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(54) **Collar connecting a construction structure penetrating the roof to the sub-roofing structure**

(57) Collar made of any flexible and water-proof material, having the shape of a frame surrounding the structure seated in the roof, consisting of elements, permanently connected to each other into a closed circuit, is characterised by that the elements arranged not in parallel against the battens (3) constitute strips connected to each other advantageously in parallel, limited at the outer side with a strip (8) of a material with easily extendible and at the same time water-tight structure.

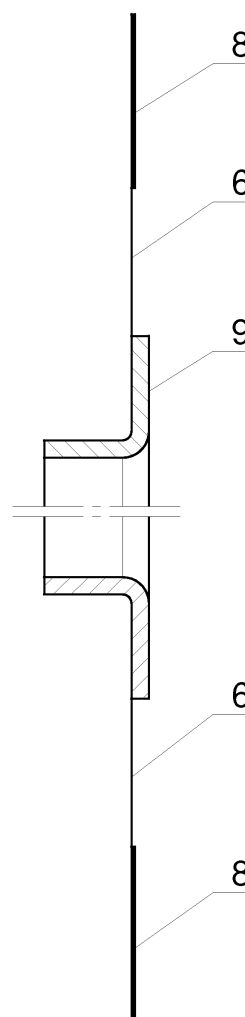


Fig. 4

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Description

[0001] The invention relates to a collar connecting any construction structure penetrating the roof to the sub-roofing structure, for instance a roof window frame or a chimney, with an outer membrane insulating deeper layers of the sub-roofing structure from the elements.

[0002] A solution of sealing roof windows with a shield comprising a water-tight covering encompassing the aperture, where the shield walls in the area of the aperture are stretched perpendicularly, and the outer walls are in parallel to the roof slope is known from DE 3 442 276 A1. A drawback of this solution is most of all lack of possibility to bend and pack the shield for transport purposes. In addition, it does not ensure a tight contact of the shield with the irregular surface of the roof structure.

[0003] Also a solution of sealing of the connection of elements going through the roof to its outer layer with elements made of a thin-walled, rigid and deformable material is known from DE 2 554 341. The original shape of the sealing in the form of a flat ring sector with coaxial arc-wise edges, after straightening of the inner ring edge causes formation of a material allowance at the outer side of the ring. This allowance is used, by mechanical deformation, for fitting the sealing to the irregular shape of the roof outer surface. This solution protects only against typical precipitation, but it does not ensure tightness and thermal insulation in the sub-roofing layer, and moreover its assembly is labour intensive.

[0004] Also a building element is known from PCT/DK95/00157 (WO 95/28537), which in one of its embodiments consists of a uniform collar or rim element and is fitted with foil sections basically parallel to the roof covering. The purpose and function of these sections appears to be, by placing them adjacent to the covering insulating foil, the sealing of connection of the roof covering to the structure penetrating the roof. This solution may be effective in many cases. However, it requires basically continuous and rather flat contact surface. A typical design of this part of the roof covering, with a foil and battens at the outer side, does not meet this requirement without additional work consisting in partial dismantling or at least loosening of battens fastening in the part of covering intended for the said building element. Failure to perform these operations leads to the formation of areas of insulation discontinuity near the battens, thus increasing the risk of moisture entry into the inner roofing and at the same time enables an uncontrolled flow of air and heat losses.

[0005] Also a collar for hermetic connection of building structures, penetrating the roof, with an outer membrane protecting against the elements and with battens seated on the membrane is known from application P-338 074 (WO 9902799). The collar consists of four components connected to each other, which have edges - the inner one, secured to the outer surface of a component of the building structure penetrating the roof - and the outer one, encompassing the battens and resting against the

membrane between the battens.

[0006] The collar elements are made of segments of a flexible and water-proof material, in addition the elements to be set cross-wise to the battens are longer than the construction structure elements to which they are going to be connected, and are bent, for instant into folds, in order to adjust the length of the collar inner edge to the length of the perimeter of the construction structure for which the collar is intended. After mounting the collar inner edge along the outer perimeter of the construction structure, the folds at the outer edge side will unfold so that they encompass the battens located over the outer membrane and adjoin the membrane between the battens.

[0007] The folded side elements of the collar are factory protected against unfolding or parting by backing with two paper strips, in addition one strip is glued along the inner edge of the collar element and thus it stabilises the length of the collar inner edge, while the other paper strip is glued at a some distance from the outer edge and protects folds against parting during transport and assembly of the collar. After connecting the collar inner edge to the construction structure, the other strip should be torn apart, so that the folds at the collar outer perimeter side could unfold freely.

[0008] The collar inner edge, protected with the glued-on paper strip is not durable enough. A damage to the strip during transport or assembly, and unfolding of folds makes the collar unsuitable and requires it to be manually refolded during connecting it to the construction structure seated in the roof.

[0009] Making the collar with side elements folded or otherwise bent to adjust their length to the length of the construction structure elements to which they are to be connected requires additional time and effort and expensive folding equipment to be used.

[0010] The purpose of the invention is to implement a collar for sealing the connection of the construction structure penetrating the roof to the sub-roofing structure, easy to assembly and effectively performing its function, having a shape of a frame surrounding the structure mounted in the roof, consisting of elements, advantageously permanently connected to each other into a closed circuit, with the internal edge enabling the collar to be connected to the outer perimeter of the construction structure.

[0011] The essence of the invention is that the collar elements arranged angularly against the battens, which most often are side elements, consist of a few, at least two strips connected in parallel and hermetically, in addition every one of them, apart from insulating the inner roof covering from the weather, performs an additional, separate function.

[0012] The outer strip constitutes a rectangular element of easily stretched, water-tight and one-sided adhesive material, permanently connected to the assembly of elements with the length equal to the total length of the collar. The material has a composite structure which

enable the strip to be stretched, permanently or not, only to a limited extent. The strip width is selected so as to ensure its free shaping and tight securing to the ridge beam and the insulating membrane surface. The main functional purpose of the outer strip is, by plastic deformation and stretching, its accurate and hermetic contact to the uneven surface which is formed e.g. by the battens and the insulating membrane, which is most often mounted directly under the battens. This solution ensures basically a better tightness in relation to the known solutions, and increases thermal insulation in the crucial area of connection of the structure mounted in the roof to the roof covering. In addition manufacturing of the collar is simple and for instance does not require an expensive folding device to be used.

[0013] The inner strip, apart from any flexible, waterproof material has an additional layer secured to its inner side, going along its whole length, performing the thermal insulation function.

[0014] The thermal insulation material may be any, advantageously porous, flexible and easily compressible structure with good thermal insulation properties. The width of this additional layer may be adjusted subject to the needs, however it should be selected so that it encompasses most of the collar and should have at least the same width on the surface adjoining the roof. It is a particularly advantageous solution, improving the thermal resistance in the crucial area of connection of the roof slope to the structure penetrating the roof. During assembly, the inner part of the strip, after flanging and securing adjacent to the structure penetrating the roof, performs the function of collar adjoining the outer contour of the structure seated in the roof.

[0015] The collar elements arranged in parallel to the roof battens usually constitute flat strips of various widths, with additional layer performing the thermal insulation function, as for the cross-wise strips, secured to their inner side, going along their entire length. The strips are limited lengthwise with parallel flanks, with various lengths but with a common axis of symmetry. The shorter flanks consist of three segments, in addition the extreme segments are perpendicular to the lengthwise flanks and connected with an oblique segment. The segments forming a straight angle with the shorter lengthwise flank form the collar part adjoining the building structure penetrating the roof.

[0016] The collar according to the invention is shown in the embodiment example in the drawing, where fig.1 shows collar elements before they are connected into a closed circuit, fig. 2 shows the collar seated on the roof window frame and adjoining the sub-roofing structure, fig. 3 presents the shape of the collar itself assumed after seating on the window frame, and fig. 4 shows the cross-section through the collar ready to be assembled, where the location of additional thermal insulation is shown.

[0017] The collar 1 connecting the structure seated in the roof, in the example shown in the drawings - the roof window frame 2, with the sub-roofing structure insulating

membrane 4 secured to battens 3, consists of elements 5, 6 and 7 connected to each other forming a closed circuit.

[0018] The top element 5 and the bottom element 7 parallel to battens 3 constitute flat strips with various widths, limited lengthwise with parallel flanks d and e , with various lengths but with a common axis of symmetry, while the shorter flanks consist of three segments, respectively a , b and c in element 5 and a , b and c' in element 7, in addition the extreme segments a and c and c' are perpendicular to lengthwise flanks d and e and are connected with the oblique segment b . The segment a defines the height of the collar, adjoining the outer contour of the structure seated in the roof, and the segment c is longer than the segment c' .

[0019] The side elements 6 of the roof 1, arranged perpendicularly to the battens 3, have the shape of an even-armed trapezoid. The shorter sides of elements 6 consist of segments a and b , identical to the segments a and b of elements 4 and 5.

[0020] The side elements 6 have at their outer side a strip 8 made of a material with easily stretchable and at the same time water-tight structure.

[0021] The elements 5, 6, 7 are permanently connected to each other along the segments a and b into a closed circuit. The angle between the oblique sides b and the sides d or e of the element 6 is known and depends on the corresponding angle in the elements 5 and 7 arranged in parallel to the battens 3 and is usually 45° .

[0022] These elements have additional layer 9 located at their inner side, performing the thermal insulation function.

[0023] The insulation material may be any, advantageously porous, flexible and easily compressible structure with good thermal insulation properties. Among others the following materials can be used: polyurethane foam PURS, impregnated with suspended acrylic, PE polyethylene foam, flexible PU polyurethane foam, PVC foam and also cellular rubber EPDM. This layer is rectangle shaped, in addition its longer side is common with the sides respectively d and d' of elements 6, and 5 and 7 respectively. The shorter sides of the insulation layer 9 are limited advantageously by the segments a . The width of the layer 9 is so selected that it covers the whole part of collar intended for flanging with the length equal to the length of the segment a , and at least the same width on the surface adjacent to the roof. The flanging of the collar is enabled by a specific angular shape of the seam, consisting of segments a , b and c , connecting reciprocally cross-wise strips. To this end it is advantageous to shape the strips connected beforehand so that after their connection one element without any redundant material allowance is formed.

[0024] The outer strip 8 as a rectangular element of easily stretched, water-tight and one-sided adhesive material, is permanently connected to the assembly of elements 5, 6 and 7 with the length equal to the total length of the collar 1.

[0025] In the embodiment example as in fig. 1, 2 and 3 the outer strips 8 are arranged perpendicularly to the longitudinal direction of battens 3, symmetrically at the both sides of the collar 1. With respect to the shape of collar 1 they are arranged in parallel to the longer side of the side element 6. In the condition ready for assembly, fig. 2 and 3, all collar elements 5, 6, 7, 8 are tightly connected to each other. The strip 8 width is selected so as to ensure its free shaping and tight securing to the ridge beam 3 and the insulating membrane 4 surface and is at least 200% of the ridge beam height.

[0026] The tightness of the collar 1 fit may be ensured by gluing and, as appropriate, by clamping with stitches, therefore in order to perform the assumed function properly, the strip 8 has at its inner side advantageously an adhesive layer protected for storage and transport, while at its outer side it has a layer of advantageously partially extendible foil or other material ensuring the tear resistance.

Claims

1. Collar made of any flexible and water-proof material, having the shape of a frame surrounding the structure seated in the roof, consisting of elements, permanently connected to each other into a closed circuit, having an inner edge enabling to connect the collar to the outer perimeter of the construction structure, **characterised in that** the elements (6) arranged not in parallel against the battens (3), constitute, advantageously strips connected to each other in parallel, limited at the outer side with a strip (8) of a material with easily extendible and at the same time water-tight structure.
2. Collar as claimed in claim 1 **characterised in that** the outer strip (8) has an adhesive layer for permanent and tight connection of the collar to the roof covering.
3. Collar as claimed in claim 1 **characterised in that** the outer strip (8) has a composite structure and is extendible, permanently or not, to a limited extent.
4. Collar as claimed in claim 1 **characterised in that** the material strips, comprising the collar (1) are connected to each other tightly.
5. Collar as claimed in claim 1, **characterised in that** at the side of the edge adjoining the structure penetrating the roof it has an additional thermal insulation layer (9), of a material in the form of advantageously porous, flexible and compressible structure with good thermal insulation properties.
6. Collar as claimed in claim 1 **characterized in that** the collar edges (1) arranged not in parallel to the

battens (3) are situated advantageously perpendicular to the lengthwise direction of the battens (3).

7. Collar as claimed in claim 1 **characterized in that** the width of the strip with the insulation layer (9) is at least 200% of the width of the strip to be flanged as the collar sealing the outer perimeter of the structure penetrating the roof.

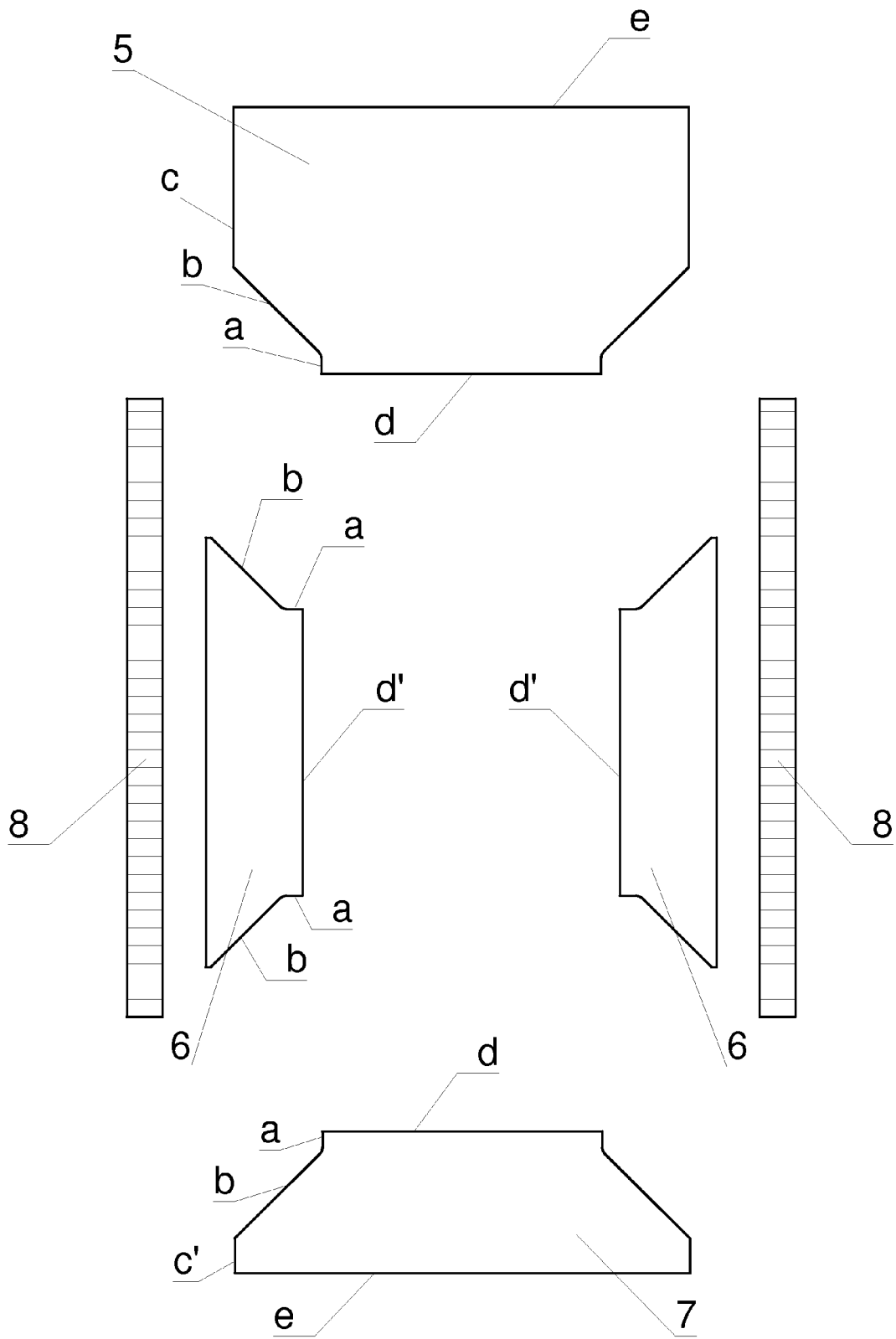


Fig. 1

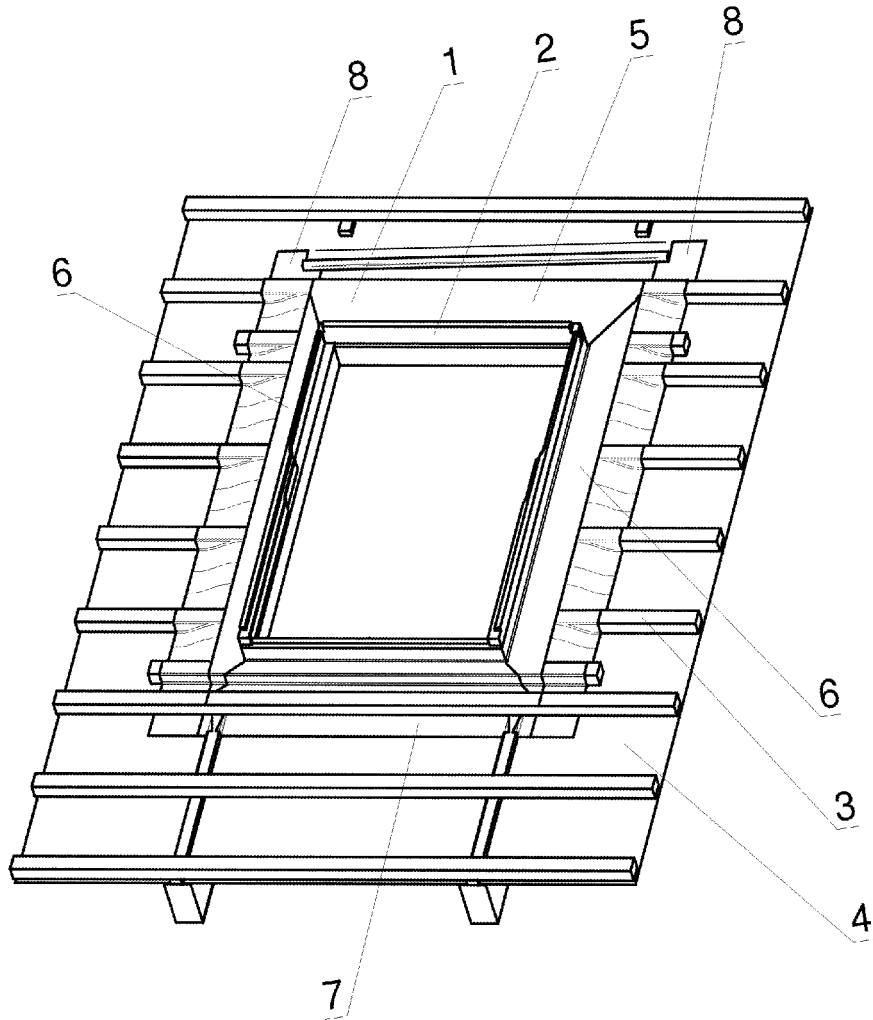


Fig. 2

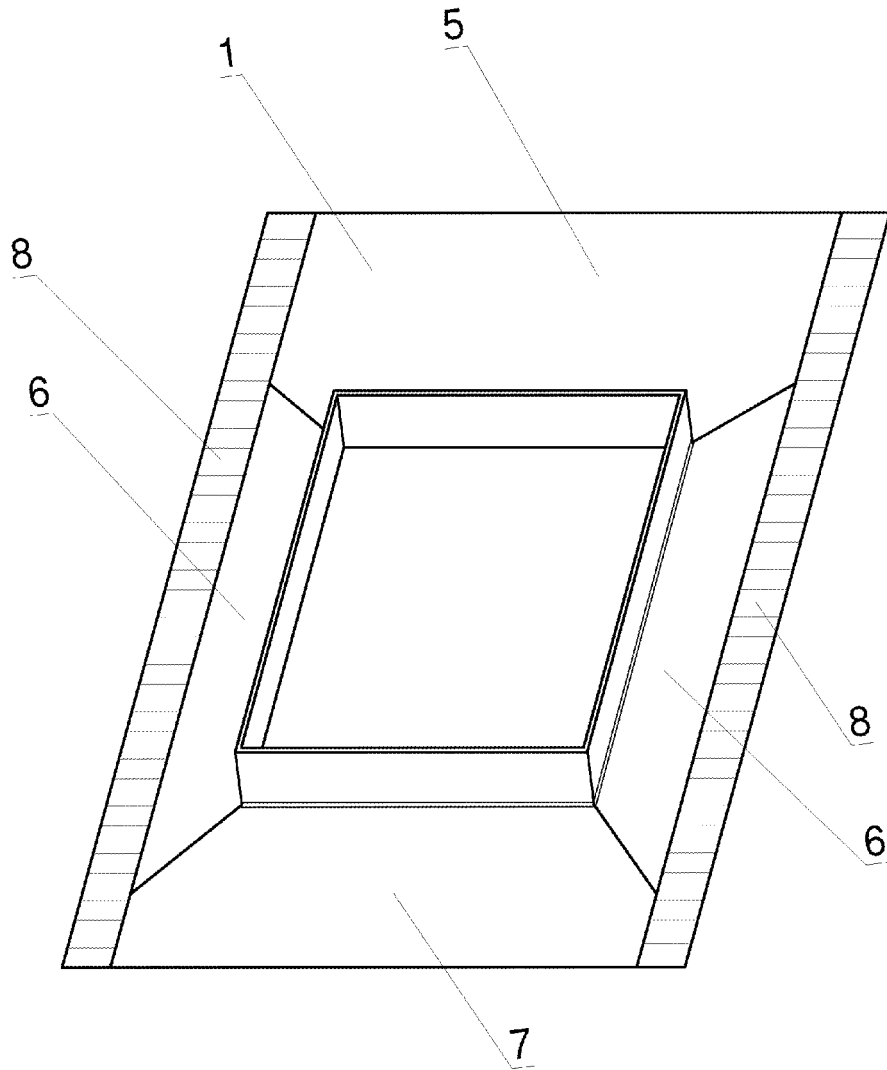


Fig. 3

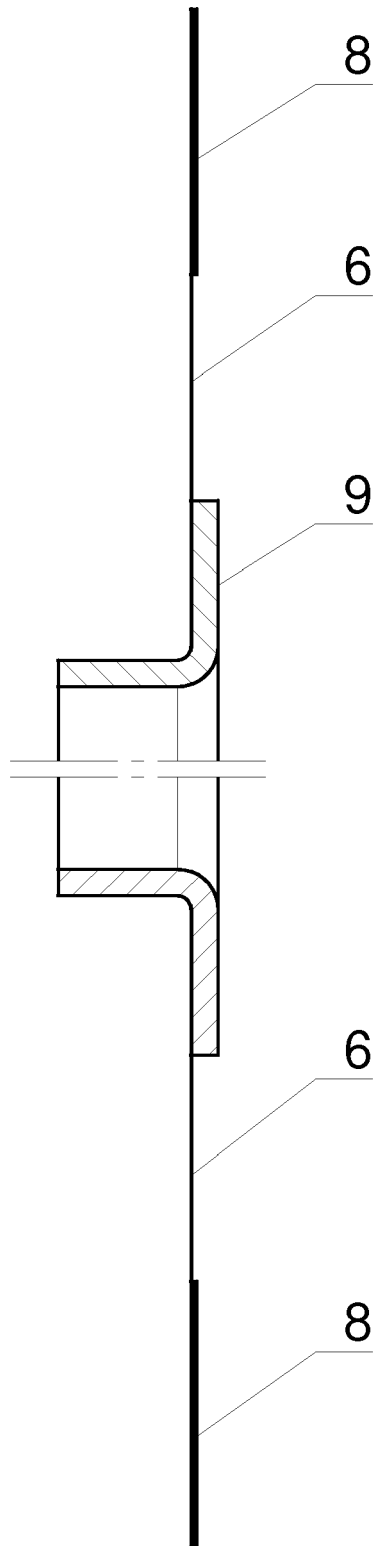


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 3442276 A1 [0002]
- DE 2554341 [0003]
- DK 9500157 W [0004]
- WO 9528537 A [0004]
- WO 9902799 A [0005]