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Amended claims in accordance with Rule 137 (2) EPC.

(54) **Sheet metal cladding panel**

(57) A sheet metal cladding panel (1) for covering roofs and walls of buildings, comprising an elongated sheet metal member forming a web (2) of the panel, which has upwards folded flanges (3, 4) along the two elongated edges of said web (2) of the panel (1), a first (3) of said upwards folded flanges being folded outwards and down-

wards along its upper edge to form a first lap (6) and a second (4) of said upwards folded flanges is folded inwards and downwards along its upper edge to form a half lap (8). The invention further includes a system and a method for cladding roofs and walls with at least two such panels (1).

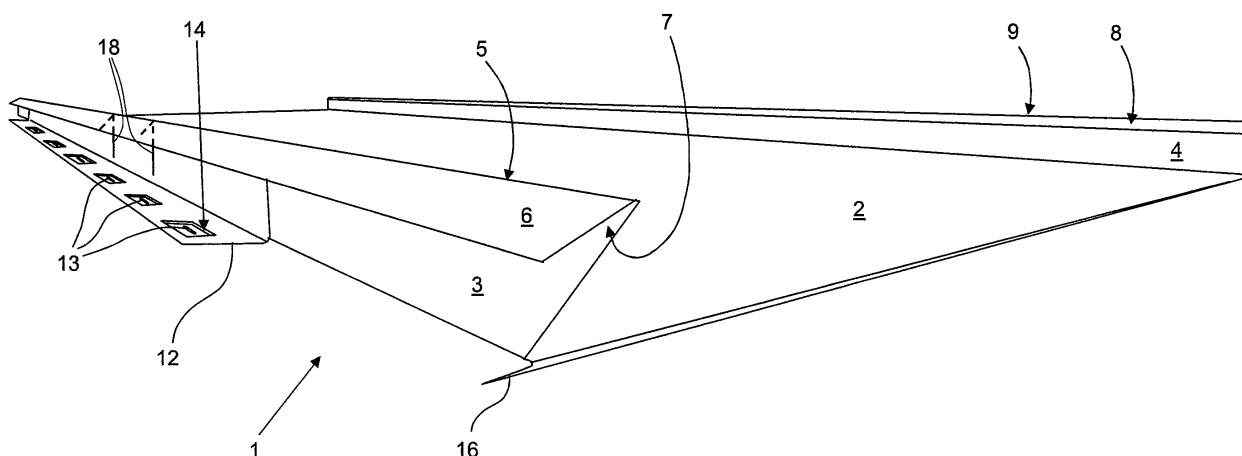


Fig. 1

Description

Technical field

[0001] The present invention relates to cladding of roofs and walls of buildings of all kinds, in particular, to a sheet metal cladding panel. The invention further relates to a method for easily attaching the panels to each other to form a sealed cover.

Background of the invention

[0002] For cladding walls and roofs of buildings, a number of different types of sheet metals panels are available on the market. Many of them have the disadvantages that the mounting of the panels is complicated and time-consuming. This is due to the fact that most known panels require, for their attachment to a substructure, special fastening elements, such as metal strips and fastening clips, which are attached to the substructure with the aid of screws or nails for positioning the panel in relation to the substructure and partly for supporting the panel. Said fastening elements must thus be positioned exactly in relation to the joint between two panels, which requires very accurate measurements for each fastening elements before they can be screwed or nailed in place. When the panel itself is lifted and positioned into its intended location, the fastening elements are folded over a side edge of the panel by hand.

[0003] As one example of a cladding panel, when the next panel is put in place to join the first one, it can have a folded seam gripping over an upstanding side edge of the first panel, whereby the fastening element is folded up and around the folded seam. After this has been done the seaming of the two plates to each other can take place with the aid of a seaming machine. In addition, the known cladding panels, which are mutually joined by seaming, very often require an adaptation of a panel to adjacent panels. This must be performed by cutting away appropriate parts of the sheet panel. This work is time consuming and requires great precision to maintain close fitting and overlapping between the panels to become joined.

[0004] A solution to overcome the listed drawbacks of prior art panels has been disclosed in the patent publication WO 89/05419. In said document, there is presented a sheet metal panel comprising a middle portion between two upwardly folded flanges, of which at least a first one of the upwardly folded flanges has a portion being bent outwardly and downwardly to form a half seam. The second one of the upwardly folded flanges is a single layer sheet metal flange of a height shorter than the height of the first folded flange. According to the arrangement, when two panels are joined alongside each other, the half seam of the first flange of a first panel is positioned over and engaging the second flange, i.e. the single layer sheet metal flange, of a second panel. The half seam of the first panel can then easily be folded to the sheet metal

flange of the second panel to arrive at a sealed folded seam between the two panels. The content of the publication WO 89/05419 is hereby in its entirety incorporated into this description.

[0005] By use of the device presented in WO 89/05419 it is important that, in order to get a complete sealing between the single layer sheet metal flange forming the second flange and the half seam of the first flange. To accomplish this, the cross section height of the second flange preferably reaches up to the inside of the folded half seam. Due to the production processes of the sheet metal panels, it has turned out that during the folding of the panels to establish the second flange, it is difficult to provide said second flange with the correct measures. The tolerance of the height of the second flange can vary up to ± 3 mm. A drawback by use of the sheet metal panel presented in said document is that it is a risk of obtaining a non perfect sealing of the seam between the two adjacent flanges of the first and the second panel, when the first and the second flanges are folded together. Moisture could penetrate the seam. A further disadvantage with the prior art panels is that an upstanding side edge of the first panel can be very sharp and thus tear from below the half seam of the adjoining panel covering said sharp edge when the panel are moving in relation to each other.

[0006] An object with the present invention is to provide an improvement of the device in relation to prior art and a method for cladding substructures by use of the device

Brief description of the invention

[0007] According to one aspect of the present invention there is provided a device characterized in claim 1.

[0008] According to a second aspect of the invention there is provided a system for use of the device of claim 1 for cladding a roof or a wall of a building according to the independent system claim.

[0009] In a further aspect of the invention a method for cladding a building with the device of claim 1 is presented in the independent method claim.

[0010] Further embodiments are presented in the dependent claims.

[0011] The advantages of the invention related to the different embodiments will be discussed below.

[0012] A great advantage with the present invention is that it is easier in the production process to provide the panels with a more exact height of the second flanges of each sheet metal panel. Consequently the second flange of a first panel will always reach up to the inside of the half seam of the second flange of a second panel when the two panels are mounted together alongside of each other. By this a complete seal between the first and the second panels can be provided.

[0013] Further features of the present invention are disclosed in the subsequent detailed description, which shall be interpreted in combination with the attached drawings. It must be emphasized that the drawings are

performed only for the purpose of illustration and shall not limit the invention. The drawings are not performed to scale and shows only conceptual structures and procedures described herein.

Brief description of the drawings

[0014]

Fig. 1 schematically shows a perspective view of the elongated sheet metal panel according to one aspect of the invention.

Fig. 2 shows in a perspective view the same panel as in figure 1 but more from the side of the panel.

Fig. 3a and 3b show cross sectional views of the panel of figure 1. In fig. 3a the view is from the higher located end of an intended location on a building. In fig. 3b the view is from the lower located end of an intended location on a building.

Fig. 4a and 4b shows side views of the panel of fig. 1.

Fig. 5 is a plan view of the panel of fig. 1 as it is seen from above.

Fig. 6 shows a schematic view of two sheet metal panels according to an aspect of the invention, wherein the seam joining two adjacent panels is shown in enlargement.

Fig. 7 is a perspective view of the panel of fig. 1 from a different angle.

Description of embodiments

[0015] Below, a number of embodiments of the invention are described in support of the enclosed drawings.

[0016] A sheet metal cladding panel (1) according to an aspect of the invention is illustrated in Fig. 1. A main portion of the panel 1 is occupied by a surface in the centre part formed by an elongated sheet metal member forming a web 2 of the panel (1).

[0017] The web 2 of the panel 1 has along its longitudinal edges upwards folded flanges, a first flange 3 and a second flange 4. Said first flange 3 is in turn along a first ridge 5 folded once again outwards and downwards, as illustrated in figures 1 and 3, to form a lap 6. A notch 7 is in this way formed between the first flange 3 and the lap 6 of said first flange 3. The cross sectional length a of the lap 6 is between 12 mm and 16 mm, in the example preferably around 16 mm. The height of the first flange 3 from the web 2 up to the first ridge 5 is between 30 mm to 50 mm and preferably around 35 mm. Thus, it can be understood that the length a of the lap 6 is approximately half the height of the first flange 3.

[0018] An object with the panels according to the in-

vention is to clad a substructure by joining panels 1 of the described type along their longitudinal edges such that the second flange 4 of a second panel is inserted into and along said notch 7 of the first flange 3 of the first panel until said second flange 4 fits into said notch 7. After the insertion of the second panel in this way, the first panel and the second panel are folded together along their united first and second flanges, described in more detail below.

[0019] In a similar way to the described first flange 3, for each panel 1, the second flange 4 is along a top line bent inwards and downwards (see figures 1 and 3) to form a half lap 8, thus forming a second ridge 9 at the intersection of the second flange 4 and the half lap 8. The cross sectional length b of the half lap 8 is in this preferred embodiment around 8 mm, but it is possible to use any length b between 4 mm to 10 mm adapted to the length of the lap 6 of an adjoining panel aimed to cover said half lap 8. An advantage with the solution of using the half lap 8 of the second flange 4 is that the deviations in the widths of the sheet metals during fabrication of the sheet metals, in comparison to prior art where these deviations appeared as different heights of the second flange 2 of the manufactured panels, are instead when using panel according to the invention established as deviations of the length b of the half lap 2, which do not cause any inconveniences or drawbacks with respect to the assembled panels.

[0020] The height of the second flange 4 from the plane of the web 2 up to the top of its second ridge 9 is a little shorter than the height of the first flange 3 up to the top of its ridge 5. This is due to the fact that the second flange 4 of a second panel shall fit well into the notch 7 of the first flange 3 of the first panel.

[0021] One improvement of the invention in relation to prior art is that the half lap 8 is provided at the production of the panels 1. As the half lap 8 is folded at a predetermined height h from the bottom of the panel 1, this is possible to arrange at the manufacturing with a high tolerance compared to the corresponding height of prior art panels, where the lap 8 and the ridge 9 are missing. The plates delivered from a production plant can have differences of their widths as much as up to ± 6 mm. These differences can affect the tolerances of the heights of the prior art single metal layer of the second flange 4.

[0022] By the height, all over this description, is meant the height measured from the underside of the panel, that is from the point where the panel contacts a substructure when being mounted.

[0023] The lap 6 and the half lap 8 of the first 3 and second 4 flanges are at the production process folded downwards to an angle around 45° in relation to the up-standing flange. This inclination downwards in an angle around 45° of the half lap 3 further serves as a water trap, when the panels are used without a finalised folding together of the lap 6 of a first flange of a first panel and a half lap 8 of a second flange of a second panel in cladding a roof or a wall where the angle in relation to the horizontal

plane does not require such a finalised folding work.

[0024] Both the first flange 3 and its lap 6 are double-folded. This means that the plate is folded along the lower longitudinal edge 11 of the lap 6 towards the inside of the notch 7 180° back so that the lap 6 is formed as a double layer. At the top of the notch 7, the plate is folded once again to follow the line of the first flange 3 downwards and thus forming also the first flange 3 into a double layer sheet. In this way all the surfaces of the second flange 3 will have the top surface of the sheet metal from which the panel 1 is produced as outer surfaces. This is important as a protection layer or a coloured surface will be unbroken at the first flange 3.

[0025] Each panel 1 includes a fastening element 12 for the purpose of fixing the panel to a substructure S to be clad by the panel 1. The fastening element 12 is a part of and a continuation of the plate which is forming the web 2, the first flange 3 and the lap 6, as the plate after being folded back along the inside of the lap 6 and further downwards along the first flange 3 is once again folded outwards from the panel 1 approximately in the plane of the web 2 of the panel 1 to form said fastening element 12 as an extended rim along the side of the panel 1 adjoining the first flange 3 in the plane of the bottom of the panel.

[0026] Fig. 6 illustrates, more in detail, how the fold between a first and a second panel 1 is accomplished. The second flange 4 has been previously inserted into the notch 7 formed between the first flange 3 of the first panel 1 and the lap 6. Preferably, according to a further aspect of the invention the notch 7 is pre-filled with a sealing agent 10, such as a grease, a plastic compound or the like. The height of the second ridge 9 should preferably be such that it abuts or nearly touches the innermost part of the notch 7. The folding to form a seam between the first and the second panel is then performed along the two flanges 3, 4. The seam is achieved by folding the lap 6 in and over the edge of the half lap 9 of the second flange 4. This is possible as the length a of the lap 6 of the first flange 3 is approximately twice the length b of the half lap 9 of the second flange 4. The folding can be made by means of hand tools or by means of a folding machine. The lap 6 is clamped towards the second flange to form a sealed seam. The sealing agent will thus further spread between the two flanges 3, 4. The high tolerance of the height of the second flange 4 will also provide for a secure sealing to make the seam resistant to water and humidity and for avoidance of capillary suction. A further advantage is that the lap 6 encircles the half lap 8, whereby the stability of the joint between the adjoining panels is improved.

[0027] A further advantage related to the invention is that the second flange 4 being without the half lap 8 would be rather sharp and thus rub against the inside of the notch 7 and could remove a protection layer of the plate in the notch 7 of the adjoining panel, when the panels 1 are moving in relation to each other.

[0028] The material of the panel 1 is a thin sheet of

aluminium, copper or a surface-treated steel. The material can as well be a surface-treated sheet of an alloy. The sheet metal member forming the web 2 of the panel 1 does not need to be flat as illustrated in the drawings. Between the flanges 3 and 4, the web 2 of the flanges can have convex or concave portions or it can have a cross section with ridges. To provide the web of the panel with such ridges or the like could be a measure to obtain higher load carrying properties. Further, if the panels are made for cladding the wall of a building the web 2 of the panels could be provided with embossing or ornamental decorations.

[0029] Further elements of the invention related to embodiments of the dependent claims are discussed in the following paragraphs.

[0030] The fastening element, hereinafter called a mounting rail 12, is provided with screw holes 13 along the rail. As an example, the screw holes 13, can be evenly distributed, such as one hole per dm. Preferably, the plate around the screw holes is pressed down to be in the level of the plane of the web 2 of the panel, whereas the edges around the pressed down plate surrounding the screw holes 13 of the mounting rail remain on a higher level, as is illustrated in figures 2 and 6, to form a frame 14 around the pressed down area of the mounting rail 12. The neighbouring panel will thus rest on said frame of the mounting rail 12. In this way the heads of the screws 15 attaching a panel to a substructure S will be sunk in relation to the frame and thus the screw heads will not tear the underside of an neighbouring panel covering the screws 15, when the panels are moving in relation to each other.

[0031] The mounting rail 12 is not extending along the full length of the first flange 3. Preferably, the mounting rail 12 is terminated 15 cm from the end which will be mounted as a lower level end of the panel on the substructure S and is further terminated 25 cm from the end which will be mounted as a higher level end of the panel on the substructure S. This design facilitates the work with joining two panels 1 in the longitudinal direction of the panels 1 and further to facilitate the work with the panel, e.g. at the base of a roof and at the roof ridge when cladding a roof with panels. Further, this shortened mounting rail 12 facilitates the work to cut the ends of a panel 1, when the lengths of the panels have to be adapted to the substructure.

[0032] The height of the second flange 4 from its bottom up to the top of the second ridge 9 formed at an intersection of the second flange 4 and the half lap 8, is approximately the same as the distance from said mounting rail 12 up to the inside top of the notch 7 formed between the first flange 3 and the lap 6. If, in a brief example, the height of the first flange 3 of the panels 1 from the bottom of the panel up to the top of the first ridge 5 of said first flange 3 is 35 mm, it would be proper to allow the height of the second flange 4 from bottom side up to the top of the second ridge 9 of the panels to amount to approximately 30 mm or a little less (if the thickness of

the plate is 0,5 mm) as 1-2 mm is the approximate thickness of the first ridge 5 and the thickness of the mounting rail 12 with its sunk areas is approximately 1-2 mm. Said dimensions are only given as brief suggestions and should not delimit the invention in this respect in any way.

[0033] When a panel 1 nevertheless has to be cut across its length, where the panel at the cut includes a mounting rail, this could be a tough work as the flange 3 consists of a double plate layer in the flange 3 and the lap 6, which makes it difficult to cut the panel with tools at these locations. Therefore, according to one aspect of the invention the plate of the panel is at the outer one of the double layers of the first flange 3 and the inner one of the double layers of lap 6 provided with a slot 18 at regular intervals, such as for each 10 cm. The slots 18 are formed as pre-cuts (an illustrated example in fig. 4b and a small number of such pre-cuts in Fig. 1), so that it will be easy to cut the panel at these locations if it is desired to use a shorter panel than the full length prefabricated panel. Said slots 18 start from a short distance above the mounting rail and runs across the outer layer of the double layered first flange 3 and continues across the inner layer of the double layered lap 6 until it almost reaches the edge 11 of the lap 6. In order to cut a panel across its width, this is easily done along a line running through one of the slots 18. A pliers or a plate shears is then used to cut across the mounting plate 12 and across the lap 6 and then further on across the panel. This process is greatly facilitated when cutting along one of said slots 18 as the panel is single layered across the whole panel when cut along one of the slots 18.

[0034] As can be seen in the figures, at one end of the panel 1, the plate between the first 3 and the second 4 flange is folded downwards and backwards in under the bottom of the web 2. This folded plate, here called a foot lap 16 of the panel 1 is arranged for grasping and engaging a foot plate along the edge of the roof to be clad by panels or for grasping a corresponding folded plate at the top of a lower panel of a wall to be clad by the panels.

[0035] A further embodiment of the invention is an arrangement for providing leak proof at the joints of two panels at the foot of a roof. The background for this measure is that if a first flange 3 and a second flange 4 are placed abutting each other at the end of the joint, a thin gap will appear between the closely located flanges. This gap can suck water by the aid of capillary forces in between the flanges of the joint and over the time this could cause damages. To prevent this from happening, the first, double layered, flange 3, according to one example at the intended lower end of the panel 1, is extended at the first ridge 5, such that the flange 3 is inclined from the level of the web 2 up to the ridge 5 at an angle around 45°, thus forming a terminating triangular section 17 of the first flange 3. The flange 3 will thus be drawn out to a sharp point. The purpose is, that after the joining of two panels 1, the superfluous triangular formed section of the drawn out part of the flange 3 is folded over the right angled end of the second flange 4 of the adjoining panel

in the joint, whereby a sealed joint is established, also as seen in the longitudinal direction of the joint. The formed triangular section 17 with the protruding sharp point at the joint also has a purpose to make the joint ugly and thus to automatically force anybody working with the roofing to fold and seal the joint at the terminated end. According to this, the extending triangular formed section will, at the ridge 5, have a length of approximately the same length as the height of the first flange 3.

Definitions:

[0036] Up and upwards means in the direction away from a substructure S to be covered by the sheet metal panel.

Down and downwards means in the direction towards the substructure S to be covered by the sheet metal panel.

Outwards means in a lateral direction away from the sheet metal member.

Inwards means in a lateral direction towards the sheet metal member.

Claims

1. A sheet metal cladding panel (1), in particular for covering roofs and walls of buildings, comprising:

- an elongated sheet metal member forming a web (2) of the panel,
- upwards folded flanges (3, 4) along the two elongated edges of said web (2) of the panel (1),
- a first (3) of said upwards folded flanges being folded outwards and downwards along its upper edge to form a first lap (6),

characterized in that:

- a second (4) of said upwards folded flanges is folded inwards and downwards along its upper edge to form a half lap (8).

2. The panel according to claim 1, wherein the cross-sectional length of the half lap (8) is smaller than the cross-section length of the first lap (6).

3. The panel according to claim 2, wherein the height of the first flange (3) from the bottom of the panel (1) to a first ridge (5) of the first flange is 30 to 50 mm and preferably around 35 mm.

4. The panel according to claim 2 or 3, wherein the height of the second flange (4) from the bottom of the panel (1) to a second ridge (9) of the first flange is 4 to 10 mm and preferably around 8 mm.

5. The panel according to claim 3, wherein said first

flange (3) is provided with a mounting rail (12) extending as a rim alongside and on the outside of said first flange (3) approximately in the same plane as the web (2) of the panel (1).

6. The panel according to claim 5, wherein said mounting rail (12) is shorter than said first flange (3) of the panel (1).
7. The panel according to claim 5, wherein the height of the second flange (4) from its bottom up to the top of a second ridge (9), formed at an intersection of the second flange (4) and the half lap (8), is approximately the same as the distance from said mounting rail (12) up to the inside top of a notch (7) formed between the first flange (3) and the lap (6).
8. The panel according to claim 5, wherein said web (2), said first flange (3), said lap (6) and said mounting rail (12) are formed integrally in one piece as the plate forming the web (2) is folded along a first line to form an inner wall of the first flange (3), folded along said ridge (5) to form a top side of said lap (6), folded along a longitudinal edge (11) of said lap (6) to form a bottom side of said lap (6), folded along and below said ridge (5) to form an outer side of said first flange (3) and folded outwards along a bottom line of said first flange (3) to form said mounting rail (12).
9. The panel according to claim 8, wherein said outer side of said first flange (3) and said bottom side of said lap (6) are provided with pre-cuts (18) at regular intervals along the panel (1).
10. The panel according to any of the preceding claims, wherein a sealing agent (10) provided at a production process of the panel (1), is applied in a notch (7) formed between said first flange (3) and said lap (6).
11. The panel according to claim 1, wherein the panel (1) at one end and between said first (3) and said second (4) flanges is provided with a foot plate (16) integrally formed with the web (2) of the panel (1) and being folded downwards and inwards below said web (2).
12. The panel according to any of the preceding claims, wherein the mounting rail (12) is provided with distributed sunk holes (13) for fastening members, such as screws.
13. The panel according to any of the preceding claims, wherein the first flange (3) is protruding from an end of the panel (1) to form a triangular section (17) as the first ridge (5) is extending a distance further in relation to the end of the panel (1) than the bottom of said first flange (3).

14. A cladding system for covering a substructure, such as a roof or a wall of a building, including at least two sheet metal cladding panels (1) of claim 1,

- a first of said panels (1) is mounted alongside a second of said panels (1),
- the first flange (3) of said first panel (1) abuts the second flange of said second panel (1) for forming a seam between them,

characterized in that:

- said lap (6) of said first flange (3) covers the half lap (8) of said second flange (4),
- the lap (6) is clamped over the half lap (8) and thus forming a folded seam of said first and said second panels (1).

15. The cladding system according to claim 14, wherein the seam is sealed by means of a sealing agent (10) provided between the first and the second panel in a notch (7) formed between said first flange (3) and said lap (6).

16. The cladding system according to claim 14, wherein the panels are fixed to the substructure (S) by means of a mounting rail (12) integrated with the first flange (3) of the first panel (1) and forming a rim alongside said first flange (3) approximately being in the plane of the web (2) of the panel (1).

17. The cladding system according to claim 16, wherein fastening means (15), such as screws, fixing the panels to the substructure (S) are arranged in holes of the mounting rail (12) and that further an area of the plate around said hole of the mounting rail is sunk in relation to the remaining area of the mounting rail, such that the screw heads will be embedded in the mounting rail (12).

18. A method for covering a substructure (S), such as a roof or a wall of a building, with at least two panels (1) according to claim 6, including the steps of:

- attaching a first one of said panels (1) to the substructure by use of the mounting rail (12) on said first panel,
- inserting the second ridge (9) of a second of said panels into and along the notch (7) of said first panel,
- rotating said second panel around the second ridge (9) downwards until the second flange (4) of the second panel abuts the first flange (3) of the first panel and
- attaching the second one of said panels (1) to the substructure by use of the mounting rail (12) on said second panel.

19. The method according to claim 18, further including the step of:

- clamping the lap (6) against the first flange (3) of the first panel, thus encircling the half lap (8) and clamping the lap (6), the half lap 8, the top of the second flange (4) and the top of the first flange (3) together and thereby establishing a sealed seam between the first and the second panel (1). 5 10

20. The method according to claim 18, further including the step of:

- folding a section (17) protruding from the end of the first flange (3) of the first panel around the end of the second flange of the second panel for form forming a sealed end of the first and second flanges (1). 15 20

Amended claims in accordance with Rule 137(2) EPC.

1. A sheet metal cladding panel (1), in particular for covering roofs and walls of buildings, comprising: 25

- an elongated sheet metal member forming a web (2) of the panel, 30
- upwards folded flanges (3, 4) along the two elongated edges of said web (2) of the panel (1),
- a first (3) of said upwards folded flanges being folded outwards and downwards along its upper edge to form a first lap (6), said upper edge thus taking shape of a first ridge (5), 35
- a second (4) of said upwards folded flanges is folded inwards and downwards along its upper edge to form a half lap (8).
- said web (2), said first flange (3), said lap (6) and said mounting rail (12) are formed integrally in one piece as the plate forming the web (2) is folded along a first line to form an inner wall of the first flange (3), folded along said ridge (5) to form a top side of said lap (6), folded a along a longitudinal edge (11) of said lap (6) to form a bottom side of said lap (6), folded along and below said ridge (5) to form an outer side of said first flange (3) and folded outwards along a bottom line of said first flange (3) to form said mounting rail (12). 40 45 50

characterized in that:

said outer side of said first flange (3) and to said bottom side of said lap (6) are provided with pre-cuts (18) at regular intervals claim 1 along the panel (1). 55

2. The panel according to claim 1, wherein the cross-sectional length of the half lap (8) is smaller than the cross-section length of the first lap (6).

3. The panel according to claim 2, wherein the height of the first flange (3) from the bottom of the panel (1) to a first ridge (5) of the first flange is 30 to 50 mm and preferably around 35 mm.

4. The panel according to claim 2 or 3, wherein the height of the second flange (4) from the bottom of the panel (1) to a second ridge (9) of the second flange is preferably around 8 mm.

5. The panel according to claim 3, wherein said mounting rail (12) extends as a rim alongside and on the outside of said first flange (3) approximately in the same plane as the web (2) of the panel (1).

6. The panel according to claim 5, wherein said mounting rail (12) is shorter than said first flange (3) of the panel (1).

7. The panel according to claim 5, wherein the height of the second flange (4) from its bottom up to the top of a second ridge (9), formed at an intersection of the second flange (4) and the half lap (8), is approximately the same as the distance from said mounting rail (12) up to the inside top of a notch (7) formed between the first flange (3) and the lap (6).

8. The panel according to any of the preceding claims, wherein a sealing agent (10) provided at a production process of the panel (1), is applied in a notch (7) formed between said first flange (3) and said lap (6).

9. The panel according to claim 1, wherein the panel (1) at one end and between said first (3) and said second (4) flanges is provided with a foot plate (16) integrally formed with the web (2) of the panel (1) and being folded downwards and inwards below said web (2).

10. The panel according to any of the preceding claims, wherein the mounting rail (12) is provided with distributed sunk holes (13) for fastening members, such as screws.

11. The panel according to any of the preceding claims, wherein the first flange (3) is protruding from an end of the panel (1) to form a triangular section (17) as the first ridge (5) is extending a distance further in relation to the end of the panel (1) than the bottom of said first flange (3).

12. A cladding system for covering a substructure, such as a roof or a wall of a building, including at

least two sheet metal cladding panels (1) of claim 1,

- a first of said panels (1) is mounted alongside a second of said panels (1),
- the first flange (3) of said first panel (1) abuts the second flange of said second panel (1) for forming a seam between them, 5
- said lap (6) of said first flange (3) covers the half lap (8) of said second flange (4),
- the lap (6) is clamped over the half lap (8) and thus forming a folded seam of said first and said second panels (1). 10

characterized in that

- fastening means (15), such as screws, fixing the panels to the substructure (S) are arranged in holes of the mounting rail (12) and that further an area of the plate around said hole of the mounting rail is sunk in relation to the remaining area of the mounting rail, such that the screw heads will be embedded in the mounting rail (12). 15 20

13. The cladding system according to claim 14, wherein the seam is sealed by means of a sealing agent (10) provided between the first and the second panel in a notch (7) formed between said first flange (3) and said lap (6). 25

14. The cladding system according to claim 14, wherein the panels are fixed to the substructure (S) by means of a mounting rail (12) integrated with the first flange (3) of the first panel (1). 30

15. A method for covering a substructure (S), such as a roof or a wall of a building, with at least two panels (1) according to claim 6, including the steps of: 35

- cutting at least one of said panels along one of said pre-cuts (18),
- attaching a first one of said panels (1) to the substructure by use of the mounting rail (12) on said first panel, 40 45
- inserting the second ridge (9) of a second of said panels into and along the notch (7) of said first panel,
- rotating said second panel around the second ridge (9) downwards until the second flange (4) of the second panel abuts the first flange (3) of the first panel and 50
- attaching the second one of said panels (1) to the substructure by use of the mounting rail (12) on said second panel. 55

16. The method according to claim 18, further including the step of:

- clamping the lap (6) against the first flange (3) of the first panel, thus encircling the half lap (8) and clamping the lap (6), the half lap 8, the top of the second flange (4) and the top of the first flange (3) together and thereby establishing a sealed seam between the first and the second panel (1).

17. The method according to claim 18, further including the step of:

- folding a section (17) protruding from the end of the first flange (3) of the first panel around the end of the second flange of the second panel for form forming a sealed end of the first and second flanges (1).

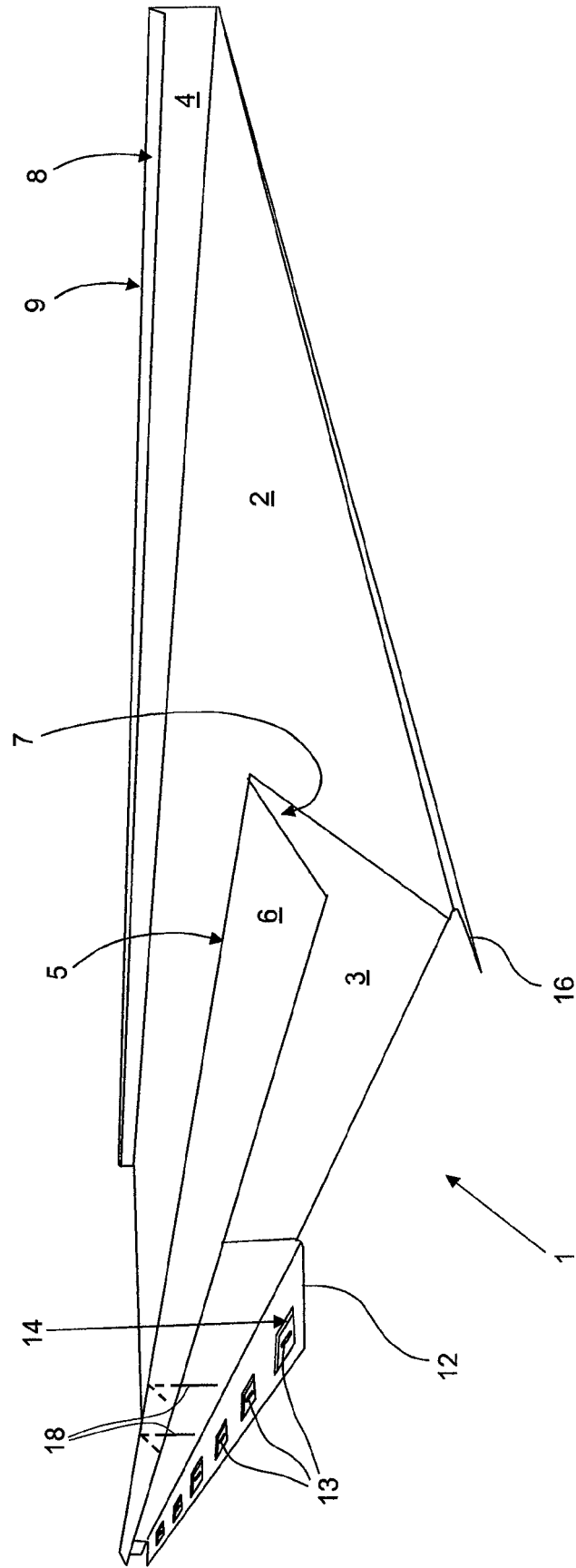


Fig. 1

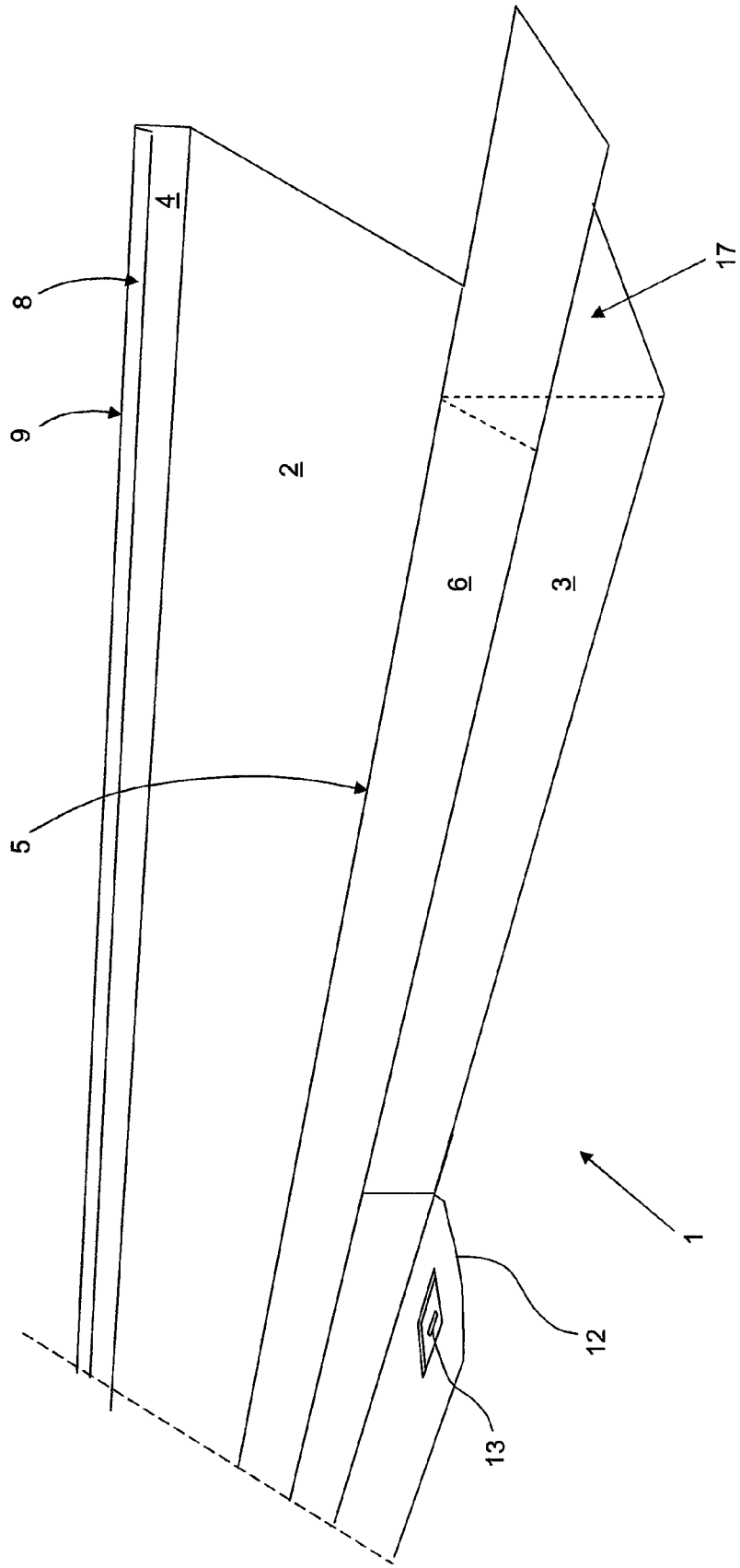


Fig. 2

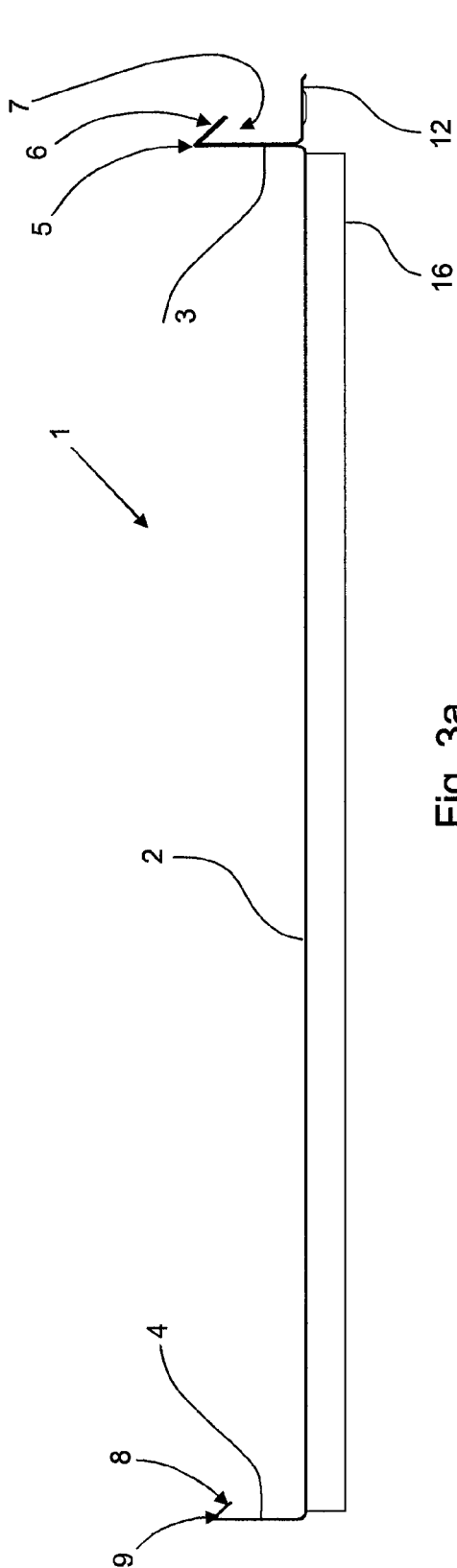


Fig. 3a

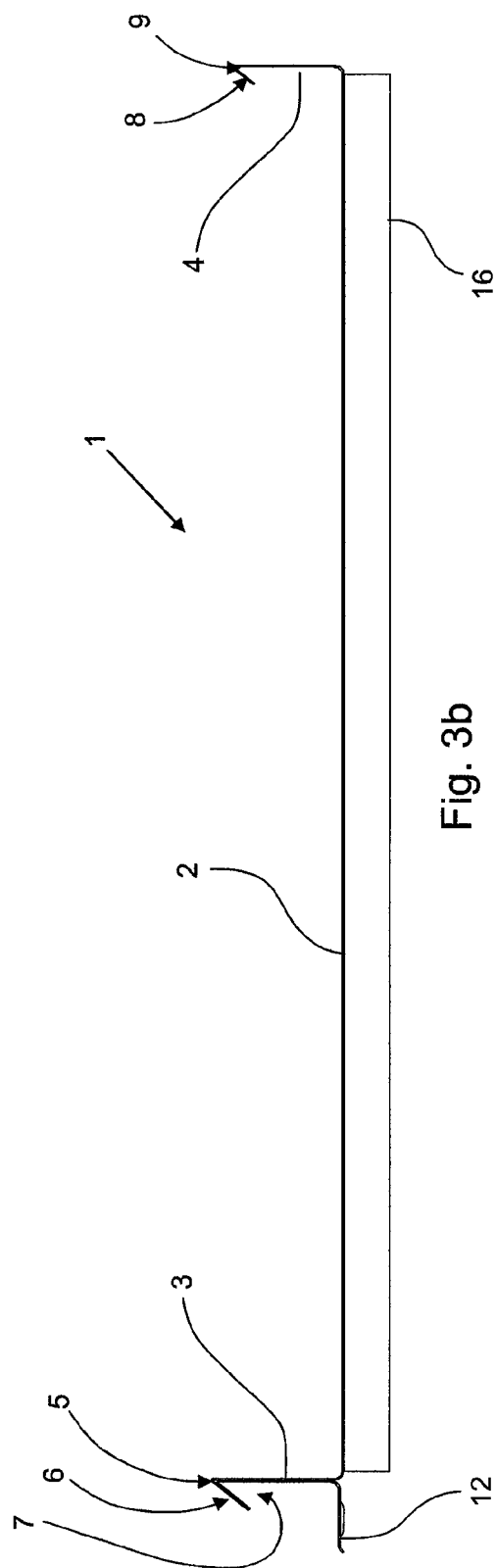
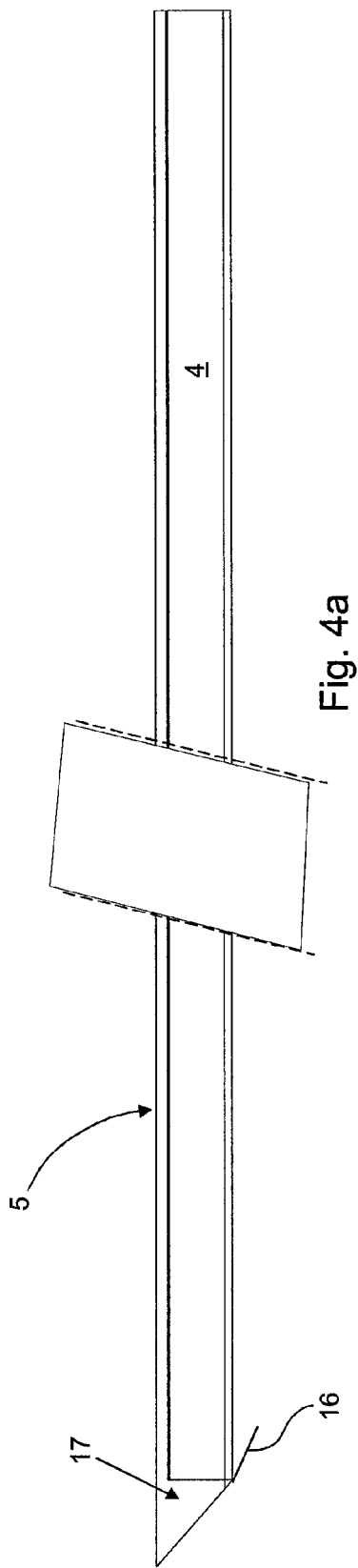
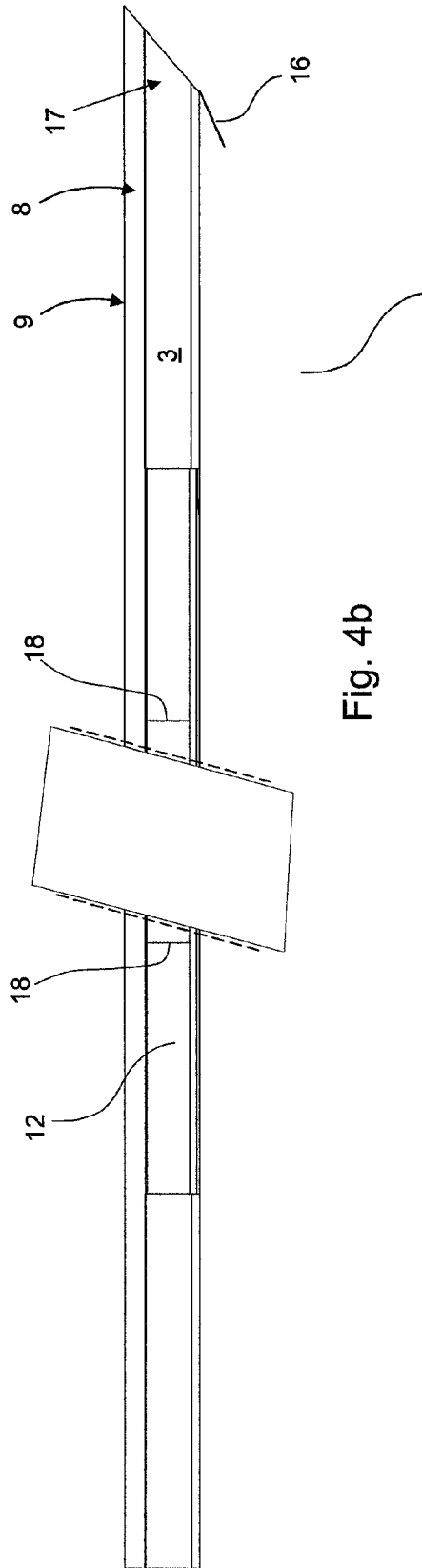


Fig. 3b



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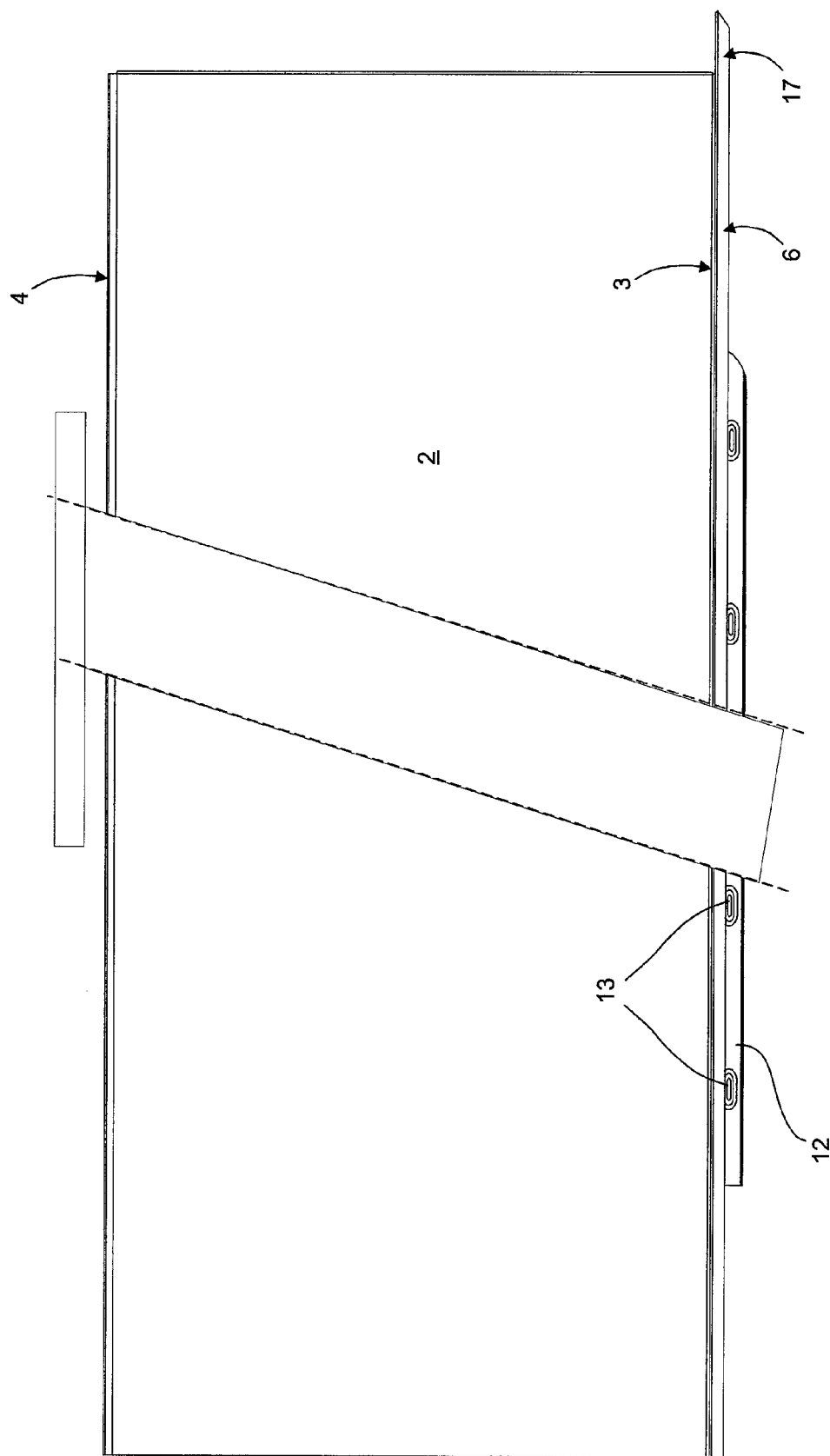


Fig. 5

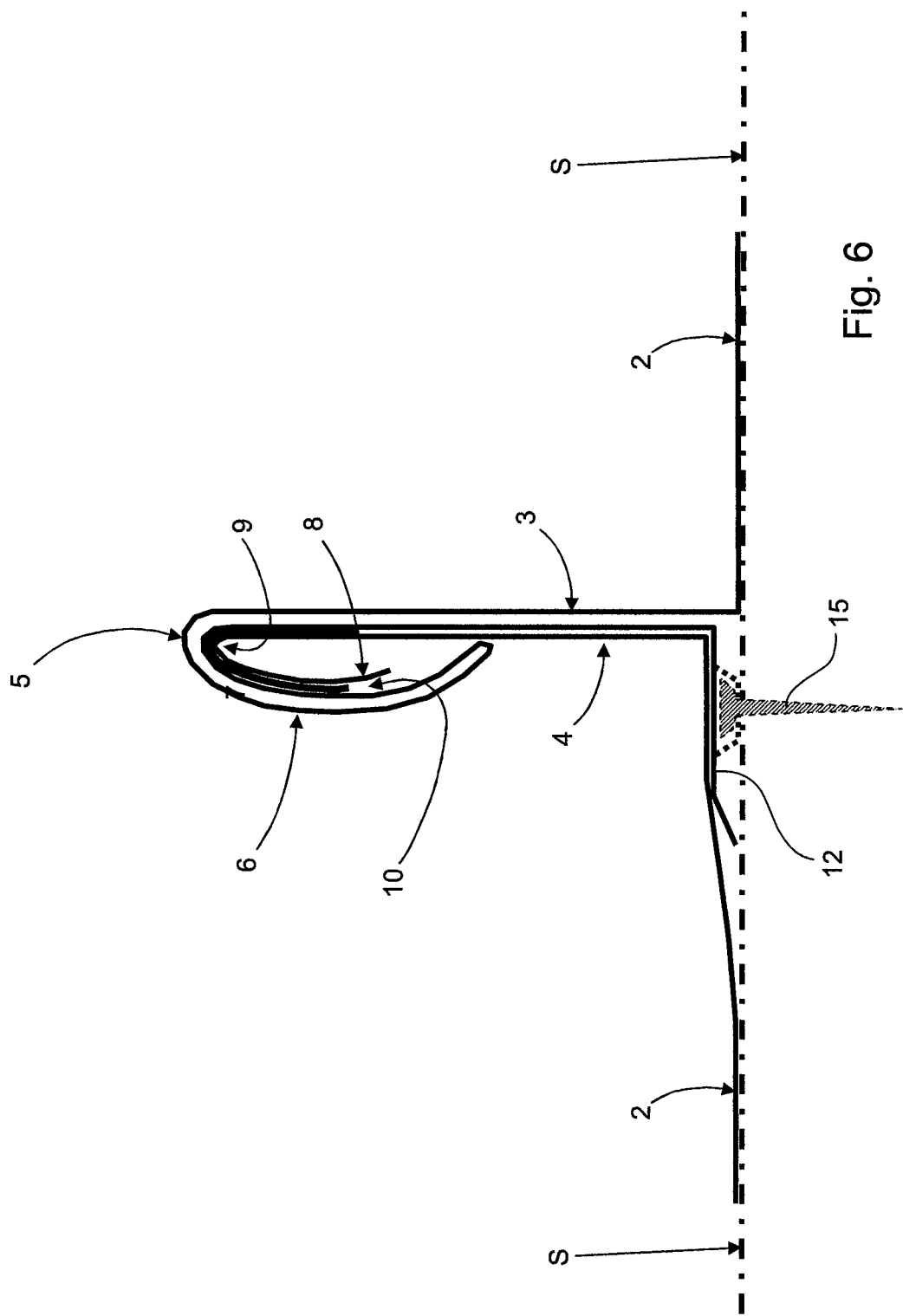


Fig. 6

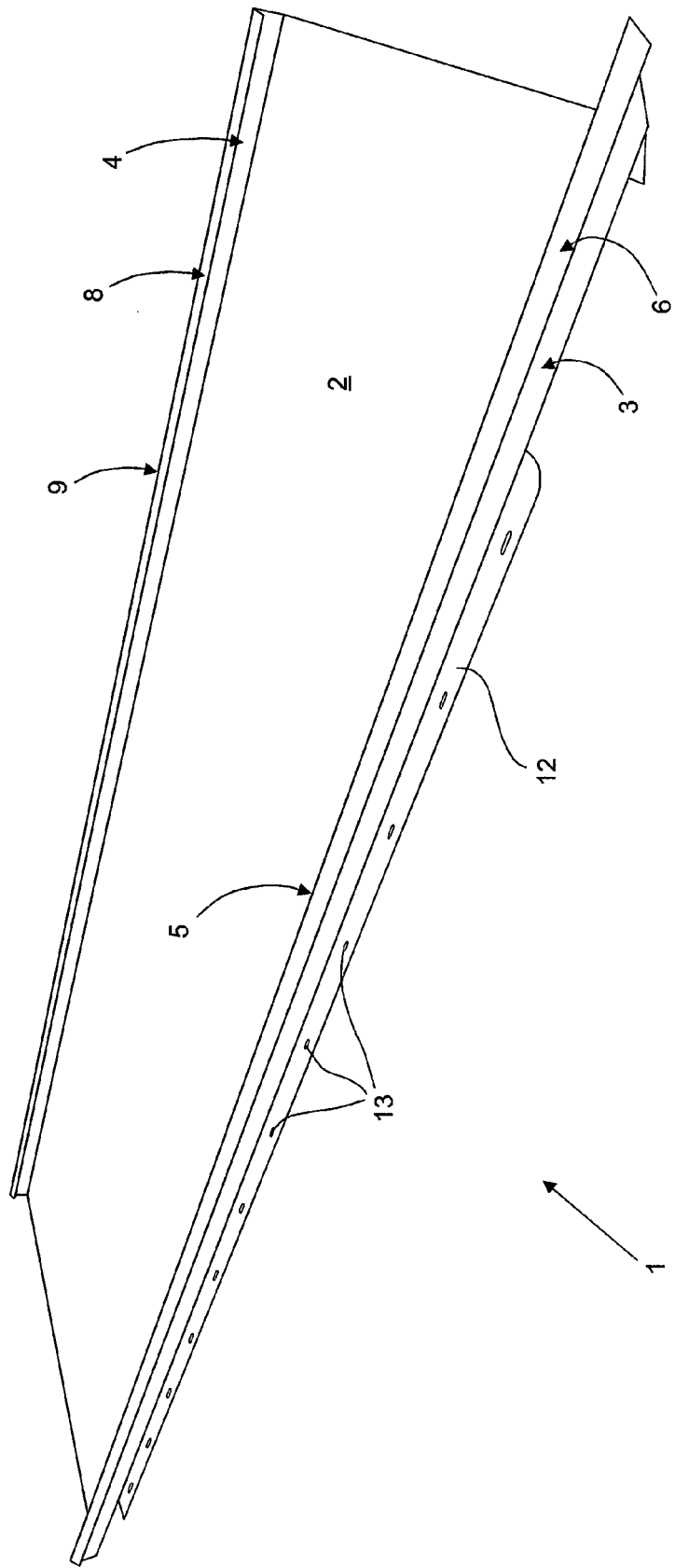


Fig. 7



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EUROPEAN SEARCH REPORT

Application Number
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Place of search		Date of completion of the search	Examiner
The Hague		13 November 2006	Mysliwetz, Wolfgang
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