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(54) **ROOF FLASHING FOR A PIPE OR DUCT**

(57) The invention relates to a flashing (1) for a pipe or duct passing through a seamed roof. The flashing (1) comprises a collar (2) at the upper end of which is provided an opening (3) for the pipe or duct, and a substantially flat flange (4) to which the lower end of the collar (2) is joined, which flange (4) is configured to be attached to a portion of a roof, whereby a plane through the upper

and lower edges of the opening (3) in the upper end of the collar (2) is set inclined by an angle in a range between 25° and 35° relative to the plane defined by the flange (4). The opening (3) at the upper end of the collar (2) has an oval or oblong shape, facilitating the use of the flashing (1) at various roof pitch angles without the collar (2) being modified.

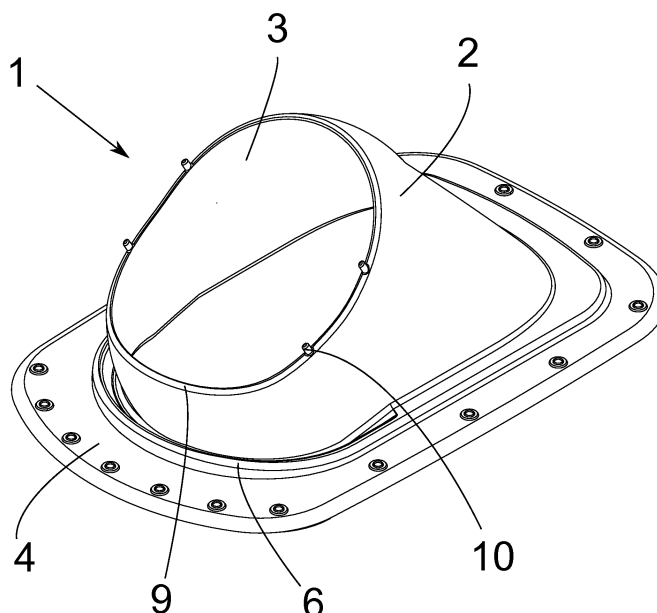


Fig. 1

Description

Technical field

[0001] The invention relates to a flashing for a pipe or duct passing through a roof. In particular, the invention relates to a flashing for a pipe or duct passing through a seamed roof.

Technical background

[0002] A building is often provided with leadthroughs, or openings for ducts and pipes passing through the roof of the building. The leadthroughs represent discontinuities in the weatherproofing roofing material and are commonly designed to preserve the tightness of the roof to water and snow. For this reason, various structures have been developed for sealing roof leadthroughs, exit openings and the like.

[0003] For example in international patent application WO 2004/003311 is disclosed a flashing for a roof having a profiled roofing, in particular for a roof assembled from profiled roofing elements, whereby the flashing comprises a collar surrounding the duct and a flange connecting to the roofing. The flange is designed to be mounted beneath the roofing element in such a manner that only the collar protrudes from an opening formed in the roofing element, the flange having a shape fitting the profile of the roofing element, and in the upper surface of the flange are provided a plurality of parallel, annular grooves for sealing compound, the grooves surrounding the collar.

[0004] For seamed roofing, various systems and methods are required for sealing an opening in the roofing, which consists of essentially flat sheets joined by standing seams. For example in US patent 4,497,151 is disclosed an arrangement for such a metal sheet roof formed of elongated sheets with standing seams. Seamed roofs of this kind often have a pitch in the range 13 to 50 degrees to ensure sufficient drainage.

[0005] For example in US patent 5,027,576 a system is disclosed for sealing an opening in a roof at the site of a penetrating pipe, whereby there is at least one standing seam coinciding with the opening and the flange is dimensioned in such a manner that it extends over the periphery of the opening in each direction, defining an overlap area extending essentially over the whole periphery of the opening, the arrangement including a sealing member for sealing the area where the flange, the standing seam and the opening meet; a stiffening member to be mounted on the opposite side of the roof surface relative to the flange and at least partially within the overlap area; and a fastening member for penetrating and joining together the sealing member, the flange, the roof surface and the stiffening member within the overlap area. This flashing construction is complicated and requires a significant amount of labor as the arrangement is attached to the roof. Dedicated structures are required for roofs with different pitch angles.

[0006] Various designs using bellows-type portions in the flashing are known. In US patent application Pub.No. 2013/0020796 is disclosed a one-piece roof flashing for a vent pipe leadthrough. The flashing includes a base having a planar flange with a raised center portion connected to a corrugated portion joined to an outer sleeve. The outer sleeve in turn is joined to a downwardly-depending inner sleeve extending into the top end of the vent pipe. The corrugated portion flexes to accommodate various roof pitch angles and pipe heights.

[0007] Bellows-type designs require fixing the pipe or duct beneath the roof, as no support is provided by the flashing itself. Bellows materials may not be so durable as less flexible plastics.

Summary of the invention

[0008] In the light of the foregoing, there is a need for a roof flashing useful for seamed roofs having various degrees of pitch angle. A seamed roof in this context refers to a roof covered with an essentially flat or planar roofing material. Such materials are, beside sheet metal, for example stone, fiber cement or felt. A seamed metal sheet roof is usually made using metal sheet strips joined by interfolded, standing seams.

[0009] Further, there is a need for a compact penetration flashing. Such flashing should be produced in an uncomplicated and economically efficient manner on an industrial scale.

[0010] The invention is characterized by the features defined in the independent claims. Particular embodiments are defined in the dependent claims.

[0011] According to the present invention, there is provided a flashing for a pipe or duct which is to penetrate a roof such as a seamed roof; the flashing comprising a collar (also called a "helmet" or "cupola") having an upper and a lower end; at the upper end is provided an opening for the pipe or duct; the flashing further comprising a substantially flat flange to which the lower end of the collar is joined, which flange is configured to be attached to a portion of a roof; whereby a plane through the upper and lower edges of the opening in the upper end of the collar is set inclined by an angle in a range between 25° and 35° relative to the plane defined by the flange.

[0012] The flashing according to the invention is particularly suited for roofs having a pitch in a range between 13° and 50°.

[0013] By the upper edge of the opening is meant the highest point of the edge to be situated in the direction of the roof ridge and by the lower edge of the opening is meant the highest point of the edge to be situated in the direction of the eave.

[0014] The projection into the plane through the upper and lower edges of the opening at the upper end of the collar in non-circular, namely it has an oval or oblong shape. Oval or oblong in this context may but does not necessarily mean ovoid or elliptical, but for example a shape of two semicircles joined by two lines of equal

length, geometrically a stadium, is meant to be included. The shape of the opening needs not be strictly geometrically defined, as long as it allows sufficient variation of the pipe position.

[0015] The lower end of the collar is attached to the flange, which inside the collar has a corresponding opening of at least the same size as the opening at the upper end of the collar.

[0016] The opening of the collar is oblong to enable use of the flashing at all roof pitch angles in the range 13 to 50 degrees so, that the pipe duct led through the flashing may be mounted vertically without the collar being modified.

[0017] The flashing is preferably manufactured as a single piece using injection moulding.

[0018] According to an embodiment, the undersurface of the flashing is provided with an integrated seal of thermoplastic elastomer along the edges of the flange. The integrated seal is preferably manufactured by a multi-component injection moulding process. Preferably, the width of the integrated seal is larger at the edge to be mounted facing the roof ridge than the width of the integrated seal along the sides and the edge to be mounted facing the eave.

[0019] Considerable advantages are obtained by the present invention. The flashing is compact and can be fixedly attached to the roof by means of screw fastening. Subsequently, the pipe or duct can be installed in a substantially vertical position due the angle of inclination of the plane of the opening of the collar. According to the invention, a single flashing can be used for different roofs each having a different pitch angle due to a combination of the shape of the collar, namely the oblong shape of the opening, and the inclination angle of the plane of the opening. Preferably, the flashing according to the invention is used with a prior art pipe having a tightly connected, preferably integral, dome shaped part for overlapping the collar. The pipe may thereby be supported by the flashing where the dome-shaped part contacts the collar.

[0020] The flashing may be manufactured simply, cost effectively, and on an industrial scale.

Brief description of the drawings

[0021]

FIGURE 1 represents a first perspective view of a flashing for a pipe duct in accordance with at least some embodiments of the present invention,

FIGURE 2 represents a second perspective view of a flashing for a pipe duct in accordance with at least some embodiments of the present invention,

FIGURE 3 represents a perspective view of a prior art pipe having a fixed dome-shaped portion being fitted to a flashing according to an embodiment of the present invention,

FIGURE 4 represents a sectional side view of a flashing for a pipe duct in accordance with at least some embodiments of the present invention,

FIGURE 5 represents a schematic view of an opening of a collar of a flashing for a pipe duct in accordance with at least some embodiments of the present invention.

Disclosure of embodiments

[0022] The flashing is particularly designed for a seamed roof or for a roofing element shaped as a seamed roof. The mounting of the flashing may be carried out rapidly due to the simple and compact structure. The same flashing may be used for various roofs, each having a different pitch.

[0023] Fig. 1 shows a first perspective view of a flashing 1 according to at least some embodiment of the flashing 1 according to the present invention. The flashing 1 comprises collar 2 having an oblong opening 3 for a pipe duct (not shown), and a substantially planar flange 4. Collar 2 is thus formed, that the flashing 1 may be used for any roof pitch in the range 13° to 50°. In other words, the flashing 1 may be used for various seamed roofs having a pitch in the mentioned range, for example 35°. The oblong shape of opening 3 facilitates this. The plane defined by the upper and lower edges of opening 3 is inclined by an angle α which is in the range 25° - 35° relative to the plane defined by flange 4; preferably, the angle α is 30°. The collar 2 in the embodiment shown is provided with four connection points 10 for attaching to an underlayment seal (not shown). The body of the flashing 1 is preferably manufactured from a polymer material, e.g. polypropylene.

[0024] The opening 3 of collar 2 is dimensioned to receive commonly used pipe sizes, for example up to 160 mm.

[0025] Further, the flashing comprises a substantially planar flange 4, which is adapted for fastening to a roof section having a pitch in the range 13° - 50°. The flashing can be mounted on top of the roofing material, and is preferably fastened using screws. According to preferable embodiments, a sealing compound e.g. silicone, is used on the undersurface of the flange 4. On the side of the roof ridge, the flange 4 is provided with a raised portion 6. The edge of a dome-shaped part (not shown) tightly fixed to the pipe duct sets between the raised portion 6 and the collar 2.

[0026] Flashing 1 is advantageously manufactured in one piece using injection molding technology.

[0027] The flashing 1 may be used on any seamed roof having a pitch in the range 13° - 50° due to the design of collar 2, namely the oblong shape of opening 3 and the inclination of the plane defined by the edges of opening 3. The flashing is to be mounted following the application of the weatherproofing roofing material.

[0028] Fig. 2 shows another perspective angle of a

flashing according to at least some embodiments of the present invention. Between the raised portion 6 and the collar 2 is a groove 7 for receiving the edge of a dome-shaped part (not shown) water-tightly fitted to the pipe. The distance between the bottom of groove 7 and the upper edge of the collar opening 3 define the damming height of the flashing.

[0029] Fig. 3 shows how a vent pipe is mounted to a flashing according to an embodiment of the invention. The pipe 11 is provided with a dome-shaped portion 12, which is sealed to the pipe in a water-tight fashion and is preferably an integral part of the pipe section penetrating the roof. The dome-shaped portion overlaps the collar 2, allowing for varying the angle between the plane determined by the flange 4 (i.e. the plane of the relevant roof section) and the vertical axis of the pipe while maintaining a configuration which does not allow entry of water or snow past the flashing. The pipe 11 is supported at the contact area between the collar 2 and the dome-shaped portion 12. Screws may be used for securing the dome-shaped portion to the collar. Thus, the pipe becomes fixed to the roof structure.

[0030] Figure 4 shows a side view section of a roof flashing according to an embodiment of the invention. The flashing 1 comprises a collar 2 with an opening 3 for a pipe. Further, the flashing comprises a substantially planar flange 4 adapted for fastening to a section of the roof. The flashing 1 preferably comprises a seal 5 of thermoplastic elastomer integrated in its undersurface, along the edges of the flange. The integrated seal 5 is preferably made by two-component injection molding in the same step as the body of the flashing. Preferably, the width of the seal 5 is greater at the side of the roof ridge than its width at the side edges and the eave side. The sealing system is adapted to improve the durability of the sealing and to provide a tight joint especially where the water load is largest.

[0031] In the alternative, a separate seal and a single-component plastic flashing may be used.

[0032] Further referring to Fig. 4, the plane A-A through the upper and lower edges of the opening 3 is inclined by the angle α , which is in the range $25^\circ - 35^\circ$ relative to the plane B-B in the direction of the flange. According to an advantageous embodiment, the angle α is 30° . The opening 3 is oblong and the collar 2 is thus adapted for mounting a pipe substantially vertically at various roof pitches, for example at any pitch angle in the range $13^\circ - 50^\circ$.

[0033] Fig. 5 shows a schematic view of a projection into plane A-A of the opening in collar 2 of a flashing in accordance with the invention. The figure is schematic and does not limit the shape or proportions of the opening. The opening 3 is in this example a geometrical stadium, its smaller width being marked x, and the edges which are closer to each other are in the direction of the roof pitch. The distance x is such as to receive a pipe of a diameter suitable for pipes used in the relevant field. For example, dimensions up to 160 mm are commonly

used but other sizes are possible. The greatest width of the opening is marked y, and it is the distance between the upper and lower edges of the opening as set out above. The oblong shape of the opening allows for mounting a throughgoing pipe and setting it substantially vertically independently of the pitch of the roof and the flange when said pitch is in the range $13^\circ - 50^\circ$.

10 Claims

1. A flashing (1) for a pipe or duct leadthrough for use on a seamed roof, comprising

- a collar (2) having at its upper end an opening (3) for the pipe or duct, the opening having an upper edge at the side of the roof ridge and a lower edge at the side of the eave,
- a substantially planar flange (4) adapted for fastening to a roof section, said flange defining a plane,

characterized in that a plane through the upper and lower edges of the opening (A-A) is set at an angle (α) relative to the plane (B-B) defined by the flange (4), said angle (α) being in the range 25 to 35 degrees; and the projection of the opening (3) into the plane through the upper and lower edges of the opening is oblong.

2. A flashing (1) according to claim 1, whereby the angle (α) is 30 degrees.

3. A flashing (1) according to claim 1, having a raised portion (6) on the flange (4) at the side of the roof ridge, providing a groove (7) between the raised portion (6) and the collar (2).

4. A flashing (1) according to any claim 1 - 3, having a seal (5) of thermoplastic polymer on the undersurface of the flange (4).

5. A flashing (1) according to claim 4, whereby the width of the seal (5) is greater at the edge facing the roof ridge than at the other edges.

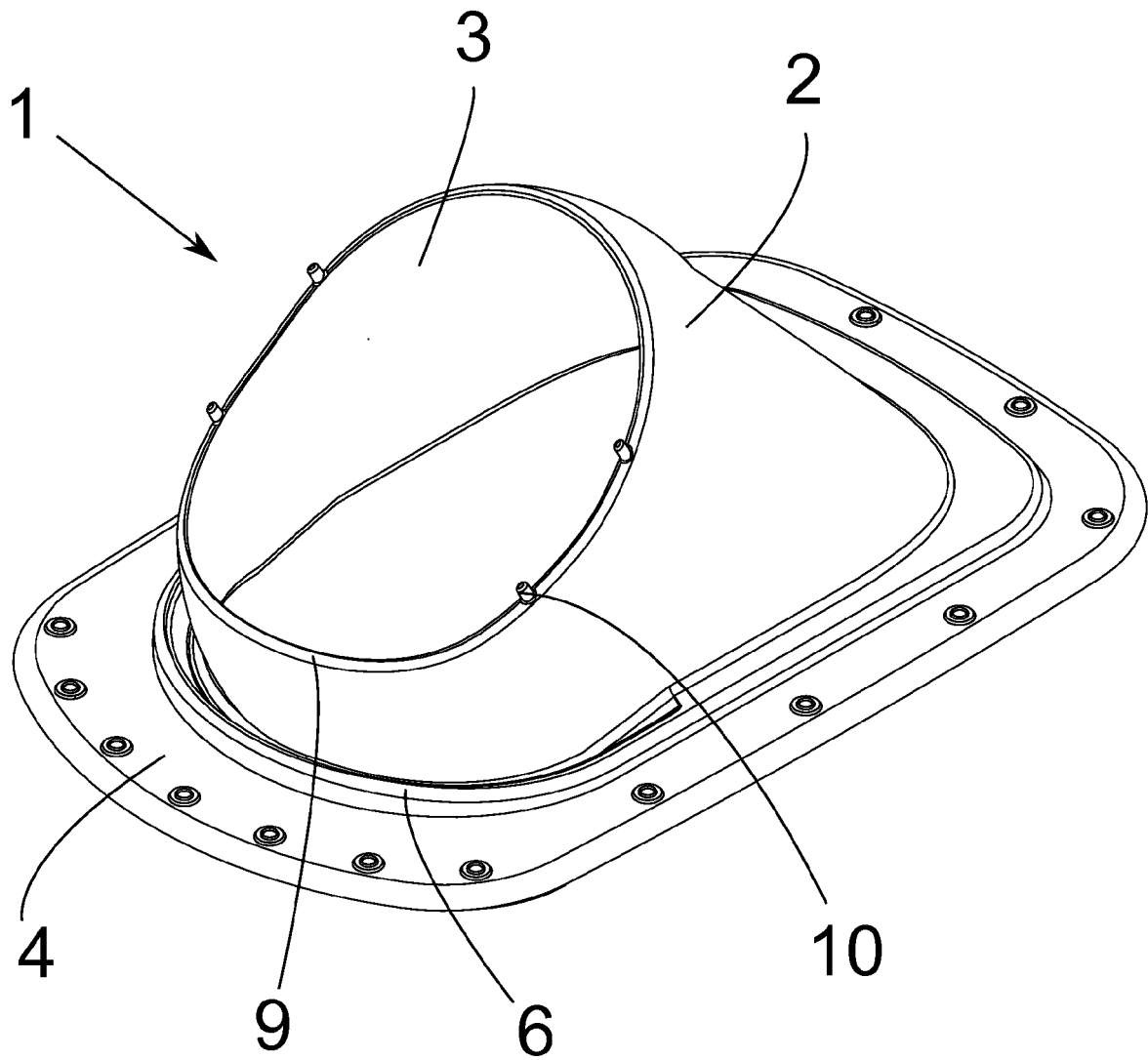


Fig. 1

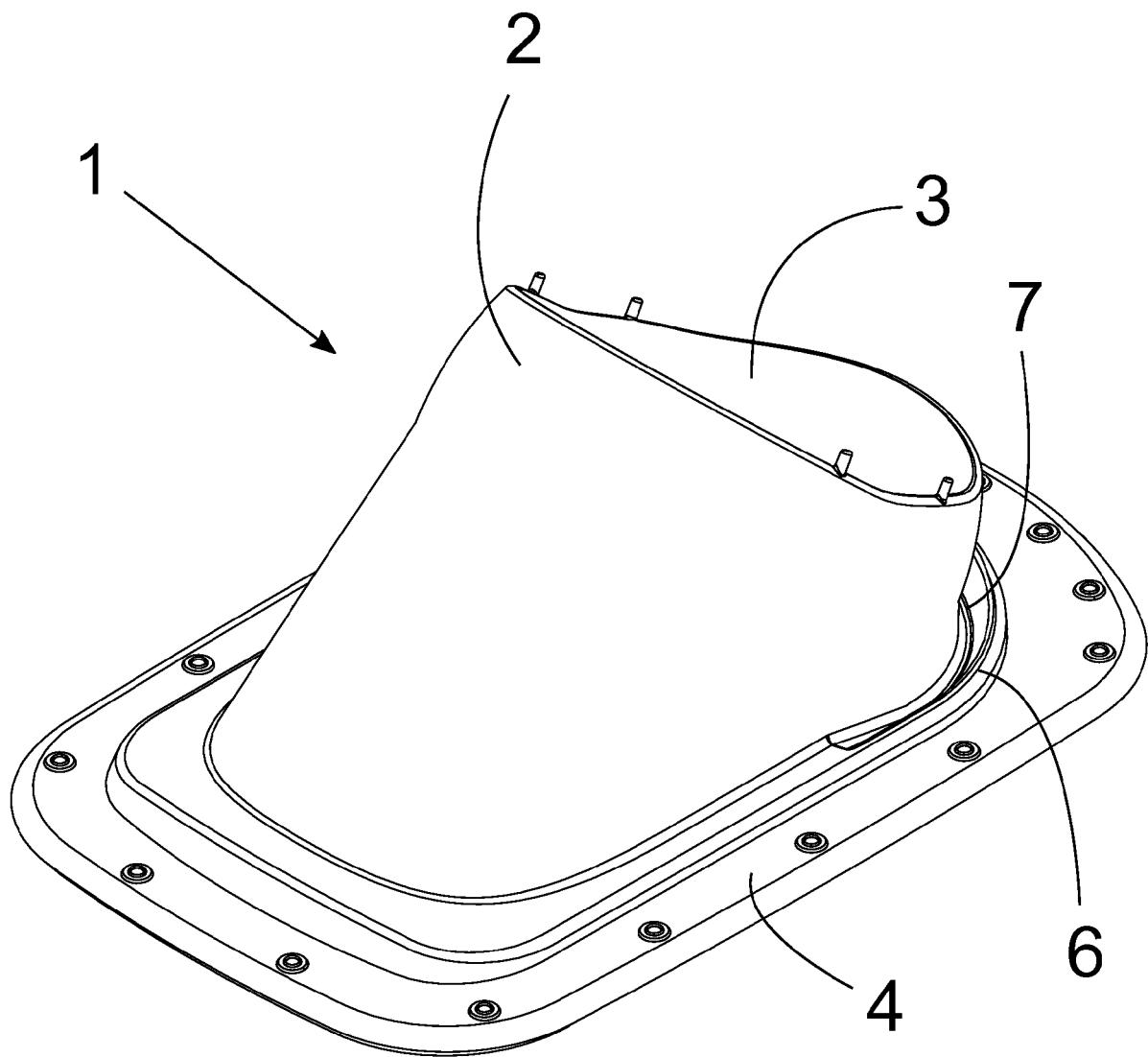


Fig. 2

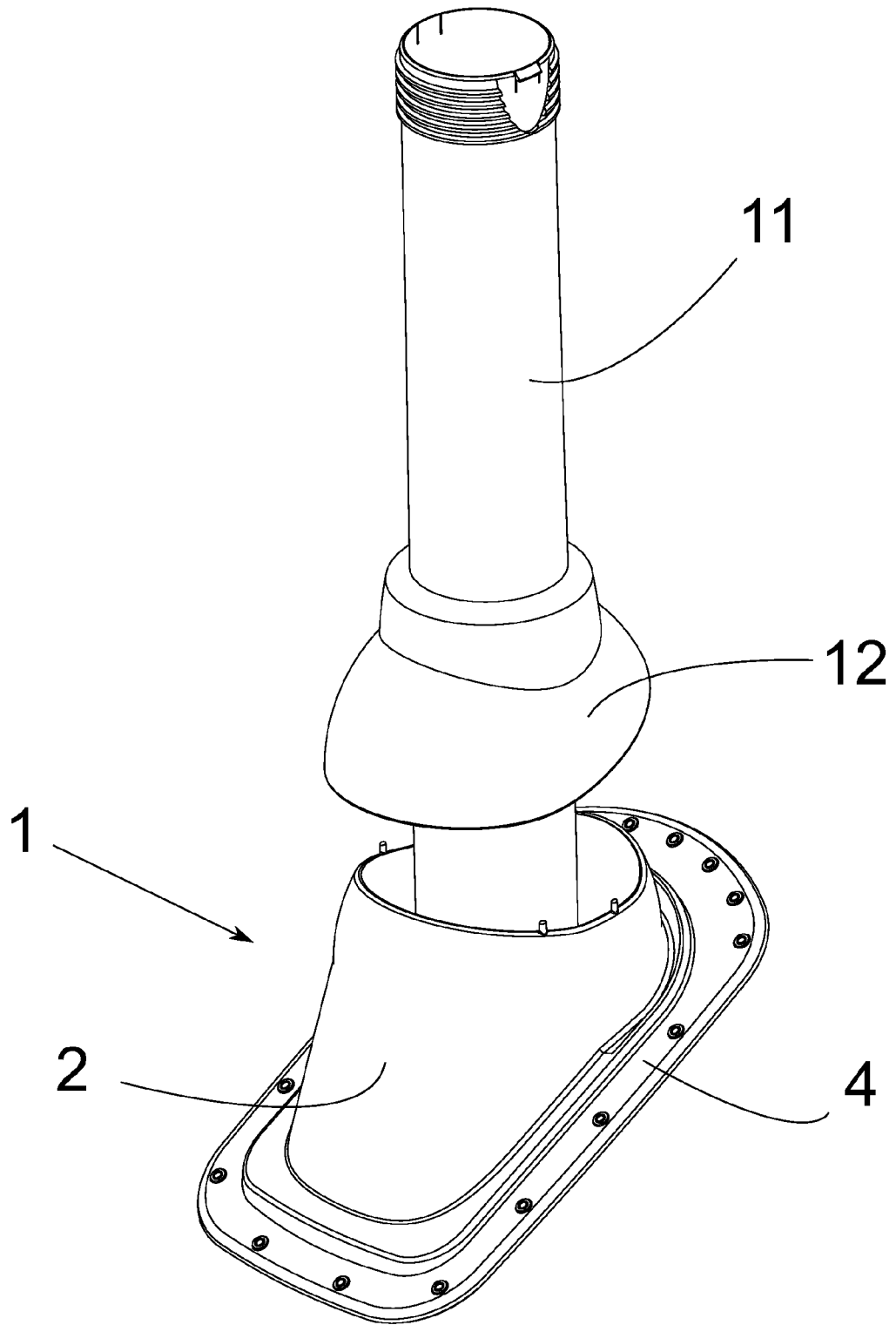


Fig. 3

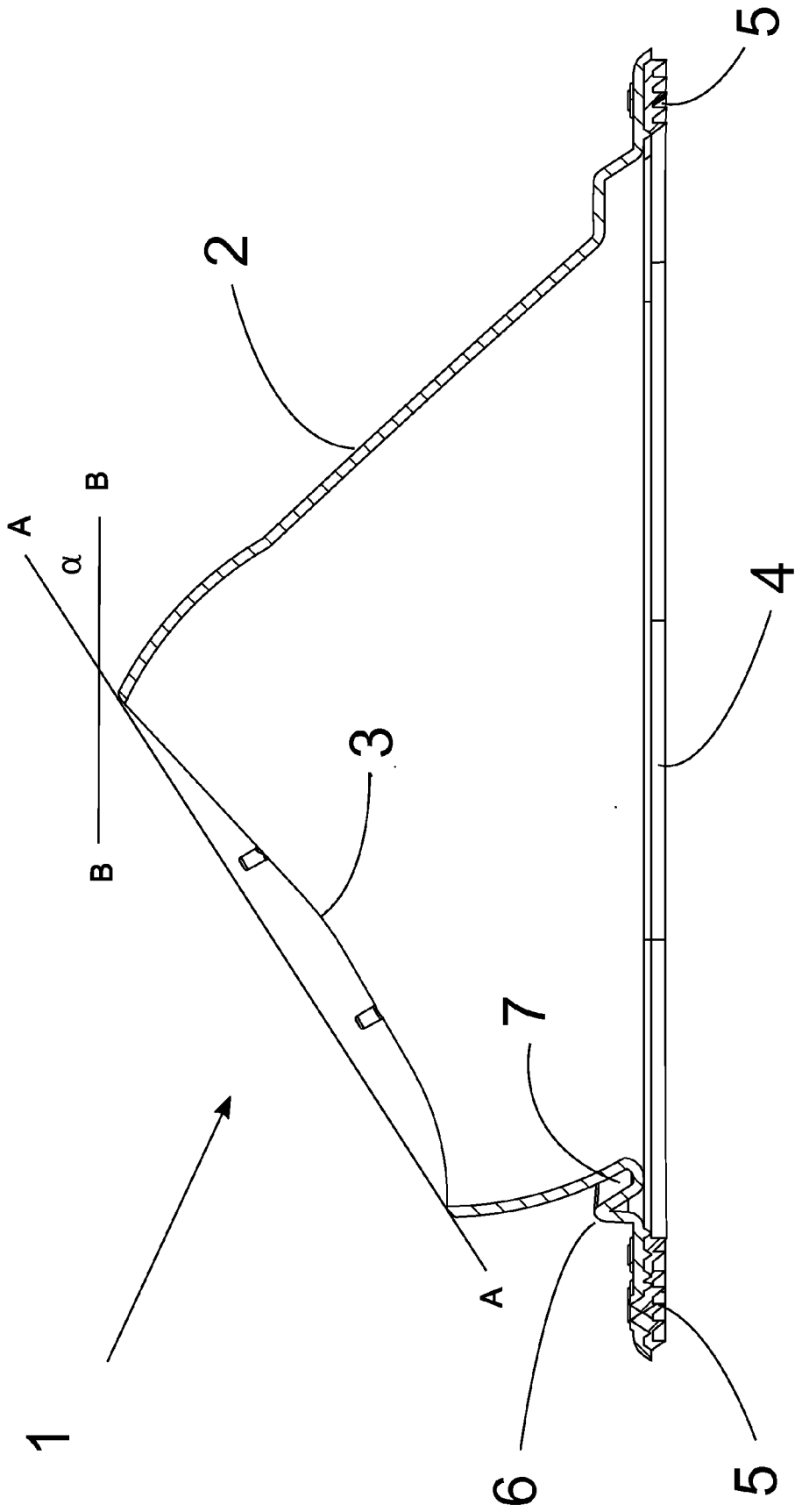


Fig. 4

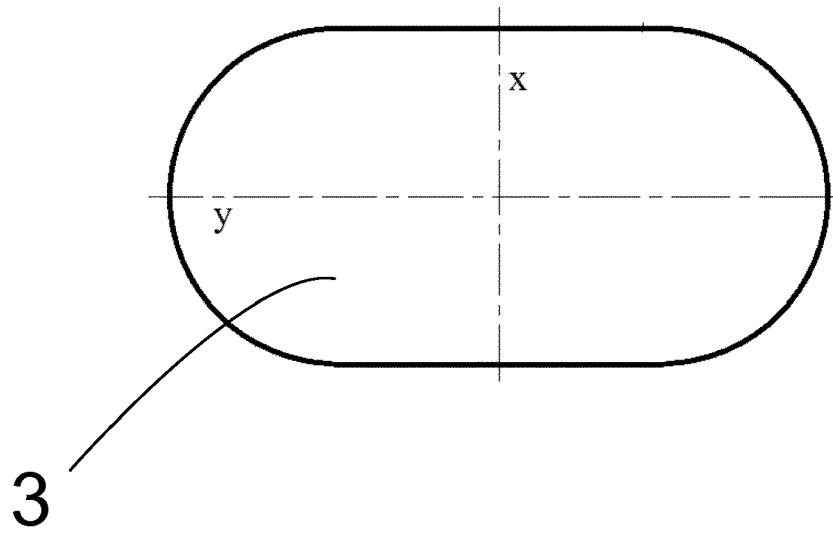


Fig. 5



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Application Number
EP 16 39 7523

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Place of search The Hague		Date of completion of the search 17 October 2016	Examiner Leroux, Corentine
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