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

(57) Sealing device for a roof terminal, such as a flue gas discharge pipe or a ventilation pipe, comprising a disc-shaped placement member (2), provided with a passage opening (14) for the roof terminal, and attached to the placement member (2) at the location of the passage opening (14) a sealing annulus or sealing ring (4) extending in the passage opening (14), made from flexible material for sealingly abutting the roof terminal, the annulus or ring (4) being attached in the edge of the passage opening (14).

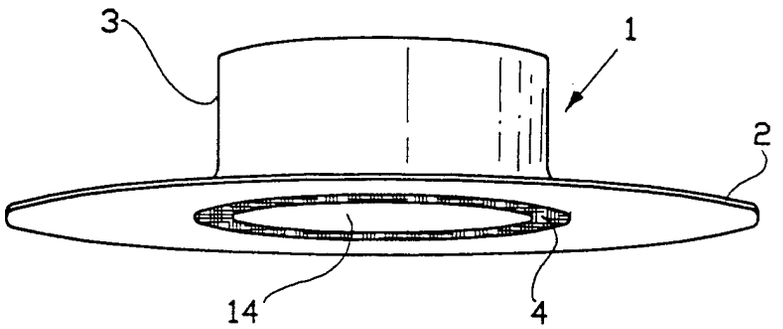

FIG. 1

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Description

[0001] The invention relates to a discharge structure for a roof terminal, such as a flue gas discharge pipe or a ventilation pipe, through a flat roof. The invention further relates to such a discharge structure accommodated in a flat roof.

[0002] Where a roof terminal 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.

[0003] 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.

[0004] 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.

[0005] Preferably the annulus or ring is attached in a boundary edge of the passage opening.

[0006] 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.

[0007] Preferably a sleeve is formed on the disc, which 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.

[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 of roof terminal, a flat roof provided with an opening for a roof terminal, which roof comprises a support and sealing layer of for instance concrete and a heat insulating layer placed at the outside thereof and a roof cover layer placed thereon - which is attached near the roof terminal to a roofing attachment plate of the usual shape -, and a sealing device according to any one of the preceding claims, in which the sealing device with placement member is situated between the support and sealing layer and the insulation layer. 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.

[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 ta 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] Alteratively 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 practically 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. 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.

2. Sealing device according to claim 1, in which the annulus or ring is attached in a boundary edge of the passage opening.

3. Sealing device according to claim 1 or 2, in which the placement member is formed by a flat ring disc.

4. Sealing device according to claim 3, in which on the disc a sleeve is formed which stands upright from the disc, and is in line with the passage opening.

5. Sealing device according to claim 4, in which the sleeve is designed such that it tapers a little in a direction away from the placement member.

6. Sealing device according to claim 4 or 5, in which the annulus is attached to the sleeve, preferably in its end.

7. Sealing device according to claim 4, 5 or 6, in which the annulus can be bent to at least the side of the sealing device which faces away from the sleeve.

8. Sealing device according to any one of the preceding claims, in which the annulus is detachably connected to the placement member.

9. Assembly of roof terminal, a flat roof provided with an opening for a roof terminal, which roof comprises a support and sealing layer of for instance concrete and heat insulating layer placed at its outside and a roof cover layer placed thereon which is attached near the roof terminal to an roofing attachment plate of the usual shape, and a sealing device according to any one of the preceding claims, in which the sealing device with placement member is situated between the support and sealing layer and the insulation layer.

10. Assembly according to claim 8, with a sealing device according to any one of the claims 4-8, in which the sleeve extends through the insulation layer.

11. Assembly according to claim 10, in which the sleeve extends a length beyond the insulation layer.

12. Assembly according to claim 10, 11 or 12, 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.

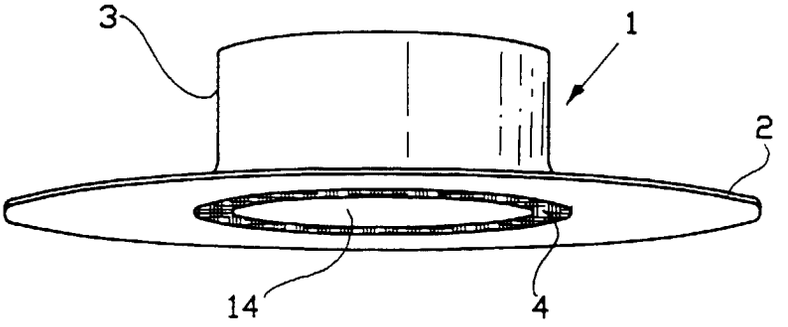

FIG. 1

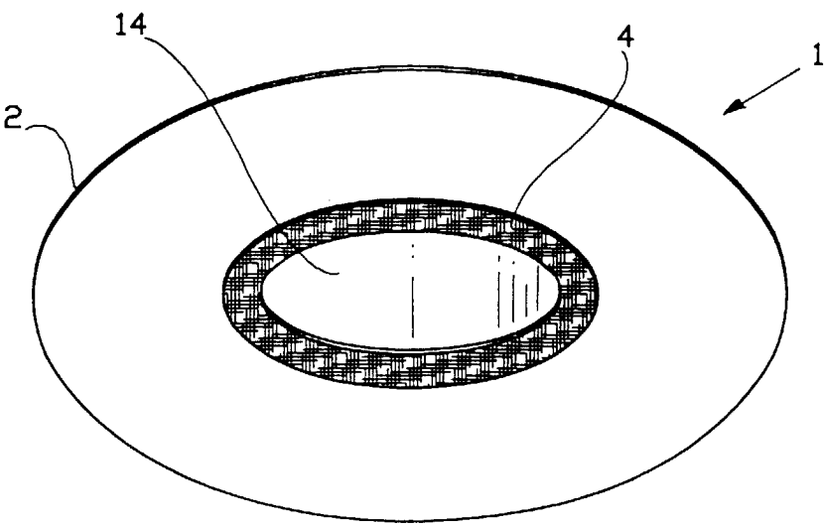

FIG. 2

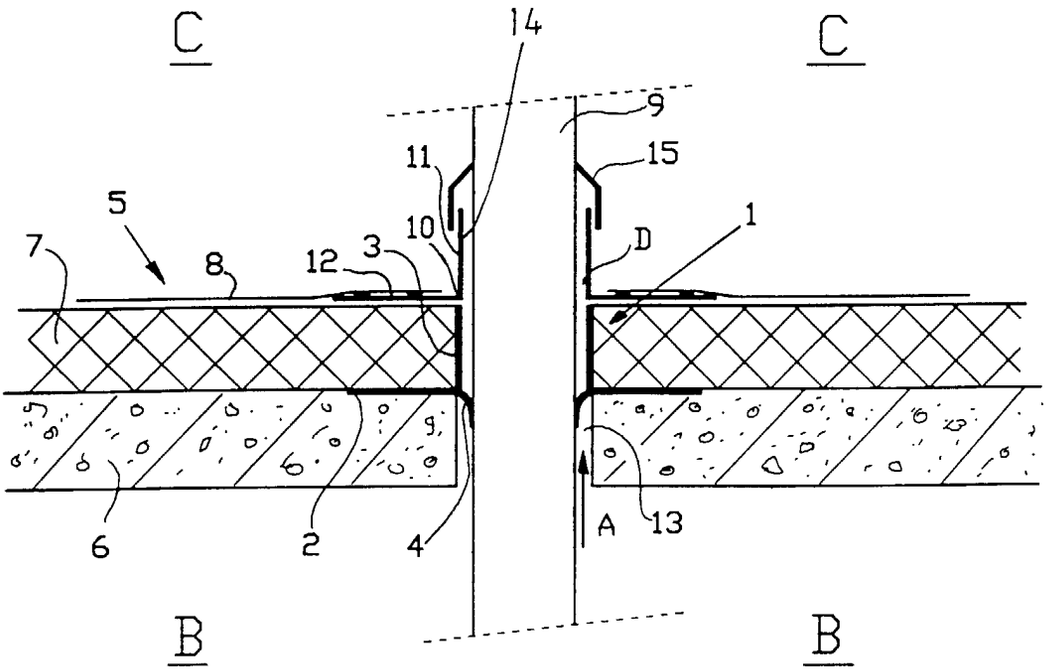

FIG. 3

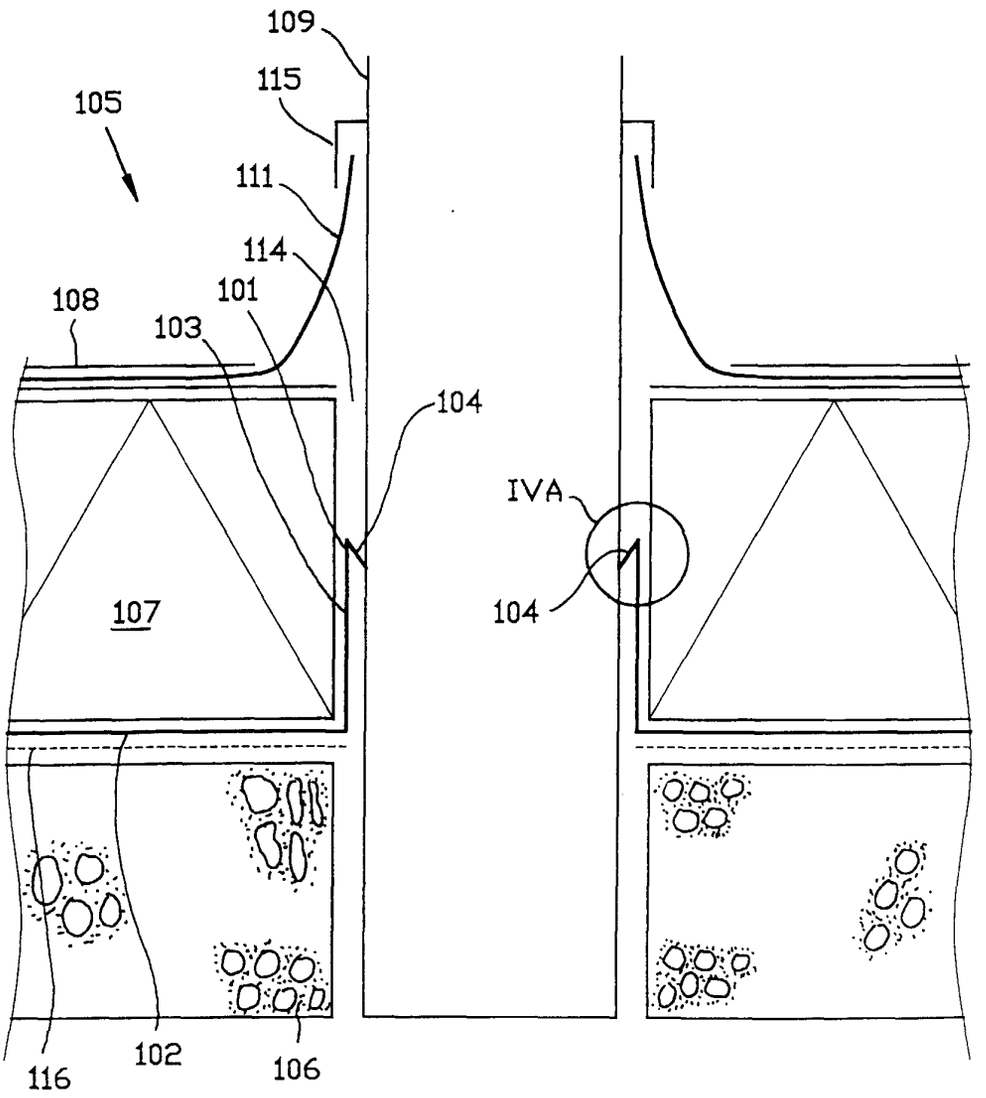
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FIG. 4

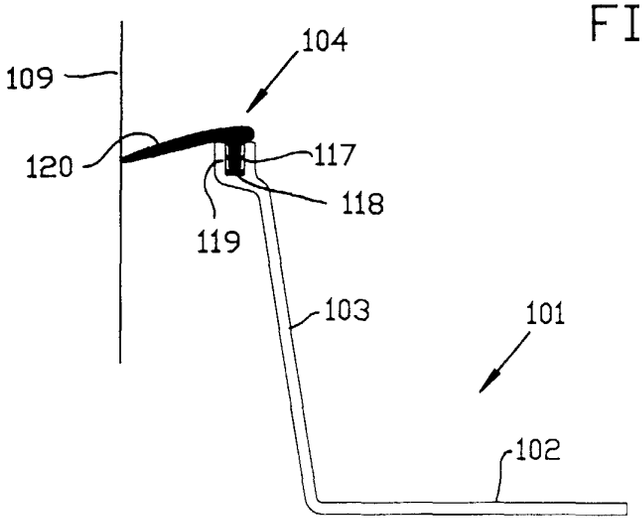
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FIG. 4A

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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 2968

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 December 1999	Hendrickx, X

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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 2968

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 December 1999	Hendrickx, X

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