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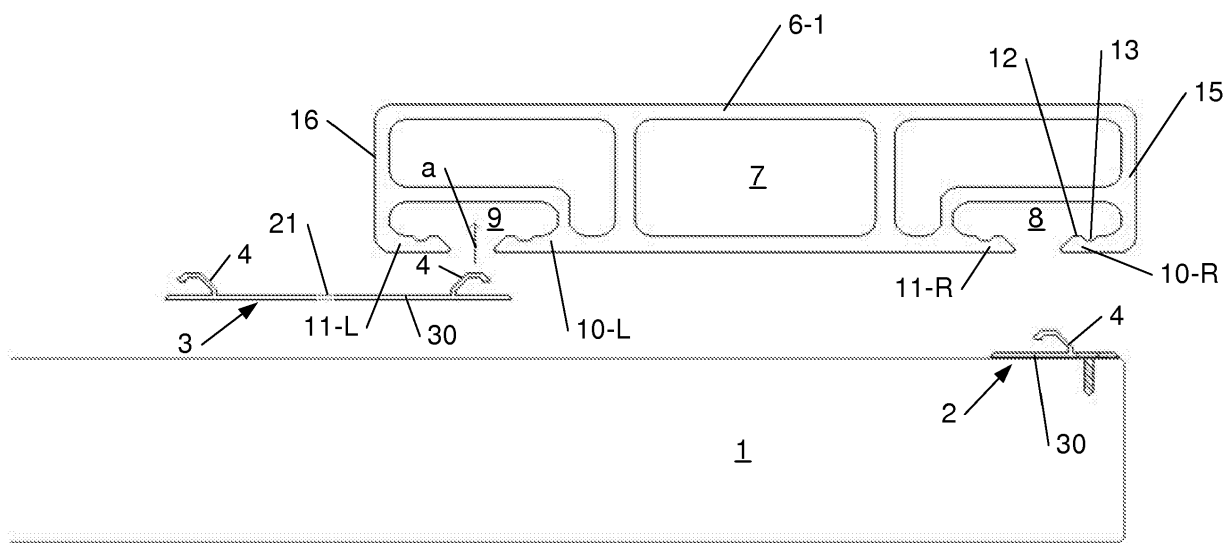
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(54) **A combined set comprising covering elements and attachment elements and a method for mounting said combined set**

(57) A combined set comprising at least two outside floor or wall covering elements (6-1) of a synthetic material and a series of attachment elements (2,3) for attaching said covering elements to a support; said covering elements having an upper and a lower surface and a first and second longitudinal edge (15,16). A gap extends between said first and second longitudinal edges of two subsequently mounted covering elements. The longitudinal edges are integrally formed with said upper

and lower surface and extend over their whole surface substantially linearly and continuously from an upper surface border to a lower surface border. First and second openings (8,9) are applied in said lower surface, offset from said first and second longitudinal edges, respectively, in order to form a cavity therein, and giving access to at a first and second anchoring lip (11-R,10-L), respectively, designed and dimensioned to match with said attachment element.



**Fig. 1**

## Description

**[0001]** The present invention relates to a combined set comprising at least two outside floor or wall covering elements made of a synthetic material and a series of attachment elements, provided for attaching said covering elements to a support, said covering elements having an upper and a lower surface and a first and second longitudinal edge, and wherein when attached on said support, a gap extends between said first and second longitudinal edges of two subsequently mounted covering elements.

**[0002]** The invention also relates to a method for mounting such a combined set.

**[0003]** Such a combined set is for example sold under the registered trademark Twinson. The known combined set is generally used for outside floor covering. In order to mount the known combined set, a frame is placed on the floor or wall and the attachment elements are fixed on the frame. Thereafter, the covering elements are applied and fixed to the frame by means of the attachment elements.

**[0004]** A drawback of the known combined set and method is that the attachment elements must comprise an initial element having a U-shaped profile and which needs to be placed where the first covering element is applied. It is often difficult to apply this initial element due to a lack of space. Once the covering elements have been placed, it is rather difficult to remove one or more of them. Moreover, as the longitudinal edges are not rectilinear, there is a need to apply covering strips along the edges, which is rather cumbersome in particular when the floor is close to a wall, as there is often not enough place to apply a screwdriver.

**[0005]** The object of the present invention is to realise a combined set comprising at least two outside floor or wall covering elements and a method for mounting said combined set, in which it is more easy to initially install the covering elements. Also the replacement of one or more covering elements should be easier to realise.

**[0006]** For this purpose, a combined set according to the invention is characterised in that said longitudinal edges are integrally formed with said upper and lower surface and extend each time over their whole surface substantially linearly and continuously from an upper surface border to a lower surface border, and wherein a first respectively a second opening is applied, offset from said first respectively second longitudinal edges in said lower surface, in order to form each time a cavity therein, said first respectively said second opening giving access to at a first, respectively a second anchoring lip designed and dimensioned so as to match with said attachment element. As the longitudinal edges extend from border to border of the upper and lower surface linearly and continuously over their whole surface, there is no need to apply coverings anymore, thereby avoiding a cumbersome mounting thereof. That the longitudinal edges are now made that way, is due to the fact that it is no longer

needed to have protrusions on the longitudinal edges on which the attachment elements clamp, as its is the case in the prior art. According to the present invention the attachment is realised by the anchoring lip placed at the lower surface of the covering element and the attachment element. By using openings, creating a cavity in the lower surface of the covering element, the attachment element can now be fixed at the lower surface. Moreover, since the attachment elements match with the anchoring lip, the anchoring is offset from the gap between subsequent covering elements. In such a manner, the fixation member of the attachment element can now be placed in such a way as to be accessible from the gap, thereby making the demounting of the covering elements more easy. Also the absence of protrusions on the longitudinal edges avoids that the latter could break off the covering element and weaken the fixation of it on the support.

**[0007]** A first preferred embodiment of a combined set according to the present invention is characterised in that said anchoring lip is provided with locking means for locking said attachment element. This enables a reliable fixation of the covering element.

**[0008]** A second preferred embodiment of a combined set according to the present invention is characterised in that said covering elements have an alveolar structure comprising longitudinal tunnels extending between said upper and lower surface of said covering element, said opening being at least partially applied within a volume described by said tunnel. In such a manner, a good combination of the alveolar structure and the opening, forming the cavity, is obtained.

**[0009]** Preferably said synthetic material is a composite material comprising a polymer, most preferably the composite material further comprises cellulose. Such a composite material is very suitable for extrusion techniques. The use of cellulose provides a natural aspect to the covering elements.

**[0010]** A third preferred embodiment of a combined set according to the present invention is characterised in that a second anchoring lip is provided, said first and second anchoring lip being mirror symmetrically applied with respect to a centre of said opening. In such a manner a same attachment element can be used for two subsequent covering elements.

**[0011]** A fourth preferred embodiment of a combined set according to the present invention is characterised in that said attachment element comprises a resilient hook, mounted on a footplate and extending in a height direction with respect to said footplate. A resilient hook forms a reliable locking of the attachment element on the anchoring lip.

**[0012]** The method according to the present invention is characterised in that a first attachment element of said set, provided to engage into said first opening, is fixed to said support, a second attachment element is engaged into said second opening of one of said covering elements and attached to said anchoring lip, the latter covering element being moved towards said first attachment

element, which is attached to the anchoring lip in said first opening by a shifting movement of the covering element, said second attachment element being thereafter fixed to said support. The shifting movement enables an easy mounting and demounting of the covering elements.

**[0013]** The invention will now be described in more details with reference to the annexed drawings illustrating preferred embodiments of the combined set according to the invention.

**[0014]** In the drawings:

figures 1 to 7 illustrate a preferred embodiment of a combined set and the different method steps for mounting this combined set;

figure 8 shows a covering element as part of the combined set; and

figures 9 to 16 illustrate other embodiments of the combined set according to the present invention.

**[0015]** In the drawings, a same reference sign has been allocated to a same or analogous element.

**[0016]** The combined set according to the present invention comprises at least two covering elements 6-1 and 6-2, as illustrated in figure 7. The covering elements are intended as floor or wall covering, in particular for a terrace or a deck. The covering elements are made of a synthetic material. In particular the synthetic material is a composite material comprising polymer preferably in combination with cellulose. Polyethylene, polyvinylchloride and polypropylene are suitable polymers for the composite material. It is also possible to add a filler to the composite material. Preferably, the covering elements are manufactured by extrusion of the composite material. Such composite material has the advantage that it does practically not require any painting and that it is resistant to various weather conditions. The cellulose can originate from wood or from vegetables and offers the possibility to give a natural look to the covering element, despite the fact that it is not a 100 % natural product.

**[0017]** As illustrated in figure 8, the covering element 6 has an essentially rectangular shape and comprises an upper and a lower surface. The upper surface is preferably provided with a groove pattern in order to form an antiskid. The covering elements further comprise a first 15 and a second 16 longitudinal edge which extend over their whole surface substantially linear and continuous with the upper and lower surface and are integrally made therewith. The longitudinal edges extend each time from the upper surface border to the lower surface border in a continuous and rectilinear manner. Contrary to the covering elements known from the prior art, the longitudinal edge of the present covering elements is, as if to say, flat and without protrusions on which attachment elements could grip. The absence of protrusions is advantageously as it simplifies the extrusion process. Moreover, the absence of such protrusions also avoids that the latter could break off the covering element and weaken the fixation of it on the support. As is shown in figure 8, the longitu-

dinal edges are over the whole height substantially perpendicular with respect to the upper and lower surface of the covering element.

**[0018]** In the embodiment shown in the figures 1 to 15, the covering elements have an alveolar structure, comprising longitudinal tunnels extending between the upper and lower surface of the covering element. In the embodiments illustrated in the figures 1 to 13, three adjacent tunnels are provided, which extend longitudinally. The tunnels are each time separated by a wall. It will however be clear that the invention is not limited to three tunnels and that more or less tunnels can be present. In the embodiments illustrated in figures 14 and 15 the tunnels have a triangular shape. The latter shape has the advantage that less material is required as the separations between the adjacent tunnels can be made more thin, without affecting the rigidity of the covering element. The alveolar structure offers the advantage to provide a rigid structure without using too much material. The alveolar structure also offers the advantage that the covering elements have a relatively light weight, which makes them easy to handle.

**[0019]** The use of an alveolar structure for the covering elements according to the present invention is however not essential. According to another embodiment illustrated in figure 16, the covering element has a plain structure and a lesser thickness than the alveolar structure in order to limit the weight of the covering element when it has a plain structure.

**[0020]** As illustrated in the figures, the covering element comprises a first 8, respectively a second 9 opening applied offset from the first 15, respectively the second 16, longitudinal edge. The openings 8 and 9 are applied in the lower surface in order to form each time a cavity therein. The openings give access to a first (11-R), respectively a second (10-L) anchoring lip, designed and dimensioned so as to match with an attachment element 2, respectively 3. Although a sole anchoring lip for each cavity or opening 8,9 is sufficient, as illustrated in figures 9 and 10, it is also possible to have two anchoring lips per cavity or opening as illustrated in the figures 1 to 7, 11 to 16.

**[0021]** As illustrated in figure 1, the two anchoring lips are mirror symmetrically applied with respect to a centre of the opening. In such a manner, the lips oppositely face each other.

**[0022]** The anchoring lip is preferably extruded with the covering element and provided with locking means for locking the attachment element. In the embodiment of the figures 1 to 7, the locking means are tooth and groove shaped. The anchoring lip has an inclined frontal face 17 (see figure 2) leading to a tooth 18, followed by a groove 19. The inclined frontal face 17, which preferably makes an angle situated between 110° and 150° with the lower surface of the covering element, facilitates the cooperation between the attachment element 2 or 3 and the anchoring lip 10 or 11 upon application of the attachment element on the anchoring lip. Once the front of the

attachment element has reached the top of the inclined frontal face, it will engage in the tooth 18 and groove 19, thereby providing a reliable fixing.

**[0023]** When an alveolar structure is used, the openings 8 and 9 and their respective cavities are at least partially applied within a volume described by the tunnel. In the embodiment where tunnels are present, the cavities extend in the tunnels adjacent the longitudinal edges. The tunnels, comprising the cavities, have a first and a second section 7-1 and 7-2 separated by a section wall 20. The first section 7-1 forms a closed loop configuration and is substantially L-shaped. The opening 8, 9 is applied in the second section 7-2. The first section bridges the second one. The section wall 20 rigidifies, as if to say, the structure of the second section and thereby provides a reinforcement for the anchoring by avoiding that they could become movable. The L shaped structure of the first section rigidifies the covering element and assures that, in case where two anchoring lips are present, they are correctly applied on the under surface of the covering element.

**[0024]** In the embodiment shown in figure 16 the covering element comprises three instead of two cavities. The additional or third cavity 8' is asymmetric with respect to the middle axis of the covering element. It should be noted that the presence of such an additional cavity is not limited to covering elements having a plane structure, but can also be applied to covering elements having an alveolar structure. Although the asymmetric application of the additional cavity is not essential, it nevertheless has the advantage of creating more flexibility for placing the covering elements. Indeed it is sometimes necessary, when the last element has to be placed, that a smaller dimension than the standard one is required. To this purpose it is than necessary to cut a stroke from the covering element. The presence of the additional cavity than enables to cut the stroke even at a location where the first or second cavity is applied, without affecting the possibility to attach the covering element, as the additional cavity can be used. The asymmetric application of the additional cavity provides the possibility by turning the covering element to find an appropriate way to attach the covering element while still providing a gap between subsequent covering elements.

**[0025]** The combined set according to the present invention further comprises a series of attachment elements 2, 3. The latter comprise a footplate 30 on which at least one resilient hook 4 is mounted. Although the figures shows each time single hooks, it could also be possible to have a set of adjacent hooks on a same footplate. The attachment element is further provided with a perforation 21 applied on the footplate. Through this perforation a fixing member 5, preferably formed by a screw, is applied in order to fix the attachment element to a frame 1. The frame is for example formed by a series of beams made of wood, steel or a synthetic material and provided to be applied on a support, on which the covering elements have to be applied.

**[0026]** The attachment element either has a single hook 4 or two hooks. The hook or hooks extend in height direction with respect to the footplate. The hook preferably has a swan-neck's shape. In the embodiment shown in the figures 1 to 7, the hooks have a first segment 22 extending substantially perpendicular to the footplate 3. The first segment is followed by a second segment 23 extending over an angle  $\alpha$  with respect to the first segment. The angle  $\alpha$  being situated between 30° and 60° and preferably 45°. The second segment is followed by a third segment 24, extending substantially parallel with respect to the footplate. The third segment 24 is followed by a fourth segment 25, which is downwardly inclined with respect to the third segment. The first and fourth segment are shorter than the second and third segment. The second segment has a longer length than the third segment. When two hooks are applied on a same footplate, they are mounted on a predetermined distance from each other in order to match with the distance between two anchoring lips as will be described hereinafter. The two hooks either point in a same direction, as illustrated in figure 9, or point in an opposite direction as illustrated in the figures 1 to 7.

**[0027]** In the embodiment shown in figure 9, the two hooks have not a same configuration. Hook 26, has the pattern of a lamppost and is provided for engaging into an anchoring lip 27. The latter preferably extends over a whole length of the covering element and forms, as if to say, a rail on which the hook 26 can be shifted. The hook is mounted on the rail by introducing it along a transversal side of the covering element and sliding it over the rail until the hook is at the desired place. As illustrated in figures 9 and 10, the hook 26 can be either left or right oriented.

**[0028]** In the embodiment illustrated in figure 11 the hook 32 has a curved shape and the hook 31 is formed by two legs, each leg being half mushroom shaped. The leg 31-1 and the leg 31-2 being mirror symmetrical with respect to a central axis  $a$  extending between those legs. The hook 31 being provided to match with the anchoring lips 33-1 and 33-2. The latter being formed by upstanding posts 33-1 and 33-2 extending on the left hand side of the covering element from the lower surface inwards the opening and integrally made with the covering element. The hook 31 is provided to click into aperture formed by the posts 33 by an upwards movement of the attachment element.

**[0029]** The embodiment illustrated in figure 12 distinguishes over the one illustrated in figure 11 by the use for attachment element 3 of a lamppost shaped hook 26 instead of the half mushroom shaped one 31 and a half mushroom shaped one 31 instead of a curved shaped one 32. Also the attachment element 2 is half mushroom shaped instead of a curved one. Moreover the leg shaped posts 33 are now on the right hand side. For mounting of the anchoring elements in this embodiment only a vertical movement is required.

**[0030]** The embodiment illustrated in figure 13 distin-

guishes over the one illustrated in the figures 11 and 12 by the fact that all the hooks are formed by two legs 31 and all the anchoring lips by upstanding posts 33.

**[0031]** The mounting of the embodiment of the combined set according to the present invention and illustrated in the figures 1 to 7 will now be described with reference to those figures. The first step is the application of a first attachment element 4 on the support frame 1. The first attachment element is mounted on the support frame placed for example near a wall of a house where a terrace is to be constructed. The attachment element is fixed by means of the fixing element 5, for example by screwing.

**[0032]** Once the first attachment element 2 is fixed, a second attachment element 3 is taken, as well as a first covering element 6-1. The second attachment element is introduced into the second opening 9 of the covering element via the space between the anchoring lips 11-L and 10-L, as indicated by arrow a. Once the hook 4 extends inside the cavity 7-2 and the footplate 3 touches the lower surface of the covering element, the attachment element is shifted towards the right, as indicated by arrow b in figure 2. The shifting movement to the right and the resilient property of the hook causes the latter to climb along the slope of the frontal face 17, to slide over the tooth 18 and to click into the groove 19. In such a manner, the second attachment element is fixed to the anchoring lip 10-L.

**[0033]** After having attached the second attachment element, the covering element 6-1 is lowered towards the first attachment element and the frame 1, so as to engage the first attachment element into the first opening 8, as illustrated in figure 3. Once the first attachment element is inside the first opening and the footplate contacts the underside of the covering element, a shifting towards the right of the covering element is done, as indicated by arrow d in figure 4. As can be seen on figures 2 and 4, in both cases of the first and second attachment element, a shifting movement to the right side is realised in order to have the attachment element fixed to the anchoring lip. By shifting the covering element towards the right, the right longitudinal edge of the covering element comes substantially in line with the border of the frame 1.

**[0034]** Once the attachment elements are anchored to the anchoring lips, the covering element is put in place, so that the fixing member 5 can now be brought towards the opening of the second attachment element (figure 5) and fixed to the support (figure 6). After having placed the first covering element, the second one is placed in an analogous manner, now using the second hook on the second attachment element, as illustrated in figure 6. As illustrated in figure 7, a gap 31 extends between the first and second longitudinal edges of two subsequently mounted covering elements. Because the hooks are offset with respect to the opening for the fixing member, the latter is offset from the longitudinal edge and extends in the gap when the covering element is mounted on the fixing member. Figure 7 also illustrates that, when mounted, the hooks of the attachment elements are un-

der the covering element inside the cavities and not in the gap between subsequently mounted covering elements. The connection between the covering elements and the attachment elements is thus realised offset from the gap 30, because the anchoring lip is situated offset from the gap. Contrary to the known covering elements, the covering element according to the present invention does not require protrusions for anchoring the attachment element as this is realised by the anchoring lip placed at the lower surface of the covering element.

**[0035]** When the embodiments illustrated in the figures 8, 9 and 10 are used, the mounting of the attachment element 2-1 is realised in an analogous manner as described for the figures 1 to 7. The hook 26 is applied by inserting the latter via a transversal edge of the covering element in the cavity 9. The hook 26 is slit over the rail 27 so that he engages with the rail. Thereafter, the mounting takes place in an analogous way as that for the embodiment illustrated in the figures 1 to 7.

**[0036]** In the embodiment illustrated in figure 11 the curved shaped hooks being shifted on the anchoring lips. The legs 31 being pushed into the opening 9, so that they click with the posts 33. In the embodiment illustrated in figure 12 the lamppost shaped hook is slide on the anchoring lip. In the embodiment illustrated in figure 13 the legs are clicked onto the posts.

**[0037]** The combined set according to the present invention offers the advantage that the longitudinal edges are an integral part of the covering element, so that it is not necessary to apply some separate beams on the edges forming the border of the terrace or wall, in order to obtain an esthetical final work.

**[0038]** As the attachment elements grip on the anchoring lip, which preferably has a length of at least 1.0 cm and preferably 2 cm, a sufficient contact surface between the anchoring lip and the hook is obtained, thereby leading to a reliable fixing of the covering element. It is also possible to create a more important contact surface between the anchoring lip and the hook. This is favourable when larger covering elements are used which require a larger contact surface due to more important mechanical forces applied on it. Moreover the expansion and shrink of the larger attachment elements due to temperature fluctuations is more important which also imposes a larger contact surface. The present invention enables a more important contact surface without affecting the aesthetical aspect of the covering element, as the attachment is realised at the underside. In comparison to the known covering elements, the width of the covering element could be doubled thereby still enabling a reliable attachment.. Moreover, as the hook is resilient, thermal fluctuations are better absorbed and they do not affect the attachment of the hook to the anchoring lip.

**[0039]** Since only the fixing member 5 is present in the gap, the latter can be kept small, even less than 4 mm, as no attachment elements extend in the gap.

## Claims

1. A combined set comprising at least two outside floor or wall covering elements made of a synthetic material and a series of attachment elements, which attachment elements are provided for attaching said covering elements to a support, said covering elements having an upper and a lower surface and a first and second longitudinal edge, and wherein when attached on said support, a gap extends between said first and second longitudinal edges of two subsequently mounted covering elements, **characterised in that** said longitudinal edges are integrally formed with said upper and lower surface and extend each time over their whole surface substantially linearly and continuously from an upper surface border to a lower surface border, and wherein a first respectively a second opening is applied, offset from said first respectively second longitudinal edges in said lower surface, in order to form each time a cavity therein, said first respectively said second opening giving access to at a first, respectively a second anchoring lip designed and dimensioned so as to match with said attachment element.
2. A combined set as claimed in claim 1, **characterised in that** said anchoring lip is provided with locking means for locking said attachment element.
3. A combined set as claimed in claim 2, **characterised in that** said locking means are tooth and grove shaped.
4. A combined set as claimed in any one of the claims 1 to 3, **characterised in that** said covering elements have an alveolar structure comprising longitudinal tunnels extending between said upper and lower surface of said covering element, said opening being at least partially applied within a volume described by said tunnel.
5. A combined set as claimed in claim 4, **characterised in that** said longitudinal tunnels located adjacent to said longitudinal edges comprise a first and a second section separated by a section wall, said first section having a closed loop configuration, said opening being applied in said second section.
6. A combined set as claimed in claim 5, **characterised in that** said first section is substantially L-shaped and bridges said second section.
7. A combined set as claimed in claim 4, **characterised in that** said longitudinal tunnels are triangularly shaped.
8. A combined set as claimed in anyone of the claims 1 to 7, **characterised in that** said synthetic material is a composite material comprising a polymer.
9. A combined set as claimed in claim 8, **characterised in that** said composite material further comprises cellulose.
10. A combined set as claimed in any one of the claims 1 to 9, **characterised in that** a second anchoring lip is provided, said first and second anchoring lip being mirror symmetrically applied with respect to a centre of said opening.
11. A combined set as claimed in any one of the claims 1 to 10, **characterised in that** said attachment element comprises a resilient hook mounted on a footplate and extending in a height direction with respect to said footplate.
12. A combined set as claimed in claim 11, **characterised in that** said hook is swan-neck shaped.
13. A combined set as claimed in claim 11, **characterised in that** said hook is lamppost shaped.
14. A combined set as claimed in claim 11, **characterised in that** said hook has a curved shape.
15. A combined set as claimed in claim 11, **characterised in that** said hook is formed by two legs, each leg being half mushroom shaped.
16. A combined set as claimed in any one of the claims 1 to 10, **characterised in that** said attachment member comprises a footplate on which two resilient hooks are mounted, which hooks extend in a height direction with respect to said footplate, said hooks being mounted at a predetermined distance from each other and point in opposite direction with respect to each other.
17. A combined set as claimed in any one of the claims 1 to 10, **characterised in that** said attachment member comprises a footplate on which two resilient hooks are mounted, which hooks extend in a height direction with respect to said footplate, said hooks being mounted at a predetermined distance from each other and point in a same direction with respect to each other.
18. A combined set as claimed in claim 16 or 17, **characterised in that** said footplate comprises a fixing member provided for fixing said attachment member to said support, said fixing member being placed in such a manner that it extends offset from said longitudinal edge when said hook is anchored in said anchoring lip.
19. A combined set as claimed in any one of the claims

1 to 19, **characterised in that** said covering element comprises a third opening applied in said lower surface, said third opening giving access to a further cavity.

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20. A combined set as claimed in claim 19, **characterised in that** said third opening is asymmetrical with respect to a middle axis of said covering element.

21. A method for mounting a combined set according to any one of the claims 1 to 20, **characterised in that** a first attachment element of said set and provided to engage into said first opening, is fixed to said support, a second attachment element is engaged into said second opening of one of said covering elements and attached to said anchoring lip, the latter covering element being moved towards said first attachment element, which is attached to the anchoring lip in said first opening by a shifting movement of the covering element, said second attachment element being thereafter fixed to said support.

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22. A method as claimed in claim 21, **characterised in that** said first attachment element is attached to said anchoring lip by a shifting movement.

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23. A method as claimed in claim 21, **characterised in that** said first attachment element is attached to said anchoring lip by a pivotal movement.

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24. A method as claimed in claim 21, **characterised in that** said first attachment element is attached to said anchoring lip by clicking.

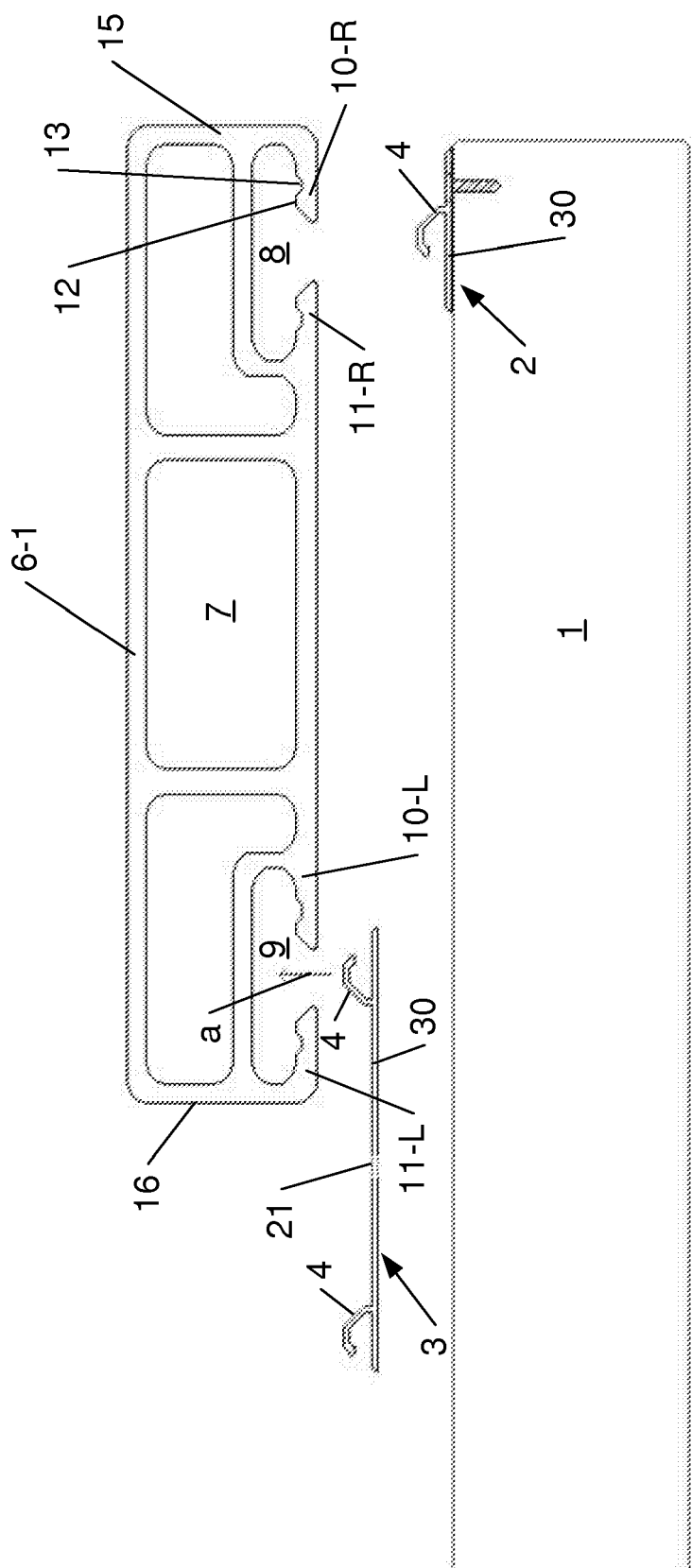
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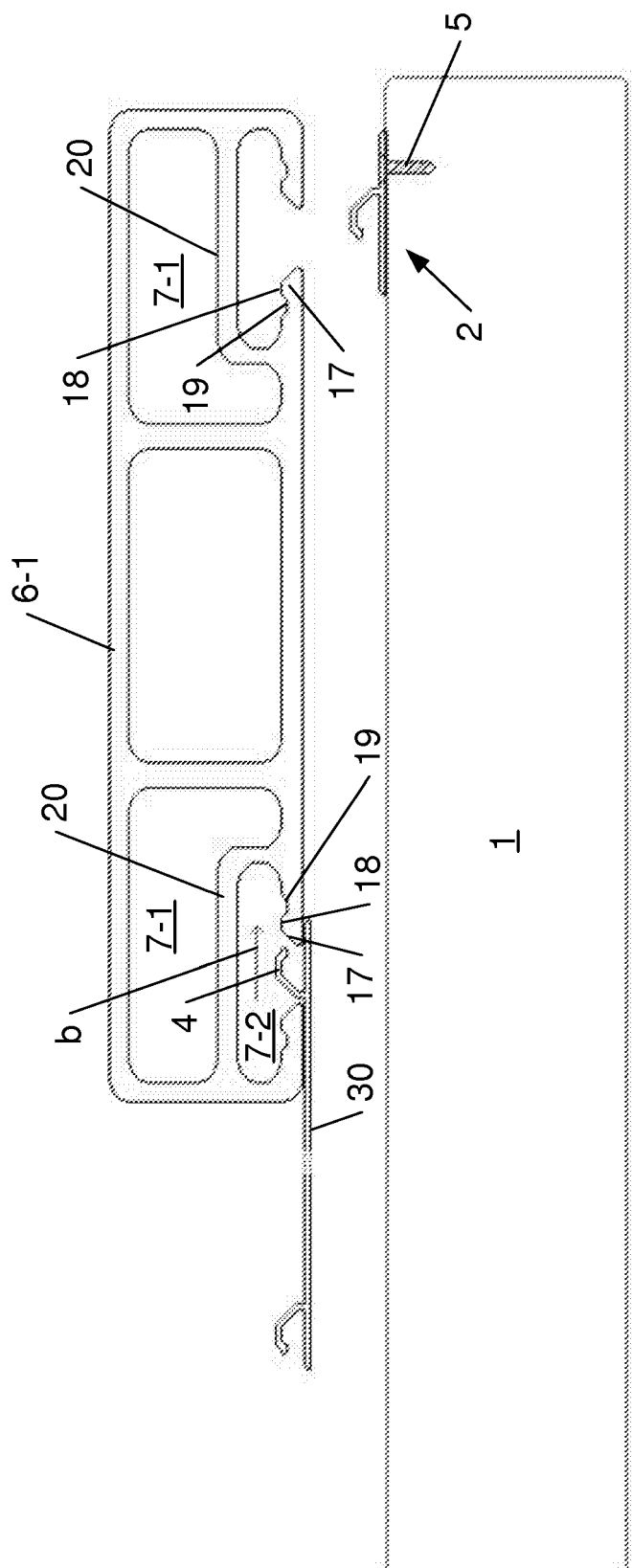
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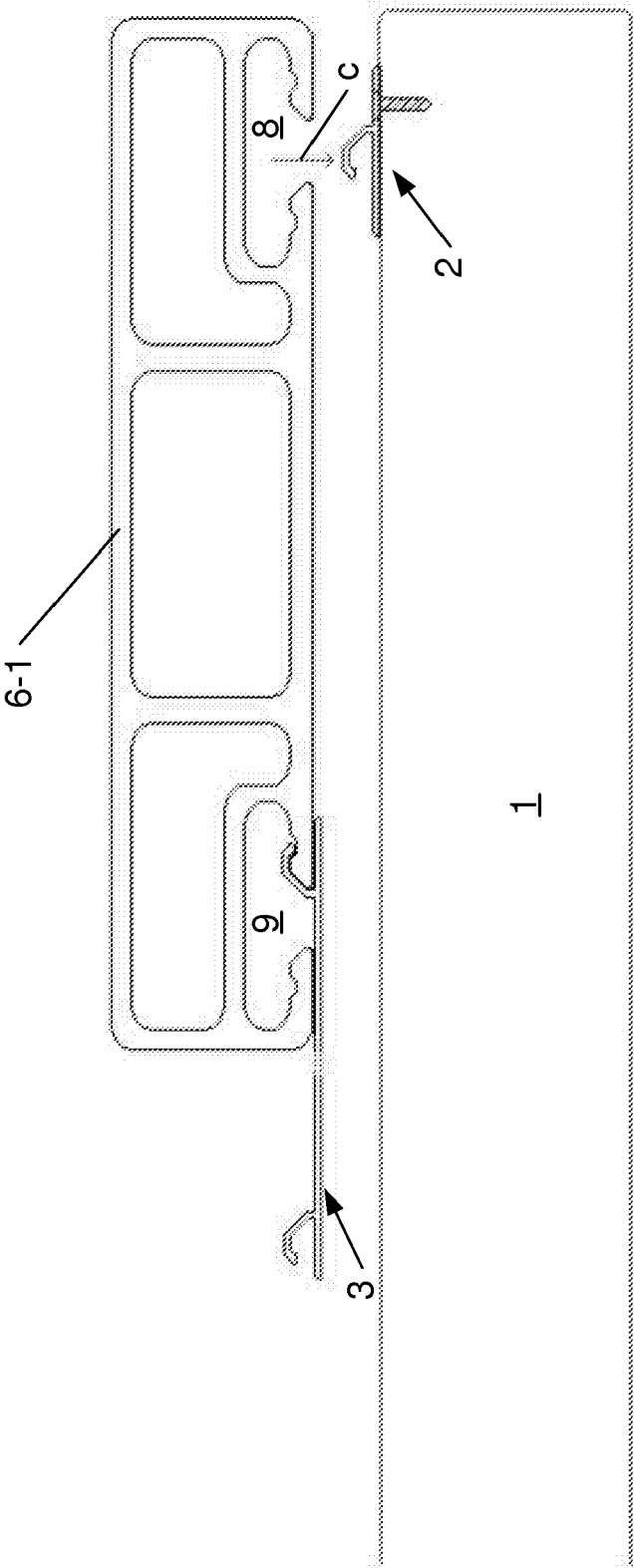


**Fig. 1**

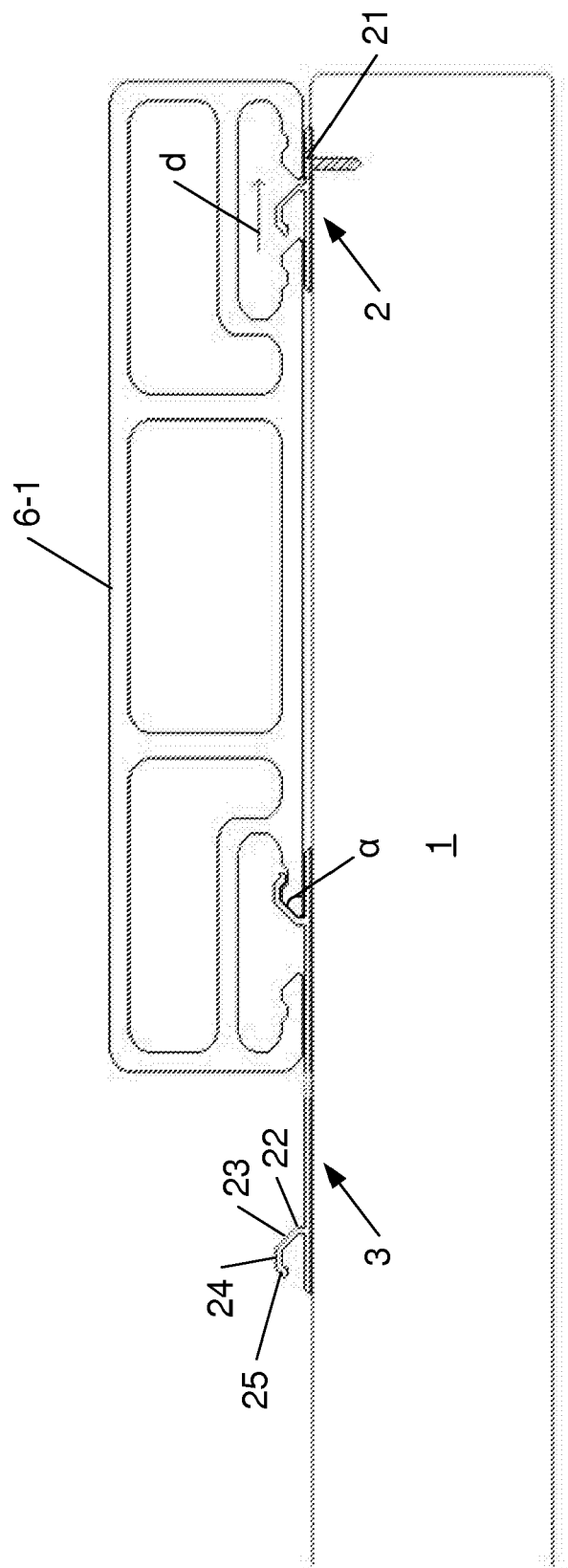




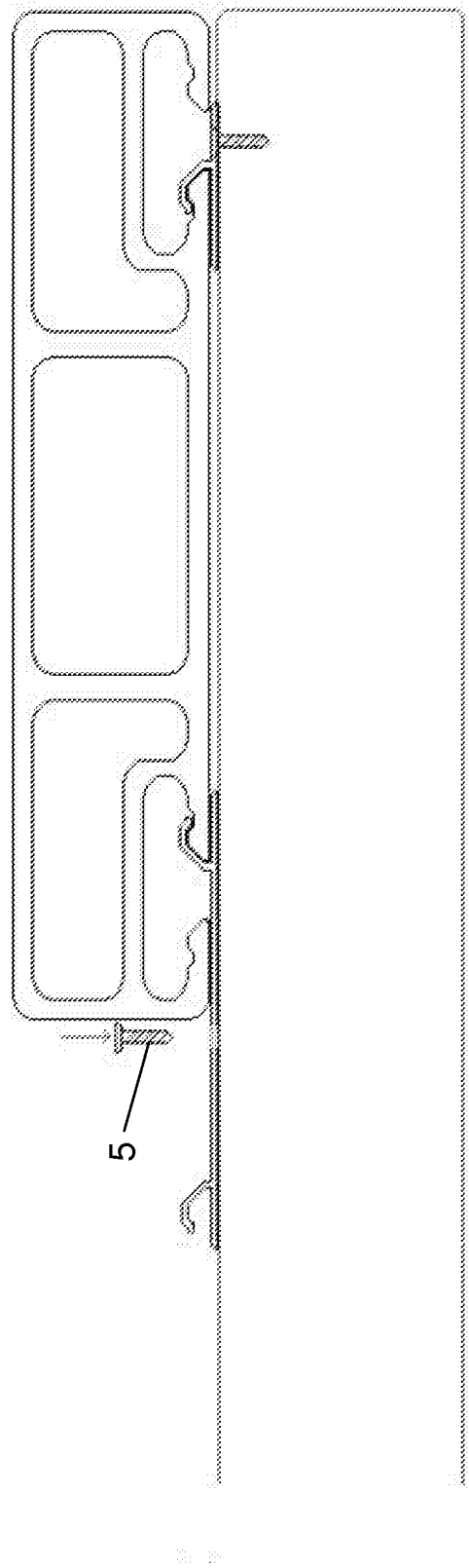
**Fig. 2**



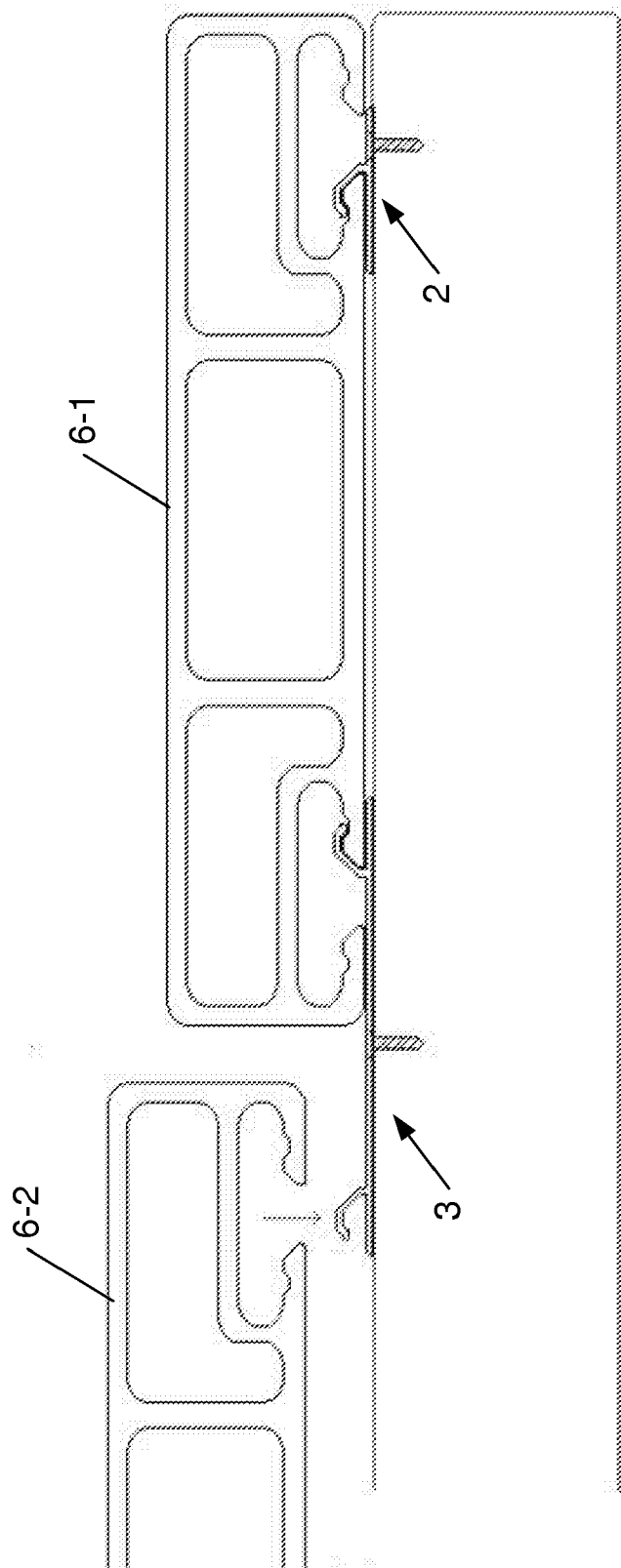
**Fig. 3**



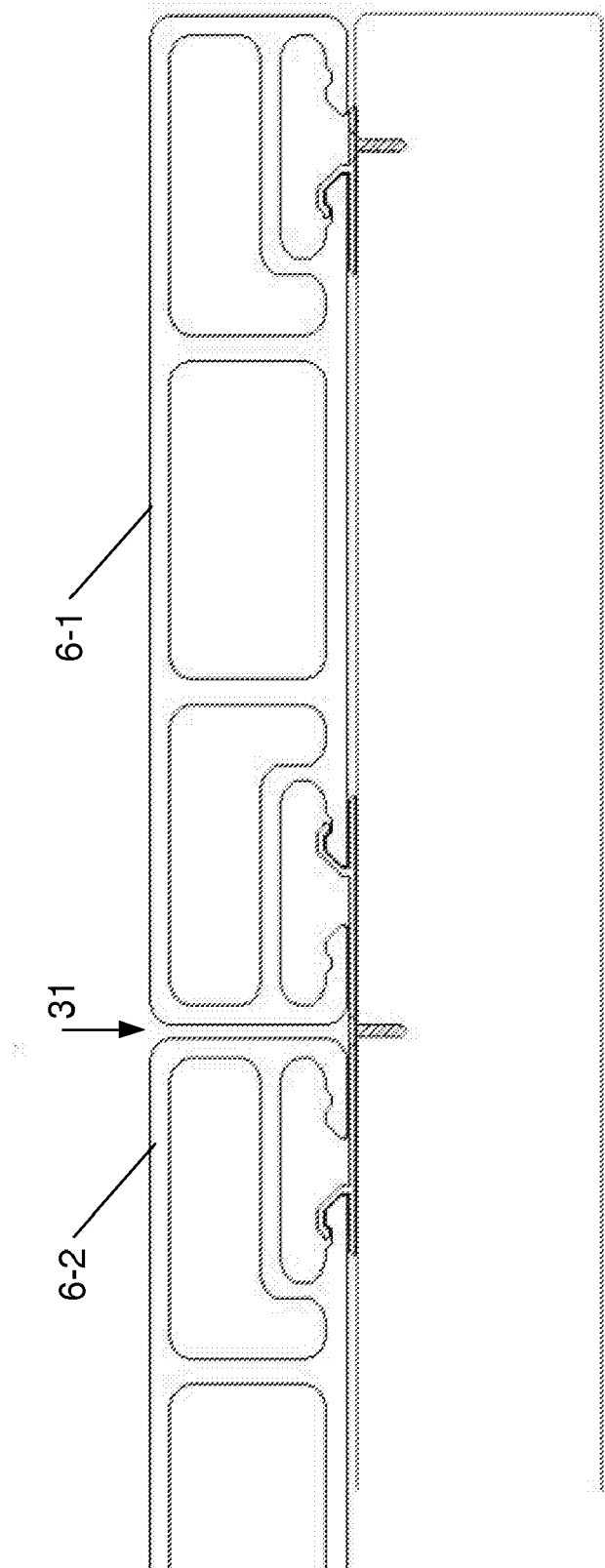
**Fig. 4**



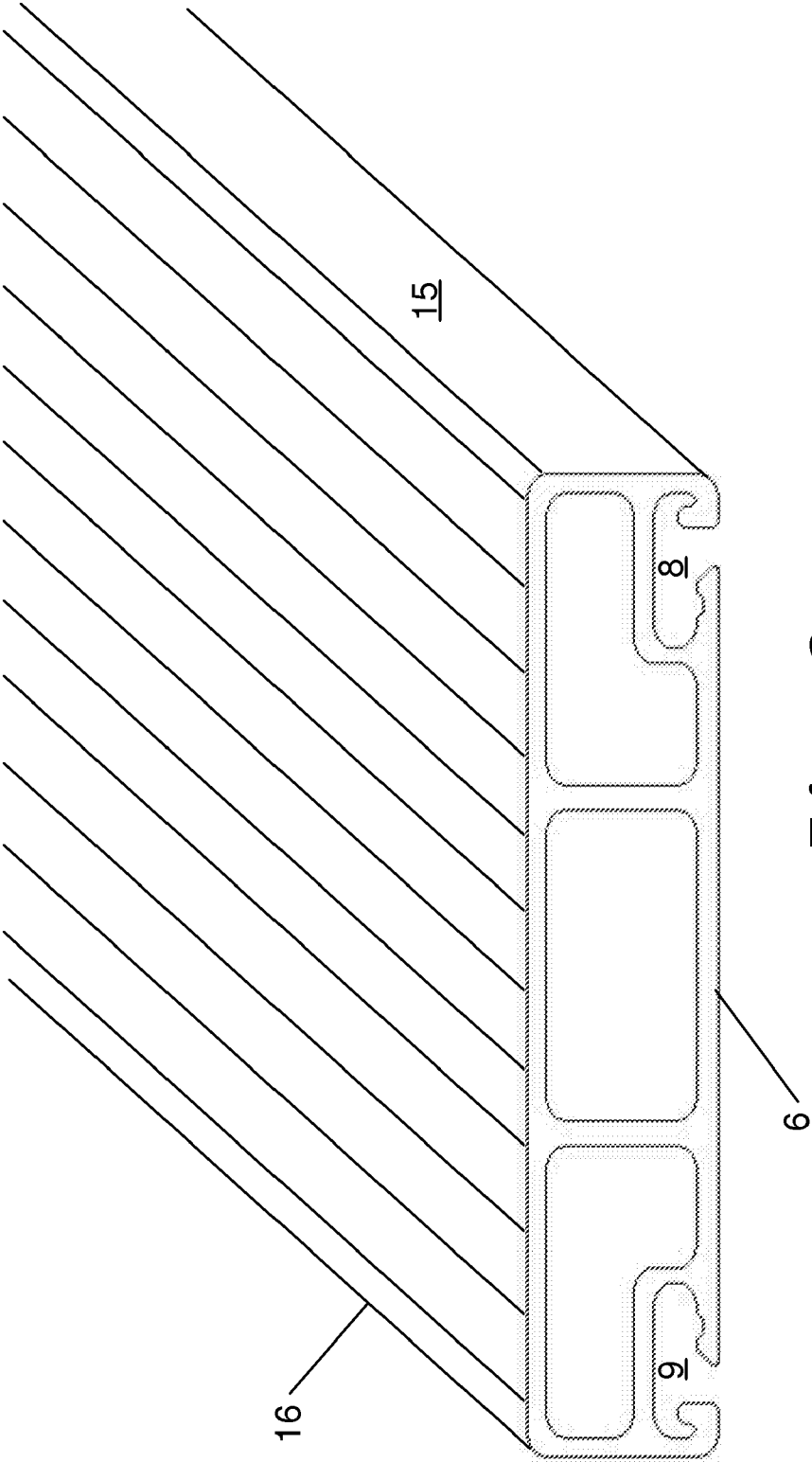
***Fig. 5***



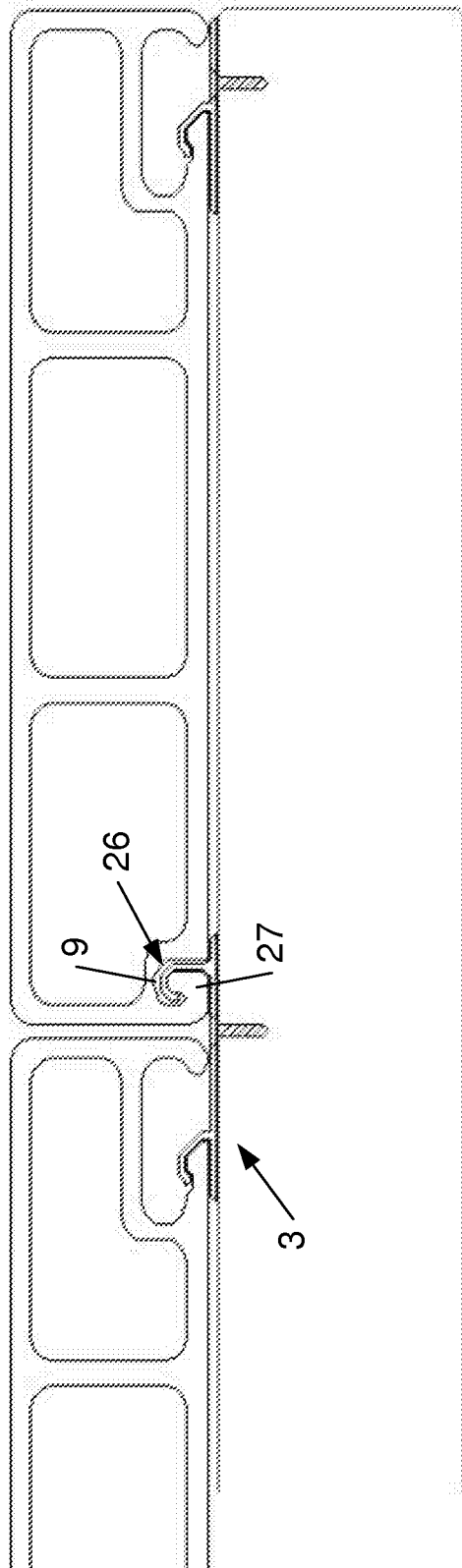
**Fig. 6**



**Fig. 7**

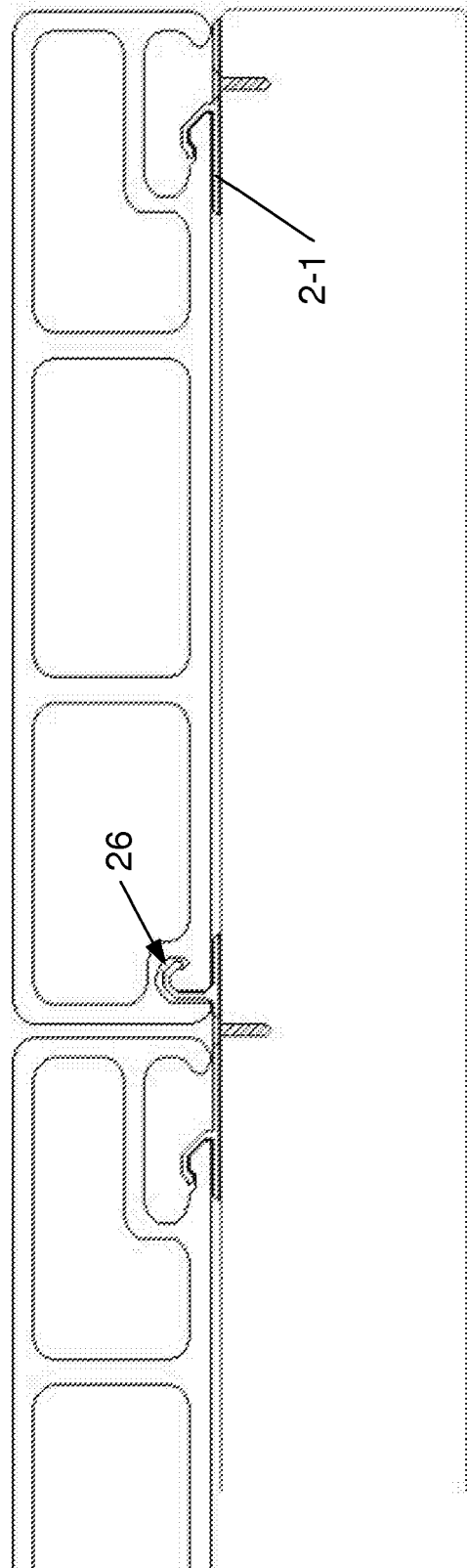


**Fig. 8**

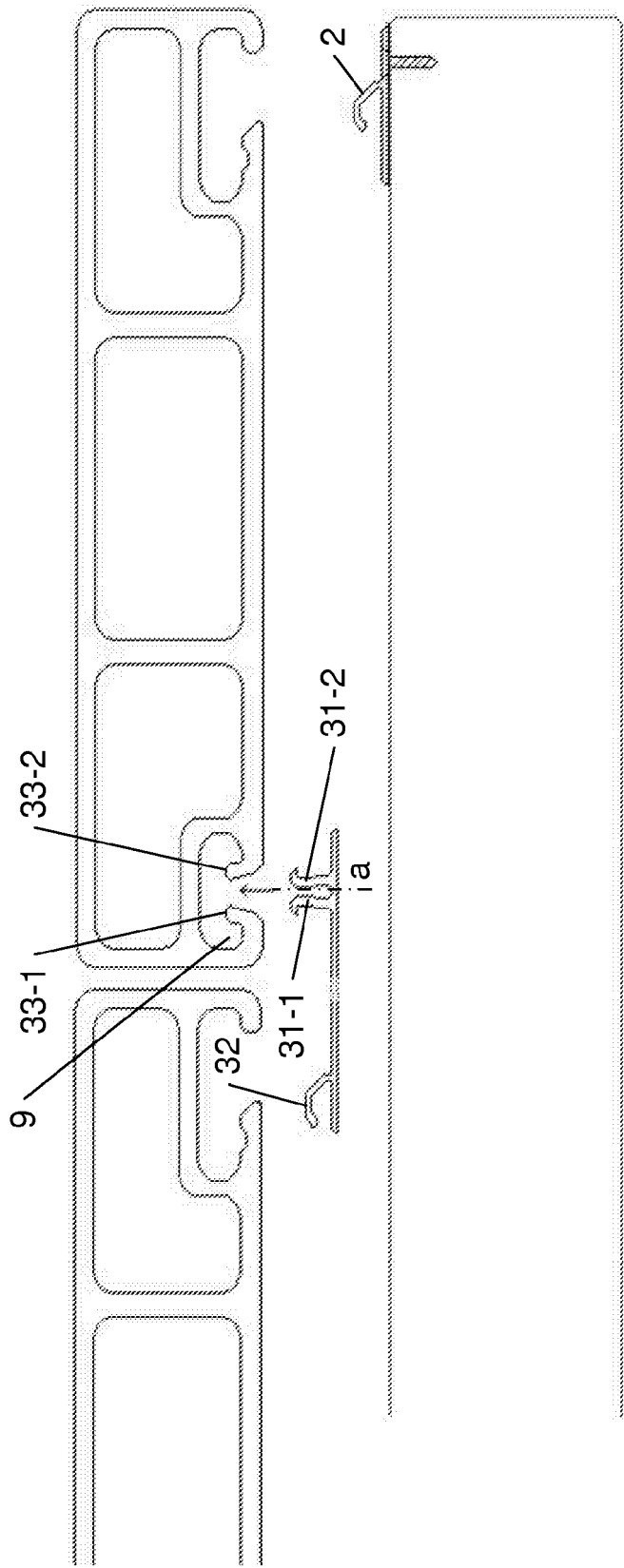


**Fig. 9**

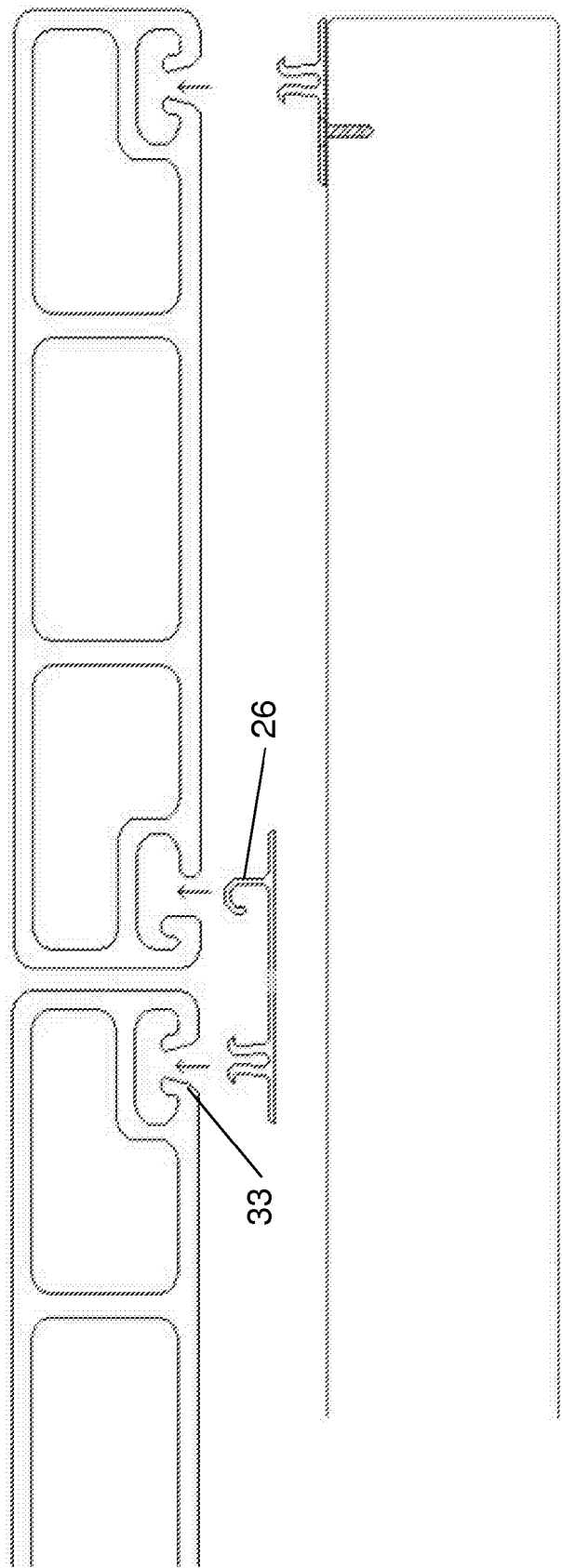




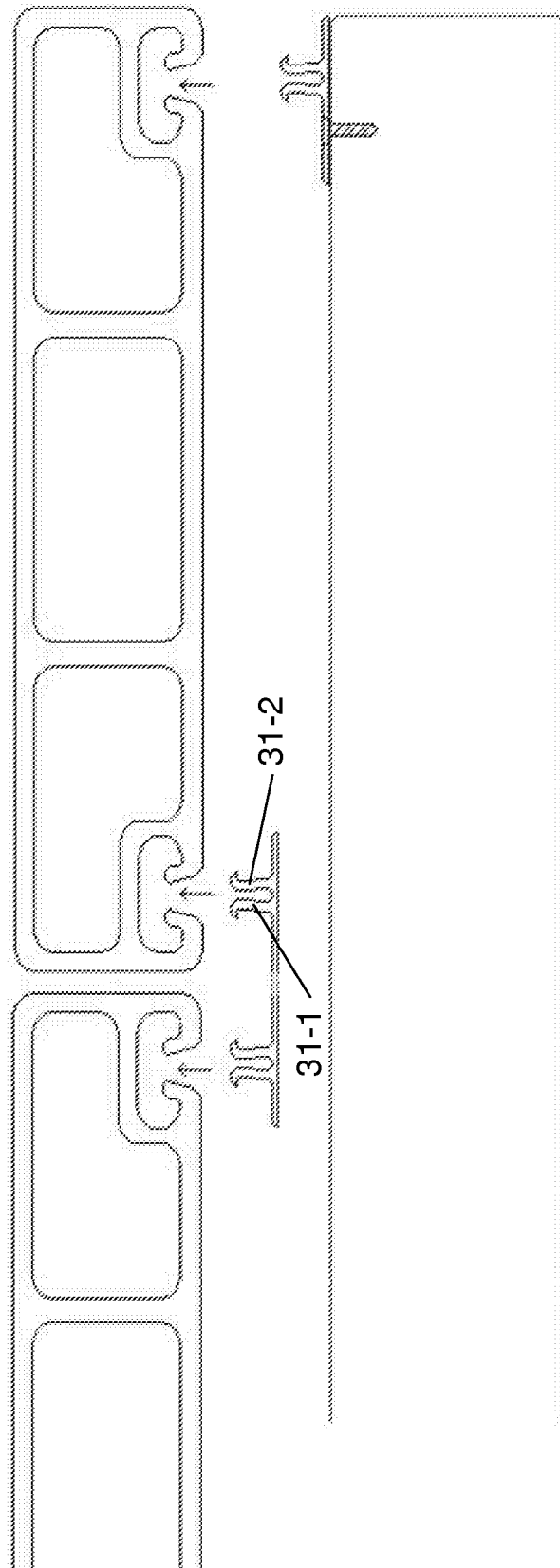
***Fig. 10***



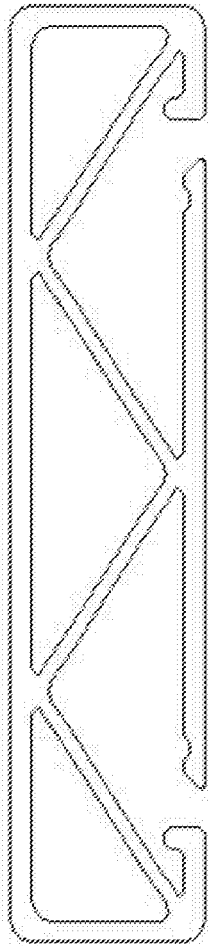
**Fig. 11**



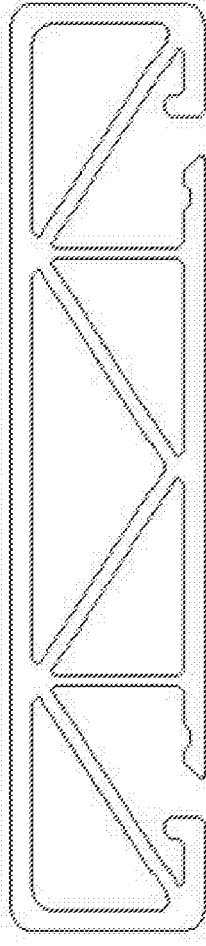
**Fig. 12**



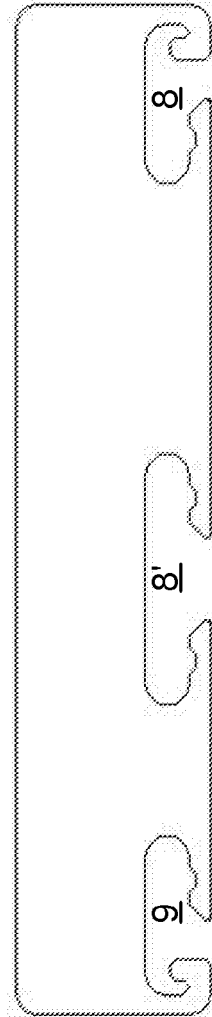
**Fig. 13**



**Fig. 14**



**Fig. 15**



**Fig. 16**



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 07 10 2777

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 691 002 A (HUDEL DR WOLFGANG [DE]) 16 August 2006 (2006-08-16) * abstract * * paragraphs [0001], [0019], [0040], [0041], [0044] - [0046], [0063], [0064] * * figures 1-3,6,12,14,15 * -----	1-3, 10-18	INV. E04F13/18 E04F15/10 E04F13/08
X	WO 99/63178 A (THERMAL IND INC [US]) 9 December 1999 (1999-12-09) * page 3, line 1 - line 9 * * page 5, line 26 - line 31 * * page 7, line 18 - line 23 * * page 8, line 2 - line 13 * * figures 3-7 * -----	1,2,4-6, 10-12,16	
X	WO 00/56996 A (THERMAL IND INC [US]; ANDRES THOMAS J [US]) 28 September 2000 (2000-09-28)	1,4-7,19	
Y	* page 1, line 5 - line 9 * * page 5, line 10 - line 29 * * page 5, line 36 - page 6, line 6 * * page 7, line 11 - line 16 * * page 7, line 24 - line 28 * * page 8, line 5 - line 18 * * page 9, line 2 - line 10 * * page 9, line 26 - page 10, line 35 * * figures 1-4,6-8 * -----	21,22,24	TECHNICAL FIELDS SEARCHED (IPC)  E04F E01C
Y	US 5 048 448 A (YODER DENNIS G [US]) 17 September 1991 (1991-09-17) * column 3, line 60 - line 66; figure 2 * -----	21,22,24	
<p>3 <del>The present search report has been drawn up for all claims</del></p>			
Place of search <b>Munich</b>		Date of completion of the search <b>7 August 2007</b>	Examiner <b>Bastian, Almut</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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 ..... &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims 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 the first ten claims.

**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 sheet B



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: 1-7,10-18,21-24

A combined set and a method for mounting this set wherein the covering elements have an alveolar structure.

1.1. claims: 1-3,10-20,21-24

A combined set and a method for mounting this set wherein the covering elements comprise a third opening.

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2. claims: 1-3,8-18,21-24

A combined set and a method for mounting this set wherein the synthetic material of the covering elements is a composite material comprising a polymer.

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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 07 10 2777

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.

07-08-2007

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