isolationsschicht (7) an der Außenseite der Trag- und Dichtungsschicht (6) angeordnet ist und die Dachabdeckschicht (8) auf der Isolationsschicht angeordnet ist, wobei die Dichtungsvorrichtung (1) mit dem Platzierungselement zwischen der Trag- und Dichtungsschicht und der Isolationsschicht angeordnet ist.

2. Anordnung nach Anspruch 1, wobei auf der Scheibe eine Hülse (3) ausgebildet ist, die sich senkrecht nach oben von der Scheibe (2) durch die Isolationsschicht erstreckt und sich in Linie mit der Durchgangsöffnung (14) befindet.
3. Anordnung nach Anspruch 2, bei der sich die Hülse (3) eine Länge über die Isolationsschicht (7) hinaus erstreckt.
4. Anordnung nach Anspruch 1, 2 oder 3, bei der eine dampfdichte Schicht zwischen der Isolationsschicht und der Trag- und Dichtungsschicht angeordnet ist und an das Platzierungselement der Dichtungsvorrichtung (1) anschließt.
5. Dichtungsvorrichtung (1) für ein Dachdurchgangsrohr, wie etwa ein Abgasabführrohr oder ein Lüftungsrohr (9), umfassend ein scheibenförmiges Platzierungselement (2), versehen mit einer Durchgangsöffnung (14) für das Dachdurchgangsrohr und angebracht am Platzierungselement an der Stelle der Durchgangsöffnung mit einem Dichtungskranz oder Dichtungsring (4), der sich in die Durchgangsöffnung erstreckt und aus einem flexiblen Material zum dichtenden Anliegen an das Dachdurchgangsrohr gefertigt ist, **dadurch gekennzeichnet, dass** auf der Scheibe (2) eine Hülse (3) ausgebildet ist, die sich senkrecht nach oben von der Scheibe erstreckt und sich in Linie mit der Durchgangsöffnung befindet, wobei der Dichtungsring oder der Dichtungskranz (4) am Ende der Hülse (3) angeordnet

ist, das sich nahe der Scheibe (2) befindet.

6. Dichtungsvorrichtung nach Anspruch 5, bei der der Kranz oder Ring (4) in einer Randkante der Durchgangsöffnung (14) angebracht ist.
7. Dichtungsvorrichtung nach Anspruch 5 oder 6, bei der das Platzierungselement durch eine flache Ringscheibe gebildet wird.
8. Dichtungsvorrichtung nach Anspruch 7, bei der die Hülse (3) derart ausgeführt ist, dass sie sich ein wenig in einer Richtung weg vom Platzierungselement (2) verjüngt.
9. Dichtungsvorrichtung nach Anspruch 6, 7 oder 8, bei der der Dichtungsring (4) wenigstens zur Seite der Dichtungsvorrichtung gebogen werden kann, die von der Hülse (3) weg weist.
10. Dichtungsvorrichtung nach einem der Ansprüche 6 bis 9, bei der der Dichtungsring (4) entfernbar am Platzierungselement (2) angebracht ist.

Revendications

1. Ensemble de sortie de toit, un toit plat (5) doté d'une ouverture pour une sortie de toit (9), ledit toit comprenant une couche de support et d'étanchéité (6) de béton par exemple, une couche d'isolation thermique (7) et une couche de couverture de toit (8) qui est fixée près de la sortie de toit à une plaque de fixation de toiture (10) de forme usuelle, l'ensemble comprenant en outre un dispositif d'étanchéité (1) pour la sortie de toit comprenant un élément de placement en forme de disque (2), doté d'une ouverture de passage (14) pour la sortie de toit (9), et au niveau de la position de l'ouverture de passage, un anneau d'étanchéité ou une bague d'étanchéité (4) s'étendant dans l'ouverture de passage est fixé(e) à l'élément de placement, composé(e) d'un matériau flexible pour abouter de manière étanche à la sortie de toit, **caractérisé en ce que** la couche isolante (7) est placée à l'extérieur de la couche de support et d'étanchéité (6) et la couche de couverture de toit (8) est placée sur la couche isolante, le dispositif d'étanchéité (1) avec l'élément de placement étant situé entre la couche de support et d'étanchéité et la couche d'isolation.
2. Ensemble selon la revendication 1, dans lequel un manchon (3) est formé sur le disque, qui s'étend perpendiculairement vers le haut depuis le disque (2) à travers la couche d'isolation, et est aligné avec l'ouverture de passage (14).
3. Ensemble selon la revendication 2, dans lequel le

manchon (3) s'étend sur une certaine longueur au-delà de la couche d'isolation (7).

4. Ensemble selon la revendication 1, 2 ou 3, dans lequel une couche résistante à la vapeur est disposée entre la couche d'isolation et la couche de support et d'étanchéité et est reliée à l'élément de placement du dispositif d'étanchéité (1).
5. Dispositif d'étanchéité (1) pour une sortie de toit, comme un conduit d'évacuation de gaz ou un conduit de ventilation (9), comprenant un élément de placement en forme de disque (2), doté d'une ouverture de passage (14) pour la sortie de toit, et au niveau de la position de l'ouverture de passage, un anneau d'étanchéité ou une bague d'étanchéité (4) s'étendant dans l'ouverture de passage est fixé(e) à l'élément de placement, composé(e) d'un matériau flexible pour abouter de manière étanche à la sortie de toit, **caractérisé en ce qu'un** manchon (3) est formé sur le disque (2), qui s'étend perpendiculairement vers le haut depuis le disque, et est aligné avec l'ouverture de passage, la bague d'étanchéité ou l'anneau d'étanchéité (4) étant disposé(e) à la fin du manchon (3) qui est proximal par rapport au disque (2).
6. Dispositif d'étanchéité selon la revendication 5, dans lequel l'anneau ou la bague (4) est fixé(e) dans un bord périphérique de l'ouverture de passage (14).
7. Dispositif d'étanchéité selon la revendication 5 ou 6, dans lequel l'élément de placement est formé d'un disque annulaire plat.
8. Dispositif d'étanchéité selon la revendication 7, dans lequel le manchon (3) est conçu de manière à se terminer légèrement en pointe dans la direction s'éloignant de l'élément de placement (2).
9. Dispositif d'étanchéité selon la revendication 6, 7 ou 8, dans lequel la bague d'étanchéité (4) peut être pliée au moins du côté du dispositif d'étanchéité faisant face à la direction opposée au manchon (3).
10. Dispositif d'étanchéité selon l'une quelconque des revendications 6 à 9, dans lequel la bague d'étanchéité (4) est reliée de manière amovible à l'élément de placement (2).

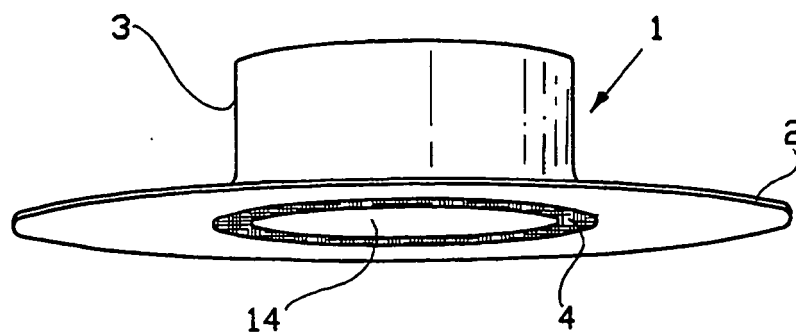


FIG. 1

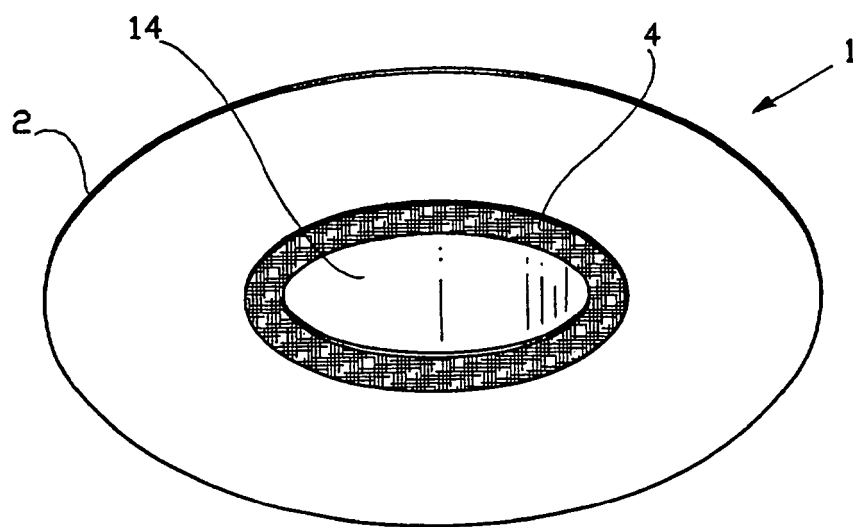


FIG. 2

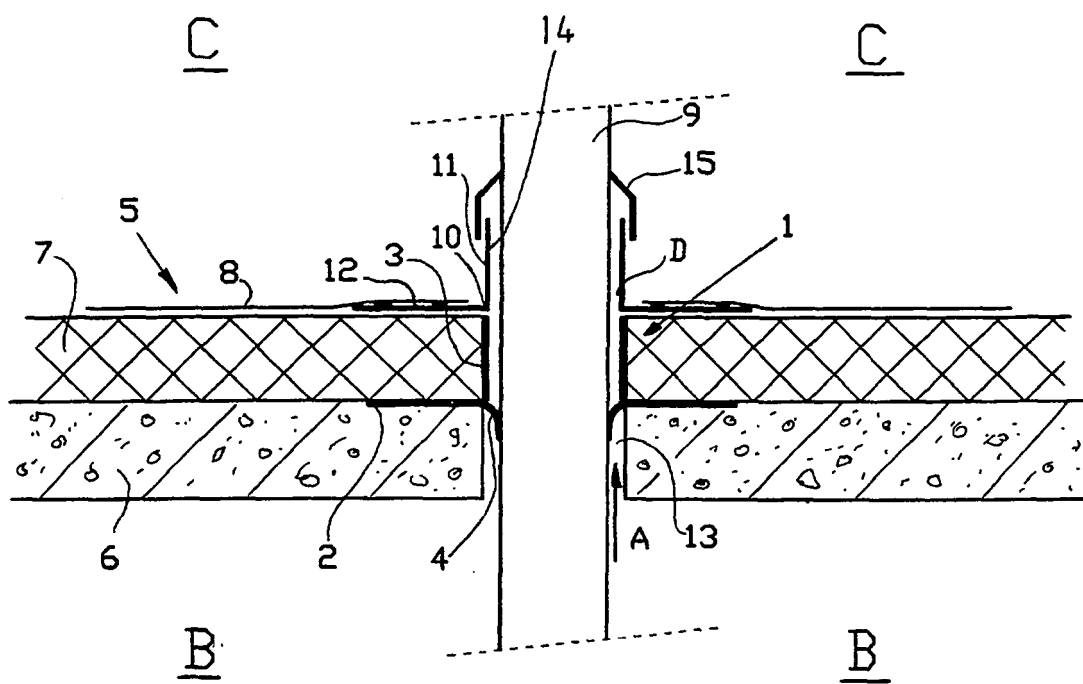


FIG. 3

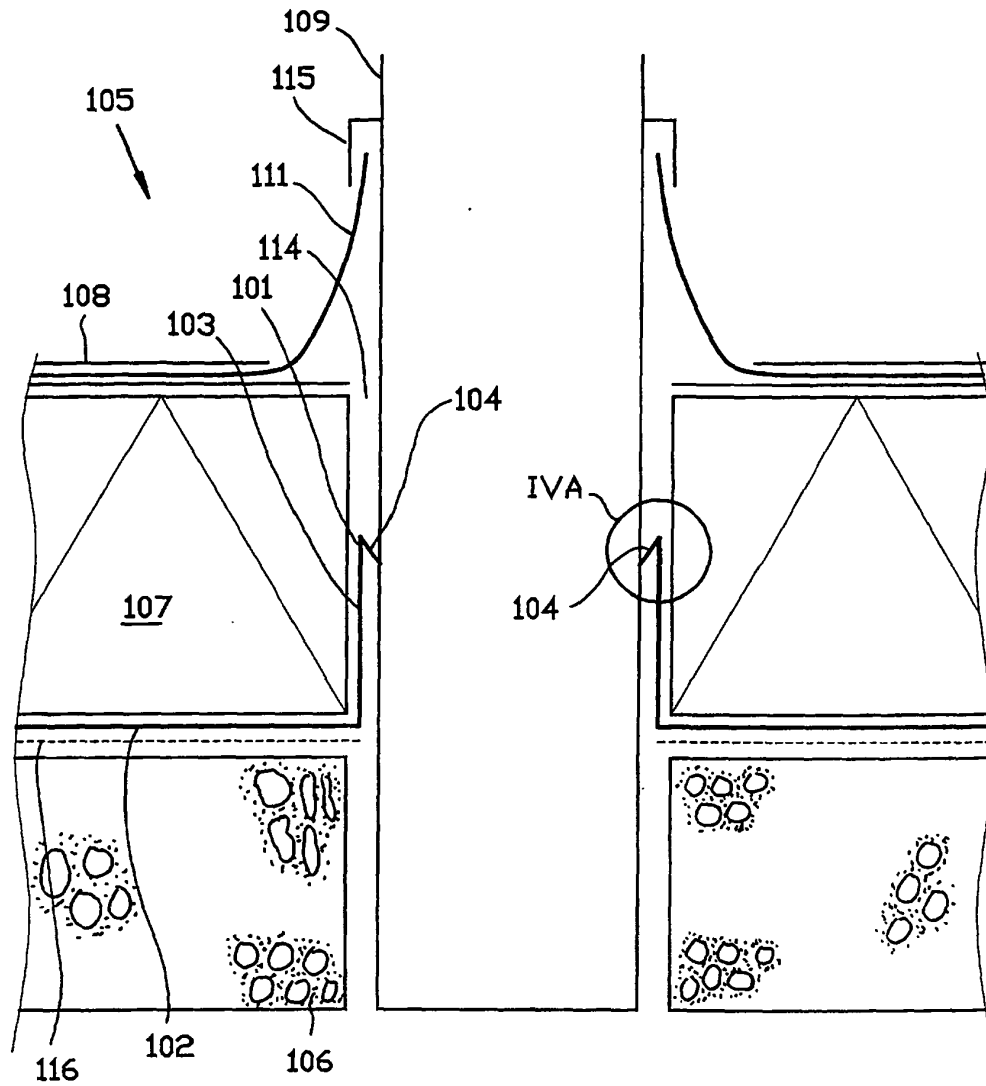


FIG. 4

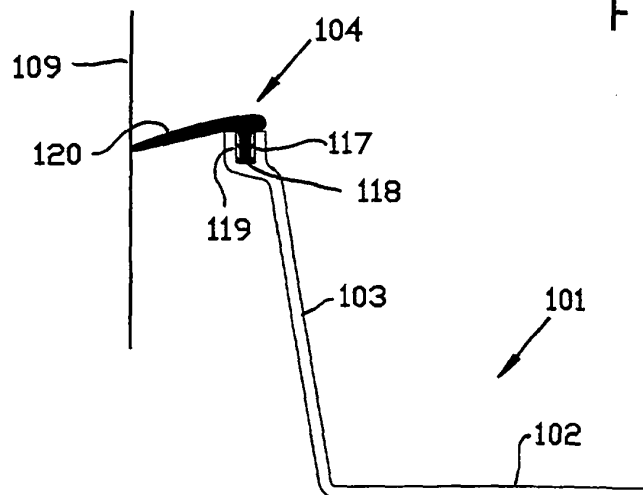


FIG. 4A

REFERENCES CITED IN THE DESCRIPTION

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