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(54) **ROOFING PANEL**

(57) A roofing panel shaped from sheet metal or plastic, comprising a roofing panel surface, an assembly strip, a covered seam and a covering seam, whose provided

sheet tongue (12) is pressed to a depth equal - with a fit tolerance - to the thickness of this sheet, and the covered seam (4) is provided with a recess (16).

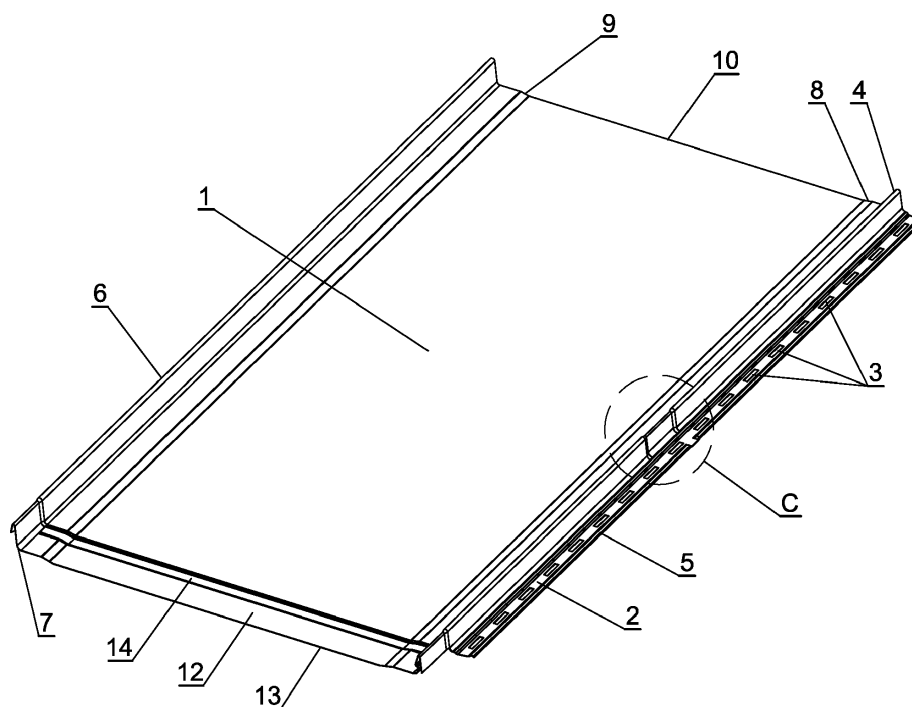


Fig.4

Description

[0001] The object of the invention is a roofing panel used to cover the roofs of buildings and structures, in particular made of sheet metal or plastic, provided with a latching seam.

[0002] There are known roofing panels made of sheet metal or plastic, in which latching elements used for connection to adjacent panels are shaped on the lengthwise edges of the panel. The sheets of such panels are cut to the desired length, usually equal to the length of the roof, and delivered at a construction site. The delivered sheets are lifted to the roof surface and bolted on. The possible crosswise connections of sheets require the preparation of proper cuts and bends in sheet metal for their connection in compliance with the craft of roofing and in a manner ensuring tightness.

[0003] From American patent description US 5519974 there is a known system of roof coverings with a standing seam, comprising a first and a second seam integrated with the opposite lengthwise edges of the panel, and a panel surface. Individual panels are connected to each other by means of protruding seams. The second seam latches onto the first seam placed on the adjacent panel.

[0004] From Polish utility model description no. PL 65782 Y1 there is in turn known a roofing panel comprising a panel surface, an inner connecting element and an outer connecting element shaped from a single metal sheet, as well as a mounting projection with openings, while the inner connecting element to the side of the mounting projection has an outer wall bent outside upwards from the panel surface at a substantially right angle, an upper inner wall directed obliquely downwards towards the panel surface at an acute angle and ended with a latching step connected to a lower inner wall connected to the panel surface. The outer connecting element situated on the opposite panel surface has an inner wall bent in a direction outside upwards from the panel surface at a substantially right angle, a ceiling and an outer wall substantially parallel to the inner wall, bent downwards towards the panel surface and ended with a latching projection bent towards the inner wall. The lower inner wall and the upper inner wall are parallel and they are of an approximately equal height, while the inner connecting element situated at the opposite side of the panel surface has an inner wall connected to a ceiling whose surface is parallel to the panel surface, and the outer wall in its lower part is bent towards the panel surface and ended with a latching projection, the latching projection having an additional bend directed outside the roofing panel surface.

[0005] The object of the invention is a roofing panel prefabricated for modular assembly. This is because the technical problem which required solving involved the development of a new roofing panel, suitable for use in a modular system, connected to adjacent panels by means of a latching seam, easy to transport and assemble and providing tightness of connections between the

individual panels.

[0006] The object of the invention is a roofing panel shaped from a metal or plastic sheet comprising a roofing panel surface, an assembly strip, a covered seam and a covering seam, which is provided with a sheet tongue pressed to a depth equal - with a fit tolerance - to the thickness of this sheet, and the covered seam is provided with a recess.

[0007] Preferably, the recess of the covered seam is situated symmetrically relative to the crosswise edges of the panel surface.

[0008] Preferably, the lower crosswise edge of the panel surface is folded downwards, and a crosswise protrusion is placed along the upper crosswise edge.

[0009] Preferably, the end of the covering seam is provided with a cut-out.

[0010] Preferably, between the left lateral slope and the right lateral slope, the panel surface is pressed down.

[0011] Preferably, the bottom side of the panel is provided with a butyl gasket placed along the downward-folded lower crosswise edge of the panel surface.

[0012] Preferably, the edge of the assembly strip is provided with a recess.

[0013] Preferably, the sheet tongue is provided with a crosswise protrusion situated parallel to the crosswise edges of the sheet.

[0014] The roofing panel according to the invention is presented in the drawing, in which:

- 30 Fig. 1 presents the panel according to the invention in a perspective view from the side of the lower crosswise edge;
- Fig. 2 presents a cross-section along the line A-A of fig. 1;
- 35 Fig. 3 presents a longitudinal section along the line B-B of fig. 1
- Fig. 4 presents the panel according to the invention in an isometric view;
- Fig. 5 presents the detail C of fig. 4 (the recess of the covered seam);
- 40 Fig. 6 presents the upper fragment of the panel according to the invention in a perspective view with a visible sheet tongue **12**;
- Fig. 7 presents the panel according to the invention in a bottom view;
- 45 Fig. 8 presents the detail D of fig. 7 (the cut-out of the covering seam **15**);
- Fig. 9 presents a sample arrangement of panels in a modular system.

[0015] According to the invention and as presented in the attached drawing, the roofing panel comprises the roofing panel surface **1**, the assembly strip **2** provided with assembly openings **3**, the covered seam **4** placed along the left lengthwise edge **5** between the panel surface **1** and the assembly strip **2**, as well as the covering seam **6** placed along the right lengthwise edge **7**. Between the left lateral slope **8** and the right lateral slope

9, the roofing panel surface 1 is pressed down. The lower crosswise edge 10 of the panel surface 1 is folded downwards. The upper part of the panel is in turn provided with a sheet tongue 12 pressed relative to the sheet surface to the depth of the panel sheet - with a fit tolerance. In addition, on the surface of the sheet tongue 12, along the upper crosswise edge 13, there is a crosswise protrusion 14 intended to accommodate the folded part of the lower crosswise edge 10 of the next roofing panel according to the invention. The covered seam 4 is in turn provided with a recess 16, preferably situated in its central part, and the end of the covering seam 6 is provided with an angled cut-out 15.

[0016] The downward folding of the lower crosswise edge 10 is intended to provide rigidity of the panel and it prevents the capillary suction of water under the panel. During manufacturing of the panel, a butyl gasket 11 with an adhesive surface protected by a tape can be placed near the fold at the bottom side of the panel. The protection is peeled off at the assembly stage. The sheet tongue 12 is provided with a crosswise protrusion 14 in order to situate in it the folded part of the lower crosswise edge 10 of the next panel. Such shaping of the panel forms a compensating pouch, which serves the function of anti-capillary suction of water which may enter between the panels during rain. The pouch also conceals the thickness of the folded sheet, resulting in the homogeneity of surface on the crosswise connection of individual panels - with no height transition.

[0017] The pressed sheet tongue 12 located in the upper part of the panel surface 1 in turn forms another compensating pouch, which reduced the overall thickness of the covered panel by the thickness of sheet metal, and at the same time it prevents angling the geometry of the panel assembly relative to the roof axis. Due to the panel being provided with the sheet tongue 12 and the crosswise protrusion 14, the next panel slid onto the sheet tongue 12 abuts the adjacent one, forming a homogeneous shape. In addition, the assembly strip 2 shorter than the length of the remaining part of the panel by the length of the sheet tongue 12 allows even more precise fitting of the panel being slid over. The cut-out of the covering seam 15 in turn facilitates full sliding of the covered seam 4, forming a tight and aesthetic crosswise connection of panels.

[0018] The roofing panels according to the invention are adjusted to an alternate assembly, which is caused in particular by the sheet tongue 12 and the recess 16 of the covered seam 4. Preferably, this recess can be placed symmetrically relative to the crosswise edges 10, 13 of a panel part. The compensating pouch formed in this manner reduces the overall thickness of the covered seam 4 by the thickness of the sheet of which the panel is made. Because of the recess, the adjacent panel being latched and slid over is properly fitted, and in addition it prevents the possibility of angling the geometry of the assembly of individual fitted panels relative to the roof axis. Preferably, an additional recess 17 may be situated

on the edge of the assembly strip 2.

[0019] The solution according to the invention is based on factory-prepared panels provided with latching seams, adjusted to a quick, easy and non-damaging connection on a roof. The placement of panels on a roof generally requires the performance of two actions of connecting the adjacent panels - latching the seams and bolting the panels placed in this manner to the roof. The roofing panels according to the invention are adjusted to an alternate assembly, resulting in the so-called chequerboard effect. Wherein the recess 16 allowing the alternate assembly of panels on the roof can be made in various places of the lengthwise edge of the panel in order to achieve different aesthetic effects. The panels according to the invention may be manufactured in sizes enabling their easy handling when transported, lifted and mounted on a roof. The factory-prepared panels according to the invention are characterised by proper bends, protrusions and recesses in places for which this is required for their correct connection. In addition, the panels according to the invention can be provided with a factory-applied butyl gasket with an adhesive surface, which constitutes a seal of the crosswise connection of the individual panels.

Claims

1. A roofing panel shaped from sheet metal or plastic comprising a roofing panel surface, an assembly strip, a covered seam and a covering seam, **characterised in that** it is provided with a sheet tongue (12) pressed to a depth equal - with a fit tolerance - to the thickness of this sheet, and the covered seam (4) is provided with a recess (16).
2. The roofing panel according to claim 1, **characterised in that** the recess (16) of the covered seam (4) is situated symmetrically relative to the crosswise edges (10, 13) of the panel surface (1).
3. The roofing panel according to claim 1, **characterised in that** the lower crosswise edge (10) of the panel surface (1) is folded downwards, and a crosswise protrusion (14) is placed along the upper crosswise edge (13).
4. The roofing panel according to claim 1, **characterised in that** the end of the covering seam (6) is provided with a cut-out (15).
5. The roofing panel according to claim 1, **characterised in that** between a left lateral slope (8) and a right lateral slope (9) the panel surface (1) is pressed down.
6. The roofing panel according to claim 3 or 4, **characterised in that** the bottom side of the panel is pro-

vided with a butyl gasket (11) placed along the downward-folded lower crosswise edge (10) of the panel surface (1).

7. The roofing panel according to claim 1, **characterised in that** the edge of the assembly strip (2) is provided with a recess (17). 5
8. The roofing panel according to claim 1, **characterised in that** the sheet tongue (12) is provided with a crosswise protrusion (14) situated parallel to the crosswise edges of the sheet (10, 13). 10

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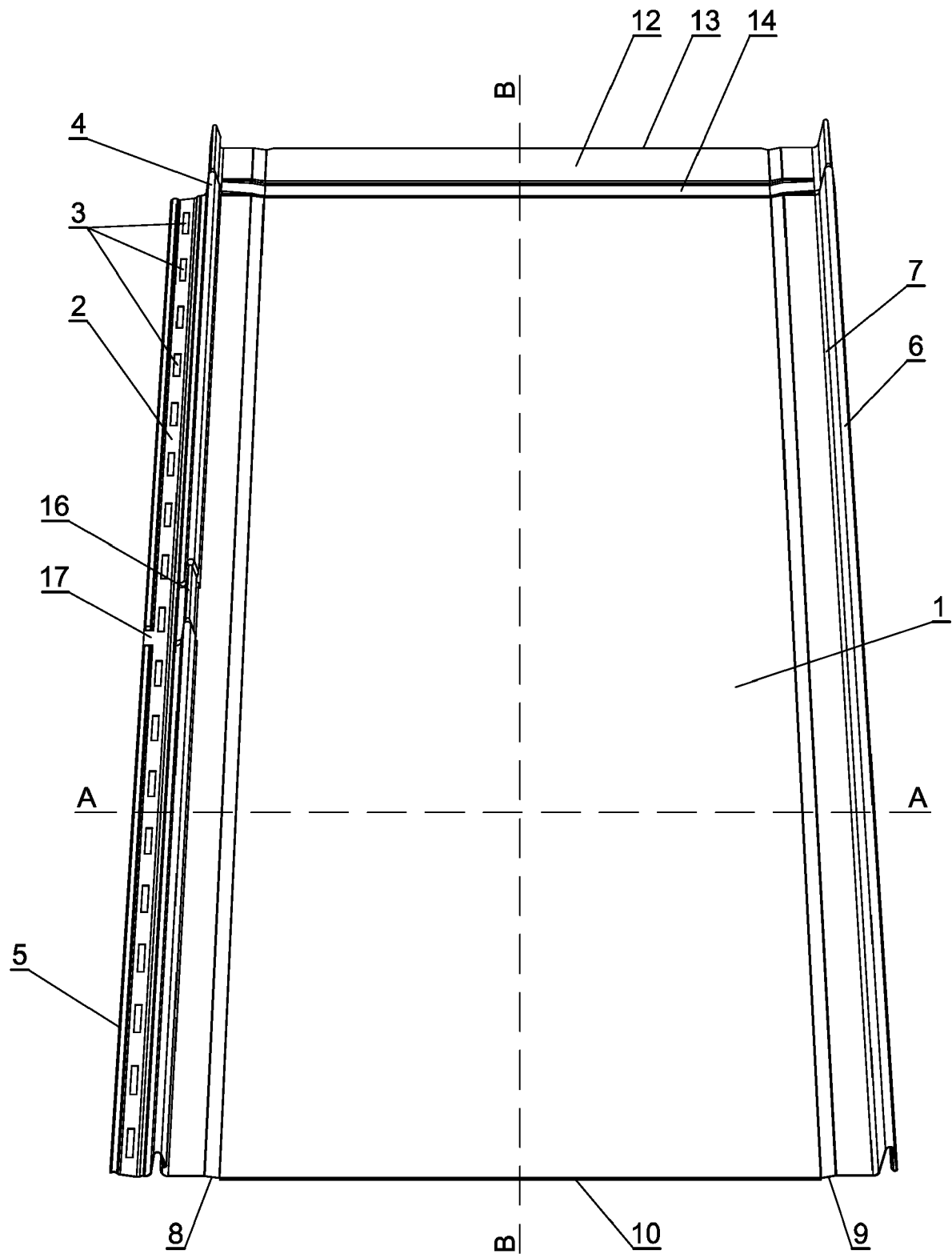


Fig.1

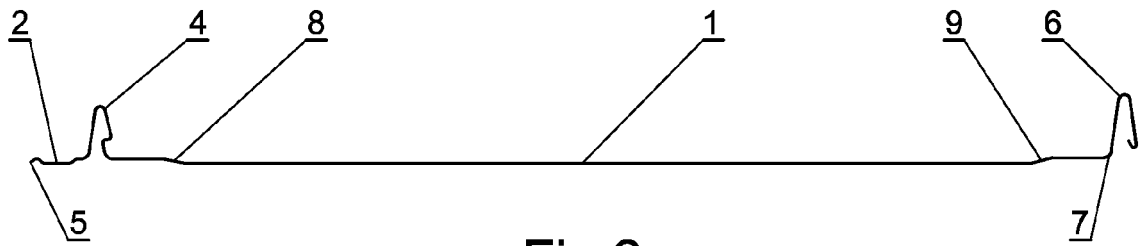


Fig.2

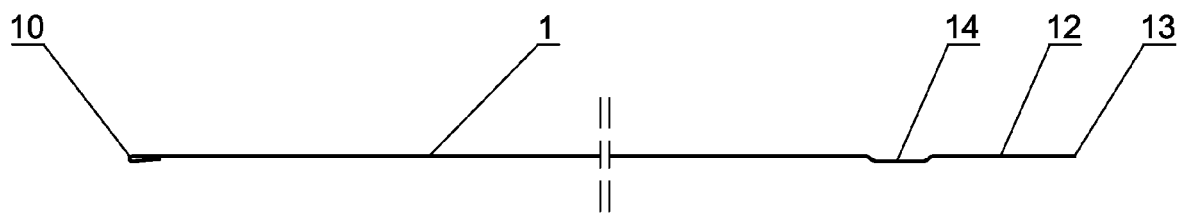


Fig.3

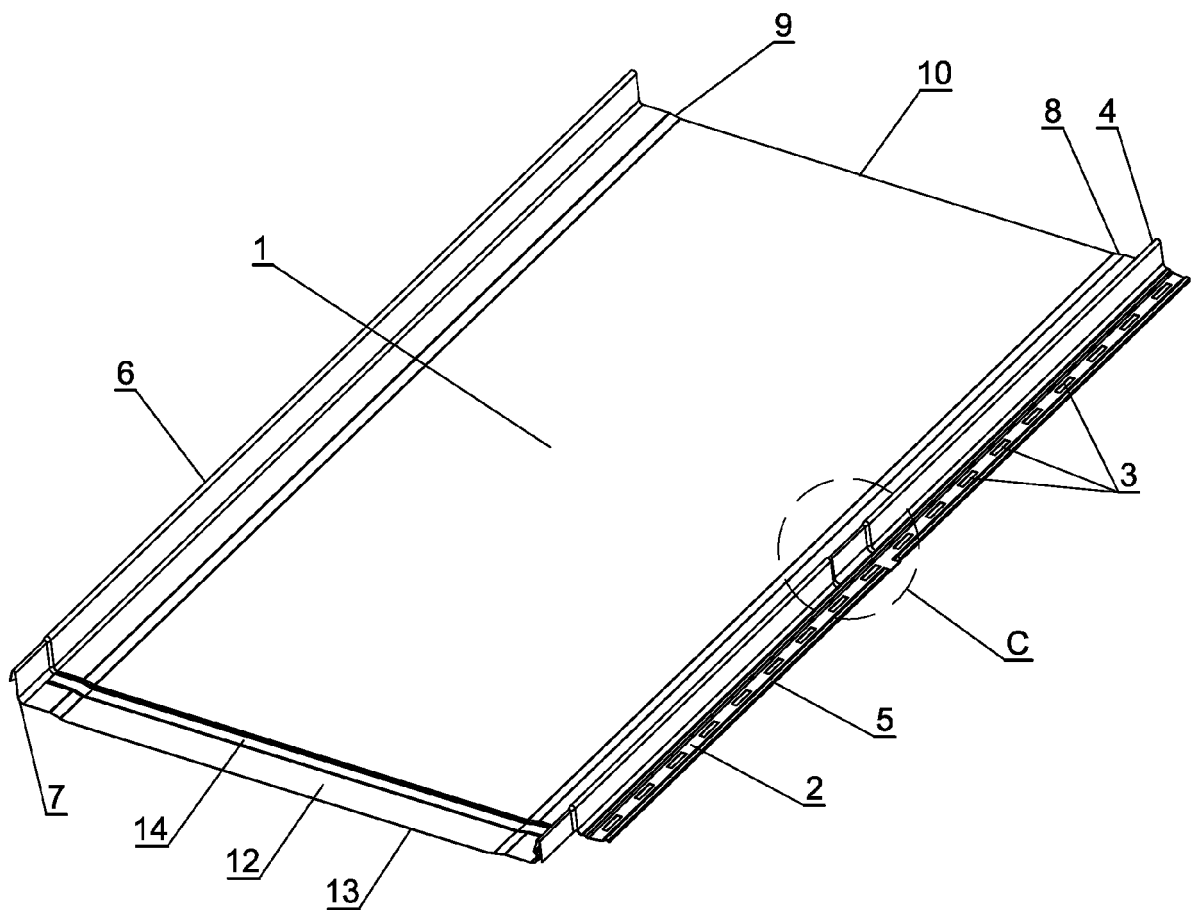


Fig.4

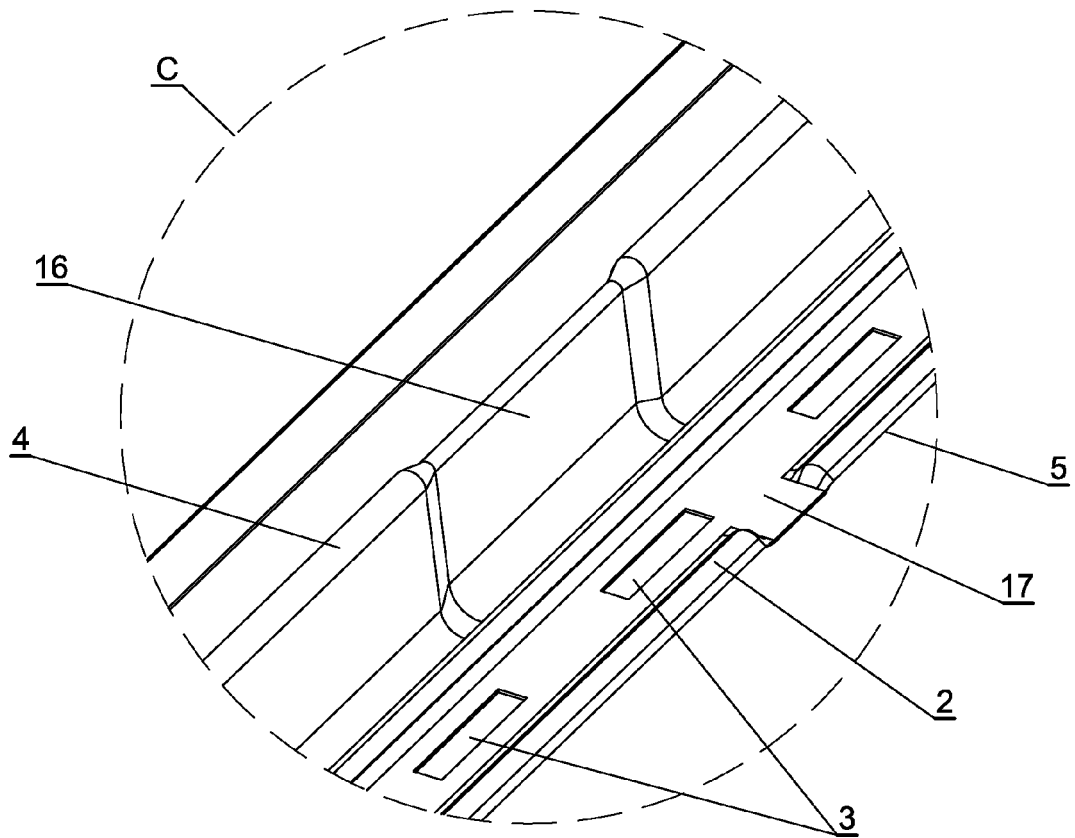


Fig. 5

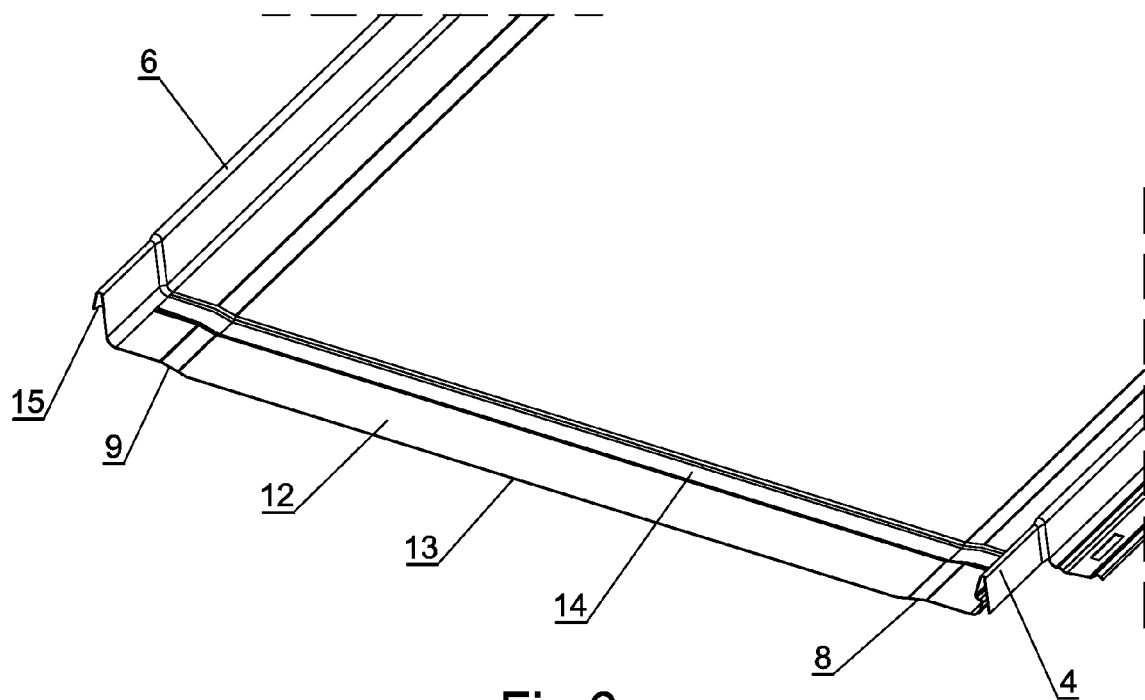


Fig. 6

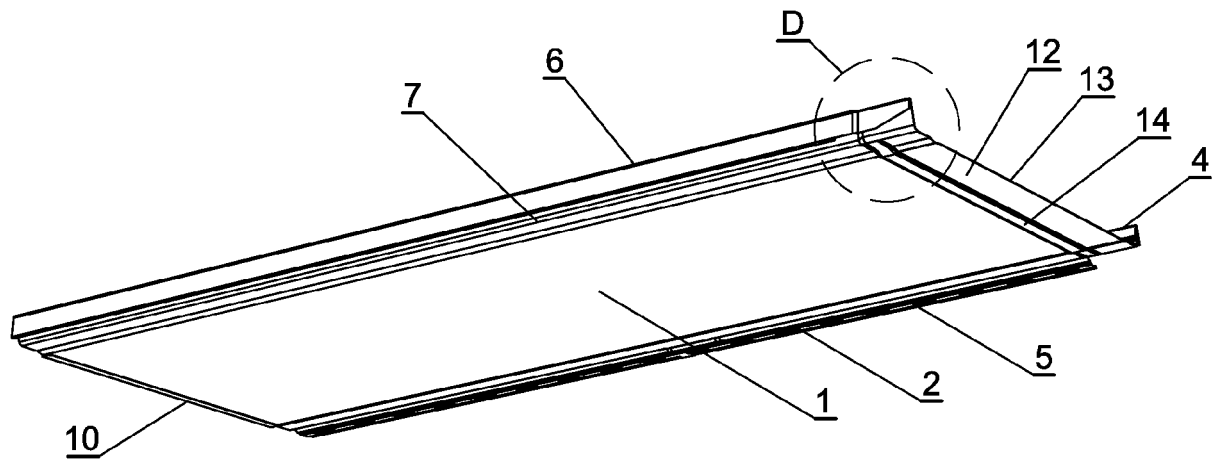


Fig.7

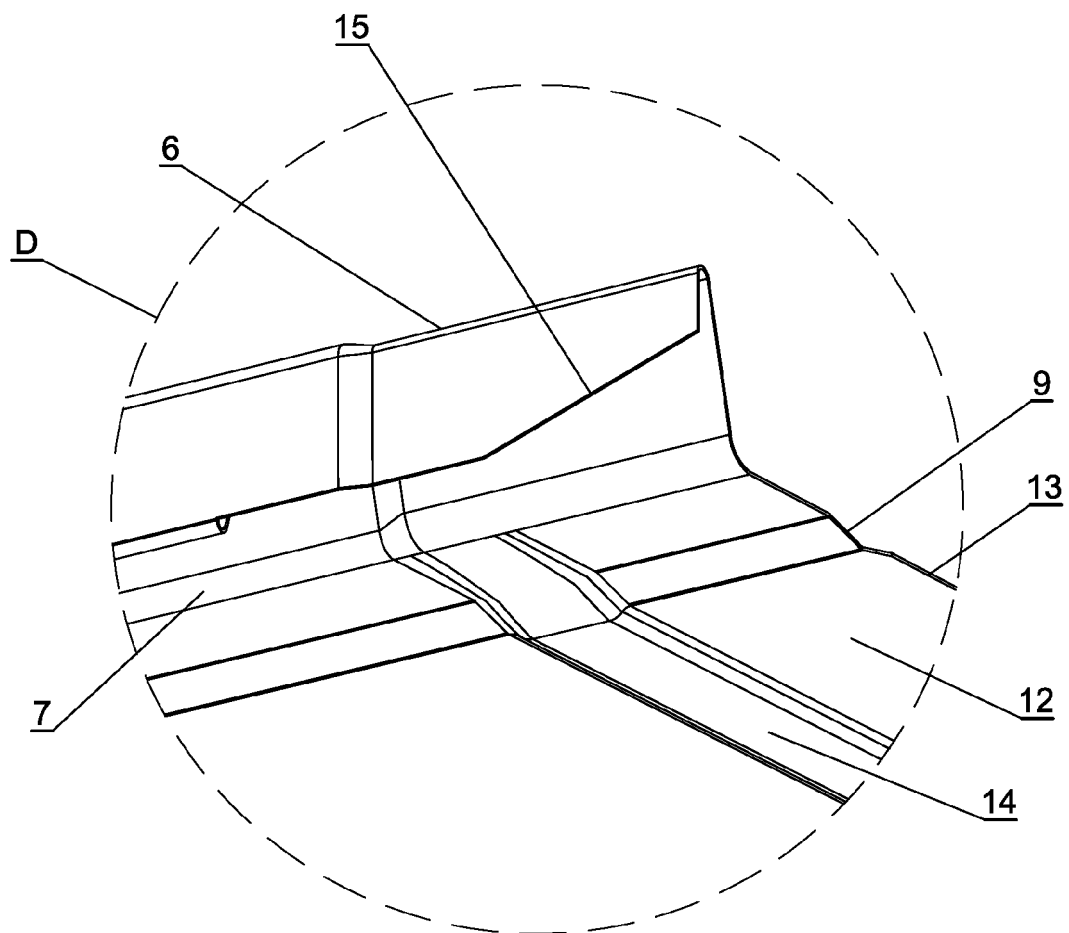


Fig.8

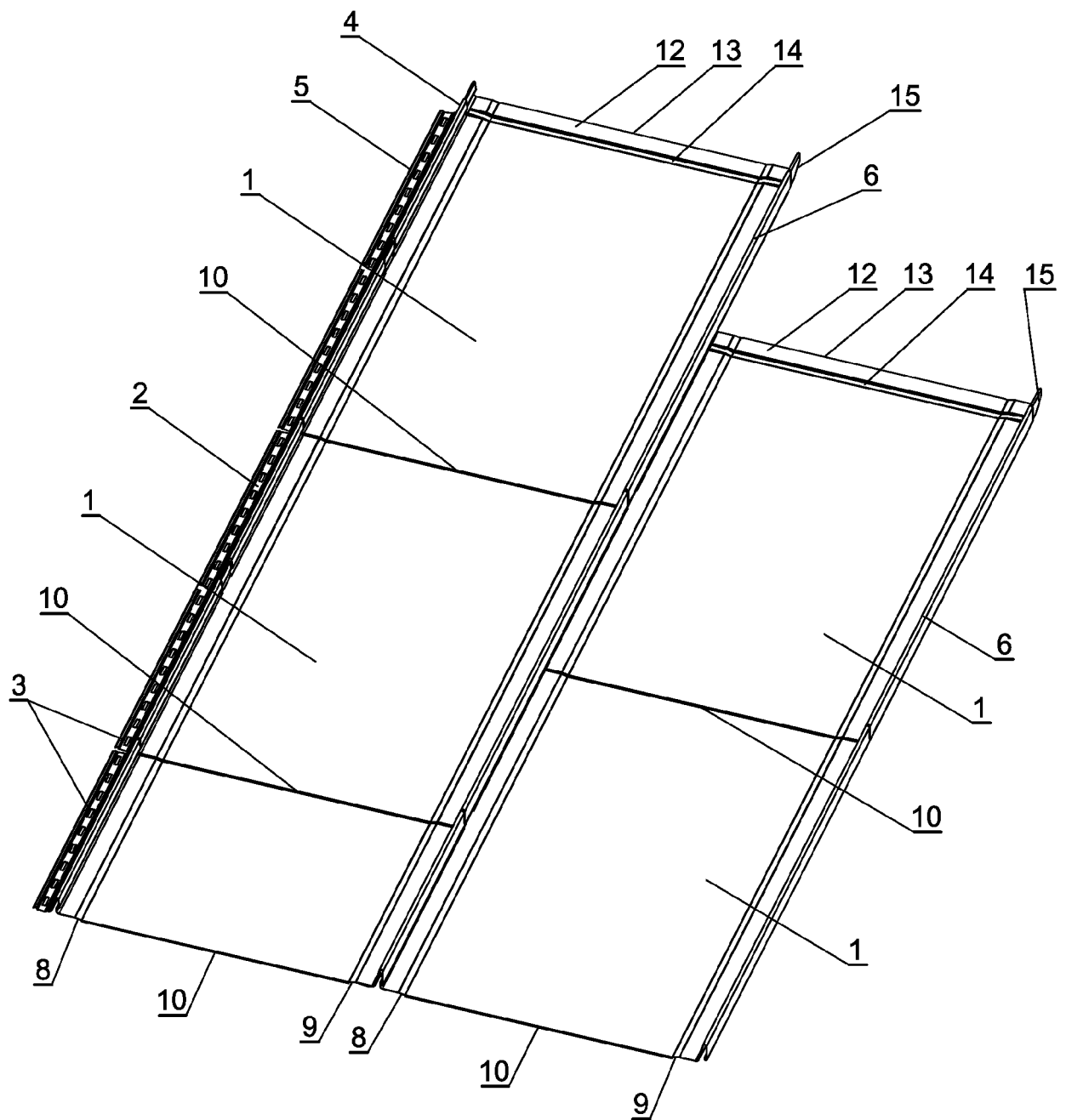


Fig.9



EUROPEAN SEARCH REPORT

 Application Number
 EP 20 46 1538

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Y	* paragraph [0030]; figures 1,2, 4,6,7 *	2,8	
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Y	JP H07 90993 A (GANTAN BEAUTY KOGYO KK) 4 April 1995 (1995-04-04) * paragraph [0030]; figure 5 *	8	
A	BE 783 676 A (JANSSON JOHN G; SJOBLUM AKE E) 18 September 1972 (1972-09-18) * figures 3-5 *	2	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		20 October 2020	Tran, Kim Lien
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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