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(72) Inventors:

- **Wozniak, Krzysztof**
62-200 Gniezno (PL)
- **Zielinski, Stanislaw**
62-004 Czerwonak (PL)
- **Wdowiak, Tomasz**
62-006 Kobylnica (PL)

(71) Applicant: **Profile VOX Sp. z o.o. Sp. K**
62-004 Czerwonak (PL)

(74) Representative: **Lisiecki, Wojciech**
Sciegienego 118
60-304 Poznan (PL)

(54) **The way of transverse-connecting of siding profiles and profiles for the realization of this type of connection**

(57) This invention relates to siding profiles designed for wall cladding, in particular for buildings.

The shaping of the endings in the profiles is adapted to join the profiles at their short sides. The profile has different endings, where one ending of the profile has the shape of a perpendicular cross-section of the profile, and at the other end the facing layer is longer than the profile core 7, thus forming a projection 9 enclosing the front part and the lower edge of the profile (see figure).

In one embodiment, one end of the profile has, except for the projection of the facing layer, projections of the mounting belt and/or coupling, while at the opposite

end the mounting belt and the coupling are respectively shorter.

In another embodiment one end is in the shape similar to the cross-section of the profile, where it is slantwise pressed at an angle β in the opposite direction to the plane of the facing layer.

In a further embodiment one end has step finishing.

One embodiment of the invention is a profile, in which both ends are alike, and the profile is designed to join two randomly shaped profiles according to the invention, wherein its construction is similar to the other profiles according to the invention.

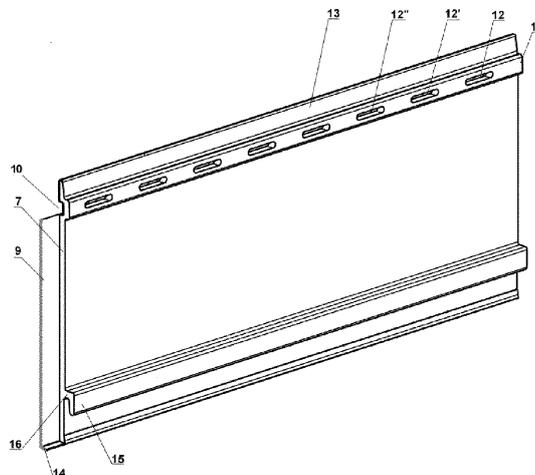


Fig. 5

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Description

[0001] This invention relates to siding profiles designed for wall cladding, in particular for buildings, characterized by the design allowing for the elimination of discontinuities between profiles. In a further aspect, the object of the invention is a method of joining siding profiles and the application of the profiles according to the present invention.

[0002] Siding profiles are widely used as wall cladding. The longitudinal joints of the profiles are generally implemented by overlaps and the transverse joints are implemented by different types of connectors. There are different types of connectors to join the two short edges of cladding profiles. Connectors are generally elements made from a material different than the profile. The joint with connectors is clearly visible on the surface of the wall.

[0003] In the patents BE1016764 and W02007/031527 there is a known butt-joint of two profiles, **characterized in that** one end of the profile has a two-piece projection, where the first section is an extension of a decorative outer layer and the second section is directed at an angle α in the opposite direction towards the outer surface of the profile and the second end of the profile has a three-piece projection, where the first section is an extension of the decorative outer layer, the second section is directed at an angle α in the opposite direction to the outer surface of the profile and the third one is parallel to the outer surface, but in a plane shifted towards the inner surface of the profile. The α angles are in the range from 0 to 90°, in particular from 30 to 60° most preferably at 45°. The two profiles are joined together in such a way that the outer edge of the dual element of the first profile is based on the outer surface of the central part of the three-piece element of the second profile. When two sections are joined, a recess is formed in the place of the joint. The patent discloses several combinations of differently-shaped projections, but the basic idea is the same. One embodiment of the invention makes it possible to create, in the place of the joint, a bump instead of a recess. In another embodiment of this invention, instead of the dual projection, there is a recess in the front edge of the profile, into which the three-piece projection is inserted.

[0004] This joint is characterized by a clear marking of the place of the joint and does not ensure full integrity and tightness between the joined profiles, since it only seals the front surface of the profile, and the profile is in fact a form with a thickness many times greater than the thickness of the outer layer, resulting in, among others, a hole being formed in the lower part of the joint. Admittedly, it is small, but it will allow both the free flow of air and water, which in addition to reduced aesthetic qualities adversely affect operational advantages of the cladding.

[0005] Another method of joining siding profiles consists in the removal of the outer layer with the part of the

profile core at one end of the profile, and at the other end the inner layer of the profile core is respectively removed, so that at the joint between two profiles, they overlap each other to form an overlap joint. In the case of large temperature differences, this joining of profiles has the effect to dimensional changes caused by shrinkage under the influence of temperature drop, gaps in the decorative surface of the profile appear, and if the temperature rises, bulges form as a result of expansion. Furthermore, similarly to the solution according to patent W02007/031527, a hole is formed in the lower part of the joint.

[0006] The purpose of the invention was to develop a design of the profile that would enable simple, tight and aesthetic joint of the shorter sides of the profiles.

[0007] With the adequate design of the profiles a method of joining profiles has been developed, which enables tight and aesthetic connection of the profiles.

[0008] This invention relates to cladding siding profiles comprising a core made of a solid, cellular or layered material with the outer front face layer. The outer front face layer is made of a hard material, especially PVC, and covers the entire visible surface of the profile and the lower and upper edges of the longer sides of the profile and serves two functions, namely, protection of the core against damage and a decorative function. Profiles have shapes, which resemble a rectangle, which in the upper part, over the entire length, has a recess, the bottom of which is the mounting belt with known designs. Between this recess and the upper edge of the profile there is an attachment tongue. The front face layer may, but need not, overlap the attachment tongue. From the inside, in the lower part of the profile, along its entire length there is an attachment slot, which generally has an L-shaped section and comprises the coupling and the coupling base, which joins the coupling with the profile core. The coupling is relative to the lower edge of the profile at a distance, which is the difference between the nominal width of the profile and the covering width. This distance, adhering to the above rule, is different for different dimensional variants of the profiles. The coupling is designed to enable an overlap joint of the two adjacent courses of profiles, where the joint is made by inserting the attachment tongue of one profile into the coupling of the second profile.

[0009] The essence of the invention is the suitable shaping of the endings in the extruded profiles, which is adapted to join the siding profiles at their short sides. The endings of the profiles can be formed in different ways, so as to comply with the condition of tight and aesthetic connection.

[0010] The first embodiment provides a profile having different endings, where one end of the profile has the shape of a perpendicular cross-section of the profile, and at the other end the facing layer is longer than the profile core, thus forming a projection enclosing the front part and the lower edge of the profile. This projection is from 0,2 to 45% of the profile length but not less than 3 mm,

where preferably for the profiles up to 1 m long this length is from 0.3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0.1 to 25%, but not less than 6 mm. The projection of the facing layer may, but need not include also the part of the facing layer located on the attachment tongue.

[0011] In the second variant of this aspect, one end of the profile has a shape of a perpendicular cross-section of the profile enclosing the core and the facing layer, where the mounting belt and/or the coupling with the coupling base are at this end shorter than the core by 0.2 to 45% of the profile length, but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0.3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0.1 to 25%, but not less than 6 mm. At the other end, the facing layer is longer than the profile core, but additionally it has at least one, and preferably two projections, one of which is an extension of the mounting belt and the other one is an extension of the coupling. Both the protruding part of the facing layer and the two projections have the length from 0.2 to 45% of the profile length, but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0.3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0.1 to 25%, but not less than 6 mm, and the projections that are the extension of the mounting belt and/or the extension of the coupling may be shorter than the projection created by the facing layer. Also in this embodiment the projection of the facing layer may, but need not include the part of the facing layer located on the attachment tongue.

[0012] Profiles according to this aspect of the invention, in both embodiments, basic and with the projections, of the mounting belt and/or coupling are joined in such a way that the projection of one profile overlaps the end of the second profile, where the projection of the facing layer overlaps from the front the end of the second profile. In the basic variation the profiles can be joined also if they are cut to a desired arbitrary length, which is a convenient feature that allows installation of the profiles on the wall of any size. The profiles can be cut to any length, where the cut can be made only at the end that has no projection. In the case of joining profiles in the second embodiment, additional projections of the mounting belt and/or coupling stabilize the joint, since the ending of the second joined profile is covered on one side by the protruding facing layer, and on the other side propped by at least one, and preferably two projections.

[0013] The second embodiment provides a profile having different endings, where at one end the facing layer is longer than the profile core, forming a projection comprising the front part and the lower edge of the profile, while the other end has a shape similar to the cross-section of the profile, and it is pressed obliquely at an angle β in the opposite direction to the plane of the facing layer. Angle β is from 0.1° to 70° preferably from 0.1° to 15°. The pressed part is from 0.2 to 45% of the profile length but not less than 3 mm, where preferably for the

profiles up to 1 m long this length is from 0.3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0.1 to 25%, but not less than 6 mm. Also, the projection of the facing layer at the opposite end of the profile is from 0.2 to 45% of the profile length but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0.3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0.1 to 25%, but not less than 6 mm. The compression can be preferably realized by suitable pressing of the core material or pressing of the core material after removal of its part.

[0014] The projection of the facing layer may, but need not include also the part of the facing layer located on the attachment tongue. In the embodiment of the profile according to this variant the attachment tongue and/or a coupling, in the compressed area, form a projection from 3 mm long to the length corresponding to the width of the compressed part.

[0015] The third embodiment provides a profile having different endings, where at one ending the facing layer is longer than the profile core, forming a projection comprising a front edge part and a lower edge of the profile, while the other end has a stepped finishing with the shape similar to the profile cross-section, where at the width representing from 0.1 to 10% of the profile width but not less than 6 mm, the profile core is thinner by from 0.1 to 40%, but not less than 0.4 mm, and the facing layer has a double fold, forming a step. The first fold between the facing layer of the profile is inclined at the γ angle from 90 to 110° in the direction from the profile front to the back, and the second fold at the δ angle from 70 to 90° is inclined towards the front of the profile, so that as of the second fold the facing layer of the modified part lies in the parallel plane to the facing layer of the rest of the profile. Preferably, the γ and δ angles sum up to 180°. In this embodiment, the attachment tongue and/or the coupling, in the bending area of the facing layer may, but need not form a projection from 3 mm long up to the length corresponding to the width of the pressed section of the facing layer.

[0016] The step can be preferably realized by suitable pressing of the core material using a suitably shaped punch, where the core and the facing layer is pressed by a force perpendicular to the facing layer, creating at the pressed section a lowered plane, which is parallel to the non-pressed facing plane.

[0017] Profiles according to this aspect of the invention, in both embodiments - basic and with projections of the mounting belt and/or coupling - are joined in such a way that the projection of one profile overlaps the end of the second profile, where the projection of the facing layer overlaps from the front the fold or the step at the end of the second profile. In the case of joining profiles in the second embodiment, additional projections of the mounting belt and/or coupling stabilize the joint, since the ending of the second joined profile is covered on one side by the protruding facing layer, and on the other side propped by at least one, and preferably two projections.

The advantage of this solution, although it requires additional technological operations in the profiles' manufacturing process in relation to the profiles according to the first aspect, is that the joining of the adjacent sections is in the same plane, and there are no stresses in the facing layer of the outer profile due to the possible deflection of that section of the facing layer from the original plane of the profile in the place of the joint, which may occur with profiles according to the first embodiment.

[0018] The fourth embodiment provides a profile having both endings of the facing layer longer from the profile core, creating at both endings projections comprising the front part and the lower edge of the profile. Each projection of the facing layer is from 0.3 to 45% of the profile length but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0.3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0.1 to 25%, but not less than 6 mm.

[0019] In this embodiment, both endings of the profile are longer than the profile core, creating at both endings the projections comprising the front part and the lower part of the profile, and additionally at least one ending has one or two projections, where one is the extension of the mounting belt, and the other one is the extension of the coupling. These projections may have the length from 3 mm to the length corresponding to the width of the projection of the facing layer.

[0020] A profile according to this embodiment is designed to join profiles that do not have any projections at any end. The profile can be used to join profiles of any length.

[0021] The fifth embodiment provides a method of butt-joining of two siding profiles according to the invention, **characterized in that** one ending of the profile is finished with a suitably contoured projection, and the projection overlaps the outer surface of the adjacent profile. The method of joining profiles according to the invention consists in joining any profiles, following the rules below:

1. the joint is made through the end of the profile in the form of the projection of the facing layer with any ending of the second profile
or
2. the joint is made through the end of the profile in the form of the projections of the facing layer and at least one projection, which is an extension of the mounting belt or an extension of the coupling.

[0022] The advantage is, on the one hand a tight joint of the two profiles, both in the front plane of the profiles, as well as at the upper and lower edges, and on the other hand, both joint planes - lower and upper - can move freely relative to one another without creating gaps in the decorative surface.

[0023] Details of the invention are shown and explained in the drawings, which illustrate all variants and embodiments of the invention, but serve only as the examples of the embodiments. All the embodiments in Fig-

ures 1 to 31 are shown in one version of symmetry, however, the invention relates to the profiles with the inverted symmetry, i.e. the elements shown in these figures on the left side, may be on the right side and respectively the elements shown on the right side can be on the left. Figures showing only the section of the profile also refer to the cases, where the given type of the finishing is in the inverted position.

[0024] The individual figures in the drawing represent:

- 1 and 2, a general view of the profiles' joint,
- 3-13 examples of the profiles according to the first embodiment,
- 14-23 examples of the profiles according to the second embodiment,
- 24-28 examples of the profiles according to the third embodiment,
- 29-31 examples of the profiles according to the fourth embodiment.

[0025] In figures 4, 5, 9, 14, 29-31 the facing layer 8 is presented with an unnatural thickness in order to clearly distinguish it from the core, and in reality it is thinner.

[0026] Figure 1 shows the joint of three adjacent profiles 1, 2 and 3, where two are joined by their fronts 1, 2 creating an outer edge of the joint 4, and the third one 3 joins with them with the longitudinal edge. In the case of mutual movement of the profiles relative to each other, particularly under the influence of the movements caused by the thermal contraction and expansion of the profiles 1, 2, the outer edge of the joint 4 slightly changes its position, but gaps do not appear, i.e. the facing layers of the adjacent profiles give the impression of a continuous plane.

[0027] Figure 2 shows an enlarged detail A of Figure 1, which depicts the fragment of the joint where the facing layers of the adjacent profiles in all planes create an impression that they are continuous, i.e. between the facing layers of the adjacent profiles 1, 2, 3 there are no gaps. The facing layers of these profiles are in contact with each other, both in the plane of the profile, forming the edge of the joint 4, as well as in the plane of the lower edges of the facing layer, forming a horizontal extension of the edge of the joint 5.

[0028] Figure 3 shows a rear view of the joint of three adjacent profiles 1, 2 and 3, where two 1, 2 are joined by their fronts, creating an inner edge of the joint 6, and the third one 3 joins with them with the longitudinal edge. Depending on the movements caused by temperature changes, the inner edge of the joint 6 may take the form of a wider or narrower gap between the cores of profile 1 and 2.

[0029] Profile according to the invention, shown in Figure 4, in front view and in Figure 5 in a rear view, has a core 7 and the outer facing layer 8 made of a hard polymer. Along the upper edge of the profile there is a recess 10, the bottom of which is the mounting belt 11 with openings 12, 12', 12" for nails, screws and similar elements

that attach the profile to the surface, e.g. wooden slats. Between the recess 10 and the upper edge of the profile there is an attachment tongue 13 designed to join the profiles along the longer edge. At one end of the profile there is a projection 9 of the outer facing layer 8, which is formed by the shortening of the core 7. The projection 9 of the outer facing layer 8 comprises the front part of the core 7, and a projection 14 comprising the lower edge of the profile core 7. For practical reasons, the thickness of the facing layer 8 should be not less than 0.4 mm. From the inner side in its lower part the profile has along its entire length the coupling 15 parallel to the lower edge, and connected to the profile with the coupling base 16 with an L-shaped cross-section, which is used to join with the attachment tongue 13 of the adjacent profile.

[0030] Figure 6 shows the profile according to the first embodiment, in which one end 17 of the profile is in the shape of a perpendicular cross-section of the profile comprising a core 7 and the facing layer 8, where the mounting belt 10 and the coupling 15 together with the coupling base 16 are shorter at this end by sections 18 and 18', while at the other end 19 the facing layer 8 is longer than the profile core, but it additionally has two projections, one 20 of which is an extension of the mounting belt and the second one 21 is an extension of the coupling.

[0031] Figure 7 shows a rear view of the joint of three adjacent profiles 1, 2 and 3, according to Figure 6. Two profiles 1, 2 are joined by their fronts, creating an inner edge of the joint 6, and the third one 3 joins with them with the longitudinal edge. Furthermore, projections 20 and 21 of the profile 1 overlap the profile core 2 at the two sections 18 and 18'.

[0032] Figure 8 shows a rear view of the joint of three adjacent profiles 1, 2 and 3, according to Figures 3 and 7. The projection 9 of the facing layer 8 of the profile 1 is pushed onto the facing layer 8 of the profile 2, forming an outer edge of the joint 4. The gap between the attachment tongues 13 and 13' has a variable width, resulting from dimensional changes of the profiles due to temperature changes.

[0033] Figures 9-13 show examples of various embodiments of the endings of the profiles according to Figure 6. Figure 9 shows a front view of the profile, which in addition to the projections of the facing layer 9 and 14 also has a projection 23 of the outer facing layer 8 comprising the attachment tongue 13.

[0034] Figure 10 shows a rear view of the profile, which in addition to the projections of the facing layer 9 and 14 also has a projection 23 of the outer facing layer 8 comprising the attachment tongue 13, where this profile has projections 20 and 21, the first of which is an extension of the mounting belt and the second one is an extension of the coupling.

[0035] A profile shown in Figure 11 has a shortened mounting belt 11 by a section 18 and the coupling 15 and the coupling connector 16 are shortened by section 18'. In addition, the attachment tongue 13 is shorter than the core by section 24.

[0036] A profile shown in Figure 12 and 13 has a shortened mounting belt 11 by a section 18 and the coupling 15 and the connector has the length of the core, and coupling base 16 is shortened by section 24'. Furthermore, a profile in Figure 14 has a shortened attachment tongue 13 by section 24.

[0037] Figures 14 to 23 show examples of profiles according to the second embodiment. Profile according to the second embodiment, shown in Figure 14 in front view and in Figure 15 in a rear view, has a core 7 and the outer facing layer 8 made of a hard polymer. Along the upper edge of the profile there is a recess 10, the bottom of which is the mounting belt 11 with openings 12, 12', 12" for nails, screws and similar elements that attach the profile to the surface, e.g. wooden slats. Between the recess 10 and the upper edge of the profile there is an attachment tongue 13 designed to join the profiles along the longer edge. From the inner side in its lower part the profile has at its entire length the coupling 15 parallel to the lower edge, and connected to the profile with the coupling base 16 with an L-shaped cross-section, which is used to join with the attachment tongue 13 of the adjacent profile. At one end 26 the profile has a projection 9 of the outer facing layer 8, which is formed by the shortening of the core 7. The projection 9 of the facing layer 8 comprises the front part of the core, and a projection 14 comprising the lower edge of the profile core 7. Furthermore, at this end the coupling 15 is longer than the core, forming a projection 27 designed to stabilize the joint with the second profile. For practical reasons, the thickness of the facing layer 8 should be not less than 0.4 mm. The second end 26 of the profile is pressed at an angle β . In the drawing the edge of the pressing was marked with line 29.

[0038] Figures 16-23 show examples of various embodiments of the endings of the profiles according to Figures 14 or 15.

[0039] Figure 16 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 and with the attachment tongue 13 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer. Compression has a shape of a section of a truncated wedge 30.

[0040] Figure 17 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer. Compression has a shape of a section of a truncated wedge 31.

[0041] Figure 18 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 and with the section of the facing layer 32 on the attachment tongue 13 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer, wherein the core 7 of the attachment tongue 13 is shortened at the section corresponding to the section 32. Compression has a shape of a section of a truncated wedge 33.

[0042] Figure 19 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer. The attachment tongue 13 is shortened by section 34 at the entire width of the compressed part of the core 7.

[0043] Figure 20 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 and with the part of the facing layer 35 on the attachment tongue 13 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer. In the drawing the section of the profile is removed to show the structure of the core in the compressed part. The core 7 in the compressed section 36 is partially removed in area 37. Furthermore, under the compressed section the profile has two projections, one of which 38 is an extension of the mounting belt and the other one 39 is an extension of the coupling. The length of the projections in the drawing is equal to the width of the compressed area, but it may be smaller.

[0044] Figure 21 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 and with the part of the facing layer 35 on the attachment tongue 13 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer. In the drawing the section of the profile is removed to show the structure of the core in the compressed part. The core 7 in the compressed section 36 is partially removed in area 37.

[0045] Figure 22 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer. In the drawing the section of the profile is removed to show the structure of the core in the compressed part. The core 7 in the compressed section 36 is partially removed in area 37. Furthermore, under the compressed section, the profile has two projections, one of which 38 is an extension of the mounting belt and the other one 39 is an extension of the coupling. The length of the projections in the drawing is equal to the width of the compressed area, but it may be smaller.

[0046] Figure 23 shows the profile's side in the shape similar to the cross-section of the profile, where together with the facing layer 8 it is slantwise compressed at an angle β in the opposite direction to the plane of the facing layer. In the drawing the section of the profile is removed to show the structure of the core in the compressed part. The core 7 in the compressed section 36 is partially removed in area 37.

[0047] The stepped-end profile shown in Figure 24 is characterized in that the facing layer 8 is inclined in area 42 at angle γ in the direction from the profile's front to the back, and the second fold at angle δ is inclined towards the front of the profile, so that from the second fold the facing layer of the modified part lies in the parallel plane to the facing layer of the rest of the profile. Figure 25 shows the enlarged detail B of Figure 24. The facing

layer 8 has two folds on the edge 43 at angles γ and δ , forming a step 44. At the other end the profile has a projection 9 of the outer facing layer 8.

[0048] Figures 26-29 show examples of various embodiments of the endings of the profiles according to Figure 24.

[0049] Figure 26 shows the profile's side in the shape similar to the cross-section of the profile, where the core 7 together with the facing layer 8 and with the part of the facing layer 35 on the attachment tongue 13 is compressed perpendicularly to the facing layer, forming at the compressed section 44 a plane, which is lowered relative to the non-compressed facing plane 8. This lowering is not smaller than the thickness of the facing layer and not larger than 30% of the core thickness.

[0050] Figure 27 shows the profile's side in the shape similar to the cross-section of the profile, where the core 7 together with the facing layer 8 and with the part of the facing layer 35 on the attachment tongue 13 is compressed perpendicularly to the facing layer, forming at the compressed section 44 a plane, which is lowered relative to the non-compressed facing plane 8. This lowering is not smaller than the thickness of the facing layer and not larger than 30% of the core thickness. Furthermore, under the compression, the profile has two projections, one of which 45 is an extension of the mounting belt and the other one 46 is an extension of the coupling. The length of the projections in the drawing is equal to the width of the compressed area, but it may be smaller.

[0051] Figure 28 shows the profile's side in the shape similar to the cross-section of the profile, where the core 7 together with the facing layer 8 is compressed perpendicularly to the facing layer, forming at the compressed section 44 a plane, which is lowered relative to the non-compressed facing plane 8. This lowering is not smaller than the thickness of the facing layer and not larger than 30% of the core thickness. Furthermore, under the compression, the profile has two projections, one of which 45 is an extension of the mounting belt and the other one 46 is an extension of the coupling. The length of the projections in the drawing is equal to the width of the compressed area, but it may be smaller.

[0052] Figures 29 to 30 show examples of profiles according to the third embodiment. A profile according to the third embodiment, shown in Figure 29, in front view and in Figure 30 in a rear view, has a core 7 and the outer facing layer 8 made of a hard polymer. Along the upper edge of the profile there is a recess 10, the bottom of which is the mounting belt 11 with openings 12, 12', 12" for nails, screws and similar elements that attach the profile to the surface, e.g. wooden slats. Between the recess 10 and the upper edge of the profile there is an attachment tongue 13 designed to join the profiles along the longer edge. From the inner side in its lower part the profile has along its entire length the coupling 15 parallel to the lower edge, and connected to the profile with the coupling base 16 with an L-shaped cross-section, which is used to join with the attachment tongue 13 of the ad-

jacent profile. At both ends 47 and 48 the profile has projections 9 and 9' of the outer facing layer 8, which are formed by shortening of the core 7. The projections 9 and 9' of the facing layer 8 comprise the front part of the core, and have projections 14 and 14' comprising the lower edge of the profile core 7.

[0053] In a variant of this embodiment shown in Figure 31, at each ends 49, 50 of the profile, the attachment tongue 13 and the coupling 15 together with the coupling base 16 are longer than the core, forming projections 51, 51', 52 and 52' designed to stabilize the joint of the adjacent profiles.

Claims

1. Siding profiles, designed as wall cladding in buildings, comprising a core made of a solid, cellular or layered material and an outer facing layer and elements designed to join and fasten, **characterized in that** the profile according to the invention has different endings, where one ending of the profile is in the shape of a perpendicular cross-section of the profile, and at the other end the facing layer **8** is longer than the profile core **7**, forming a projection **9** comprising the front part and the lower edge of the profile.
2. A profile according to claim 1 **characterized in that** the projection **9** of the facing layer is from 0,2 to 45% of the profile length but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0,3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0,1 to 25%, but not less than 6 mm.
3. A profile according to claim 1 or 2 **characterized in that** at one end the mounting belt **11** and/or coupling **15** are shorter than the core **7** by 0,2 to 45% of the profile length, but not less than 3 mm, while at the other end the profile, apart from the projection **9** of the facing layer **8**, has one or two projections, one of which is an extension of the mounting belt **11**, and the second one is an extension of the coupling **15**, where the length of the projections is not less than 3 mm, and not more than the length of the projection **9** of the facing layer **8**.
4. Siding profiles, designed as wall cladding in buildings, comprising a core made of a solid, cellular or layered material and an outer facing layer and elements designed to join and fasten, **characterized in that** the profile according to the invention has different endings, where one ending of the profile is in the shape of a perpendicular cross-section of the profile, and at the other end the facing layer **8** is longer than the profile core **7**, forming a projection **9** comprising the front part and the lower edge of the profile, while at the other end the profile is in the shape of a cross-section, with the facing layer **8** slantwise pressed at the angle β in the opposite direction to the plane of the facing layer, and the pressed part is 0,2 to 45% the profile length, but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0,3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0,1 to 25%, but not less than 6 mm.
5. A profile according to claim 4 **characterized in that** angle β is from 0.1 to 70° preferably from 0.1° to 15°.
6. A profile according to claim 4 or 5 **characterized in that** the projection **9** of the facing layer is from 0,2 to 45% profile length but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0,3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0,1 to 25%, but not less than 6 mm.
7. A profile according to claim 4 or 5 or 6 **characterized in that** at one end the mounting belt **11** and/or coupling **15** are shorter than the core **7** by 0,2 to 45% of the profile length, but not less than 3 mm, while at the other end the profile, apart from the projection **9** of the facing layer **8**, has one or two projections, one of which is an extension of the mounting belt **11**, and the second one is an extension of the coupling **15**, where the length of the projections is not less than 3 mm, and not more than the length of the projection **9** of the facing layer **8**.
8. Siding profiles, designed as wall cladding in buildings, comprising a core made of a solid, cellular or layered material and an outer facing layer and elements designed to join and fasten, **characterized in that** the profile has different endings, where at one end the facing layer **8** is longer than the profile core **7**, forming a projection **9** comprising the front part and the lower edge of the profile, while the other end has stepped finishing and has a shape similar to the cross-section of the profile, where in the stepped part **44** the profile core **7** is 0,1 to 10% of the profile length, but not less than 6 mm, is thinner by 0,1 to 40%, but not less than 0,4 mm, and the facing layer **8** is folded twice, forming a step.
9. A profile according to claim 8 **characterized in that** the projection **9** of the facing layer is from 0,2 to 45% of the profile length but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0,3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0,1 to 25%, but not less than 6 mm.
10. A profile according to claim 8 or 9 **characterized in that** the first fold of the facing layer **8** between the facing layer of the profile is inclined at the angle γ

from 90 to 110° in the direction from the profile's front to the back, and the second fold at angle δ from 70 to 90° is inclined towards the front of the profile, so that from the second fold the facing layer **8** lies in the parallel plane to the facing layer of the profile. 5

11. Siding profiles, designed as wall cladding in buildings, comprising a core made of a solid, cellular or layered material and an outer facing layer and elements designed to join and fasten, **characterized in that** the both endings of the facing layer **8** are longer than the profile core, forming at both ends projections **9, 9'** comprising the front part and the lower edge of the profile, where each projection **9, 9'** of the facing layer is from 0,3 to 45% of the profile length, but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0,3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0,2 to 25%, but not less than 6 mm. 10
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12. A profile according to claim 11 **characterized in that** at both ends the profile, apart from the projection **9, 9'** of the facing layer **8**, has one or two projections **51, 51', 52, 52'**, one of which **51, 51'** is an extension of the mounting belt **11**, and the second one **52, 52'** is an extension of the coupling **15**, where the length of the projections **51, 51', 52, 52'** is not less than 3 mm and not more than the length of the projection **9** of the facing layer **8**. 25
30
13. The method of transverse-joining of two siding profiles according to the invention, **characterized in that** the transverse joint of the two profiles, where at least one has a suitably contoured projection **9** of the facing layer **8**, which the projection overlaps the outer surface of the adjacent profile. 35
14. A method according to claim 13 **characterized in that** the joint is made through the end of the profile in the form of the projection of the facing layer with any ending of the second profile. 40
15. A method according to claim 13 **characterized in that** the joint is made through the end of the profile in the form of the projections of the facing layer and at least one projection, which is an extension of the mounting belt or extension of the coupling. 45
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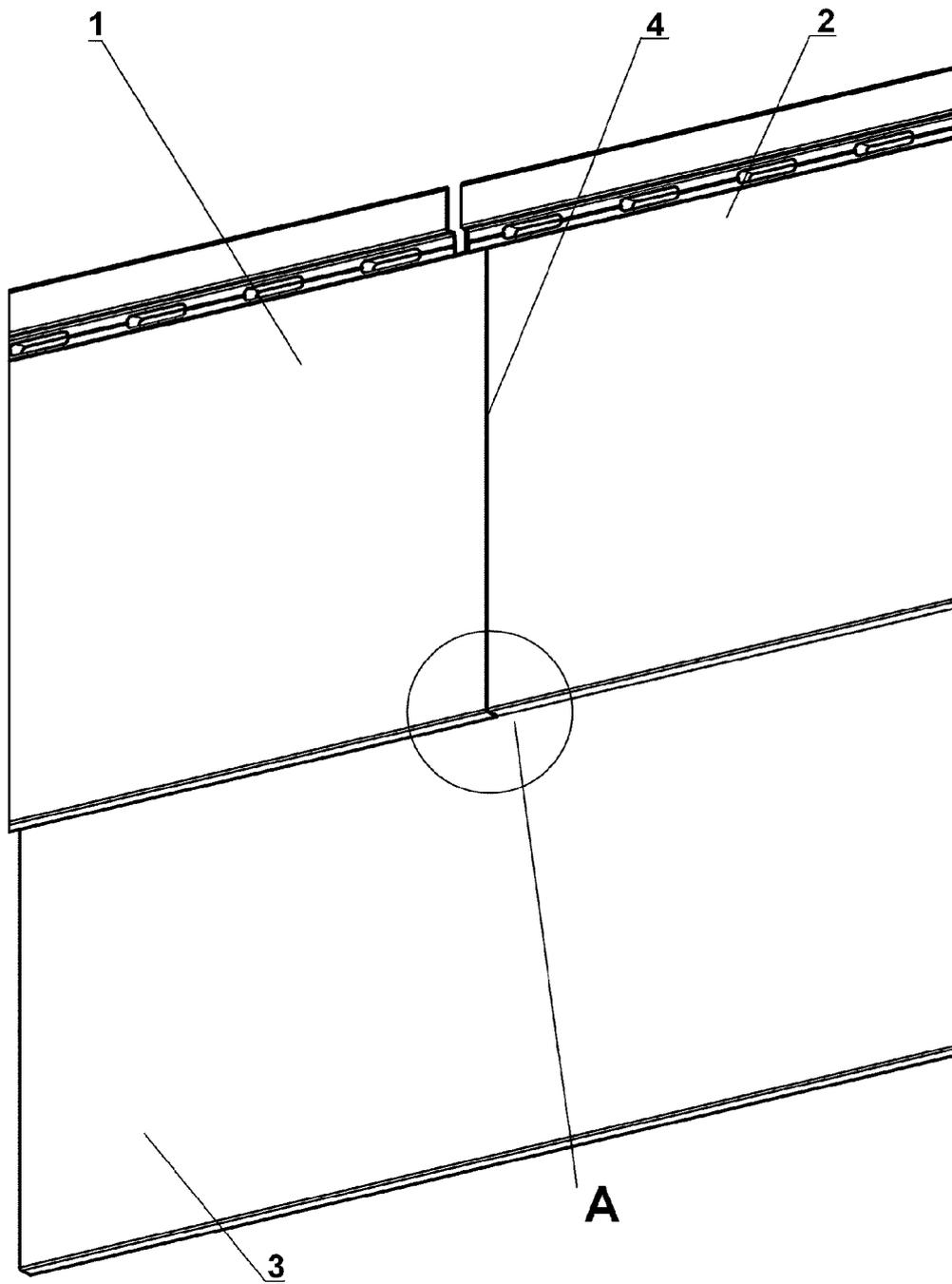


Fig. 1

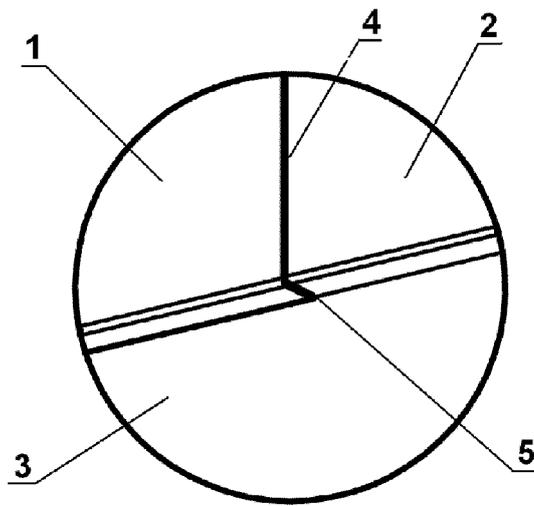


Fig. 2

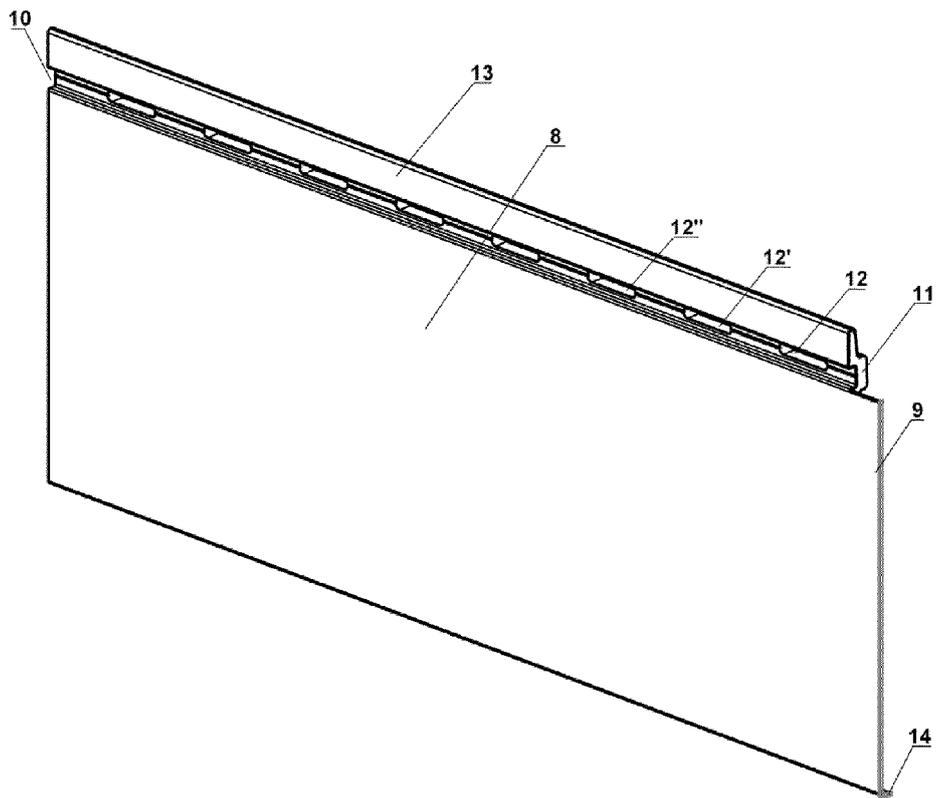


Fig 4

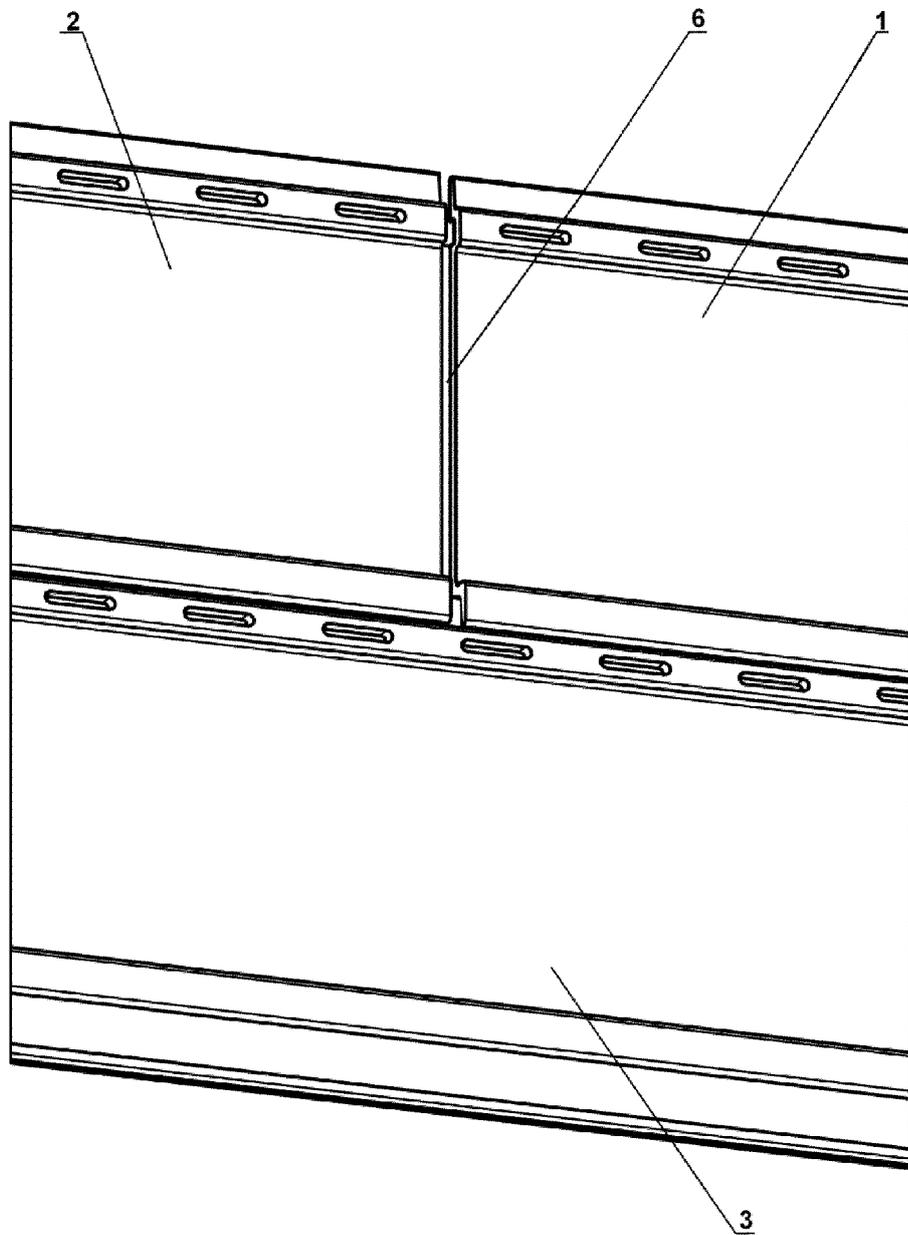


Fig.3

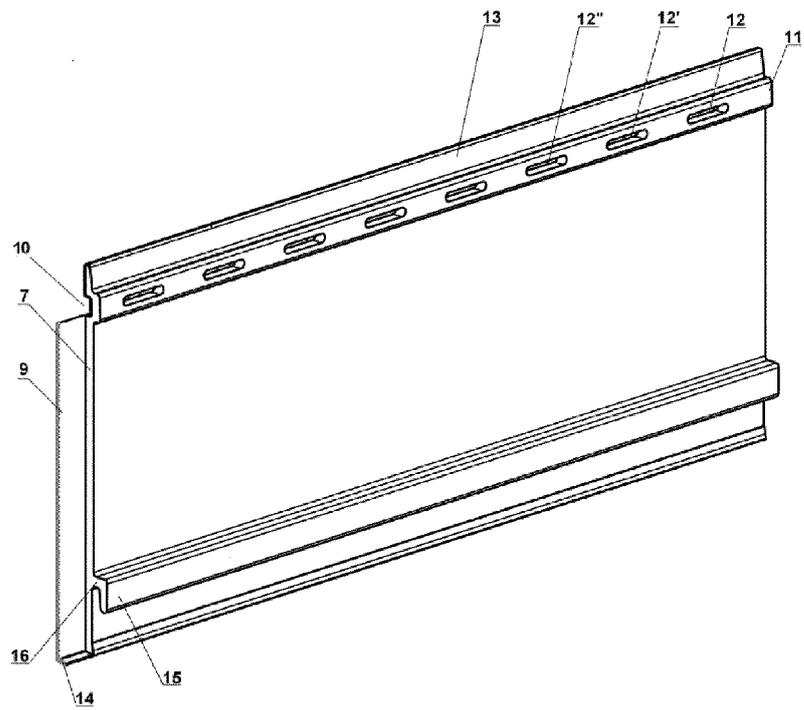


Fig. 5

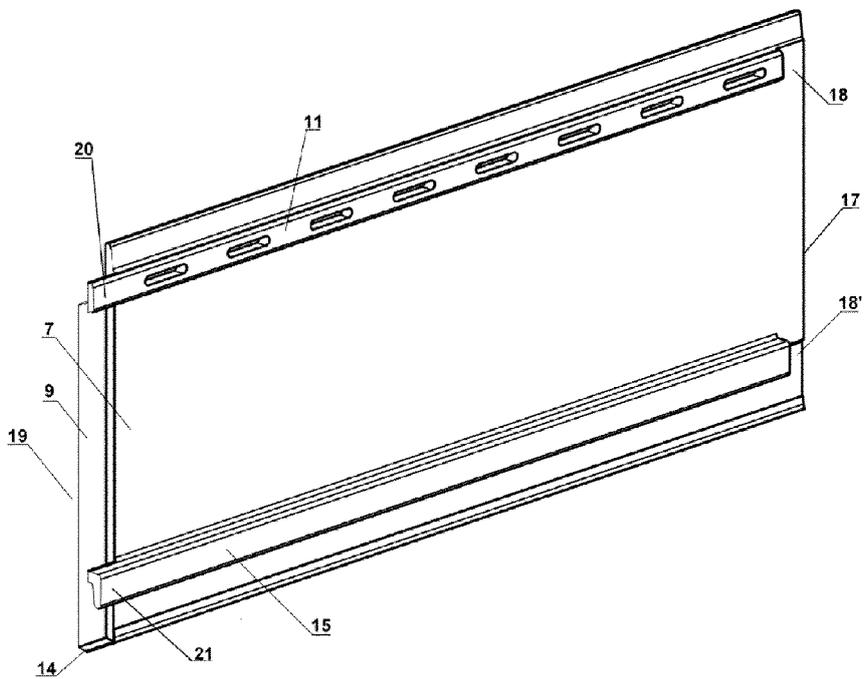


Fig. 6

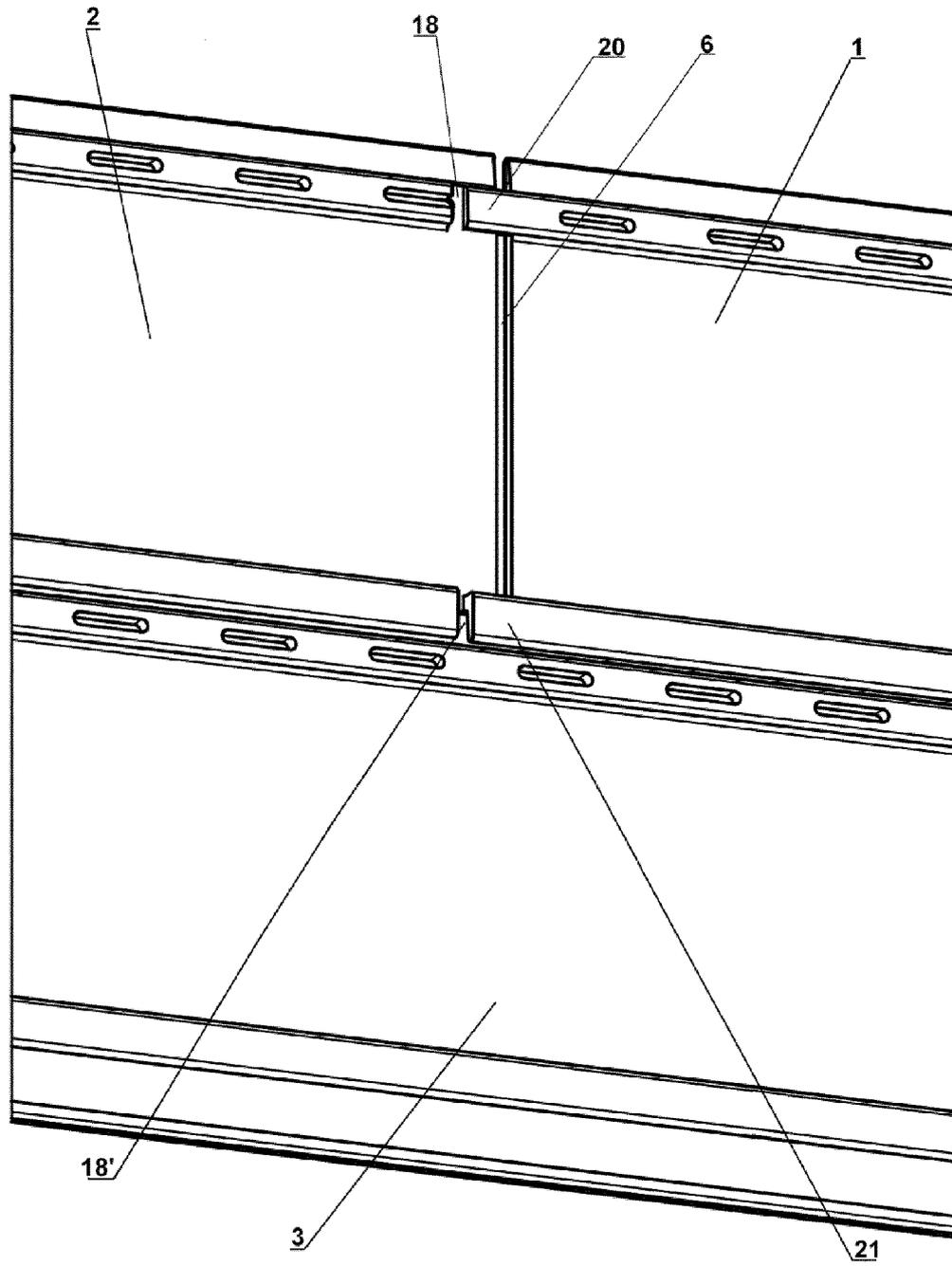


Fig. 7

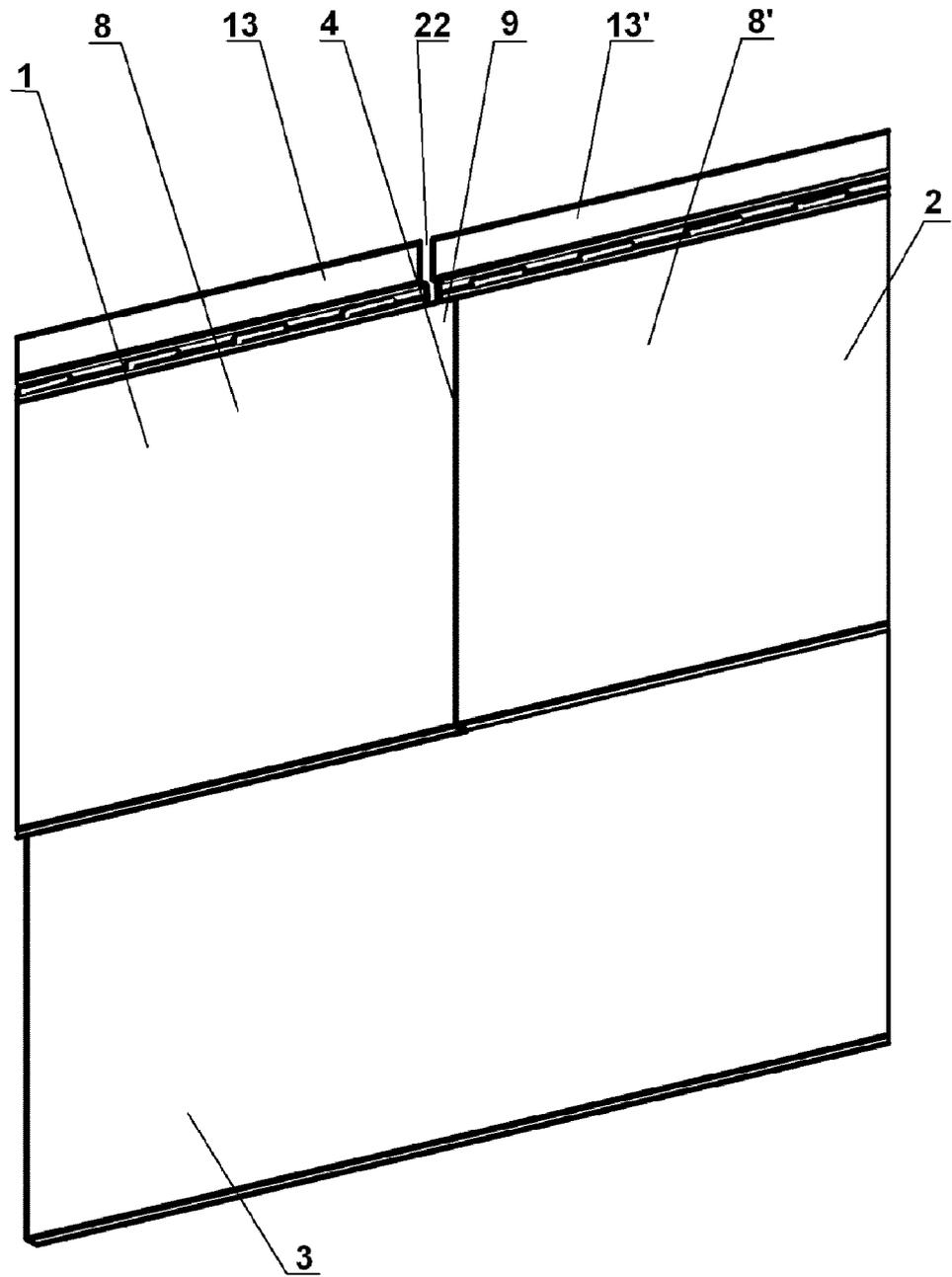


Fig. 8

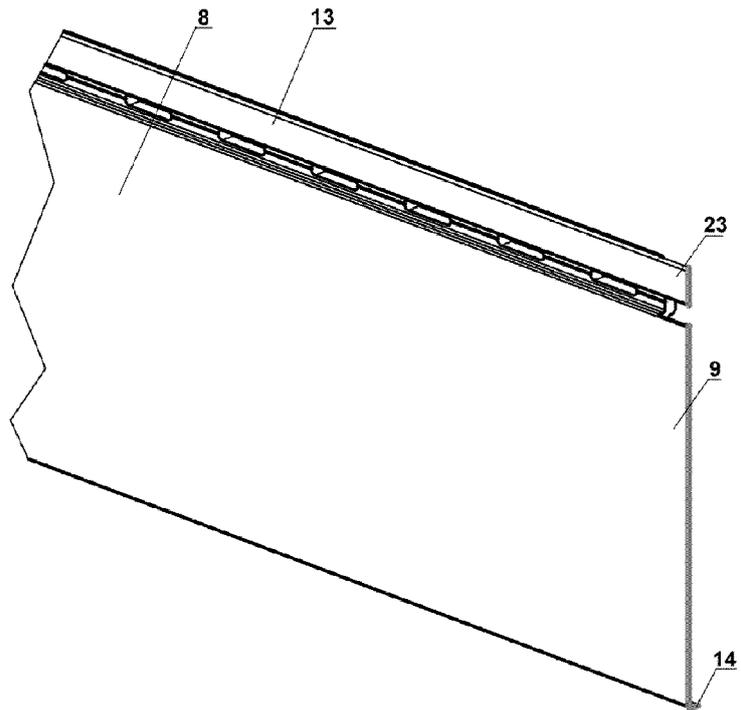


Fig.9

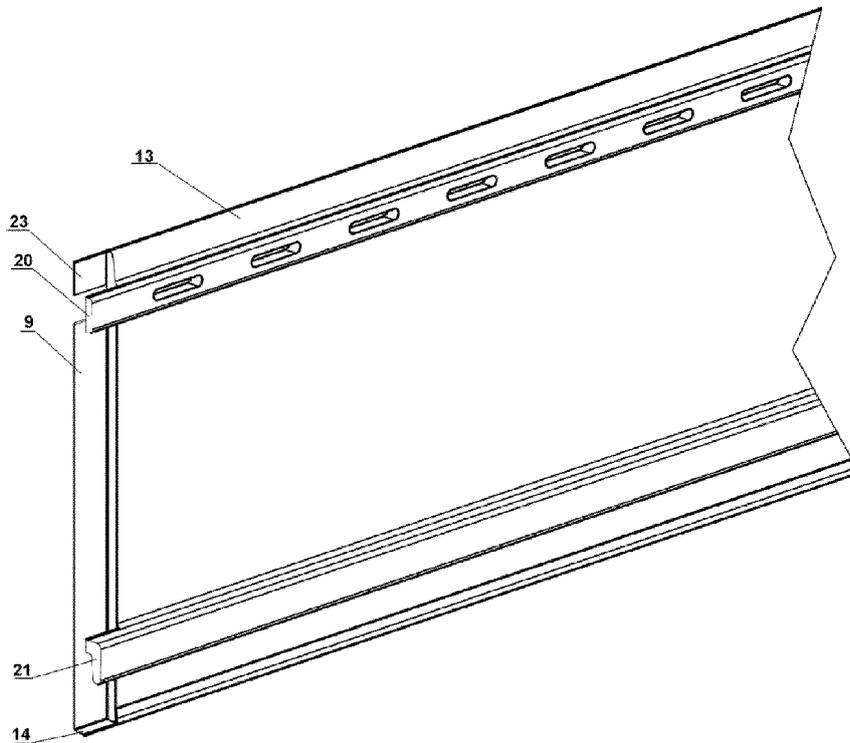


Fig 10

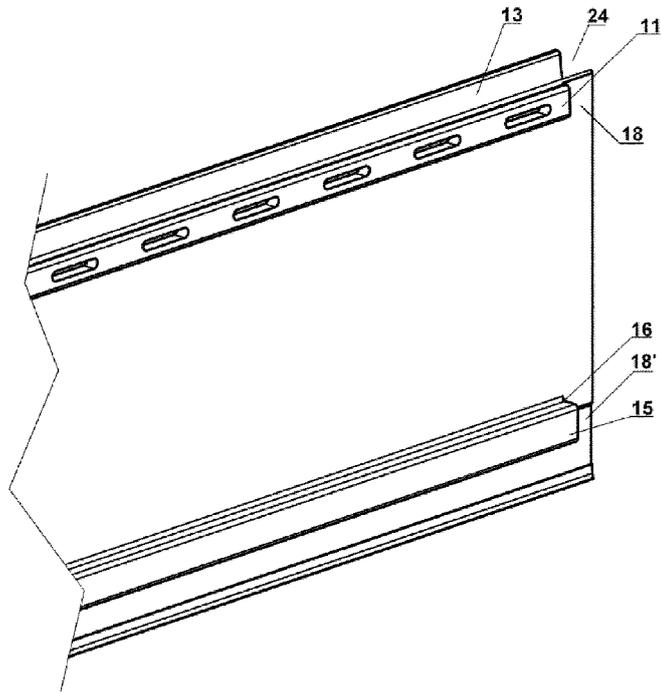


Fig. 11

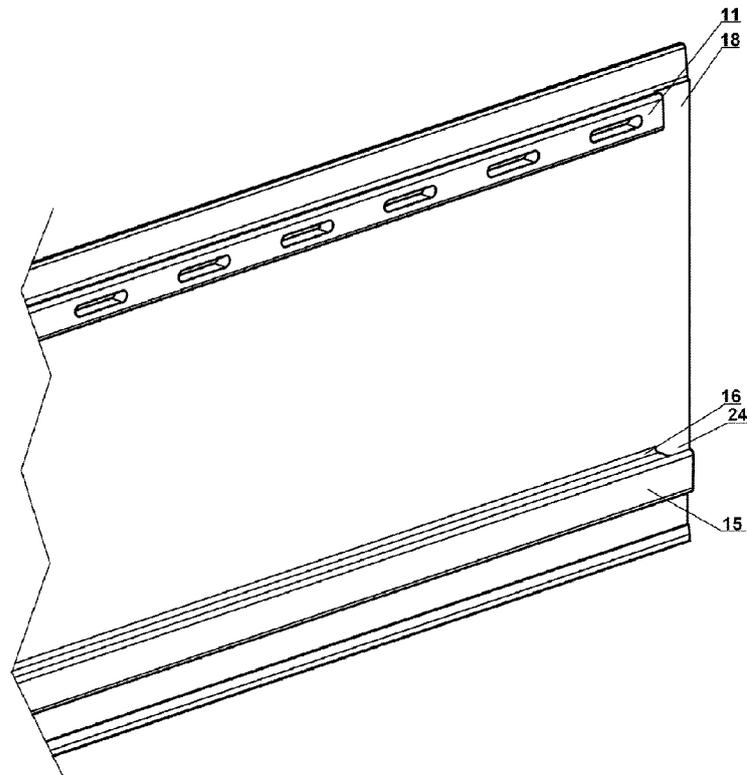


Fig 12

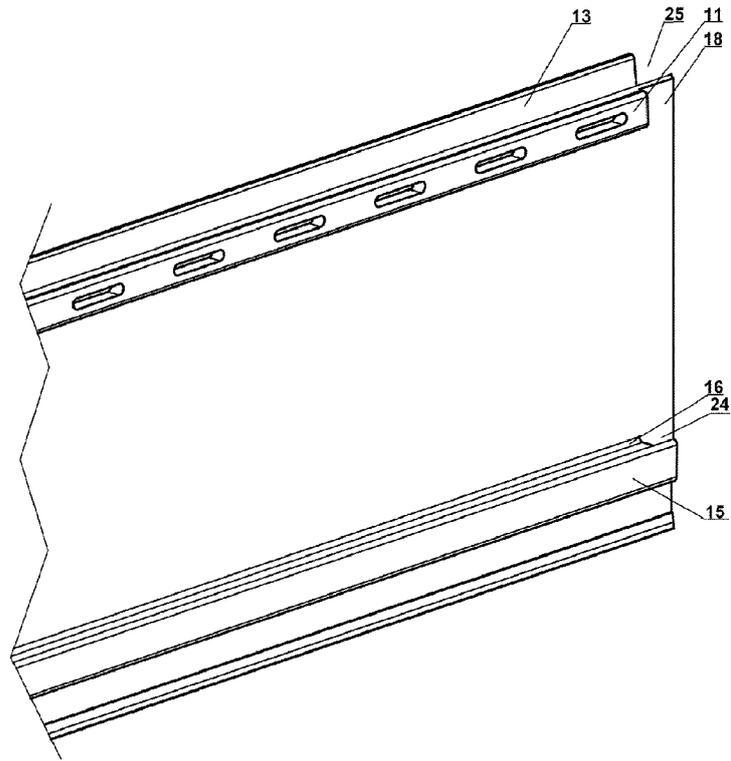


Fig.13

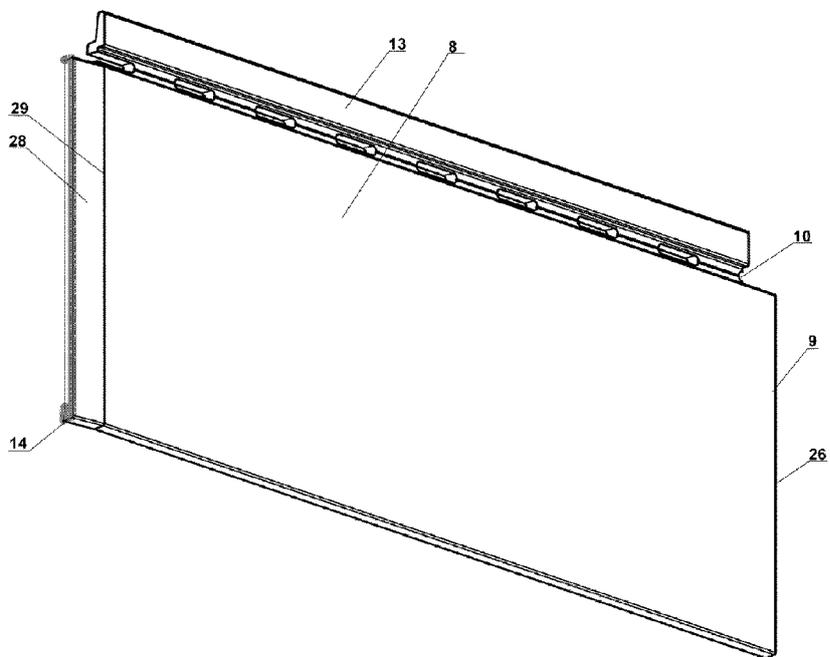


Fig 14

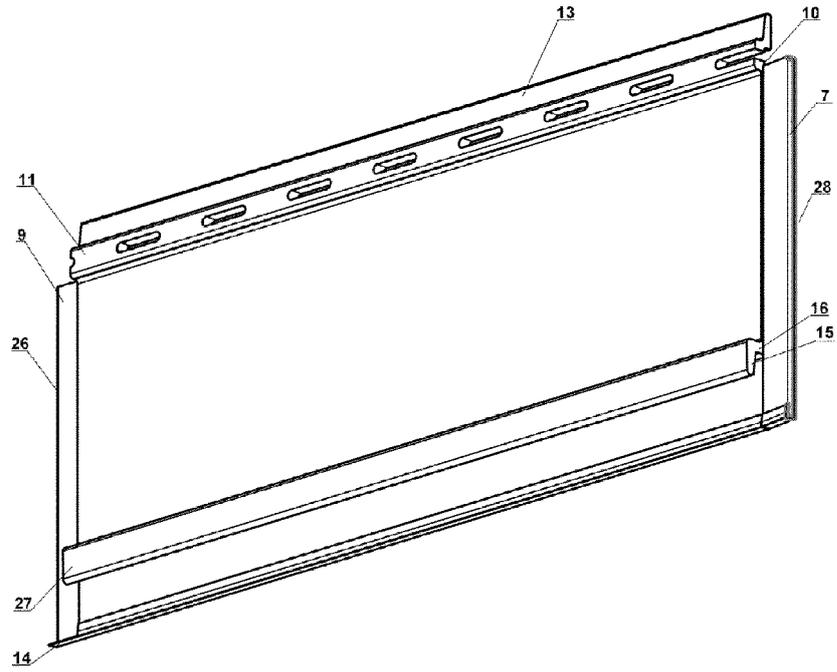


Fig. 15

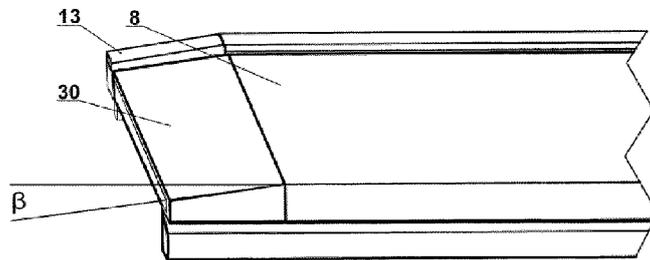


Fig 16

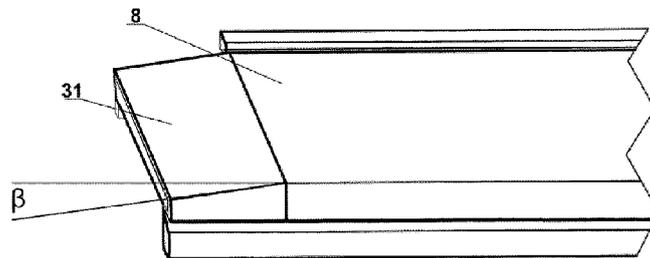


Fig.17

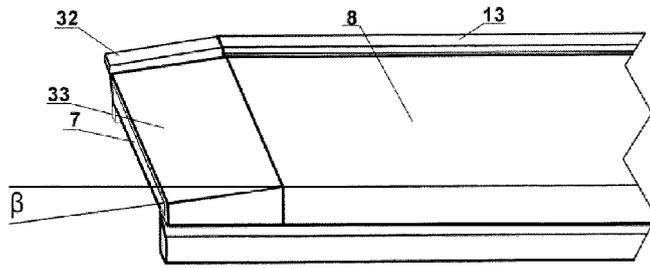


Fig.18

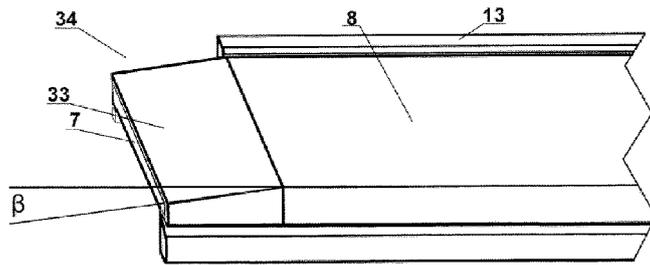


Fig. 19

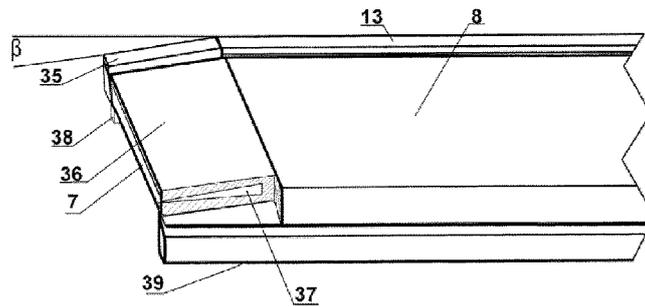


Fig. 20

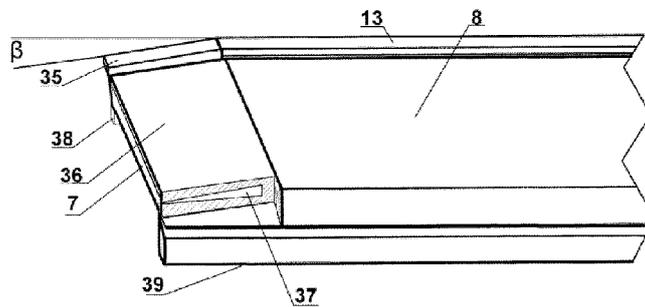


Fig.21

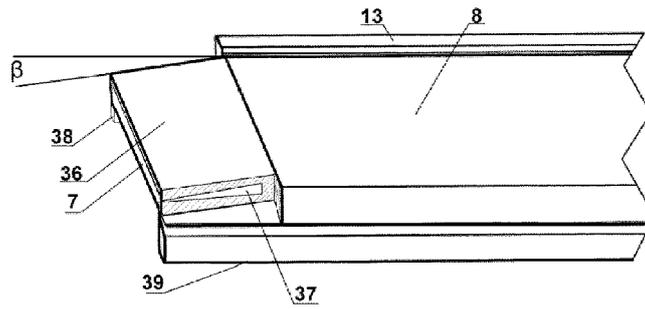


Fig. 22

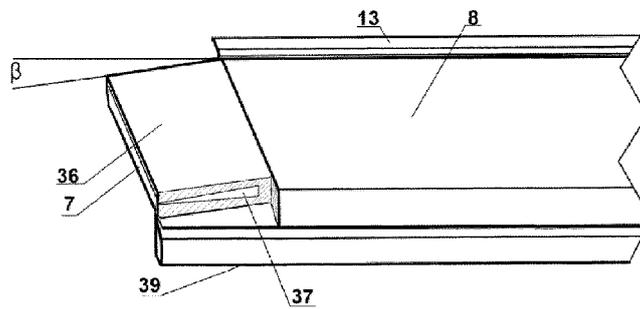


Fig. 23

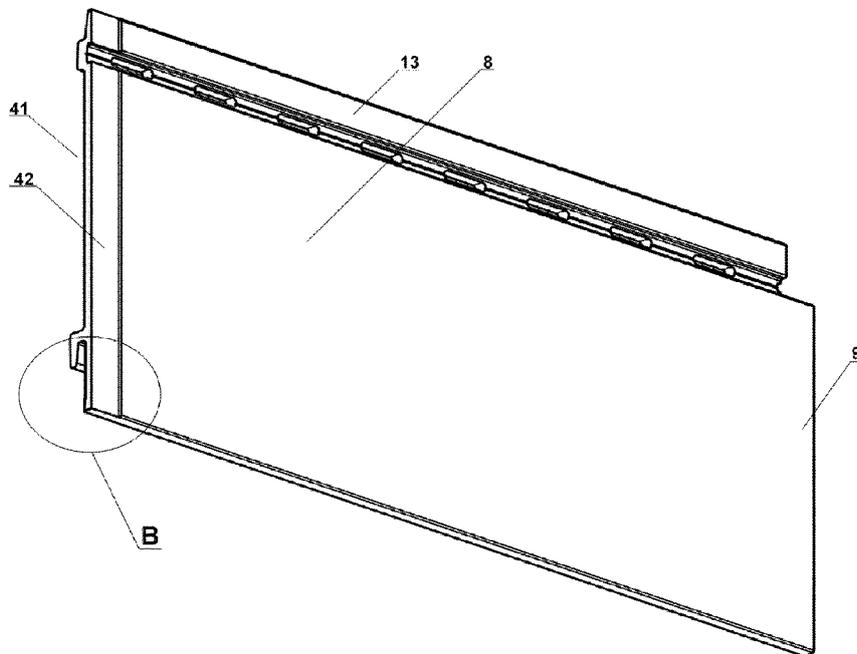


Fig. 24

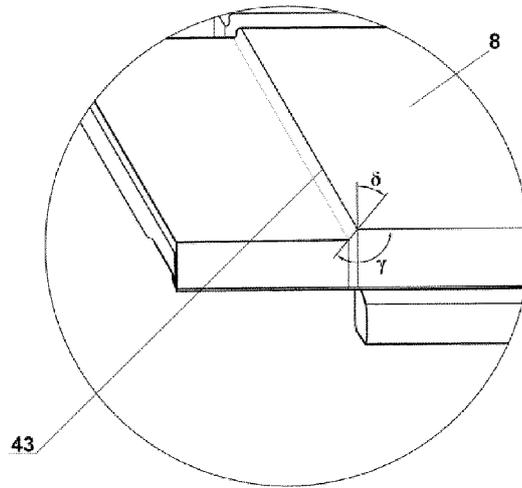


Fig.25

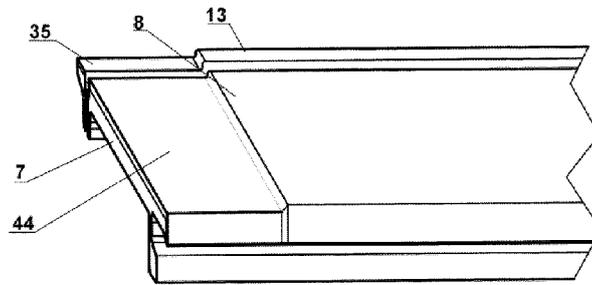


Fig.26

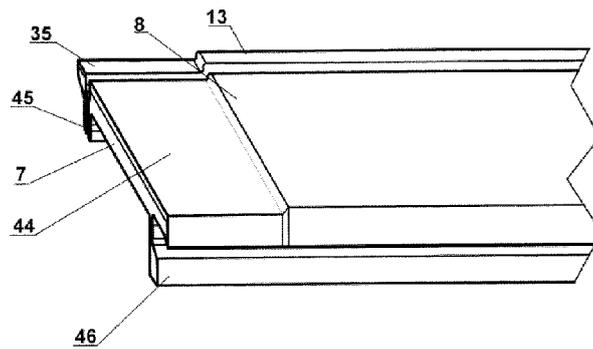


Fig. 27

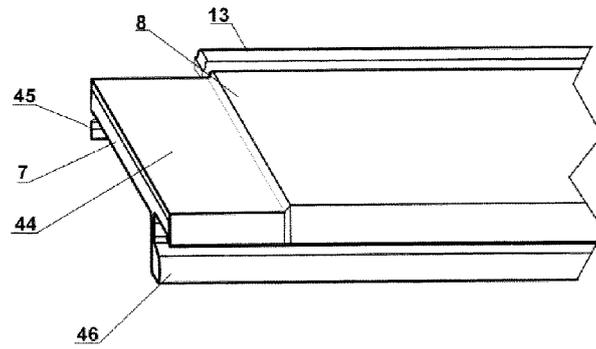


Fig.28

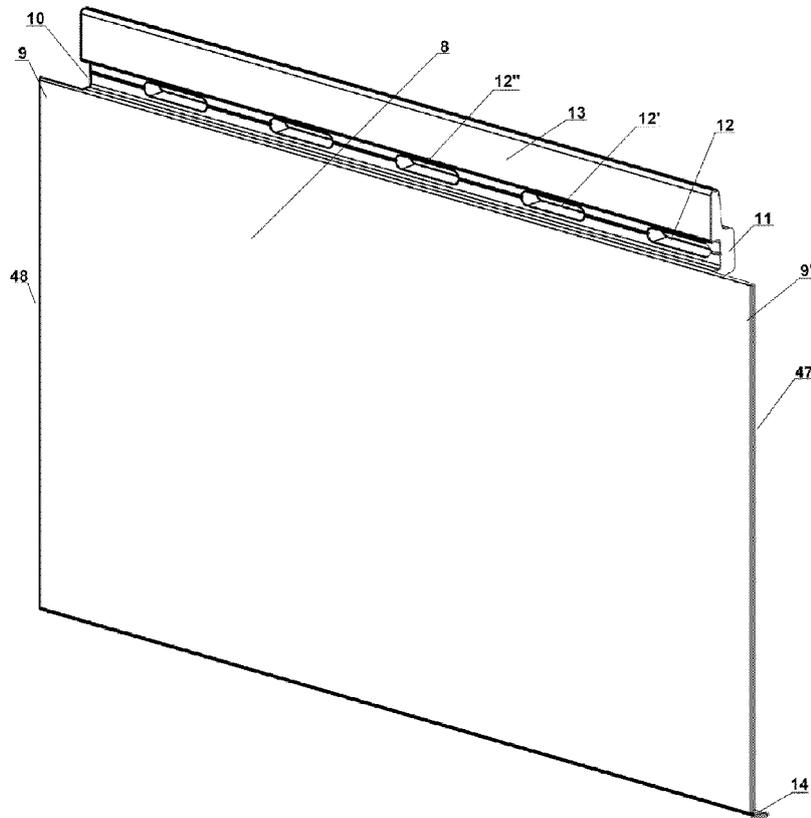


Fig.29

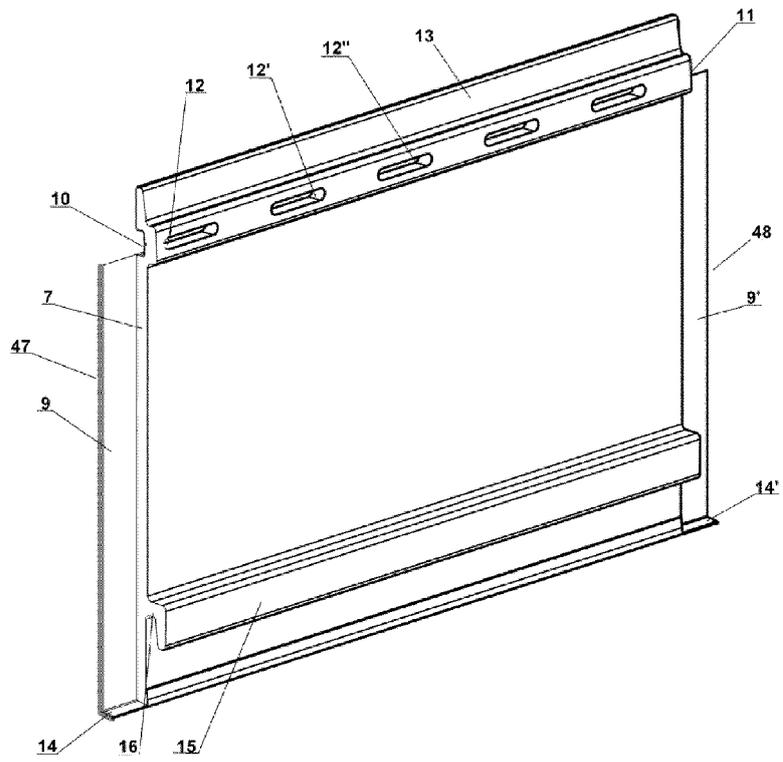


Fig.30

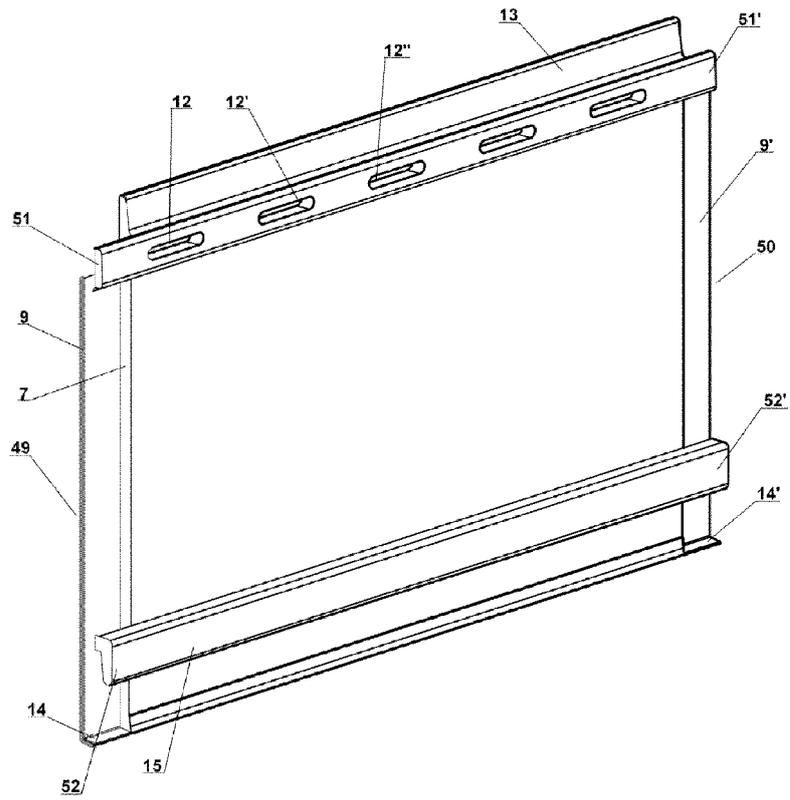


Fig 31



EUROPEAN SEARCH REPORT

Application Number
EP 12 46 1546

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	BE 1 016 764 A6 (DEWEERDT MARC [BE]) 5 June 2007 (2007-06-05) * the whole document *	1,13	INV. E04F13/08
A,D	----- W0 2007/031527 A1 (DEWEERDT MARC [BE]) 22 March 2007 (2007-03-22) * the whole document *	1,13	
X	----- FR 2 548 711 A1 (SAINT GOBAIN ISOVER [FR]) 11 January 1985 (1985-01-11) * page 7, paragraph second last * * page 4, line 8 - line 18 * * figures 1-3 *	1,2	TECHNICAL FIELDS SEARCHED (IPC)
X	----- FR 2 512 094 A1 (MIPLACOL [FR]) 4 March 1983 (1983-03-04) * page 3, line 7 - line 11; figures 1-3 *	1,2,13, 14	
A	----- US 2009/038252 A1 (KING DANIEL W [US]) 12 February 2009 (2009-02-12) * paragraph [0024]; figures 1-6 *	1,13	E04F
X	----- DE 80 02 534 U1 (PROMET GESELLSCHAFT FÜR MODERNE WERKSTOFFE MBH & CO KG) 30 April 1980 (1980-04-30) * page 3, last paragraph - page 4, paragraph first * * page 2, paragraph 3 * * figures 1-4 *	1,2,11	
----- The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 February 2013	Examiner Warthmüller, Almut
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	

2
EPO FORM 1503 03/82 (P04C01)



Application Number

EP 12 46 1546

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
see additional sheet(s)
- The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 12 46 1546

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3, 11-15

Siding profiles, designed as wall cladding in buildings, comprising a core made of a solid, cellular or layered material and an outer facing layer and elements designed to join and fasten, having different endings, where one ending of the profile is in the shape of a perpendicular cross-section of the profile, and at the other end the facing layer is longer than the profile core forming a projection comprising the front part and the lower edge of the profile.

Dimensions of the projection, and an additional extension of a mounting belt and/or coupling.

1.1. claims: 11, 12

Siding profiles, designed as wall cladding in buildings, comprising a core made of a solid, cellular or layered material and an outer facing layer and elements designed to join and fasten, wherein the both endings of the facing layer are longer than the profile core, forming at both ends projections comprising the front part and the lower edge of the profile, where each projection of the facing layer is from 0,3 to 45% of the profile length, but not less than 3 mm, where preferably for the profiles up to 1 m long this length is from 0,3 to 45%, but not less than 3 mm, and for profiles longer than 1 m from 0,2 to 25%, but not less than 6 mm.

2. claims: 4-10

Siding profiles having all features of claim 1, while additionally at the other end the profile is in the shape of a cross-section, with the facing layer slantwise pressed at the angle in the opposite direction to the plane of the facing layer, and the pressed part is 0,2 to 45% the profile length, but less than 3 mm (= claim 4).

Siding profiles, designed as wall cladding in buildings, comprising a core made of a solid, cellular or layered material and an outer facing layer and elements designed to join and fasten, wherein the profile has different endings, where at one end the facing layer 8 is longer than the profile core forming a projection comprising the front part and the lower edge of the profile, while the other end has stepped finishing and has a shape similar to the cross-section of the profile, where in the stepped part the profile core 7 is 0,1 to 10% of the profile length, but not less than 6 mm, is thinner by 0,1 to 40%, but not less than 0,4 mm, and the facing layer 8 is folded twice, forming a step (= claim 8).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 12 46 1546

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 12 46 1546

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-02-2013

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Patent documents cited in the description

- BE 1016764 [0003]
- WO 2007031527 A [0003] [0005]