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(54) **A fixing bracket, a system comprising such a fixing bracket, and use of a fixing bracket**

Befestigungswinkel, System mit einem solchen Befestigungswinkel und Verwendung für einen
Befestigungswinkel

Support de fixation, système comprenant un tel support de fixation et utilisation d'un support de fixation

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Description

[0001] The present invention relates in a first aspect to a fixing bracket or fixing clip for mounting flat elements, specifically profiled planks or long panels, in coplanarity in continuation of each other to form a building façade. More specifically, the first aspect relates to a fixing bracket according to the introductory part of claim 1. In a second aspect as defined in claim 8 the invention relates to a system comprising such a fixing bracket and at least one flat element. In a third aspect as defined in claim 13 the invention relates to use of two fixing brackets for mounting a profiled plank or long panel to a building structure to form a building façade.

[0002] Today, building façades are often constructed by positioning a number of profiled planks or elongate panels (e.g. wood, plastic, stone or Rockpanel® panels) in coplanarity in continuation of each other in the height direction of a building wall such as to form a weather screen of the building. The panels are typically positioned with their length direction extending horizontally.

[0003] Often the panels have a profile with a longitudinally extending key at the top and two longitudinally extending projections at the bottom forming a longitudinally extending groove between them. The panels at a top side are profiled such that the front surface of the panel tapers towards the rear surface to form the key. Hereby, when an upper and a lower panel are positioned in continuation of each other, the front projection of the upper panel extends to cover at least part of the key of the lower panel, and the front surfaces of the panels are substantially flush with each other.

[0004] A simple prior art method of mounting such panels on the underlying building structure uses screws inserted through the upper key to secure an upper portion of the panel, the screw heads being hidden in the mounted position by the front projection of the upper element. Also, the key of the lower panel extends into the groove of the upper panel such as to also secure a lower portion of the upper panel.

[0005] Another generally known way to mount such panels on a building structure is to apply a number of certain fixing brackets that are secured in horizontal and vertical lines to the underlying building structure to form an array of brackets. Each horizontal line of brackets (except the topmost and bottommost line) secures a bottom portion of an upper panel as well as a top portion of a lower panel to the underlying building structure. After mounting the fixing brackets are often hidden by the panels by letting part of the bottom portion of each panel extend to cover the brackets similar to the above-described securing method applying screws inserted directly through the panel key. The panels may be releasable from the brackets such as to be replaceable.

[0006] One example of this type of fixing bracket is disclosed in US 7,748,188 B2. The document discloses a fixing bracket for fastening exterior panels (e.g. shiplap) to a façade, the fixing bracket comprising fingers extend-

ing upwards and downwards for engagement with the panels. Other examples of like prior art fixing brackets are disclosed in JP 2001-032500 A and JP 2003-268952 A.

[0007] WO 94/24388 A1, on which the introductory part of claim 1 is based, discloses a fixing bracket for flexible mounting of flat elements (e.g. stone) on a façade. The elements have grooves at both a top and at a bottom portion. Upwards and downwards extending fingers of the fixing bracket engage in the opposing grooves of the elements arranged on top of each other on the façade. A transversely extending central portion connects a front portion comprising the fingers with a rear portion that is secured to the underlying building structure. The rear portion further comprises a resilient tongue extending downwards and obliquely frontwards, pushing a top portion of a lower flat element towards the lower finger of the fixing bracket. The elements are replaceable by means of resilience of the fingers, tongue and central portion.

[0008] With the fixing bracket according to WO 94/24388 A1 the flexible fixing bracket makes the resulting building façade unstable. Furthermore, durability of the façade is unsatisfactory since the resilient parts of the fixing bracket tend to deteriorate, i.e. loose resilience and become loose, over time, which makes two flat elements positioned above each other to individually move to positions in which their surfaces are no longer flush with each other. Also, since the fingers and central portion carry the flat elements, they may even break or become so deformed over time that one or more flat elements will be unintentionally released and fall off from the building façade. See as well DE 103 22 396 A1.

[0009] On this background it is the object of the first aspect of the invention to provide a fixing bracket according to the introductory part of claim 1, from which the flat panels can be readily released, and with which the flat elements can be secured in a more stable manner while the resultant building façade is more durable.

[0010] This object is reached by means of the provision of the features of the characterizing part of claim 1.

[0011] The lower front finger is thus longer than the upper front finger, which makes it possible to easily release a flat element secured to two fixing brackets mounted to secure an upper and a lower portion, respectively, of the flat element. This may be achieved by simply shifting the flat element a suitable distance upwards. When shifting the flat element upwards, the upper front finger of the lower bracket will thus release the lower portion of the flat element while the lower front finger of the upper bracket still engages the top portion of the flat element. The released bottom portion of the flat element can then be pivoted frontwards (i.e. outwards) and subsequently moved downwards such as to also release the top portion of the flat element from the upper bracket.

[0012] When the two brackets are positioned at a suitable distance from each other (the suitable distance being dependent on the height of the flat element), the secured flat element can thus slide a short distance up-

wards until the lower projection at the backwards or rear side (the rear projection) of the lower portion of the flat element has moved beyond the upper front finger such that the lower portion of the flat element is free to move frontwards. In other words a suitable play is provided for the secured flat element when being shifted in the upwards direction.

[0013] In the secured position the bottom portion of the flat element can be secured due to the upper front finger of the lower fixing bracket extending into the groove of the bottom portion. The upper portion of the flat element can be secured due to the resilient tongue pushing the upper portion against the lower front finger. Since none of the load-carrying parts of the fixing bracket (central portion, fingers) thus need be flexible or resilient in order to make the flat element releasable, the flat element is secured in a more reliable, stable and durable manner.

[0014] Due to the force on the flat element exerted by the resilient tongue of the upper fixing bracket, shifting the flat element upwards may in some instances be done more easily if the flat element (or the top portion of the flat element) is first or simultaneously pushed backwards such that the upper portion of the flat element no longer abuts the lower front finger of the upper fixing bracket.

[0015] By a reversed releasing operation the flat element can similarly be readily secured to the fixing brackets. Both releasing a flat element from and securing a flat element to the brackets (e.g. to replace the flat element) can thus be readily carried out without the use of tools.

[0016] Dependent claims 2 to 7 define preferred embodiments of the first aspect of the invention as defined in claim 1.

[0017] In preferred embodiments the lower front finger is at least 1.2, preferably at least 1½, more preferred at least 2, even more preferred at least 2½, and most preferred at least 3 times longer than the upper front finger, but preferably no more than 10, preferably no more than 7, most preferred no more than 5 times longer than the upper front finger. This ensures that the flat element is safely secured when in the secured position, it still however being possible to release the upper portion of the flat element from the lower front finger and the resilient tongue when tilting or pivoting the lower portion frontwards.

[0018] In a preferred embodiment the rear portion of the fixing bracket further comprises an upper rear finger extending upwards, the upper rear finger comprising a resilient tongue adapted such that when the rear projection of the two longitudinally extending projections of the upper flat element is inserted between the upper front and rear fingers, the tongue exerts a frontwards directed force on the rear surface of the bottom portion of the upper flat element securing the rear projection against the upper front finger to thereby secure the bottom portion of the upper flat element. While ensuring a more reliable attachment of the flat element, this also makes it even easier to release the flat element since the resilient

tongue of the rear finger will automatically push the lower portion outwards when it has been released from the upper front finger of the bracket. The lower portion will thus be automatically ejected to pivot frontwards as soon as the rear projection of the lower portion has been shifted beyond the upper front finger of the bracket.

[0019] In a preferred embodiment the fixing bracket is in one piece, preferably cut or punched out from one preferably metal plate after which it has been bent into shape. This provides a low cost way of providing a strong bracket with suitably resilient tongue(s). The upper and lower front fingers are further preferably provided displaced in a sideward direction when viewing the fixing bracket from the front, and preferably at least two of each finger type are provided on the bracket, the fingers more preferred being positioned symmetrically about a centre plane of the bracket.

[0020] In a preferred embodiment the resilient tongue(s) is (are) formed as a flat, plate-shaped, preferably substantially plane member, which is inclined in a frontwards direction. Each resilient tongue further preferably extends from and is attached at one end to the upper rear finger. This provides suitable strength, durability and resilience of the tongue(s).

[0021] In a preferred embodiment the fingers, and preferably the central portion as well as an upper rear finger, are each formed as a flat, substantially plane member, the upper and lower front fingers being substantially coplanar, the front fingers extending upwards and downwards, respectively, from a front end of and preferably at substantially right angles to the central portion, the upper rear finger further preferably extending upwards from a rear end of and preferably at substantially right angles to the central portion. This provides a strong, stiff and durable bracket structure, especially as regards the load-bearing parts.

[0022] In a preferred embodiment the fixing bracket further comprises a lower rear finger adapted to be positioned at a distance from the lower flat element when mounted, and the (lower) resilient tongue is inclined frontwards at an angle such as to allow the lower flat element to be released by pivoting the bottom portion of this frontwards. This provides room at the upper portion for the flat element to be slightly rotated after release of the bottom portion, whereby the upper portion can be slid downwards such as to release the flat element from the bracket.

[0023] In its second aspect as defined in claim 8 the invention relates to a system comprising a fixing bracket according to any one of the above embodiments and at least one flat element.

[0024] Objects of and advantages gained with the system of the second aspect of the invention are similar to those described above in relation to the first aspect.

[0025] In an embodiment of the second aspect of the invention each flat element at a top side is profiled such that the front surface of the flat element tapers towards the rear surface to form the longitudinally extending key

of the top portion of the flat element, whereby two front surfaces of an upper and lower of said flat elements secured in continuation of each other to the fixing bracket will substantially be flush with each other. This provides a more uniform resultant building façade.

[0026] In a preferred embodiment the two longitudinally extending projections of the lower portion of the flat element are in the form of a front projection and a rear projection, the front projection extending farther downwards than the rear projection such that in a mounted position the upper front finger is covered or hidden by the front projection. This also provides a more uniform resultant building façade with concealed fixing brackets.

[0027] Preferably, an upper and/or a lower rear finger of each of the upper and lower fixing brackets comprise(s) at least one hole through which a fastening means such as a screw has been inserted into a building structure such as to fasten the fixing brackets to the building structure, the respective rear finger(s) preferably abutting the building structure. This provides a reliable attachment of the fixing brackets to the underlying building structure.

[0028] In its third aspect as defined in claim 13 the invention relates to use of two similar fixing brackets for mounting a flat element to a building structure to form a building façade.

[0029] The third aspect of the invention provides advantages similar to those described above in relation to the first and second aspects of the invention. However, with this aspect of the invention the respective lower front finger of the brackets need not necessarily be longer than the upper front finger. Instead, the upper front finger of each fixing bracket is so much longer than the rear projection of the lower portion of the flat element so that the bottom portion rests on the upper front finger. Hereby, when the fixing brackets are mounted at a suitable mutual distance the upper portion of the flat element is displaceable upwards with a distance to allow for the flat element to be released from the fixing brackets by shifting the flat element upwards, until the rear projection of the bottom portion has moved beyond the upper front finger of the lower fixing bracket.

[0030] The flat element can thus be released from the brackets with a movement (i.e. an upwards shift) that is similar to the releasing movement to be used with any of the first and second aspects of the invention. And again, simultaneously pushing the flat element backwards may accommodate the upwards shift of the flat element and thereby accommodate release of the flat element.

[0031] In a preferred embodiment of the third aspect of the invention the bottom portion of the flat element rests on the lower fixing bracket, a distance from an upper, distal end of the longitudinally extending key of the flat element to the central part of the upper fixing bracket is larger than a distance from an upper, distal end of the upper front finger of the lower fixing bracket to a lower distal end of the rear projection of the flat element, and a distance from a lower, proximal end of the longitudinally extending key of the flat element to a lower, distal end of

the lower front finger of the upper fixing bracket is larger than the distance from the upper, distal end of the upper front finger of the lower fixing bracket to the lower distal end of the rear projection of the flat element. These structural features and mutual distances allows for the flat element to be released from the fixing brackets with a suitable movement in the upwards direction.

[0032] The brackets and flat elements used according to the third aspect of the invention may comprise any of the optional and preferred features as described above in relation to the first and second aspects of the invention, thereby gaining similar advantages.

[0033] In the following the invention will be described by means of examples of embodiments with reference to the drawings in which

Fig. 1 shows a perspective view of a first embodiment of the fixing bracket according to the first aspect of the invention, which may form part of the system according to the second aspect of the invention, and which may be used in embodiments according to the third aspect of the invention,

Fig. 2 shows a front view of the fixing bracket of Fig. 1, Fig. 3 shows a side view of the fixing bracket of Fig. 1, Fig. 4 shows a perspective view of a panel to be mounted by means of the fixing bracket of Fig. 1, the panel further being suitable for being used in embodiments of second and third aspects of the invention

Fig. 5 shows a side view of the fixing bracket of Fig. 1 in a use position in which it secures an upper and a lower panel to form an embodiment of the system according to the second aspect of the invention as well as an embodiment of the use according to the third aspect of the invention,

Fig. 6 shows a perspective view of a second embodiment of the fixing bracket according to the first aspect of the invention positioned to secure a lower panel to form an embodiment of the system according to the second aspect of the invention as well as an embodiment of the use according to the third aspect of the invention,

Fig. 7 shows a side view of the fixing bracket of Fig. 6 in a use position in which it secures an upper and a lower panel to form an embodiment of the system according to the second aspect of the invention as well as an embodiment of the use according to the third aspect of the invention, and

Fig. 8 shows a side view of an embodiment of a fixing bracket positioned to form another embodiment of the use according to the third aspect of the invention.

[0034] In the drawings similar elements or elements of the same function of different embodiments are provided with similar reference numbers. Generally in the specification "up", "down", "upwards", "downwards" and like expressions refer to directions of the respective building elements in a mounted position forming a vertical building

wall. Note that in principle the building wall may be inclined, the said expressions in this case referring accordingly to similarly inclined directions. Similarly, "front", "frontwards" and like expressions refer to at the outer side of the wall or a direction away from the wall, "back", "backwards", "rear", "rearwards" and like expressions referring to an inner side of the wall or a direction towards the wall.

[0035] Figs 1 to 3 show a first embodiment of a fixing bracket or fixing clip according to the first aspect of the invention. The bracket comprises a transversely extending central portion 1 comprised of two central parts 2, 3 connecting a front portion 4 and a rear portion 5 of the bracket. The front portion 4 comprises two upper front fingers 6, 7 extending upwards and two lower front fingers 8, 9 extending downwards. The rear portion 5 comprises an upper rear finger 10. Each of the fingers 6 to 10 as well as the central parts 2, 3 are each formed as flat, plane members or flanges. The front fingers 6, 8; 7, 9 extend substantially in coplanarity and in extension of each other, respectively, when seen from the side, cf. Fig. 3. The front fingers 6, 8; 7, 9 each extend upwards and downwards from a front end of and at substantially right angles to respective central parts 2; 3. The upper rear finger 10 extends upwards from rear ends of and at substantially right angles to both central parts 2, 3. All fingers 6 to 10 extend substantially in parallel with one another.

[0036] From the front end of the central portion 1 the lower front fingers 8, 9 extend farther downwards than the upper front fingers 6, 7 extend upwards; more specifically the lower front fingers 8, 9 are in the present embodiment about 3.5 times longer than the upper front fingers 6, 7.

[0037] The upper rear finger 10 extends at a bottom or downwards end into a lower resilient tongue 11 that is inclined or slanted (bent) frontwards to form an angle with the upper rear finger 10 of about 20° (in an unloaded position). Further, from the upper rear finger 10 an upper resilient tongue 12 extends inclined or slanted frontwards to form an angle with the upper rear finger 10 of about 35° (in an unloaded position). The resilient tongues 11, 12 thus extend inclined upwards and frontwards, and downwards and frontwards, respectively, but note that each of them might extend for example reversely, i.e. downwards instead of upwards and vice versa, respectively. The resilient tongues 11, 12 are each formed as flat, plate-shaped, preferably substantially plane members, which are bent in the frontwards direction from the rear finger 10. Each resilient tongue 11, 12 extends from and is attached at one end to the upper rear finger 10. At an opposite end each tongue 11, 12 extends into small portions, 13, 14, respectively, that are bent slightly backwards, the purpose being to allow for the force exerted on a rear surface of the panels to be exerted on a larger area, cf. below.

[0038] The fixing bracket is in one, integral piece and has been punched out from one metal plate after which

it has been bent into shape. The upper and lower front fingers 6 to 9 are further provided displaced from each other in a sideward direction when viewing the fixing bracket from the front (Fig. 2). The respective upper and lower front fingers 6 to 9 are positioned symmetrically about a centre plane P of the bracket, respectively, cf. Figs 1 and 2. Note that the bent parts forming transitions between the different parts of the bracket as well as some of the other transitions are rounded as shown in Fig. 1 rather than the sharp corners shown in Figs 3 and 4, as well as Fig. 5. As regards the tongues 11, 12 the respective transitions to the small portions 13, 14 is thus also more rounded to efficiently allow for the force exerted on a rear surface of the panels to be exerted on a larger area of the panels.

[0039] The upper rear finger 10 further comprises a hole 15 for insertion of a screw to mount the bracket on an underlying building structure, such as a wood bar. To this end the upper rear finger 10 also comprises backwards bent, sharp upper corners that are to be forced into the underlying building structure during mounting of the bracket to prevent the fixing bracket from rotating about the hole 15.

[0040] Fig. 4 schematically shows a flat element in the form of an elongate, profiled panel 16, 17, for example a wood, plastic, stone, or Rockpanel® panel.

[0041] Fig. 5 shows the fixing bracket of Figs 1 to 3 in a position in which it is used for mounting two similar such panels, more specifically an upper panel 16 and a lower panel 17. Fig. 5 thus shows a small part of a building façade or weather screen constructed by a number of similar panels, which are positioned in coplanarity in continuation of each other in the height direction of an underlying building structure 18 such that their front surfaces are substantially flush with each other.

[0042] The panels of the façade, including panels 16, 17, are generally, but not necessarily, similar to each other and form elongate panels positioned with their length direction extending horizontally, i.e. in the depth direction of the drawing plane of Fig. 4.

[0043] The panels each have substantially similar profile and cross-sectional shape throughout the length. As can be seen best in Fig. 4, cf. the lower panel 17, the panels are each at a top portion 19 profiled such that a front surface of the panel tapers towards a rear surface to form a longitudinally extending key 20 that extends upwards. At a bottom portion 21 each of the panels further has two longitudinally extending projections 22, 23 that each projects downwards and extends in the length direction of the panel. These two projections take the form of a front projection 22 and a rear projection 23, respectively, forming a longitudinally extending groove 24 between them. In the present embodiment the front projection 22 is longer than the rear projection 23 such that in a mounted position the upper front fingers 6, 7 as well as the lower front fingers 8, 9 of the bracket are covered and hidden by the front projection 22.

[0044] A number of fixing brackets similar to that of

Figs 1 to 3 are secured in horizontal and vertical lines to the underlying building structure 18 to form an array of brackets (not shown). Each horizontal line of brackets (except the topmost and bottommost line) secures a bottom portion of an upper panel (in Fig. 4 bottom portion 21) as well as a top portion of a lower panel (in Fig. 4 top portion 19) to the underlying building structure 18.

[0045] The fixing brackets are mounted at similar mutual vertical distances from each other, this distance being so that the panels can be released by shifting the panel upwards, until the rear projection of the bottom portion of the upper panel has moved beyond the upper front finger of the lower fixing bracket.

[0046] Referring to Fig. 5, when the rear projection 23 is inserted between the upper front finger 7 and the rear finger 10, the upper tongue 12 exerts a frontwards directed force (directed to the left in Fig. 5) on the rear surface of the bottom portion 21 of the upper panel 16 securing the rear projection 23 against the upper front finger 7 to thereby secure the bottom portion 21. Similarly, when the key 20 of the lower panel 17 is inserted between the lower front fingers 8, 9 and the building structure 18, the lower tongue 11 exerts a frontwards directed force on the rear surface of the top portion 19 of the lower panel 17 securing the key 20 against the lower front fingers 8, 9 to thereby secure the top portion 19. In Fig. 5 the tongues 11, 12 in the unloaded position, in which the panels are released, are shown in broken lines.

[0047] Referring to the upper panel 16 of Fig. 5, because of the distance or play between the key 20 and the central parts 2, 3 of an upper bracket (not shown, but similar to that shown with respect to the lower panel 17) the panel 16 can manually be shifted upwards until the rear projection 23 has moved beyond the upper front fingers 6, 7 of the fixing bracket. When releasing the panel 16 (cf. the lower panel 17 of Fig. 5) the panel 16 is thus shifted upwards until the rear projection 23 has moved beyond the upper front fingers 6, 7 of the fixing bracket. The shifting movement is eased by pushing the panel 16 backwards, thus pivoting also the tongues 12, 11 of respective upper and lower brackets in the backwards or rear direction. The upper tongue 12 of the lower bracket then automatically pushes or pivots the lower portion 21 outwards. The lower front fingers 8, 9 of the upper bracket are positioned at such distance from the building structure 18 that room R is provided for the upper portion of the flat element to be slightly rotated (clockwise in Fig. 5) after release of the bottom portion 21 so that the upper portion 19 of the panel 16 can be slid downwards and completely release the panel 16 from the fixing bracket.

[0048] In the mounted position shown in Fig. 5 the bottom portion 21 of the upper panel 16 rests on the fixing bracket; more specifically, a bottom of the groove 24 rests on respective upper, distal ends of the upper front fingers 6, 7.

[0049] In Fig. 5 distance D1 is the distance in the up-down direction from an upper, distal end of the key 20 of the lower panel 17 to the central parts 2, 3 of the fixing

bracket. Distance D2 is the distance in the up-down direction from a lower, proximal end of the key 20 to respective lower, distal ends of the lower front fingers 8, 9. The lower, proximal end of the key 20 is defined as that position from the top of the panel in which the key 20 changes its profile, i.e. in the present embodiment the position in which the panel's front surface changes direction. Thus, the front surface of the key 20 extends substantially linearly, preferably linearly in the up-down direction, in its entire length. (Note in this context that in principle the key 20 may extend linearly in the entire height of the panel 16, 17.) Distance D3 is the distance in the up-down direction from an upper, distal end of the upper front fingers 6, 7 to a lower, distal end of the rear projection 23 of the upper panel 16. In this context, note that as long as $D1 > D3$, and $D2 > D3$ for one and the same panel, it is possible to release the panel in the explained way.

[0050] Referring to the embodiment of the fixing bracket of Figs 1 to 3 and 5 it is understood that the bracket may be manufactured in ways different from being punched out of one plate, and that it may be manufactured from other materials than metal, such as moulded from plastic or aluminium.

[0051] Further, the different parts of the bracket, for instance the different fingers can be positioned in a variety of suitable ways. Accordingly, Figs 6 and 7 show a second embodiment of the fixing bracket according to the invention in which these features are varied.

[0052] Thus, Fig. 6 shows a fixing bracket mounted on a building structure (in this case a wood bar or column) to secure a lower panel 17, and Fig. 7 shows this fixing bracket securing both the lower 17 and an upper panel 16, the view of Fig. 7 thus corresponding to that of Fig. 5. Note that this fixing bracket is in many ways, including function, similar to that of the first embodiment, and that in the following primarily differences from the first embodiment will be described. Thus, elements not described in the following are substantially similar to those of the previous embodiment. The panels used in this embodiment are of the type as illustrated in Fig. 4, although the transition to the upper key 20 is curved in an initial portion instead of being straight.

[0053] In the fixing bracket of Figs 6 and 7 the central portion 1 comprises only a single part 2 that connects the front portion 4 and rear portion 5. Similarly, the front portion 4 comprises only a single upper front finger 6 and lower front finger 8, respectively. The rear portion 5 comprises an upper rear finger 10. Each of the fingers 6, 8, 10 as well as the central part 2 are formed as flat, plane members or flanges. This embodiment of the fixing bracket may thus be manufactured for example by means of a metal or plastic casting process or by welding respective metal or plastic, one-piece front and rear portions 4, 5 to a one-piece central part 2. Each of these elements or even the whole fixing bracket may be manufactured for example as extruded aluminium. Note that the lower front finger 8 is again longer than the upper front finger

6. Further, with the present embodiment the lower resilient tongue 11 curves from a straight portion that abuts the wall into an inclined portion that is bent frontwards, cf. Fig. 7.

[0054] The rear finger 10 comprises two holes 15 (not visible) for insertion of respective screws 25, of which the head is visible in Figs 6 and 7, or like attachment means to mount the bracket to the underlying building structure 18. As is visible in Fig. 7 the screws 25 may be used as abutment for the upper panel 16 and may for this purpose be fitted with a suitable resilient cap or the like such as to provide a function similar to that of the upper resilient tongue as described above with reference to the first embodiment.

[0055] Fig. 8 illustrates an example of use of two similar fixing brackets according to the third aspect of the invention. Again, this embodiment of a fixing bracket is in many ways, including function and use, similar to that of the above two embodiments of the first aspect of the invention, and that in the following primarily differences from the first and second embodiments will be described. Elements not described in the following are substantially similar to the corresponding ones of the previous embodiments.

[0056] The fixing bracket used in the embodiment of Fig. 8 is similar to that of the above first embodiment of the first aspect of the invention, except for the noteworthy fact that the lower front fingers 8, 9 (of which only finger 9 is visible in Fig. 8) are not longer than the upper front fingers 6, 7 (of which only finger 7 is visible in Fig. 8), instead it is somewhat shorter. However, it is understood that the lower front fingers 8, 9 may instead be longer than as well as be of the same length of the upper front fingers 6, 7.

[0057] To achieve the same function with respect to dismounting the panels 16, 17 as with the previous embodiments the upper front fingers 6, 7 of the fixing bracket are each so much longer than the rear projection 23 of the lower portion 21 of the applied flat elements 16, 17 that a bottom surface of the groove 24 of the bottom portion 21 rests on upper surfaces of the respective upper front fingers 6, 7. Hereby, when two similar such fixing brackets are mounted at a suitable mutual distance the upper portion 19 of a secured flat element 16, 17 is displaceable upwards with a distance to allow for the flat element 16, 17 to be released from the fixing brackets by shifting the flat element 16, 17 upwards, until the rear projection 23 of the bottom portion 21 has moved beyond the upper front fingers 6, 7 of the lower fixing bracket. A suitable distance between the two fixing brackets involves in this case that enough play is provided between the upper portion 19 of the lower flat element 16 and the central parts 2, 3 (of which only central part 3 is visible in Fig. 8), i.e. the distance between the upper portion 19 of the lower flat element 16 and the central parts 2, 3 is larger than the length of the rear projection 23 of the upper flat element 17. The flat element 16, 17 can then similar to the previous embodiments be released from

the brackets with an upwards movement of translation. And again, simultaneously pushing the flat element 16, 17 backwards or rearwards accommodates the upwards movement of the flat element and thereby accommodates release of the flat element 16, 17.

[0058] Note that similar to the above considerations with reference to Fig. 5, also in the embodiments of Figs 6 to 8 it holds true that for one and the same panel 16, 17 the relationship between distances D1 to D3 is so that D1 > D3, and D2 > D3, this making it possible to release the panel 16, 17.

[0059] The fixing bracket, the system and the use as explained above by means of examples can be varied further within the scope of the appended claims. For example, the fixing bracket may, as part of its rear portion, further comprise a lower rear finger that extends downwards from the upper rear finger. The lower tongue may be cut out from the lower rear finger similar to the upper tongue. Also, screw holes may be provided for instance in part of the lower tongue (e.g. in the linear portion of the lower tongue of the embodiment of Figs 6 and 7) or in a lower rear finger. Furthermore, other attachment devices may form part of the fixing bracket, e.g. in the form of pins cut out from a metal rear portion of the bracket and bend backwards.

[0060] Note that the term "finger" as used in this specification is to be understood in its widest possible sense and is thus generally not meant to indicate any specific shape or form other than that each "finger" extends in a direction. The "fingers" may thus take any other suitable form than flanges or flat elements as long as they fulfil their inherent purpose, such as rod-shaped, whether circular-cylindrical or with another cross-sectional shape, such as rectangular, quadratic, or triangular.

Claims

1. A fixing bracket for mounting flat elements (16, 17), more specifically profiled planks or long panels, in coplanarity in continuation of each other to form a building façade, comprising
 - a central portion (1) connecting a front portion (4) and a rear portion (5),
 - the front portion (4) comprising an upper front finger (6; 7) extending upwards such as to be adapted for insertion into a groove (24) of an upper (16) of said flat elements and a lower front finger (8; 9) extending downwards such as to be adapted for supporting a front surface of a lower (17) of said flat elements,
 - the rear portion (5) comprising a resilient tongue (11) extending downwards and being adapted to exert a frontwards directed force on a rear surface of said lower flat element (17), wherein
 - from the central portion the lower front finger (8; 9) extends farther downwards than the upper front finger extends upwards,
 - characterized in that** the rear portion comprises

- backwards bent, sharp upper corners (15a).
2. A fixing bracket according to claim 1, wherein the lower front finger (8; 9) is at least 1.2, preferably at least 1½, more preferred at least 2, even more preferred at least 2½, and most preferred at least 3 times longer than the upper front finger (6; 7), and/or wherein the lower front finger (8; 9) is no more than 10, preferably no more than 7, most preferred no more than 5 times longer than the upper front finger (6; 7).
 3. A fixing bracket according to any one of the previous claims, wherein the rear portion (5) of the fixing bracket further comprises an upper rear finger (10) extending upwards, the upper rear finger comprising a resilient tongue (12) adapted such that when a rear projection (23) of two longitudinally extending projections of the upper flat element forming the groove (24) is inserted between the upper front (6; 7) and rear (10) fingers, the tongue (12) exerts a frontwards directed force on the rear surface of the bottom portion of the upper flat element (16) securing the rear projection against the upper front finger (6; 7) to thereby secure the bottom portion of the upper flat element (16).
 4. A fixing bracket according to any one of the previous claims, wherein the resilient tongue(s) (11, 12) is (are) formed as a flat, plate-shaped, preferably substantially plane member, which is inclined in a frontwards direction.
 5. A fixing bracket according to claims 3 and 4, wherein each resilient tongue (11, 12) extends from and is attached at one end to the upper rear finger (10).
 6. A fixing bracket according to any one of the previous claims, wherein the fingers, and preferably the central portion (1) as well as an upper rear finger (10), are each formed as a flat, substantially plane member, the upper and lower front fingers (6; 7; 8; 9) being substantially coplanar, the front fingers (6; 7; 8; 9) extending upwards and downwards, respectively, from a front end of and preferably at substantially right angles to the central portion (1), the upper rear finger (10) further preferably extending upwards from a rear end of and preferably at substantially right angles to the central portion (1).
 7. A fixing bracket according to any one of the previous claims, further comprising a lower rear finger adapted to be positioned at a distance from the lower flat element (17) when mounted, and the (lower) resilient tongue (11) is inclined frontwards at an angle such as to allow the lower flat element (17) to be released by pivoting the bottom portion of this frontwards.
 8. A system comprising a fixing bracket and at least one flat element (16; 17), the fixing bracket being for mounting a number of said flat elements (16, 17) in coplanarity in continuation of each other to form a building façade, and comprising a central portion (1) connecting a front portion (4) and a rear portion (5), the front portion (4) comprising an upper front finger (6; 7) extending upwards such as to be adapted for insertion into a groove (24) of an upper (16) of said flat elements and a lower front finger (8; 9) extending downwards such as to be adapted for supporting a front surface of a lower (17) of said flat elements, the rear portion (5) comprising a resilient tongue (11) extending downwards and being adapted to exert a frontwards directed force on a rear surface of said lower flat element (17), the lower front finger (8; 9) from the central portion extending farther downwards than the upper front finger extends upwards, and the rear portion comprises backward bent sharp upper corners (15a). the at least one flat element (16; 17) being of the type having a profile with a front surface and a rear surface, a top portion of which comprises a longitudinally extending key (20) and a bottom portion of which comprises two longitudinally extending projections (22; 23) forming a longitudinally extending groove (24) between them, the upper front finger (6; 7) being adapted for insertion into the groove (24) of the flat element (16; 17) to secure the bottom portion of the element (16; 17), the lower front finger (8; 9) of the fixing bracket being adapted for supporting the longitudinally extending key (20) of a front surface of the flat element (16; 17), the resilient tongue (11) being adapted such that when the longitudinally extending key (20) of the lower flat element (16; 17) is fitted between the lower front and rear fingers (8; 9), the tongue (11) exerts a frontwards directed force on a rear surface of the key (20) of the lower flat element (17) securing the key (20) against the lower front finger (8; 9) to thereby secure the top portion of the lower flat element (17), wherein the fixing bracket is mounted to form a lower fixing bracket, a similar, upper fixing bracket being mounted at a distance upwards from the lower fixing bracket, the top portion of one of said at least one flat elements being secured to the upper fixing bracket, the bottom portion being secured to the lower fixing bracket, the upper and lower fixing brackets being mounted at such distance from each other that the secured flat element can be released by shifting the flat element (16; 17) upwards while optionally simultaneously pushing the flat element backwards, until a rear projection (23) of the bottom portion of the flat element has moved beyond the upper front finger (6; 7) of the lower fixing bracket.
 9. A system according to claim 8, wherein each flat element (16; 17) at a top side is profiled such that the

front surface of the flat element tapers towards the rear surface to form the longitudinally extending key (20) of the top portion of the flat element, whereby two front surfaces of an upper and lower of said flat elements secured in continuation of each other to the fixing bracket will be substantially flush with each other.

10. A system according to claim 8 or 9, wherein the two longitudinally extending projections (22; 23) of the lower portion of the flat element (16; 17) are in the form of a front projection (22) and a rear projection (23), the front projection (22) extending farther downwards than the rear projection (23) such that in a mounted position the upper front finger (6; 7) is covered or hidden by the front projection (22).

11. A system according to claim 10, wherein an upper (10) and/or a lower rear finger of each of the upper and lower fixing brackets comprise(s) at least one hole (15) through which a fastening means such as a screw has been inserted into a building structure such as to fasten the fixing brackets to the building structure, the respective rear finger(s) (10) preferably abutting the building structure.

12. Use of two similar fixing brackets, each according to any one of the previous claims, for mounting a flat element (16; 17), more specifically a profiled plank or long panel, to a building structure to form a building façade, each fixing bracket comprising a central portion (1) connecting a front portion (4) and a rear portion (5), the front portion (5) comprising an upper front finger (6; 7) extending upwards and a lower front finger (8; 9) extending downwards, the rear portion (5) comprising a resilient tongue (11) extending downwards, a lower of said two fixing brackets being mounted to form a lower fixing bracket, an upper of said two fixing brackets being mounted at a distance upwards from the lower fixing bracket, the flat element (16; 17) having a profile with a front surface and a rear surface, a top portion of which comprises a longitudinally extending key (20) and a bottom portion of which comprises two longitudinally extending projections (22; 23) forming a longitudinally extending groove (24) between them, the top portion being secured to the upper fixing bracket by means of the lower front finger (8; 9) of the upper fixing bracket supporting a front surface of the key (20), and the resilient tongue (11) exerting a frontwards directed force on a rear surface of the key (20) securing the key (20) against the lower front finger (8; 9), the bottom portion being secured to the lower fixing bracket by means of the upper front finger (6; 7) of the lower fixing bracket extending into the groove (24) of the flat element (16; 17), the upper front finger

(6; 7) of each fixing bracket is longer than a rear projection (23) of the two longitudinally extending projections of the flat element so that the bottom portion rests on the upper front finger (6; 7),

the upper and lower fixing brackets being mounted at a distance from each other corresponding to a height of the flat element with the key (20) of the flat element positioned at a distance from the central part (1) of the upper bracket such as to be displaceable upwards towards the central part (1) of the upper bracket with a distance adequate to allow for the secured flat element to be released from the fixing brackets by shifting the flat element upwards while optionally simultaneously pushing the flat element backwards, until the rear projection of the bottom portion has moved beyond the upper front finger of the lower fixing bracket.

13. Use according to claim 12, wherein the bottom portion of the flat element rests on the lower fixing bracket, a distance from an upper, distal end of the longitudinally extending key (20) of the flat element (16; 17) to the central part (1) of the upper fixing bracket is larger than a distance from an upper, distal end of the upper front finger (6; 7) of the lower fixing bracket to a lower distal end of the rear projection (23) of the flat element, and a distance from a lower, proximal end of the longitudinally extending key (20) of the flat element to a lower, distal end of the lower front finger (8; 9) of the upper fixing bracket is larger than the distance from the upper, distal end of the upper front finger (6; 7) of the lower fixing bracket to the lower distal end of the rear projection (23) of the flat element.

14. Use according to claim 12 or 13, wherein the rear portions (5) of the respective fixing brackets further comprise respective upper rear fingers (10) extending upwards, the upper rear fingers (10) each comprising a resilient tongue (14), the resilient tongue (14) of the lower fixing bracket exerting a frontwards directed force on the rear surface of the bottom portion of the flat element (16; 17) securing the rear projection (23) against the upper front finger (6; 7) to thereby secure the bottom portion of the flat element, and/or wherein each flat element at a top side is profiled such that the front surface of the flat element tapers towards the rear surface to form the longitudinally extending key (20) of the top portion of the flat element, whereby two front surfaces of an upper and lower of said flat elements secured in continuation of each other to the fixing bracket will be substantially flush with each other, and/or wherein the two longitudinally extending projections (22; 23) of the lower portion of the flat element are in the form of a front projection (22) and a rear pro-

jection (23), the front projection (22) extending farther downwards than the rear projection (23) such that in a mounted position the upper front finger (6; 7) is covered or hidden by the front projection (22).

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Patentansprüche

1. Befestigungswinkel zur Befestigung flacher Elemente (16, 17), insbesondere von Planken mit Profil oder langen Platten, koplanar aufeinander folgend zum Bilden einer Gebäudefassade, umfassend:

einen zentralen Abschnitt (1), der einen vorderen Abschnitt (4) und einen hinteren Abschnitt (5) verbindet,

wobei der vordere Abschnitt (4) einen oberen vorderen Finger (6; 7) umfasst, der sich nach oben erstreckt, um in eine Nut (24) eines oberen (16) der flachen Elemente eingeführt zu werden, und einen unteren vorderen Finger (8; 9), der sich nach unten erstreckt, um eine vordere Oberfläche eines unteren (17) der flachen Elemente zu halten,

wobei der hintere Abschnitt (5) einen elastischen Zapfen (11) umfasst, der sich nach unten erstreckt und zum Ausüben einer nach vorne gerichteten Kraft auf eine hintere Oberfläche des unteren flachen Elements (17) ausgelegt ist, wobei

sich der untere vordere Finger (8; 9) von dem zentralen Abschnitt weiter nach unten erstreckt, als sich der obere vordere Finger nach oben erstreckt, **dadurch gekennzeichnet, dass** der hintere Abschnitt nach hinten gebogene, scharfe obere Ecken (15a) umfasst.

2. Befestigungswinkel nach Anspruch 1, wobei der untere vordere Finger (8; 9) mindestens 1,2, vorzugsweise 1,5, mehr bevorzugt mindestens 2, und noch mehr bevorzugt mindestens 2,5 und am meisten bevorzugt mindestens 3 Mal länger als der obere vordere Finger (6; 7) ist, und/oder wobei der untere vordere Finger (8; 9) nicht mehr als 10, vorzugsweise nicht mehr als 7, am meisten bevorzugt nicht mehr als 5 Mal länger als der obere vordere Finger (6; 7) ist.

3. Befestigungswinkel nach einem der vorhergehenden Ansprüche, wobei der hintere Abschnitt (5) des Befestigungswinkels ferner einen oberen hinteren Finger (10) aufweist, der sich nach oben erstreckt, wobei der obere hintere Finger einen elastischen Zapfen (12) umfasst, der derart ausgebildet ist, dass, wenn ein hinterer Vorsprung (23) von zwei längs verlaufenden Vorsprüngen des oberen flachen Elements, das die Nut (24) bildet, zwischen dem oberen vorderen (6; 7) und den hinteren (10) Finger einge-

führt wird, und der Zapfen (12) eine nach vorne gerichtete Kraft auf die hintere Oberfläche des unteren Abschnitts des oberen flachen Elements (16) ausübt und den hinteren Vorsprung an dem oberen vorderen Finger (6; 7) sichert, um dadurch den unteren Abschnitt des oberen flachen Elements (16) zu sichern.

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4. Befestigungswinkel nach einem der vorherigen Ansprüche, wobei der/die elastische(n) Zapfen (11; 12) als flache(s), plattenförmige(s), vorzugsweise im Wesentlichen ebene(s) Element(e) ausgebildet ist/sind, das/die sich nach vorne neigt/neigen.

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5. Befestigungswinkel nach einem der Ansprüche 3 und 4, wobei sich jeder elastische Zapfen (11, 12) von einem Ende des oberen hinteren Fingers (10) erstreckt und daran befestigt ist.

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6. Befestigungswinkel nach einem der vorherigen Ansprüche, wobei die Finger und vorzugsweise der zentrale Abschnitt (1) und ein oberer hinterer Finger (10) jeweils als flaches, im Wesentlichen ebenes Element ausgebildet ist, wobei die oberen und unteren vorderen Finger (6; 7; 8; 9) im Wesentlichen koplanar sind, wobei sich die vorderen Finger (6; 7; 8; 9), nach oben und unten jeweils von einem vorderen Ende des zentralen Abschnitts (1) und vorzugsweise im Wesentlichen rechtwinklig zu dem zentralen Abschnitt (1) erstrecken, wobei sich der obere hintere Finger (10) weiterhin vorzugsweise nach oben von einem hinteren Ende des zentralen Abschnitts (1) und vorzugsweise im Wesentlichen rechtwinklig dazu erstreckt.

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7. Befestigungswinkel nach einem der vorherigen Ansprüche, ferner umfassend einen unteren hinteren Finger, der zum Anordnen in einem Abstand von dem unteren flachen Element (17) bei Montage davon ausgelegt ist, wobei der (untere) elastische Zapfen (11) derart nach vorne in einem Winkel geneigt ist, dass das untere flache Element (17) durch Drehen des unteren Abschnitts davon nach vorne freigegeben werden kann.

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8. System, umfassend einen Befestigungswinkel und mindestens ein flaches Element (16; 17), wobei der Befestigungswinkel zur Befestigung einer Anzahl von flachen Elementen (16; 17) koplanar aufeinander folgend eine Gebäudefassade bilden und einen zentralen Abschnitt (1) umfassen, der einen vorderen Abschnitt (4) und einen hinteren Abschnitt (5) verbindet, wobei der vordere Abschnitt (4) einen oberen vorderen Finger (6; 7) umfasst, der sich nach oben erstreckt, um in eine Nut (24) eines oberen (16) der flachen Elemente eingeführt zu werden, und sich ein unterer vorderer Finger (8; 9) derart nach unten erstreckt, um eine vordere Oberfläche eines unteren

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- (17) der flachen Elemente zu stützen, wobei der hintere Abschnitt (5) einen elastischen Zapfen (11) aufweist, die sich nach unten erstreckt, um eine nach vorne gerichtete Kraft an einer hinteren Oberfläche des unteren flachen Elements (17) auszuüben, wobei sich der untere vordere Finger (8; 9) von dem zentralen Abschnitt weiter nach unten erstreckt als sich der obere vordere Finger nach oben erstreckt, und der hintere Abschnitt nach hinten gebogene, scharfe obere Ecken (15a) umfasst, wobei das mindestens eine flache Element (16; 17) des Typs ist, das ein Profil mit einer vorderen Oberfläche und einer hinteren Oberfläche aufweist, wobei ein oberer Abschnitt davon einen längs verlaufenden Keil (20) und einen unteren Abschnitt umfasst, der zwei sich längs erstreckende Vorsprünge (22; 23) umfasst, die eine längs verlaufende Nut (24) dazwischen bilden, der obere vordere Finger (6; 7) zur Einführung in die Nut (24) des flachen Elements (16; 17) ausgelegt ist, um den unteren Abschnitt des Elements (16; 17) zu sichern, wobei der untere vordere Finger (8; 9) des Befestigungswinkels zum Stützen des längs verlaufenden Keils (20) einer vorderen Oberfläche des flachen Elements (16; 17) ausgelegt ist, der elastische Zapfen (11) ausgebildet ist, damit, wenn der längs verlaufende Keil (20) des unteren flachen Elements (16; 17) zwischen dem unteren vorderen und hinteren Finger (8; 9) eingepasst ist, der Zapfen (11) eine nach vorne gerichtete Kraft auf eine hintere Oberfläche des Keils (20) des unteren flachen Elements (17) ausübt und den Keil (20) an dem unteren vorderen Finger (8; 9) sichert, um so den oberen Abschnitt des unteren flachen Elements (17) zu sichern, wobei der Befestigungswinkel zum Bilden eines unteren Befestigungswinkels befestigt wird, wobei ein ähnlicher, oberer Befestigungswinkel in einem Abstand oberhalb des unteren Befestigungswinkels befestigt ist, wobei der obere Abschnitt eines des mindestens einen flachen Elements an dem oberen Befestigungswinkel gesichert ist, wobei der untere Abschnitt an dem unteren Befestigungswinkel befestigt ist, wobei der obere und der untere Befestigungswinkel in einem Abstand voneinander befestigt sind, sodass das gesicherte flache Element durch Schieben des flachen Elements (16; 17) nach oben freigegeben werden kann, während wahlweise das flache Element nach hinten gedrückt wird, bis ein hinterer Vorsprung (23) des unteren Abschnitts des flachen Elements sich über den oberen vorderen Finger (6; 7) des unteren Befestigungswinkels hinaus bewegt.
9. System nach Anspruch 8, wobei jedes flache Element (16; 17) an einer oberen Seite ein Profil aufweist, sodass sich die vordere Oberfläche des flachen Elements zu der hinteren Oberfläche hin verjüngt, um den längs verlaufenden Keil (20) des oberen Abschnitts des flachen Elements zu bilden, wobei bei zwei vordere Oberflächen eines oberen und unteren der flachen Elemente, die nacheinander an dem Befestigungswinkel gesichert sind, im Wesentlichen bündig miteinander abschließen.
10. System nach Anspruch 8 oder 9, wobei die zwei längs verlaufenden Vorsprünge (22; 23) des unteren Abschnitts des flachen Elements (16; 17) in Form eines vorderen Vorsprungs (22) und eines hinteren Vorsprungs (23) vorliegen, wobei sich der vordere Vorsprung (22) weiter nach unten erstreckt als der hintere Vorsprung (23), sodass in einer montierten Position der obere vordere Finger (6; 7) von dem vorderen Vorsprung (22) bedeckt oder verborgen wird.
11. System nach Anspruch 10, **dadurch gekennzeichnet, dass** ein oberer (10) und/oder ein unterer hinterer Finger der jeweils oberen und unteren Befestigungswinkel mindestens ein Loch (15) umfassen, durch das ein Befestigungsmittel wie eine Schraube in eine Gebäudestruktur eingeführt wurde, um die Befestigungswinkel an der Gebäudestruktur zu befestigen, wobei die/der jeweilige(n) hintere(n) Finger (10) an die Gebäudestruktur angrenzt bzw. angrenzen.
12. Verwendung von zwei ähnlichen Befestigungswinkeln jeweils nach einem der vorhergehenden Ansprüche zur Montage eines flachen Elements (16; 17), insbesondere einer Profilplanke oder langen Platte an einer Gebäudestruktur zum Bilden einer Gebäudefassade, wobei jeder Befestigungswinkel einen zentralen Abschnitt (1) umfasst, der einen vorderen Abschnitt (4) und einen hinteren Abschnitt (5) verbindet, wobei der vordere Abschnitt (5) einen oberen vorderen Finger (6; 7), der sich nach oben erstreckt, und einen unteren vorderen Finger (8; 9) umfasst, der sich nach unten erstreckt, wobei der hintere Abschnitt (5) einen elastischen Zapfen (11) umfasst, der sich nach unten erstreckt, wobei ein unterer der zwei Befestigungswinkel zum Bilden eines unteren Befestigungswinkels angebracht ist und wobei ein oberer der zwei Befestigungswinkel in einem Abstand nach oben von dem unteren Befestigungswinkel angebracht ist, wobei das flache Element (16; 17) ein Profil mit einer vorderen Oberfläche und einer hinteren Oberfläche aufweist, wobei ein oberer Abschnitt einen längs verlaufenden Keil (20) und einen unteren Abschnitt umfasst, der wiederum zwei längs verlaufende Vorsprünge (22; 23) umfasst, die eine längs verlaufende Nut (24) dazwischen bilden, wobei der obere Abschnitt am oberen Befestigungswinkel mittels des unteren vorderen Fingers (8; 9) des oberen Befestigungswinkels, der eine vordere Oberfläche des Keils (20) stützt, gesichert ist, und

der elastische Zapfen (11) eine nach vorne gerichtete Kraft auf eine hintere Oberfläche des Keils (20) ausübt, die den Keil (20) an dem unteren vorderen Finger (8; 9) sichert,

wobei der untere Abschnitt am unteren Befestigungswinkel über den oberen vorderen Finger (6; 7) des unteren Befestigungswinkels, der sich in die Nut (24) des flachen Elements (16; 17) erstreckt, gesichert ist, wobei der obere vordere Finger (6; 7) jedes Befestigungswinkels länger als ein hinterer Vorsprung (23) der zwei längs verlaufenden Vorsprünge des flachen Elements ist, sodass der untere Abschnitt auf dem oberen vorderen Finger (6; 7) aufliegt,

wobei der obere und untere Befestigungswinkel in einem Abstand voneinander angeordnet sind, der einer Höhe des flachen Elements mit dem Keil (20) des flachen Elements entspricht, das in einem Abstand von dem zentralen Teil (1) des oberen Winkels angeordnet ist, um nach oben zu dem zentralen Teil (1) des oberen Winkels mit einem Abstand verschiebbar zu sein, der es dem gesicherten flachen Element ermöglicht, durch Verlagern des flachen Elements nach oben bei wahlweise gleichzeitigem Drücken des flachen Elements nach hinten freigegeben zu werden, bis sich der hintere Vorsprung des unteren Abschnitts über den oberen vorderen Finger des unteren Befestigungswinkels hinaus bewegt hat.

13. Verbindung nach Anspruch 12, wobei der untere Abschnitt des flachen Elements auf dem unteren Befestigungswinkel aufliegt, ein Abstand von einem oberen entfernten Ende des längs verlaufenden Keils (20) des flachen Elements (16; 17) zum zentralen Teil (1) des oberen Befestigungswinkels größer als ein Abstand von einem oberen entfernten Ende des oberen vorderen Fingers (6; 7) des unteren Befestigungswinkels an einem unteren entfernten Ende des hinteren Vorsprungs (23) des flachen Elements ist, und ein Abstand von einem unteren, nahen Ende des längs verlaufenden Keils (20) des flachen Elements zu einem unteren entfernten Ende des unteren vorderen Fingers (8; 9) des oberen Befestigungswinkels größer als der Abstand des oberen distalen Endes des oberen vorderen Fingers (6; 7) des unteren Befestigungswinkels zum unteren entfernten Ende des hinteren Vorsprungs (23) des flachen Elements ist.

14. Verwendung nach Anspruch 12 oder 13, wobei die hinteren Abschnitte (5) der jeweiligen Befestigungswinkel jeweils obere hintere Finger (10) umfassen, die sich nach oben erstrecken, wobei die oberen hinteren Finger (10) jeweils einen elastischen Zapfen (14) umfassen, wobei der elastische Zapfen (14) des unteren Befestigungswinkels eine

nach vorne gerichtete Kraft auf die hintere Oberfläche des unteren Abschnitts des flachen Elements (16; 17) ausübt, um den hinteren Vorsprung (23) an dem oberen vorderen Finger (6; 7) zu sichern, um dadurch den unteren Abschnitt des flachen Elements zu sichern und/oder

wobei jedes flache Element an einer oberen Seite ein Profil aufweist, sodass sich die vordere Oberfläche des flachen Elements zu der hinteren Oberfläche verjüngt, um den längs verlaufenden Keil (20) des oberen Abschnitts des flachen Elements zu bilden, wodurch zwei vordere Oberflächen des oberen und unteren flachen Elements, die aufeinander folgend an dem Befestigungswinkel gesichert sind, im Wesentlichen bündig miteinander abschließen, und/oder

wobei die zwei längs verlaufenden Vorsprünge (22; 23) des unteren Abschnitts des flachen Elements in Form eines vorderen Vorsprungs (22) und eines hinteren Vorsprungs (23) vorliegen, wobei sich der vordere Vorsprung (22) weiter nach unten erstreckt als der hintere Vorsprung (23), sodass in einer montierten Position der obere vordere Finger (6; 7) von dem vorderen Vorsprung (22) bedeckt oder verborgen wird.

Revendications

1. Support de fixation pour monter des éléments plats (16, 17), plus précisément des planches profilées ou des panneaux longs, de manière coplanaire dans le prolongement les uns des autres pour former une façade de bâtiment, comprenant une portion centrale (1) reliant une portion avant (4) et une portion arrière (5), la portion avant (4) comprenant un doigt avant supérieur (6 ; 7) s'étendant vers le haut de manière à être adapté pour l'insertion dans une rainure (24) d'un élément plat supérieur (16) desdits éléments plats et un doigt avant inférieur (8 ; 9) s'étendant vers le bas de manière à être adapté pour supporter une surface avant d'un élément plat inférieur (17) desdits éléments plats, la portion arrière (5) comprenant une languette élastique (11) s'étendant vers le bas et étant adaptée pour exercer une force dirigée vers l'avant sur une surface arrière dudit élément plat inférieur (17), le doigt avant inférieur (8 ; 9) s'étendant, à partir de la portion centrale, davantage vers le bas que le doigt avant supérieur s'étend vers le haut, **caractérisé en ce que** la portion arrière comprend des coins supérieurs pointus (15a) courbés vers l'arrière.
2. Support de fixation selon la revendication 1, dans lequel le doigt avant inférieur (8 ; 9) est au moins 1,2 fois, de préférence au moins 1½ fois, plus préféra-

- blement au moins 2 fois, de préférence encore au moins 2½ fois, et idéalement au moins 3 fois plus long que le doigt avant supérieur (6 ; 7), et/ou dans lequel le doigt avant inférieur (8 ; 9) n'est pas plus de 10 fois, de préférence pas plus de 7 fois, idéalement pas plus de 5 fois plus long que le doigt avant supérieur (6 ; 7).
3. Support de fixation selon l'une quelconque des revendications précédentes, dans lequel la portion arrière (5) du support de fixation comprend en outre un doigt arrière supérieur (10) s'étendant vers le haut, le doigt arrière supérieur comprenant une languette élastique (12) adaptée de telle sorte que lorsqu'une saillie arrière (23) de deux saillies s'étendant longitudinalement de l'élément plat supérieur formant la rainure (24) est insérée entre les doigts supérieurs avant (6 ; 7) et arrière (10), la languette (12) exerce une force dirigée vers l'avant sur la surface arrière de la portion inférieure de l'élément plat supérieur (16) fixant la saillie arrière contre le doigt avant supérieur (6 ; 7) pour ainsi fixer la portion inférieure de l'élément plat supérieur (16).
 4. Support de fixation selon l'une quelconque des revendications précédentes, dans lequel la/les languette(s) élastique(s) (11, 12) est/sont formée(s) en tant qu'organe plat, en forme de plaque, de préférence sensiblement plan, qui est incliné dans une direction vers l'avant.
 5. Support de fixation selon les revendications 3 et 4, dans lequel chaque languette élastique (11, 12) s'étend à partir du doigt arrière supérieur (10) et est fixée à une extrémité à celui-ci.
 6. Support de fixation selon l'une quelconque des revendications précédentes, dans lequel les doigts, et de préférence la portion centrale (1) ainsi qu'un doigt arrière supérieur (10), sont chacun formés en tant qu'organe plat, sensiblement plan, les doigts avant supérieurs et inférieurs (6 ; 7 ; 8 ; 9) étant sensiblement coplanaires, les doigts avant (6 ; 7 ; 8 ; 9) s'étendant vers le haut et vers le bas, respectivement, à partir d'une extrémité avant de la portion centrale (1) et de préférence sensiblement à angle droit par rapport à celle-ci, le doigt arrière supérieur (10) s'étendant de préférence en outre vers le haut à partir d'une extrémité arrière de la portion centrale (1) et de préférence sensiblement à angle droit par rapport à celle-ci.
 7. Support de fixation selon l'une quelconque des revendications précédentes, comprenant en outre un doigt arrière inférieur adapté pour être positionné à une distance de l'élément plat inférieur (17) lorsqu'il est monté, et la languette élastique (inférieure) (11) est inclinée vers l'avant suivant un angle de manière à permettre à l'élément plat inférieur (17) d'être libéré en pivotant la portion inférieure de celui-ci vers l'avant.
 8. Système comprenant un support de fixation et au moins un élément plat (16 ; 17), le support de fixation étant destiné au montage d'un certain nombre desdits éléments plats (16, 17) de manière coplanaire dans le prolongement les uns des autres pour former une façade de bâtiment, et comprenant une portion centrale (1) reliant une portion avant (4) et une portion arrière (5), la portion avant (4) comprenant un doigt avant supérieur (6 ; 7) s'étendant vers le haut de manière à être adapté pour l'insertion dans une rainure (24) d'un élément plat supérieur (16) desdits éléments plats et un doigt avant inférieur (8 ; 9) s'étendant vers le bas de manière à être adapté pour supporter une surface avant d'un élément plat inférieur (17) desdits éléments plats, la portion arrière (5) comprenant une languette élastique (11) s'étendant vers le bas et étant adaptée pour exercer une force dirigée vers l'avant sur une surface arrière dudit élément plat inférieur (17), le doigt avant inférieur (8 ; 9) s'étendant, à partir de la portion centrale, davantage vers le bas que le doigt avant supérieur s'étend vers le haut, et la portion arrière comprenant des coins supérieurs pointus (15a) courbés vers l'arrière, l'au moins un élément plat (16 ; 17) étant du type ayant un profil présentant une surface avant et une surface arrière, dont une portion supérieure comprend une clavette (20) s'étendant longitudinalement et dont une portion inférieure comprend deux saillies (22 ; 23) s'étendant longitudinalement formant entre elles une rainure (24) s'étendant longitudinalement, le doigt avant supérieur (6 ; 7) étant adapté pour l'insertion dans la rainure (24) de l'élément plat (16 ; 17) pour fixer la portion inférieure de l'élément (16 ; 17), le doigt avant inférieur (8 ; 9) du support de fixation étant adapté pour supporter la clavette (20) s'étendant longitudinalement d'une surface avant de l'élément plat (16 ; 17), la languette élastique (11) étant adaptée de telle sorte que lorsque la clavette (20) s'étendant longitudinalement de l'élément plat inférieur (16 ; 17) est insérée entre les doigts inférieurs avant et arrière (8 ; 9), la languette (11) exerce une force dirigée vers l'avant sur une surface arrière de la clavette (20) de l'élément plat inférieur (17) fixant la clavette (20) contre le doigt avant inférieur (8 ; 9) pour ainsi fixer la portion supérieure de l'élément plat inférieur (17), dans lequel le support de fixation est monté pour former un support de fixation inférieur, un support de fixation supérieur similaire étant monté à une distance vers le haut à partir du support de fixation inférieur, la portion supérieure de l'un parmi le ou les éléments plats étant fixée au support de fixation supérieur, la portion inférieure étant fixée au support

de fixation inférieur, les supports de fixation supérieur et inférieur étant montés à une distance telle l'un de l'autre que l'élément plat fixé puisse être libéré en décalant l'élément plat (16 ; 17) vers le haut tout en poussant éventuellement simultanément l'élément plat vers l'arrière, jusqu'à ce qu'une saillie arrière (23) de la portion inférieure de l'élément plat se soit déplacée au-delà du doigt avant supérieur (6 ; 7) du support de fixation inférieur.

9. Système selon la revendication 8, dans lequel chaque élément plat (16 ; 17) est profilé au niveau d'un côté supérieur de telle sorte que la surface avant de l'élément plat s'amincisse en direction de la surface arrière pour former la clavette (20) s'étendant longitudinalement de la portion supérieure de l'élément plat, moyennant quoi deux surfaces avant d'un élément plat supérieur et d'un élément plat inférieur desdits éléments plats fixés dans le prolongement l'un de l'autre au support de fixation seront sensiblement en affleurement l'une avec l'autre.

10. Système selon la revendication 8 ou 9, dans lequel les deux saillies (22 ; 23) s'étendant longitudinalement de la portion inférieure de l'élément plat (16 ; 17) se présentent sous la forme d'une saillie avant (22) et d'une saillie arrière (23), la saillie avant (22) s'étendant davantage vers le bas que la saillie arrière (23) de telle sorte que, dans une position montée, le doigt avant supérieur (6 ; 7) soit couvert ou caché par la saillie avant (22).

11. Système selon la revendication 10, dans lequel un doigt supérieur (10) et/ou un doigt inférieur arrière de chacun des supports de fixation supérieur et inférieur comprend/comprennent au moins un trou (15) à travers lequel un moyen de fixation tel qu'une vis a été inséré dans une structure de bâtiment de manière à fixer les supports de fixation à la structure de bâtiment, le(s) doigt(s) arrière (10) respectif(s) venant de préférence en butée contre la structure de bâtiment.

12. Utilisation de deux supports de fixation similaires, chacun selon l'une quelconque des revendications précédentes, pour monter un élément plat (16 ; 17), plus précisément une planche profilée ou un panneau long, sur une structure de bâtiment pour former une façade de bâtiment, chaque support de fixation comprenant une portion centrale (1) reliant une portion avant (4) et une portion arrière (5), la portion avant (5) comprenant un doigt avant supérieur (6 ; 7) s'étendant vers le haut et un doigt avant inférieur (8 ; 9) s'étendant vers le bas, la portion arrière (5) comprenant une languette élastique (11) s'étendant vers le bas, un support de fixation inférieur desdits deux supports de fixation étant monté pour former un support de

fixation inférieur, un support de fixation supérieur desdits deux supports de fixation étant monté à une distance vers le haut à partir du support de fixation inférieur,

l'élément plat (16 ; 17) ayant un profil présentant une surface avant et une surface arrière, dont une portion supérieure comprend une clavette (20) s'étendant longitudinalement et dont une portion inférieure comprend deux saillies (22 ; 23) s'étendant longitudinalement formant entre elles une rainure (24) s'étendant longitudinalement,

la portion supérieure étant fixée au support de fixation supérieur au moyen du doigt avant inférieur (8 ; 9) du support de fixation supérieur supportant une surface avant de la clavette (20), et la languette élastique (11) exerçant une force dirigée vers l'avant sur une surface arrière de la clavette (20) fixant la clavette (20) contre le doigt avant inférieur (8 ; 9),

la portion inférieure étant fixée au support de fixation inférieur au moyen du doigt avant supérieur (6 ; 7) du support de fixation inférieur s'étendant dans la rainure (24) de l'élément plat (16 ; 17), le doigt avant supérieur (6 ; 7) de chaque support de fixation étant plus long qu'une saillie arrière (23) des deux saillies s'étendant longitudinalement de l'élément plat, de telle sorte que la portion inférieure repose sur le doigt avant supérieur (6 ; 7),

les supports de fixation supérieur et inférieur étant montés à une distance l'un de l'autre correspondant à une hauteur de l'élément plat, la clavette (20) de l'élément plat étant positionnée à une distance de la partie centrale (1) du support supérieur de manière à pouvoir être déplacée vers le haut en direction de la partie centrale (1) du support supérieur avec une distance appropriée pour permettre à l'élément plat fixé d'être libéré des supports de fixation en décalant l'élément plat vers le haut tout en poussant éventuellement simultanément l'élément plat vers l'arrière, jusqu'à ce que la saillie arrière de la portion inférieure se soit déplacée au-delà du doigt avant supérieur du support de fixation inférieur.

13. Utilisation selon la revendication 12, dans laquelle la portion inférieure de l'élément plat repose sur le support de fixation inférieur,

une distance à partir d'une extrémité distale supérieure de la clavette (20) s'étendant longitudinalement de l'élément plat (16 ; 17) jusqu'à la partie centrale (1) du support de fixation supérieur est supérieure à une distance à partir d'une extrémité distale supérieure du doigt avant supérieur (6 ; 7) du support de fixation inférieur jusqu'à une extrémité distale inférieure de la saillie arrière (23) de l'élément plat, et une distance à partir d'une extrémité proximale inférieure de la clavette (20) s'étendant longitudinalement de l'élément plat jusqu'à une extrémité distale inférieure du doigt avant inférieur (8 ; 9) du support de fixation supérieur est supérieure à la distance à

partir de l'extrémité distale supérieure du doigt avant supérieur (6 ; 7) du support de fixation inférieur jusqu'à l'extrémité distale inférieure de la saillie arrière (23) de l'élément plat.

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14. Utilisation selon la revendication 12 ou 13, dans laquelle les portions arrière (5) des supports de fixation respectifs comprennent en outre des doigts arrière supérieurs (10) respectifs s'étendant vers le haut, les doigts arrière supérieurs (10) comprenant chacun une languette élastique (14), la languette élastique (14) du support de fixation inférieur exerçant une force dirigée vers l'avant sur la surface arrière de la portion inférieure de l'élément plat (16 ; 17) fixant la saillie arrière (23) contre le doigt avant supérieur (6 ; 7) pour ainsi fixer la portion inférieure de l'élément plat, et/ou dans laquelle chaque élément plat est profilé au niveau d'un côté supérieur de telle sorte que la surface avant de l'élément plat s'amincisse en direction de la surface arrière pour former la clavette (20) s'étendant longitudinalement de la portion supérieure de l'élément plat, moyennant quoi deux surfaces avant d'un élément plat supérieur et d'un élément plat inférieur desdits éléments plats fixés dans le prolongement l'un de l'autre au support de fixation seront sensiblement en affleurement l'une avec l'autre, et/ou dans laquelle les deux saillies (22 ; 23) s'étendant longitudinalement de la portion inférieure de l'élément plat se présentent sous la forme d'une saillie avant (22) et d'une saillie arrière (23), la saillie avant (22) s'étendant davantage vers le bas que la saillie arrière (23) de telle sorte que, dans une position montée, le doigt avant supérieur (6 ; 7) soit couvert ou caché par la saillie avant (22).

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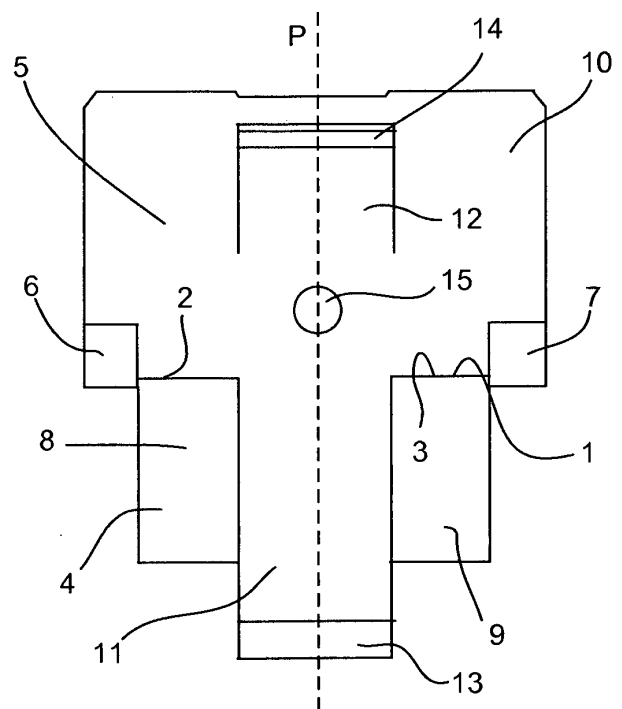
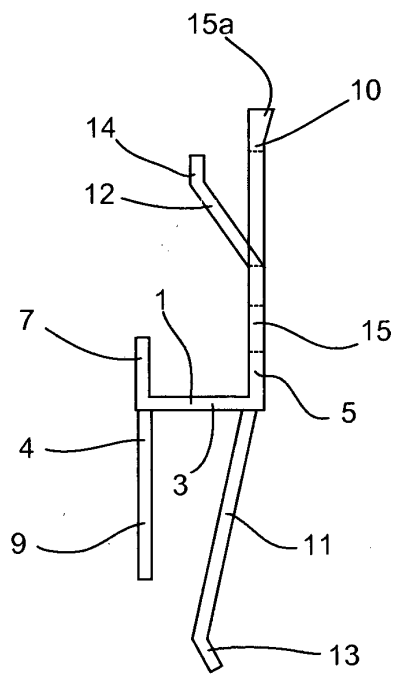
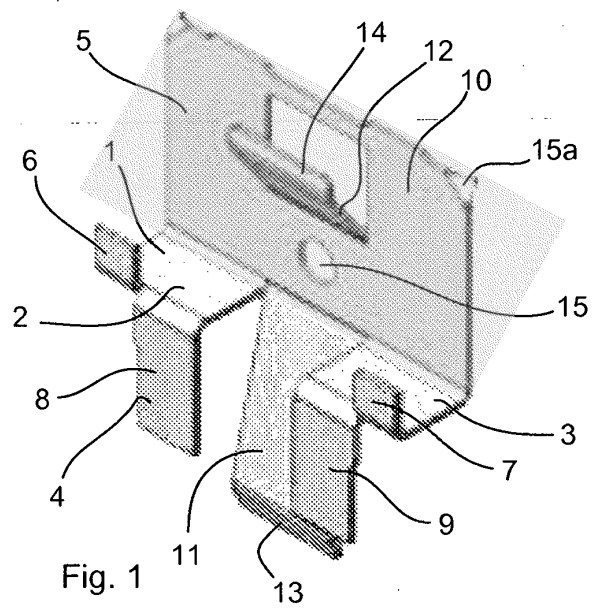
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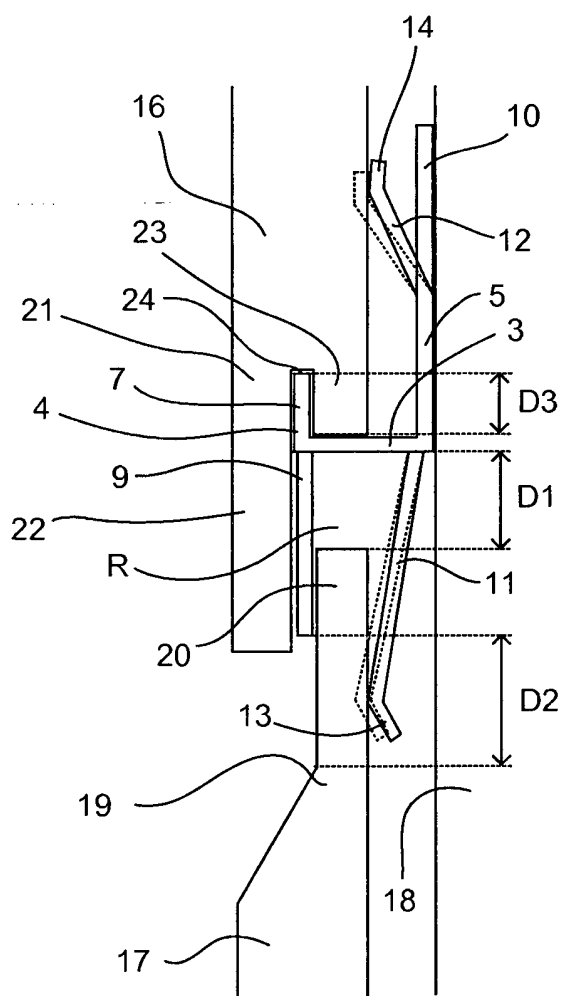


Fig. 5

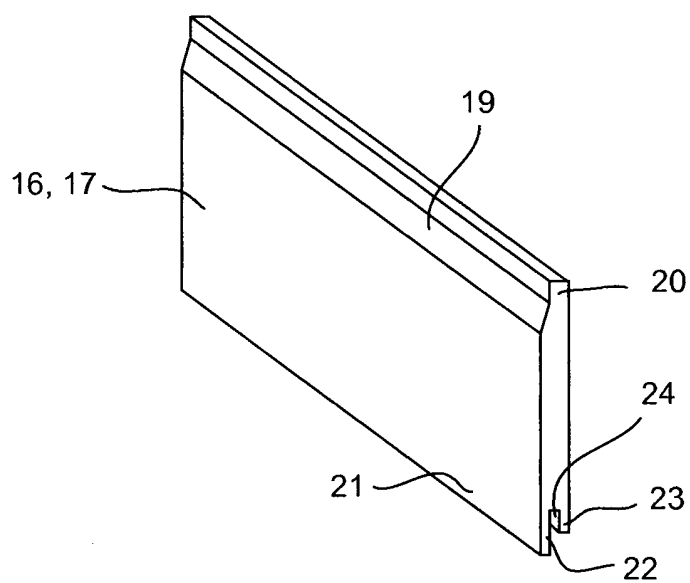


Fig. 4

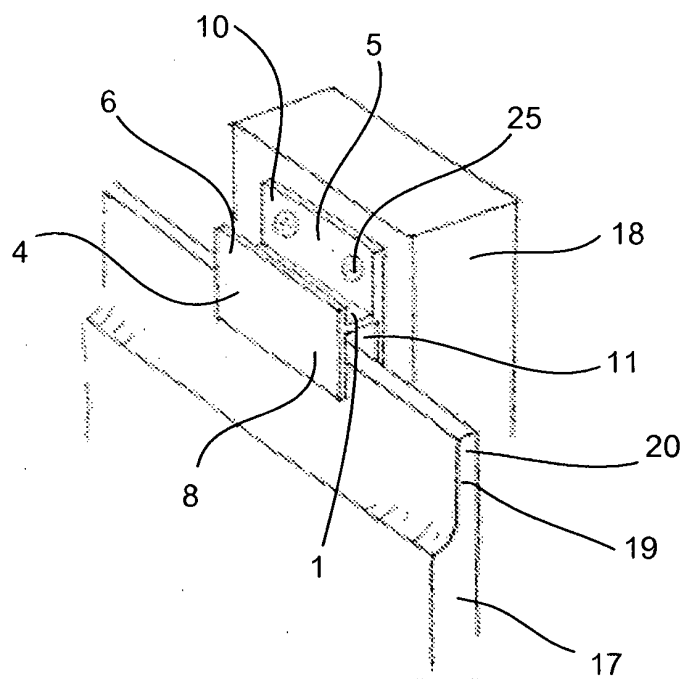


Fig. 6

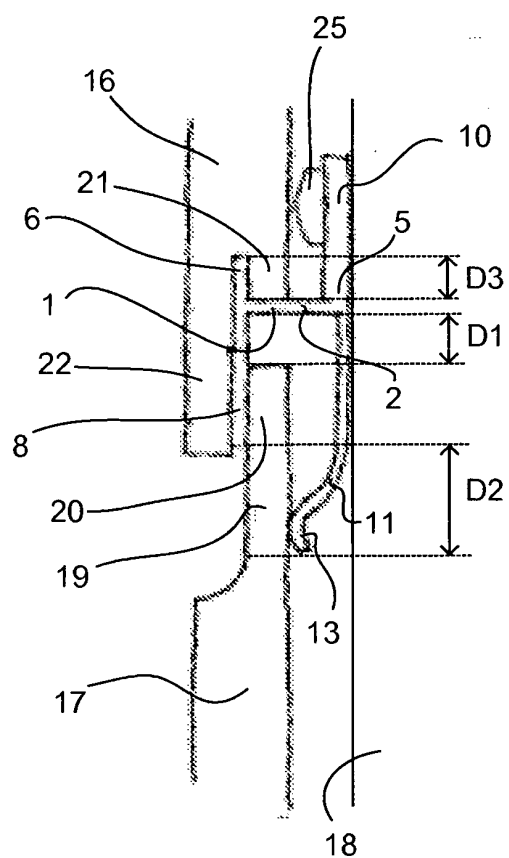


Fig. 7

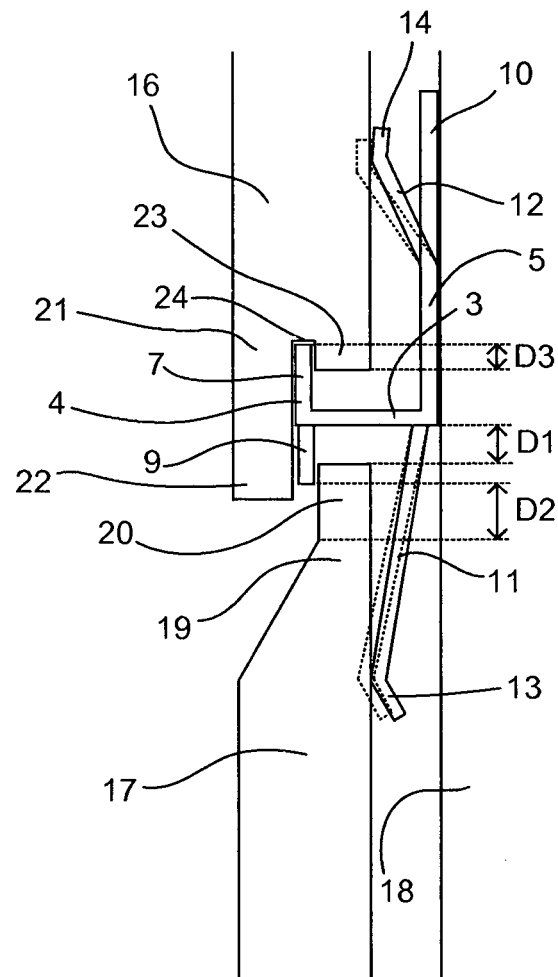


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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