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(54) **Roof tube and method for producing such a roof tube**

(57) The invention relates to a roof duct for a flat roof for draining rainwater or for carrying conduits through the roof. The roof duct consists of a metal tube forming the actual duct and a sheet-like part which is connected to the metal tube and which is manufactured from a flexible plastic. The sheet-like part is herein provided with an opening, an edge of which protrudes into the metal tube.

The roof duct further consists of an inner tube, a first part of which lies against the inward protruding edge of the sheet-like part and a second part of which lies against the inner wall of the metal tube. For the purpose of fixing the sheet-like part the roof duct is provided with a constriction such that the edge of the sheet-like part is clamped between the metal tube and the inner tube.

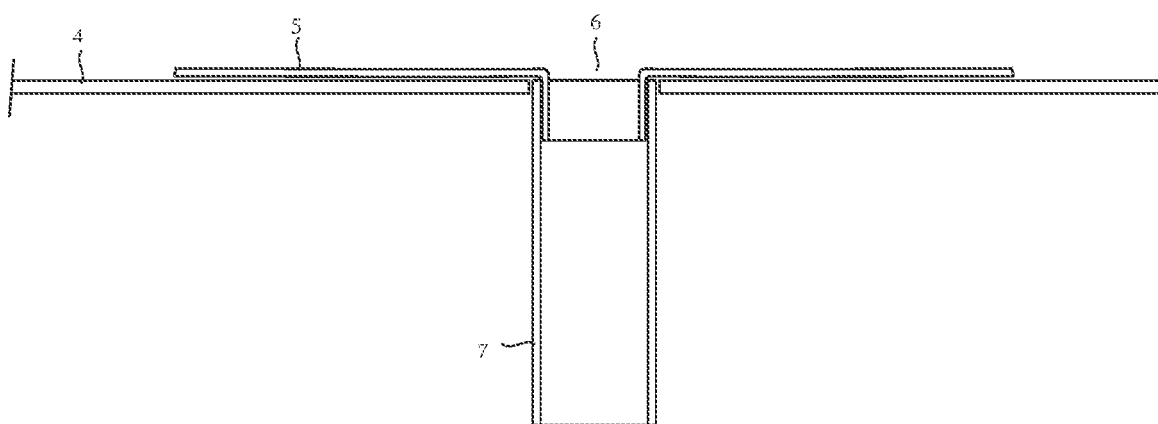


Fig. 1B

Description

[0001] The invention relates to a roof duct for an at least substantially flat roof for draining rainwater or for carrying conduits, venting ducts and the like through the roof, comprising a metal tube forming the actual duct and a sheet-like part which is connected to the metal tube and which rests on the roof in a position of use. Known roof ducts generally consist of a metal sheet provided with an opening onto which the tube is soldered. Problems may arise when the roof duct has to be placed at an upright edge, because the metal tube must then be bent such that it follows the upright edge precisely. A roof covering of a flexible plastic or of a bitumen product is then laid over the metal sheet.

[0002] The roof duct according to the invention has the feature that the sheet-like part is manufactured from a flexible plastic or from a bitumen product. It is then possible to first lay the roof covering, cut an opening in the roof covering at the position of the roof duct and place the metal tube of the roof duct therethrough. The sheet-like part can then be glued or sealed to the roof covering, after which another or multiple layers of roof covering can be arranged if desired. The flexible sheet-like part here follows a possible upright edge without problem.

[0003] A great advantage of the invention is that the roof duct can be placed as a whole from the roof side. The connection to an existing, further tube (such as a standpipe) situated under the roof is hereby easy to realize without the further tube having to be disassembled.

[0004] A favourable embodiment of the inventive roof duct has the feature that the sheet-like part is provided with an opening, an edge of which protrudes into the metal tube such that the collar is formed in its entirety by the sheet-like part. The drainage of rainwater is hereby not impeded by height differences on the roof. In addition, the inventive roof duct can be applied on an irregularly formed roof or a roof provided with obstacles (such as an edge), since the flexible sheet-like part can be shaped to correspond with the irregularly formed roof or the obstacles. The edge is herein preferably glued against an inner wall of the metal tube.

[0005] A further favourable embodiment of the inventive roof duct has the feature that the roof duct also comprises an inner tube, a first part of which lies against the inward protruding edge of the sheet-like part and a second part of which lies against the inner wall of the metal tube. The inner tube here ensures that the inward protruding edge remains in place even after prolonged use. At the position of a transition from the first part to the second part the roof duct is moreover preferably provided with a constriction, such that the edge of the sheet-like part is clamped between the metal tube and the inner tube.

[0006] On the outside the metal tube is preferably provided all around with a recess in which a rubber ring is arranged. When the metal tube is placed on a further tube with a greater diameter, the rubber ring functions

as a stench trap.

[0007] In addition, the metal tube is preferably manufactured from anodized aluminium. It is hereby possible to connect the metal tube to a further tube manufactured from copper or zinc. Anodized aluminium has the favourable property that no contact corrosion with other materials occurs.

[0008] The invention also relates to a method for manufacturing a roof duct, wherein a metal tube is provided with a sheet-like part which rests on the roof in a position of use. According to the invention an opening is made here in a sheet-like part manufactured from a flexible plastic or from a bitumen product and an edge of the opening is protruded into the metal tube, after which an inner tube is placed in the metal tube such that the inward protruding edge is situated at least partially between the metal tube and the inner tube.

[0009] A favourable realization of the method has the feature that, before the inner tube is placed, the inward protruding edge is moreover glued to an inner wall of the metal tube. Before the inward protruding edge is glued to the inner wall of the metal tube, this inner wall is preferably roughened, degreased and provided with a primer. After drying of the primer an adhesive layer of a type associated with the flexible plastic or the bitumen product can then be applied to the primer.

[0010] A further favourable realization of the method, with which a particularly robust product can be obtained, has the feature according to a further aspect of the invention that, before the inner tube is placed, a diameter of a first part of the inner tube is reduced or that a diameter of a remaining second part is increased such that, after placing, the first part lies at least substantially against the inward protruding edge of the sheet-like part, and the remaining second part lies at least substantially against the inner wall of the metal tube. The reduction of the diameter can for instance be carried out with a per se known press, as is used for instance to mount connectors on hydraulic conduits. The increase of the diameter can for instance be carried out by sliding part of the inner tube over a tapered mandrel.

[0011] A favourable alternative realization of the inventive method has the feature that, before the edge of the opening is protruded into a part of the metal tube, an inner diameter of this part is increased such that, after placing, the inner tube lies at least substantially against the inward protruding edge of the sheet-like part and against the inner wall of the metal tube.

[0012] A further favourable realization has the feature that the metal tube is provided with a constriction such that the edge of the opening of the sheet-like part is clamped between the metal tube and the inner tube. Such a constriction can for instance be arranged with a per se known press, as is used for instance to mount connectors on hydraulic conduits.

[0013] The invention will now be further elucidated with reference to the following figures, wherein:

Fig. 1A shows a schematic section of a known roof duct;

Fig. 1B shows a schematic section of a possible embodiment of a roof duct according to the invention;

Fig. 2A shows a schematic section of an alternative embodiment of a roof duct according to the invention;

Fig. 2B shows a schematic section of a further alternative embodiment of a roof duct according to the invention;

Fig. 3A shows a schematic section of a further alternative embodiment of a roof duct according to the invention;

Fig. 3B shows a schematic section of an embodiment of a roof duct according to the invention which is suitable for throughfeed of conduits.

[0014] Fig. 1A shows a schematic section of a known roof duct consisting of a zinc sheet 1 provided with an opening 2 onto which a zinc tube 3 is soldered. Tube 3 is placed through an opening in a roof for covering, after which roof covering 4 is arranged, for instance a bitumen product or a polyvinyl product, or an ethylene-propylene-diene-monomer product. Roof covering 4 is glued and/or sealed, wherein a hole is cut in roof covering 4 at the position of opening 2.

[0015] Fig. 1B shows a schematic section of a possible embodiment of a roof duct according to the invention, consisting of a sheet of flexible material 5, for instance a polyvinyl product or an ethylene-propylene-diene-monomer product, in which is made an opening 6, the edge of which protrudes into a metal tube 7 and is there glued or sealed. Roof covering 4 is again glued or sealed, wherein a hole is cut at the position of an opening in the roof for covering. Tube 7 is placed through this opening, wherein sheet 5 comes to rest on the roof covering and can be glued or sealed thereto.

[0016] Fig. 2A shows a schematic section of an alternative embodiment of a roof duct according to the invention. An opening 6, the edge of which protrudes into tube 7, is arranged in material 5. Slid into tube 7 is a metal inner tube 8, a first part 9 of which lies against the inward protruding edge of the sheet-like part and a second part 10 of which lies against the inner wall of tube 7. Tube 7, inner tube 8 and the protrusion in material 5 can be glued to each other. In addition or instead it is also possible to provide tube 7 with a constriction at the position of a transition between first part 9 and second part 10 of inner tube 8. The constriction can for instance be made with a per se known, radially symmetrically operating press 11, as is for instance used to mount connectors on hydraulic conduits. Using the constriction a very strong connection is obtained between tube 7, the protrusion and tube 8. Because the constriction is arranged some distance from the outer end of tube 7, material 5 retains its full thickness and strength at the position of the transition to the protrusion, whereby the chance of the roof duct being damaged during mounting is small and the roof duct has a long lifespan.

[0017] Fig. 2B shows a schematic section of a further alternative embodiment of a roof duct according to the invention, which in fact corresponds wholly with the roof duct shown in Fig. 2A but wherein it is not possible to glue the protrusion of material 5 into tube 7. Inner tube 8 is therefore pressed downward from above into opening 6 and in this way holds the protrusion of material 5 in place. As indicated in the figure, tube 7 can then be slid upward from below over inner tube 8 and over the protrusion, after which a constriction is arranged in tube 7 at the position of a transition between first part 9 and second part 10 of inner tube 8 using press 11.

[0018] Fig. 3A shows a schematic section of a further alternative embodiment of a roof duct according to the invention. Tube 7 is provided at an outer end with a widened portion 12, for instance by pressing tube 7 beforehand onto a tapered mandrel.

[0019] Made in material 5 is an opening 6, the edge of which protrudes into the widened part of tube 7. A metal inner tube 8 is slid into tube 7. The widened portion in tube 7 is chosen such that inner tube 8 lies against the inward protruding edge of the sheet-like part and against the inner wall of tube 7. Tube 7, inner tube 8 and the protrusion in material 5 can be glued to each other. In addition or instead it is also possible to provide tube 7 with a constriction at the position of the transition between tube 7 and the widened part of tube 7. The constriction can for instance be made with a per se known radially symmetrically operating press 11, as is for instance used to mount connectors on hydraulic conduits. Using the constriction a very strong connection is obtained between tube 7, the protrusion and tube 8. Because the constriction is arranged some distance from the outer end of tube 7, material 5 retains its full thickness and strength at the position of the transition to the protrusion, whereby the chance of the roof duct being damaged during mounting is small and the roof duct has a long lifespan.

[0020] Fig. 3B shows a schematic section of an embodiment of a roof duct according to the invention which is suitable for throughfeed of conduits. Arranged in material 5 is an opening 6, the edge of which protrudes into a metal tube 7. Slid into tube 7 is a metal inner tube 8, a first part 9 of which lies against the inward protruding edge of the sheet-like part and a second part 10 of which lies against the inner wall of tube 7 and then continues on and forms a bend. Tube 7, inner tube 8 and the protrusion in material 5 are mutually connected by providing tube 7 with a constriction 13 at the position of a transition between first part 9 and second part 10 of inner tube 8. Using the constriction a very strong connection is obtained between the protrusion and tube 7. Because the constriction is arranged some distance from the outer end of tube 7, material 5 retains its full thickness and strength at the position of the transition to the protrusion.

Claims

1. Roof duct for an at least substantially flat roof for draining rainwater or for carrying conduits, venting ducts and the like through the roof, comprising a metal tube forming the actual duct and a sheet-like part which is connected to the metal tube and which rests on the roof in a position of use, **characterized in that** the sheet-like part is manufactured from a flexible plastic or from a bitumen product.
2. Roof duct as claimed in claim 1, **characterized in that** the sheet-like part is provided with an opening, an edge of which protrudes into the metal tube such that the collar is formed in its entirety by the sheet-like part.
3. Roof duct as claimed in claim 2, **characterized in that** the edge is glued against an inner wall of the metal tube.
4. Roof duct as claimed in claim 2 or 3, **characterized in that** the roof duct also comprises an inner tube, a first part of which lies against the inward protruding edge of the sheet-like part and a second part of which lies against the inner wall of the metal tube.
5. Roof duct as claimed in claim 4, **characterized in that** at the position of a transition from the first part to the second part the roof duct is provided with a constriction such that the edge of the sheet-like part is clamped between the metal tube and the inner tube.
6. Roof duct as claimed in any of the foregoing claims, wherein the metal tube is provided on the outside with a recess in which a rubber ring is arranged.
7. Roof duct as claimed in any of the foregoing claims, wherein the metal tube is manufactured substantially from anodized aluminium.
8. Method for manufacturing a roof duct, wherein a metal tube is provided with a sheet-like part which rests on the roof in a position of use, **characterized in that** an opening is made in a sheet-like part manufactured from a flexible plastic or from a bitumen product, and that an edge of the opening is protruded into the metal tube, after which an inner tube is placed in the metal tube such that the inward protruding edge is situated at least partially between the metal tube and the inner tube.
9. Method as claimed in claim 8, **characterized in that** before the inner tube is placed the inward protruding edge is glued to an inner wall of the metal tube.
10. Method as claimed in claim 9, **characterized in that**, before the inward protruding edge is glued to the inner wall of the metal tube, this inner wall is roughened, degreased and provided with a primer.
11. Method as claimed in claim 10, **characterized in that** after drying of the primer an adhesive layer of a type associated with the flexible plastic or the bitumen product is applied to the primer.
12. Method as claimed in any of the claims 8-11, **characterized in that**, before the inner tube is placed, a diameter of a first part of the inner tube is reduced or that a diameter of a remaining second part is increased such that, after placing, the first part lies at least substantially against the inward protruding edge of the sheet-like part, and the remaining second part lies at least substantially against the inner wall of the metal tube.
13. Method as claimed in any of the claims 8-11, **characterized in that**, before the edge of the opening is protruded into a part of the metal tube, an inner diameter of this part is increased such that, after placing, the inner tube lies at least substantially against the inward protruding edge of the sheet-like part and against the inner wall of the metal tube.
14. Method as claimed in claim 12 or 13, **characterized in that** the metal tube is provided with a constriction such that the edge of the opening of the sheet-like part is clamped between the metal tube and the inner tube.

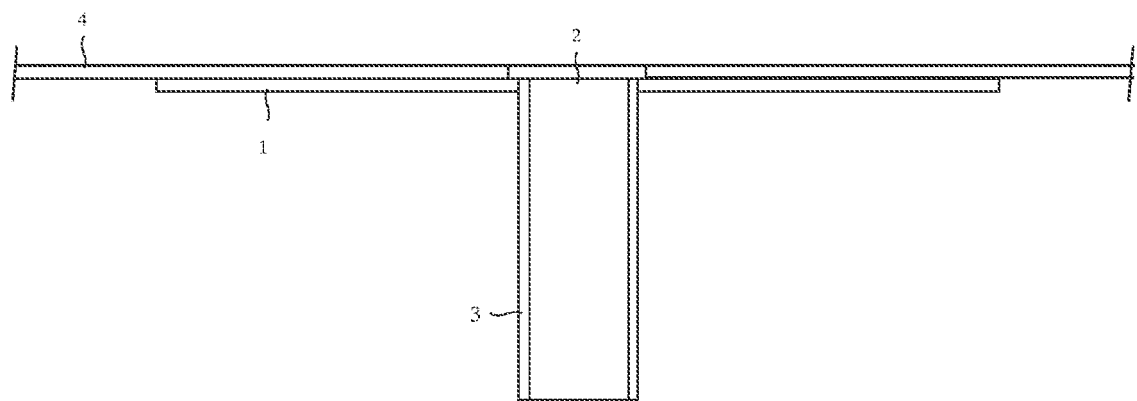


Fig. 1A

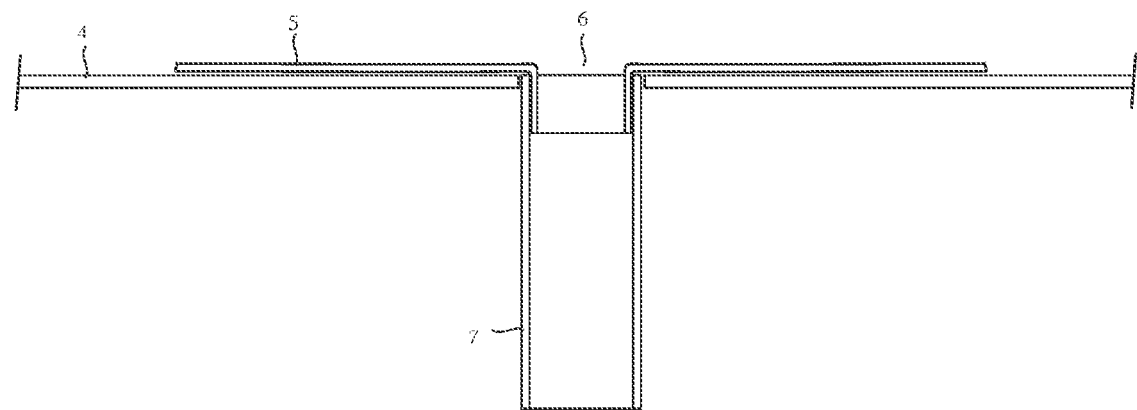
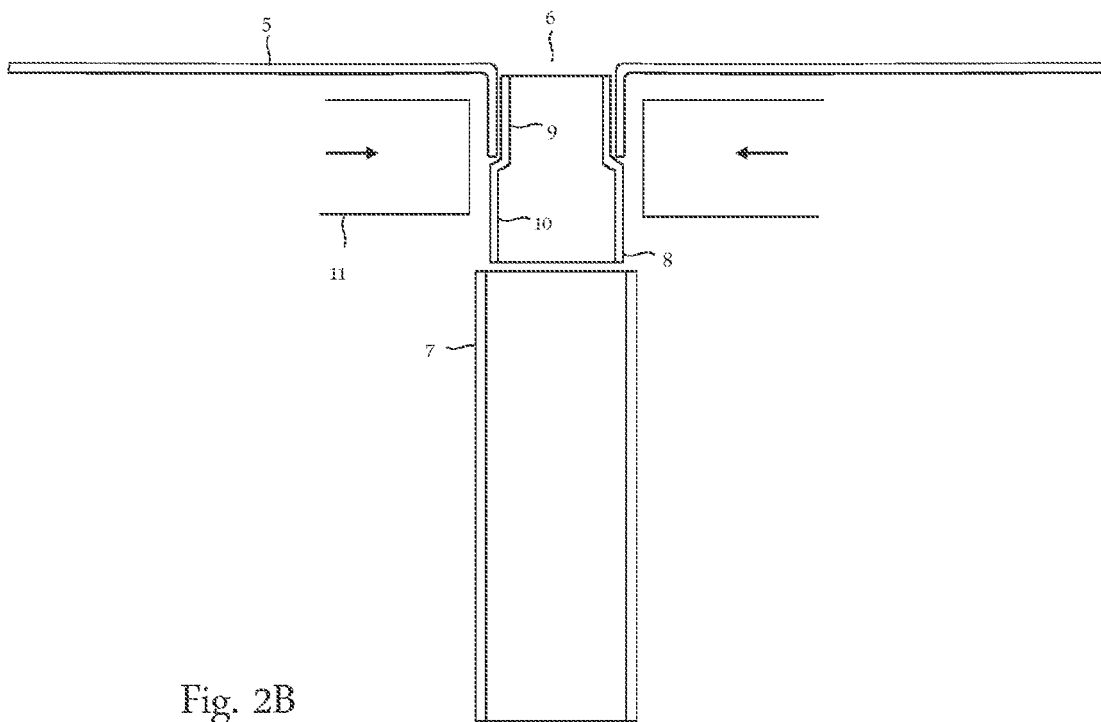
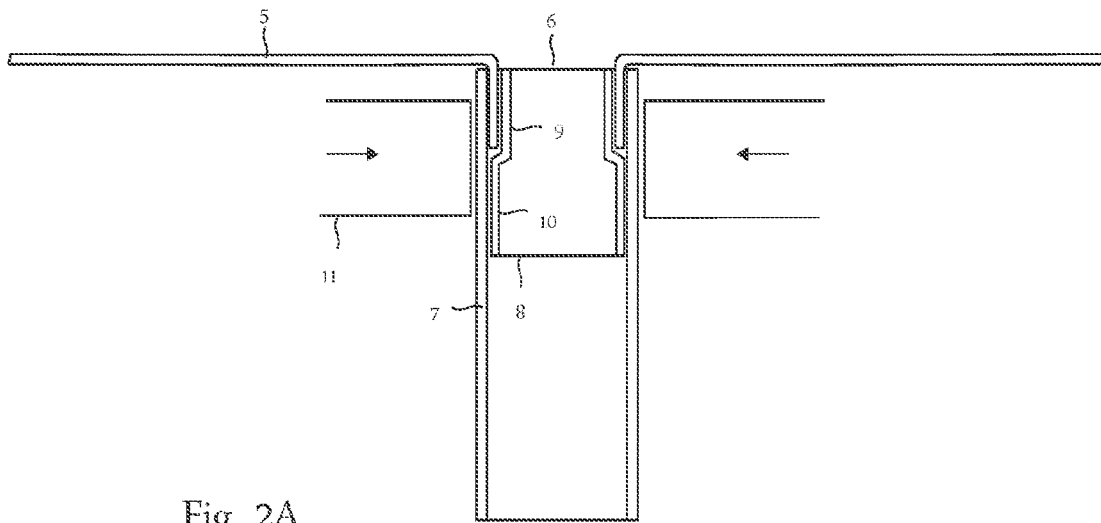


Fig. 1B



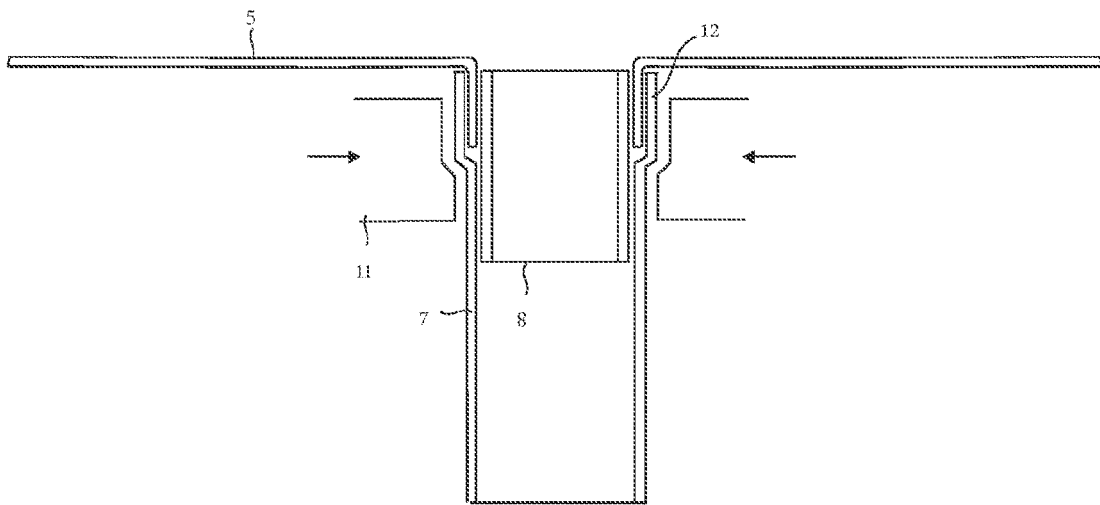


Fig. 3A

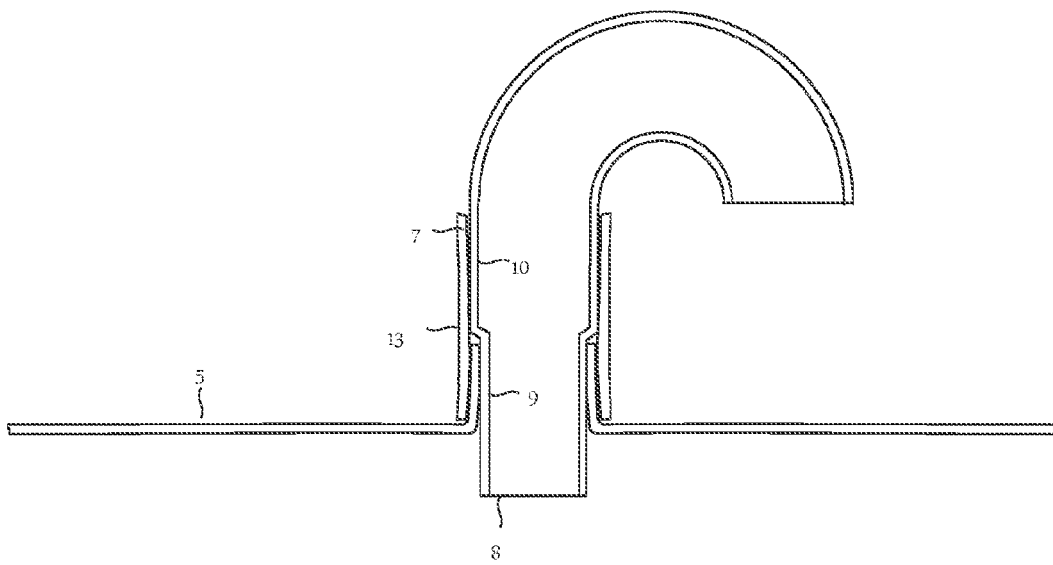


Fig. 3B



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 3559

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Place of search The Hague		Date of completion of the search 16 August 2010	Examiner Demeester, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (F04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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