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(73) Patenthaver: **Cupa Innovación, S.L.U., Las Carneiras-Macal, 32, 36213 Vigo Pontevedra, Spanien**

(72) Opfinder: **FERNANDEZ FERNANDEZ, Javier, Carneiras-Macal 32, 36213 Vigo-Pontevedra, Spanien**

(74) Fuldmægtig i Danmark: **Patrade A/S, Ceresbyen 75, 8000 Århus C, Danmark**

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EP-A1- 0 271 400
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DE-U1-202010 000 520
NL-A- 8 701 061

DESCRIPTION

Field of the invention

[0001] The present invention relates to a ventilated façade, made up of cladding parts, for example, slate, natural stone, ceramic or metal plates, plastic, composite panels, cement fiber, etc., that are assembled on horizontal battens fixed on vertical battens anchored to the wall to be cladded or directly on said wall. The assembly of the cladding parts on the battens is carried out by means of hook anchoring elements hanging from said battens.

Background of the invention

[0002] Ventilated façades are those having an air chamber between the cladding and the wall of the façade. This air chamber creates the so-called "chimney effect", providing continuous ventilation due to temperature differences between the outside air and the chamber air.

[0003] Among ventilated façades, façades are known in which the cladding is made up of, for example, slate parts, that are assembled by means of anchoring elements, made of sheet metal or wire, on horizontal battens, generally made of wood, fixed to the wall of the façade.

[0004] In this sense, patent documents CH 659679 and EP0167032 can be mentioned, in which the assembly of the cladding parts is carried out by means of anchoring parts comprising a straight section that finishes at its ends in bents heading in opposite directions, in the form of hooks of different width. Through the hook with a larger width, which is in an inverted position, the anchoring part hangs from the battens, and the upper edge of a panel belonging to a lower row of panels is introduced between the batten and the straight section of the anchoring part, while the lower edge of a panel belonging to an upper row of panels is supported on the hook with a smaller width. In patent document EP 0167032 the external branch of the hook with a larger width can be prolonged sideways in a loop which is housed in the batten and which serves as upward support means of the hook on said batten.

[0005] Patent documents NL8701061C and EP0271400 A disclose further examples of ventilated façades comprising supporting horizontal battens and separate clip-like anchoring elements.

[0006] With this constitution, in the case of using panels of different thickness in one and the same row, zones located in different planes appear in the visible surface of the cladding, due to the fact that the anchoring part does not have the capacity to adjust thicknesses.

Description of the invention

[0007] The present invention relates to a ventilated façade made up of a covering which is formed by cladding parts of any type (slate, granite, plastic, sheet metal, cement fiber, etc.), which are assembled on metallic battens by means of anchoring elements made of wire or sheet metal.

[0008] The façade covering allows achieving a durable finish with a good visual appearance, in comparison with claddings with wooden or pre-fabricated panels.

[0009] Metallic battens offer improved performance and resistance against humidity and possible fires with respect to wooden battens.

[0010] The anchoring elements, made of wire, metallic rod or sheet metal, are formed such that they have greater capacity to absorb or adjust to possible differences in the thicknesses of the slate parts, which allows achieving a practically flat visible surface.

[0011] The ventilated façade of the invention is of the previously indicated type, formed by cladding parts that are assembled on horizontal battens by means of anchoring elements made of wire or sheet metal hanging from the battens through openings which said battens have.

[0012] According to the present invention as defined in the appended claims, the anchoring elements are U-shaped and hang in an inverted position from the horizontal battens, with a rear side branch introduced through the openings of the battens, and a front side branch running downwards along the front of the batten. The aforementioned front side branch finishes in an upward bent, forming an outer hook on which there will be supported the lower edge of a cladding part, belonging to an upper row of cladding parts. In turn, the rear side branch, introduced through the openings of the battens, has an inner projection establishing with the front branch of the U shape a narrowing having a width smaller than the thickness of the cladding parts. The upper edge of a cladding part belonging to a lower row of cladding parts is introduced through this narrowing.

[0013] The aforementioned inner projection of the rear branch of the U shape can be obtained by means of transverse formations made on said rear side branch. Furthermore, the inner projection can consist of a spring which is fixed on the inner surface of the rear side branch of the U shape.

[0014] With regards to the horizontal battens on which the cladding parts with an angular profile are fixed, they are made up of three sections, a central section and two end sections perpendicular to the central section and heading in opposite directions. Along the outer surface of one of the end sections these battens have a flap which is parallel to the central section of the batten. The openings are located on the aforementioned flap, through which openings the rear branch of the U shape forming the anchoring elements is introduced. Furthermore this flap finishes in a longitudinal support assuring the positioning of the anchoring elements on the

batten.

[0015] The transverse formations of the rear side branch of the anchoring elements can consist of an end bent heading towards the inside of the U shape and which will define a narrowing in the mouth of said U shape, which will be elastically supported on the upper edge of a cladding part introduced between said bent and the front side branch of the U shape.

[0016] Furthermore, the transverse formations of the rear side branch of the U shape can consist of intermediate bents, also heading towards the inside of the U shape, which bents forming inside the U shape an inner step which will be elastically supported against the upper edge of a cladding part introduced between the mentioned intermediate bent and the front side branch of the U shape.

Brief Description of the Drawings

[0017] The features and advantages of the invention will be demonstrated based on the non-limiting embodiment shown in the attached drawings, in which:

Figure 1 shows a partial vertical section view of a ventilated façade formed according to the invention.

Figure 2 is the perspective view of a section of one of the battens forming part of the façade of Figure 1.

Figure 3 is the profile view of one of the anchoring elements of the cladding parts.

Figure 4 shows a perspective view of an anchoring element made of sheet metal.

Figures 5 to 9 show the profile views of possible variants of the anchoring element.

Figure 10 shows in a section view an auxiliary profile for assembling cladding parts in hard-to-reach areas.

Figure 11 shows a possible variant of the auxiliary profile of Figure 10.

Detailed Description of a Preferred Embodiment

[0018] Figure 1 shows in a partial vertical section view a ventilated façade formed by a covering (1), which is assembled on the wall (2) of the façade. The covering (1) is made up of parts (3-3') that are assembled in horizontal alignments on horizontal battens (4) which are fixed to vertical battens (4') anchored to the wall (2) of the façade, or directly on said wall.

[0019] The assembly of the cladding parts is carried out by means of anchoring elements (5) which hang from the battens (4). The cladding parts (3-3') can be of any type, for example, of slate, granite, plastic, metal, cement fiber, etc.

[0020] The battens (4), Figure 2, are of metallic type and have an angular profile made up of three consecutive sections, a central section (6) and two end sections (7 and 8) perpendicular to the central section (6) and heading in opposite directions.

[0021] From the end section (8), along its length, a flap (10) projects parallel and close to the section (6), the section of which ends in a longitudinal support (11) for the anchoring elements (5), in the shape of an inverted channel with walls of different height. The base (12) of this channel is approximately coplanar with the central section (6) of the batten (4).

[0022] The flap (10) has, along its length, openings (13) that will be used for hanging the anchoring elements (5).

[0023] Ribs (14) for positioning screws (15) for fixing the horizontal battens (4) to the vertical battens (4') run along the inner surface of the end section (7), which vertical battens (4') can be fixed to the wall by means of brackets (16) and also screws (15).

[0024] The anchoring elements (5'), Figures 3 to 7, have a U shape with considerably parallel branches (17 and 18). These anchoring elements hang in an inverted position from the horizontal battens (4), Figure 1, with the side branch (18), called the rear side branch, being introduced through the openings (13), while the side branch (17), called the front side branch, running along the front of the batten. In turn, the central branch (19) of the U shape has an intermediate bent, establishing sections of different depths which can be coupled on the flap (10) and support (11) of the horizontal batten.

[0025] The front side branch (17) finishes in an upward outer bent (20), forming a hook (21) on which there is supported the lower edge of a cladding part (3), belonging to an upper row of cladding parts.

[0026] The rear side branch (18) has formations which can be defined by end bents in the shape of a hook (22), Figures 3 and 4, heading towards the inside of said U shape, or in the shape of an inner tab (23), Figure 6. The mentioned formations can also be defined by intermediate bents (24-25), Figures 5 and 7.

[0027] In any case, the mentioned formations establish a narrowing in the inside of the U shape which will be elastically supported against the upper portion of a cladding part (3') belonging to a lower row of cladding parts partially introduced in the U shape, as shown in Figure 1. The hook (22), the tab (23) and the bents (24 and 25) establish a narrowing inside the U shape providing a spring effect compressing the cladding part (3') against the front side branch (17) of the U shape. As a consequence, the cladding parts (3') will be pushed against the parts (3), which allows absorbing possible differences in thicknesses between cladding

parts, thereby achieving in each row of cladding parts a virtually flat outer surface.

[0028] In the embodiment of Figure 3, the end branch (26) of the hook (22) can be provided with a cladding (27) made of an elastically compressible material or with a deformation (27'), Figure 4, to increase the aforementioned spring effect and provide improved support to the cladding parts (3').

[0029] The anchoring element of Figures 3 and 4 can be sub-divided in two independent parts (28 and 29), Figure 8, both in U shape, which can be hung from different openings (13) of the horizontal battens (4), through their rear side branch (18). The part (29) will be used for supporting the lower edge of cladding parts (3), through its hook (21), while the part (28) will provide, through the hook (22), the spring effect pushing the parts (3') of a lower row against the parts (3) of an upper row.

[0030] With the described components, for the construction of the façade of the invention, the battens (4) are thus fixed in a horizontal position on vertical battens (4') anchored to the wall (2), or directly on said wall. Next, the anchoring elements (5) are assembled by introducing the branch (18) and the hook (22) through the openings (13) of the batten (4). Once the anchoring elements are assembled, the cladding part (3) of an upper row of parts is supported on the hook (21), through the lower edge of said parts (3). At the same time, the upper edge of the cladding parts (3') belonging to a lower row of parts is introduced in the U-shape, these parts (3') being compressed between the side (26) of the hook (22), or on the cladding (27), which acts like a spring, and the branch (17) of the U shape, all according to the depiction of Figure 1.

[0031] The anchoring element is supported on the end section (8) of the battens (4) through the branch (18). The central branch (19) of the anchoring part has a shape which allows achieving safe seating on the batten (4).

[0032] By means of introducing the hook (22) of the anchoring element (5) through the opening (13), said anchoring is blocked against horizontal movements with respect to the batten.

[0033] The inner narrowing of the U shape, providing the aforementioned spring effect, can also be achieved by means of arranging a spring (30) fixed to the inner surface of the rear branch (18) of the U shape, Figure 8. The upper edge of a cladding part (3') belonging to a lower row of cladding parts is introduced between this spring (30) and the front branch (17) of the U shape.

[0034] Vertical chambers are demarcated between the surface of the wall (2) and the cladding elements (3-3'), which via the so-called "chimney effect", maintain continuous ventilation due to the temperature differences between the inside and outside of said chamber.

[0035] For improving the resistance to impact of the covering, the cladding parts can

incorporate a glass fiber mesh, fixed by means of resin, for example. Intermediate support profiles (31), Figure 1, can also be installed between the cladding parts (3-3') and the vertical battens (4').

[0036] For assembling cladding parts in special areas of the façade, for example meeting points with windows, balconies or corners, where anchoring elements cannot be installed or where the attachment should be reinforced, auxiliary parts (32) with the profile shown in Figure 10, fixed by means of screwing them onto the batten (4), can be used. The cladding parts are introduced between the tabs (33 and 34), forming an inverted clamp (35), and may or may not be fixed with screws through the tab (33), depending on the particular installation conditions of the cladding parts in each case.

[0037] Figure 11 shows, for the same purpose, an auxiliary part (36) in an inverted U shape, which is assembled on the horizontal battens in the same way as that described in reference to Figure 1, and between the branches (37 and 38) of which, forming an inverted clamp (35), there is introduced the upper edge of cladding parts (3-3') which can be fixed by means of screws (39).

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CH659679 **[0004]**
- EP0167032A **[0004] [0004]**
- NL8701061C **[0005]**
- EP0271400A **[0005]**

PATENTKRAV

1. Ventileret facade, omfattende vandrette bjælker (4), beklædningsdele (3-3 ') og forankringselementer (5), hvor de vandrette bjælker (4) har en vinkelprofil med tre sektioner, en central sektion (6) og første og anden endesektioner (7 og 8) hver anbragt vinkelret på den centrale sektion (6) og rettet i modsatte retninger derfra, og hvor forankringselementerne er fremstillet af tråd eller metalplader, og gennem hvilke beklædningsdelene er monteret på bjælkerne, hvor den første endesektion (7) er indrettet til at blive fastgjort til facadens understøtningsstruktur, **kendetegnet ved**, at:

- De vandrette bjælker har, langs den ydre overflade af den anden af endesektionerne (8) en flap (10) parallelt med bjælkens centrale sektion (6), hvor flappen har åbninger (13), hvorfra forankringselementerne (5) hænger og afslutter i en langsgående understøtning (11) for forankringselementerne;
- Forankringselementerne (5) er U-formede og hænger i en omvendt position fra de vandrette bjælker (4) med et bagsideben (18) indført gennem bjælkernes åbninger (13), og et forsideben (17) der forløber ned langs forsiden af bjælken, hvor forsidebenet (17) afslutter i en opadgående bøjning (20), der danner en ydre krog (21), på hvilken den nedre kant af en beklædningsdel (3) der tilhører en øvre række af beklædningsdele er understøttet, og hvor bagsidebenet (18) har et indvendigt fremspring (22,26) der med forsidebenet (17) af U-formen har en indsnævring med en bredde, der er mindre end tykkelsen af en beklædningsdel (3'), gennem hvilken den øverste kant af nævnte beklædningsdel (3'), der hører til en nedre række af beklædningsdele, indføres.

2. Facade ifølge krav 1, **kendetegnet ved**, at den langsgående understøtning (11) er konfigureret i form af en omvendt kanal, hvis bund (12) er parallel og omtrent koplanar med bjælkens centrale sektion (6) og hvis vægge er parallelle med bjælkens endesektioner (7 og 8).

3. Facade ifølge krav 1, **kendetegnet ved**, at mellemliggende langsgående ribber (14) strækker sig fra den indre overflade af den vandrette bjælkes (4) første endesektion (7).

4. Facade ifølge krav 1, **kendetegnet ved**, at det indvendige fremspring af U-formens bagsideben (18) er dannet af tværgående formationer af nævnte bagsideben (18).

5. Facade ifølge krav 4, **kendetegnet ved**, at de tværgående formationer af U-formens bagsideben (18) består af en endebøjning (22) der er rettet mod indersiden af U-formen, som definerer en indsnævring i U-formens munding og er elastisk støttet mod den øvre kant af en beklædningsdel (3') indført mellem U-formens nævnte bøjning og forsideben (17).

6. Facade ifølge krav 4, **kendetegnet ved**, at de tværgående formationer af U-formens bagsideben (18) består af mellemliggende bøjninger (24-25) der er rettet mod indersiden af U-formen, der er elastisk støttet mod den øvre kant af en beklædningsdel (3') indført mellem nævnte mellemliggende bøjning og U-formens forsideben (17).

7. Facade ifølge krav 5, **kendetegnet ved**, at den ende, der er bøjet af U-formens bagsideben (18) danner en krog (22), der er koplanar med U-formen og er rettet mod indersiden af samme, som er elastisk støttet mod den øvre kant af beklædningsdelen (3') indført mellem nævnte krog og forsidebenet (17).

8. Facade ifølge krav 1, **kendetegnet ved**, at det indvendige fremspring af U-formens bagsideben (18) består af en fjeder (26), som er fastgjort på den indvendige overflade af nævnte bagsideben (18).

9. Facade ifølge krav 1, **kendetegnet ved**, at forankringselementerne omfatter to uafhængige U-formede dele, der hænger i en omvendt position fra de vandrette bjælker, hvor en første del (28) danner tværgående formationer i dets bagsideben (18) og en anden dels (29) forsideben (17) danner den ydre krog (21).

10. Facade ifølge krav 1, **kendetegnet ved**, at den yderligere omfatter hjælpeforankringselementer (32-36) til fastgørelse af beklædningsdele, der tilhører en og samme række af dele, hvis hjælpeforankringselementer er samlet på de vandrette bjælker (4) og danner en omvendt klemme (35) til modtagelse af den øvre kant af en beklædningsdel (3 eller 3'), der tilhører en række af beklædningsdele.

DRAWINGS

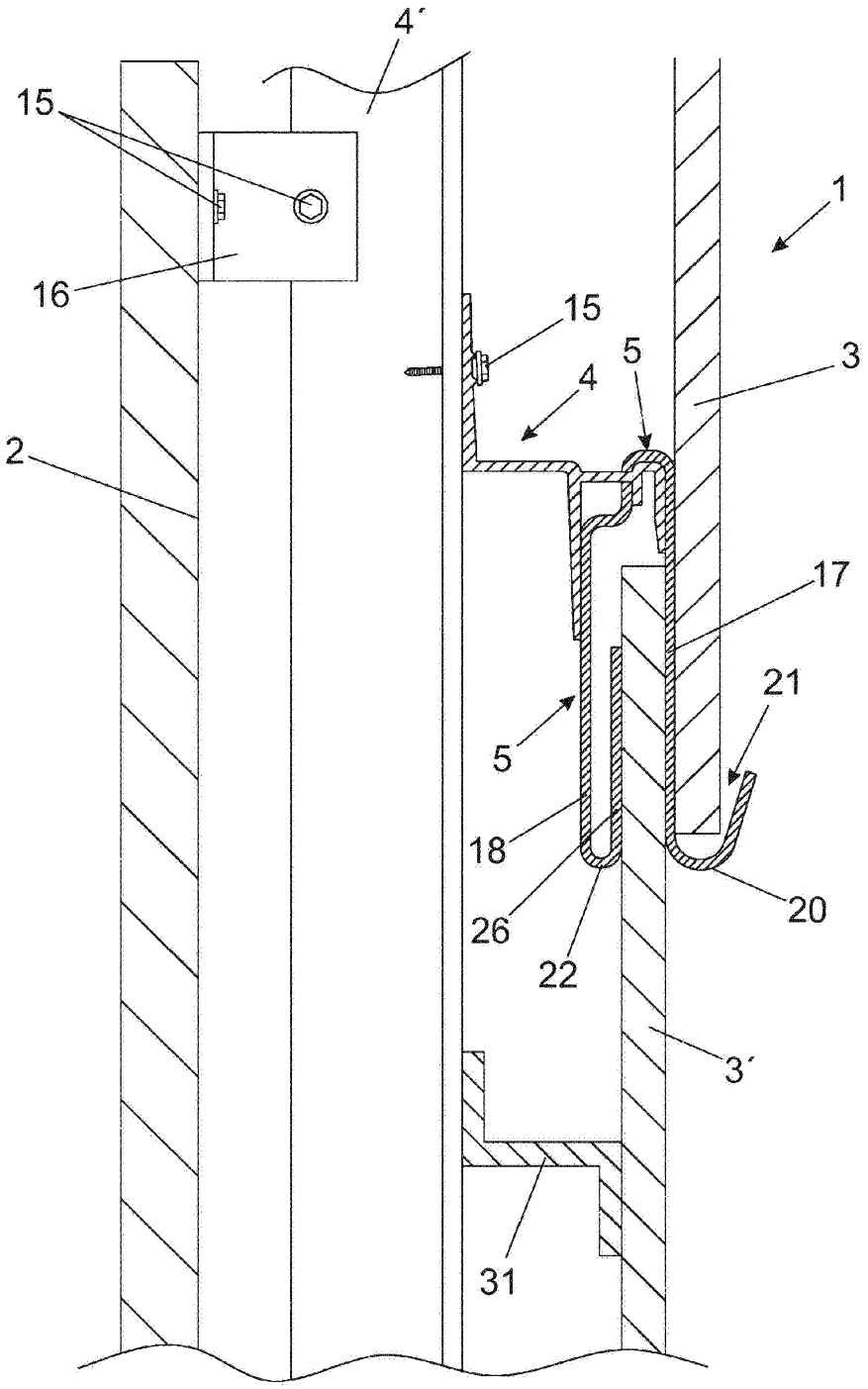

Fig. 1

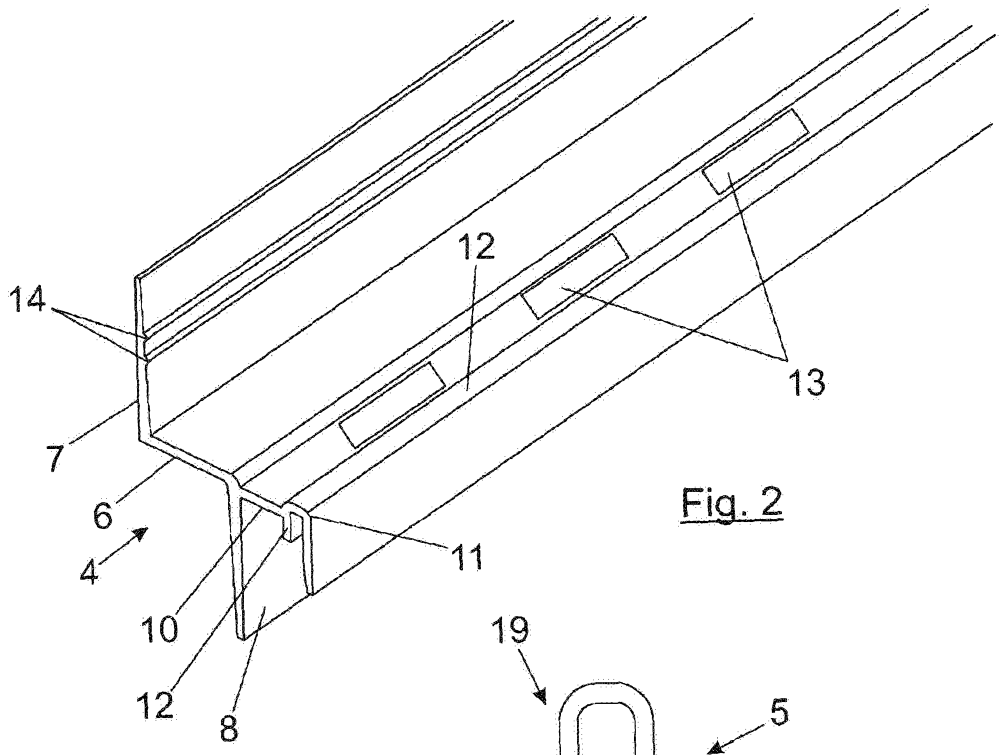

Fig. 2

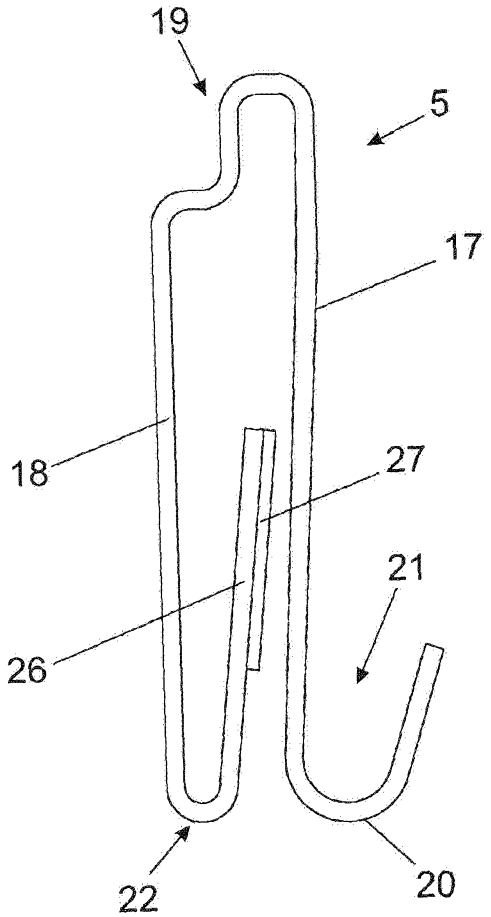

Fig. 3

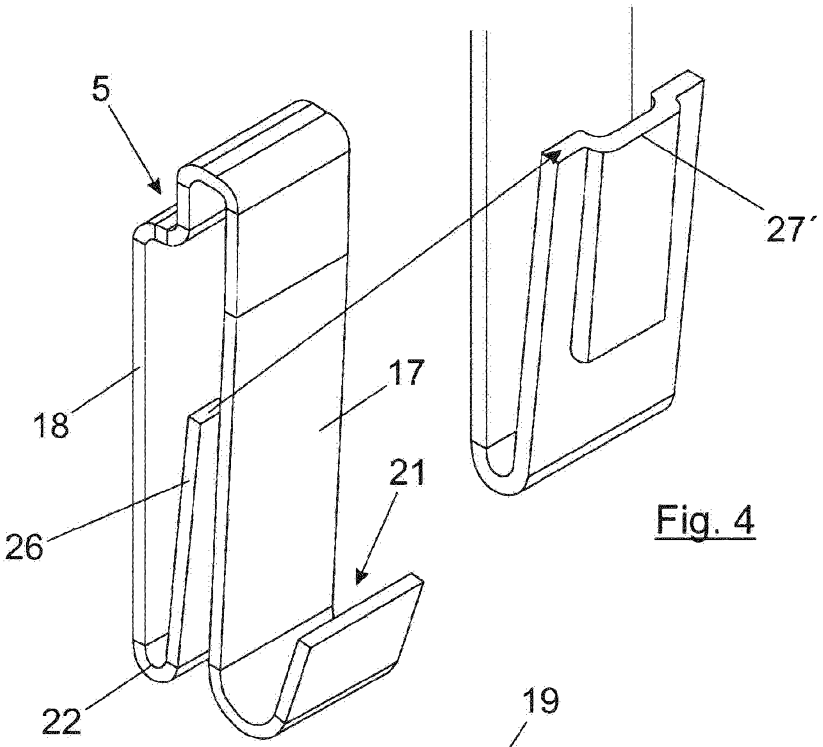

Fig. 4

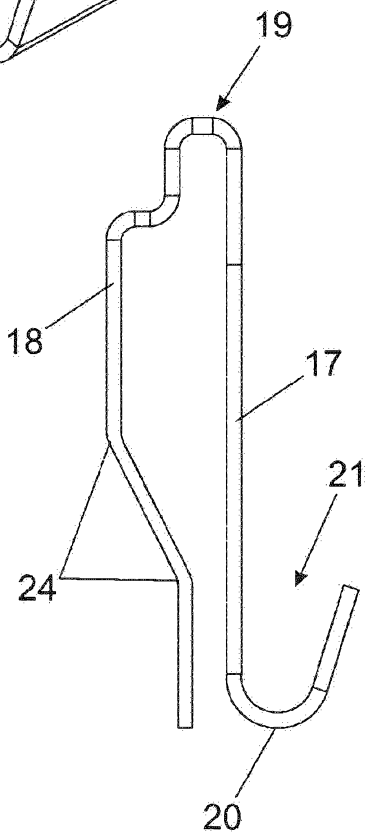

Fig. 5

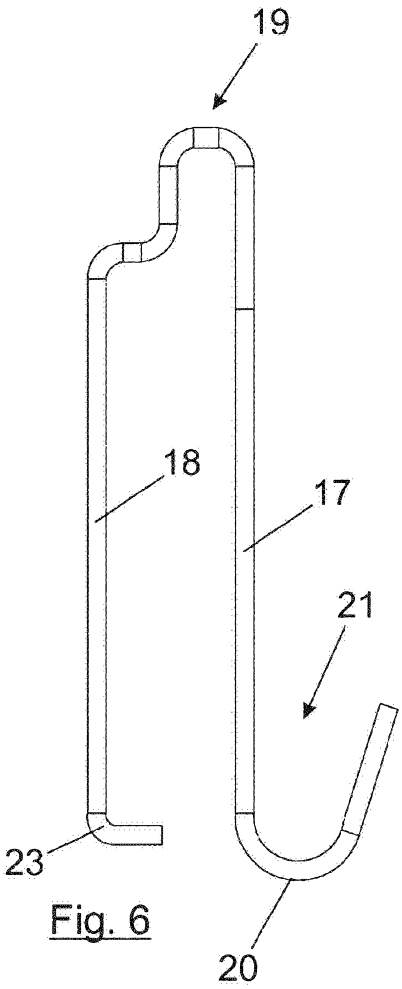

Fig. 6

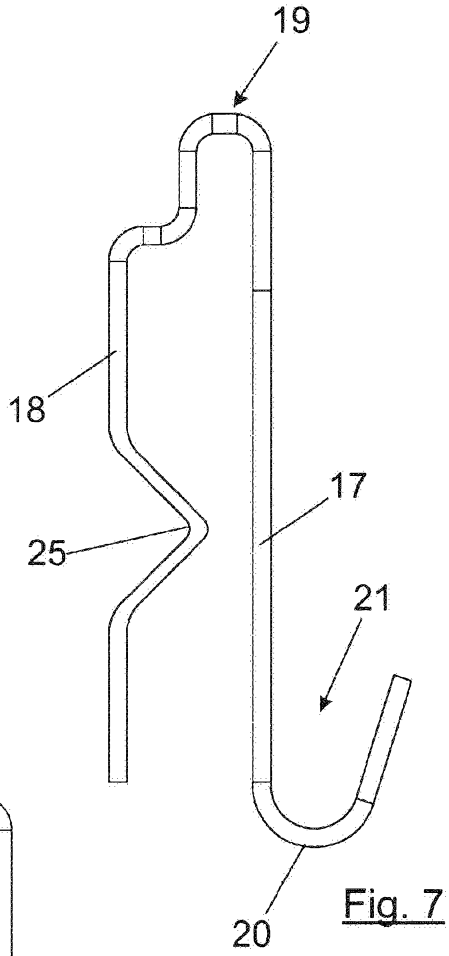

Fig. 7

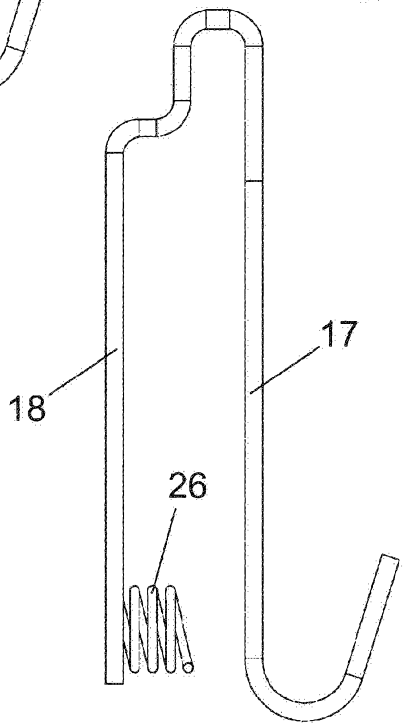

Fig. 8

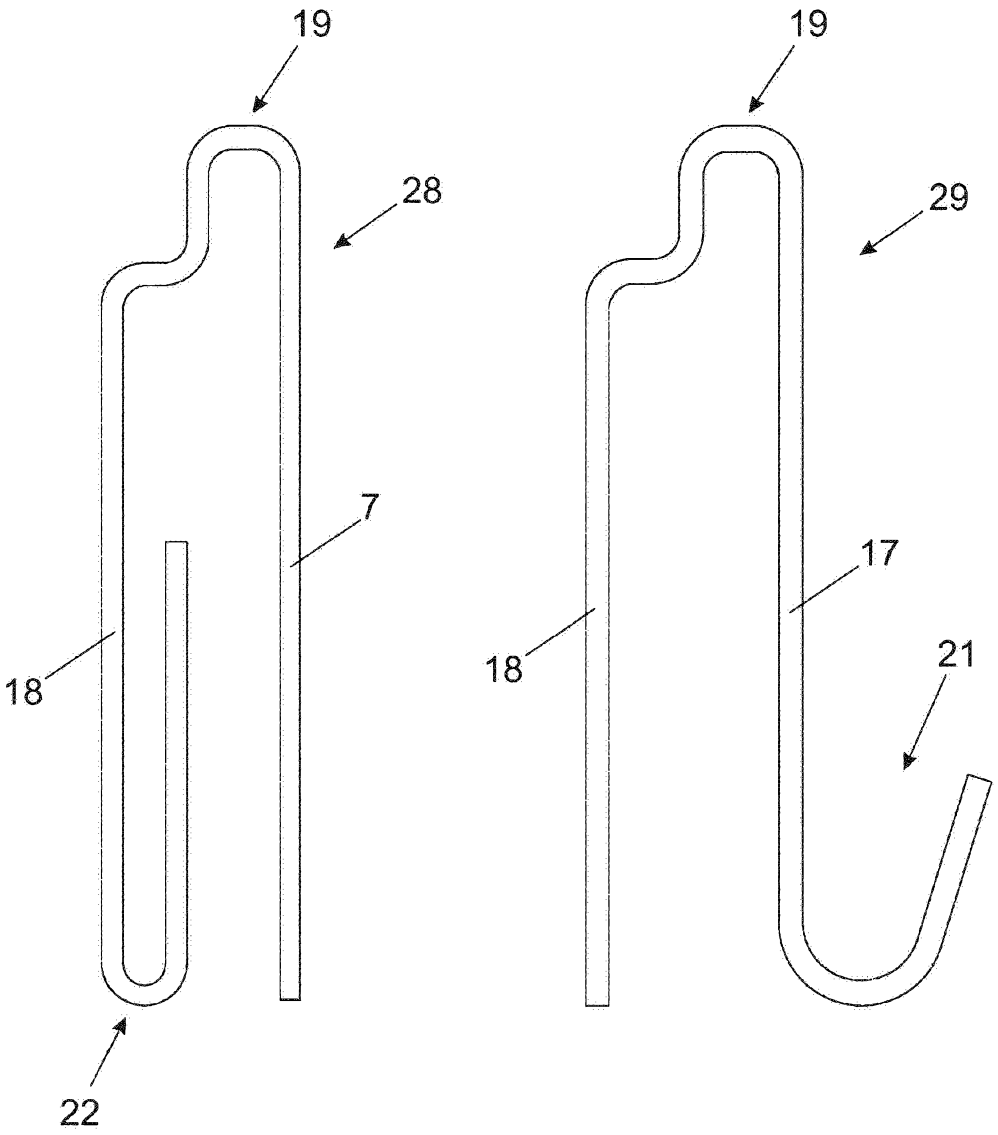

Fig. 9

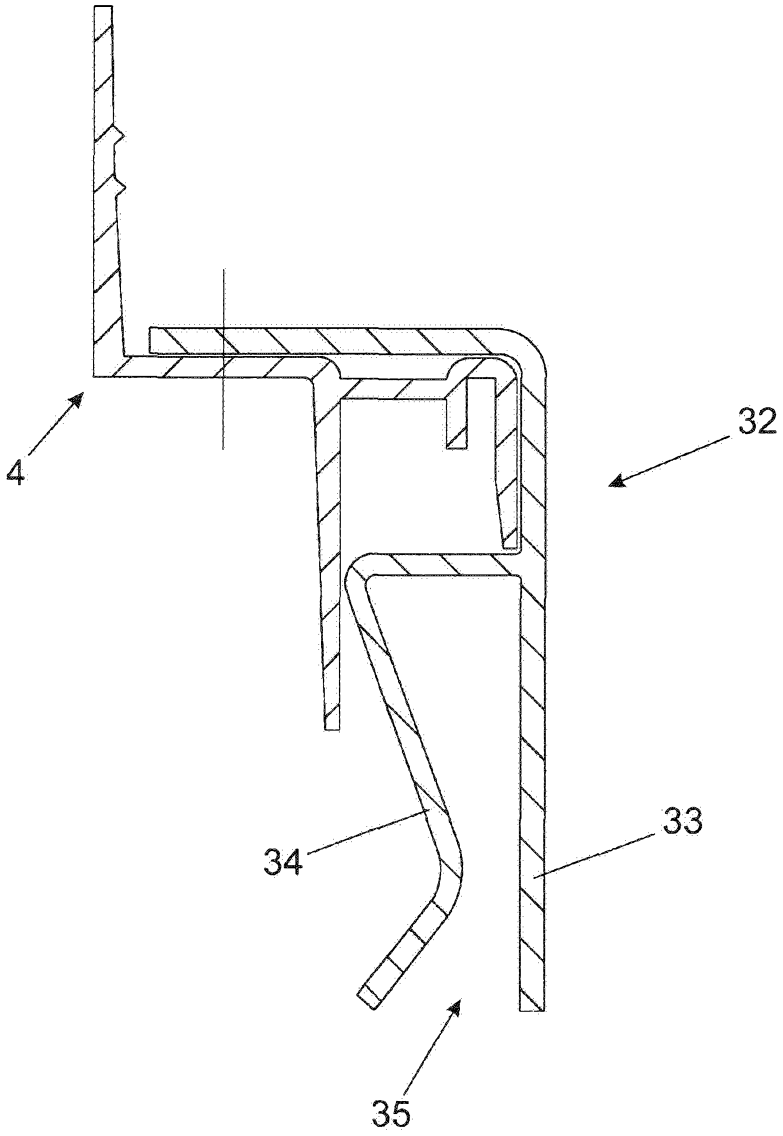

Fig. 10

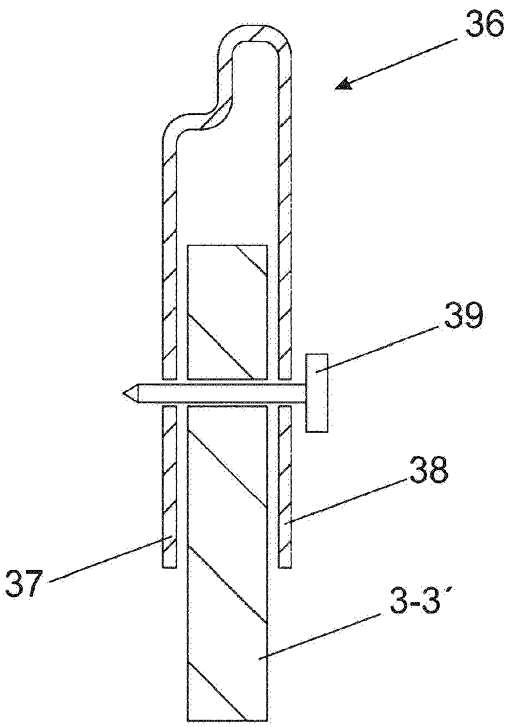

Fig. 11