

Support for fastening facade elements

Description

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The invention relates to a bracket, in particular a wall bracket, for fastening facade elements of in particular suspended, rear-ventilated facades, having a wall fastening portion which is designed for mounting the bracket on a building wall, and having a facade fastening portion which is designed for mounting of support or mounting profiles, wherein the facade fastening portion has a first connecting portion which is designed for horizontal mounting of support or mounting profiles, and a second connecting portion which is designed for vertical mounting of support or mounting profiles, wherein the second connecting portion is arranged orthogonally to the first connecting portion.

Wall brackets are widely known from the prior art. For example, EP 0 901 549 B1 shows a wall support for facade substructures with a fastening leg for mounting the wall support on a load-bearing wall and a supporting leg extending perpendicularly thereto, the supporting leg having a leg flap for clamping a supporting profile.

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A disadvantage of such a bracket known from the prior art is that these brackets are usually produced as aluminum extrusions. On the one hand, such aluminum extrusions have a high thermal conductivity, so that insulation of a

building cannot be readily guaranteed, since the aluminum extrusions act as thermal bridges.

On the other hand, aluminum extrusions are limited in
5 length and generate high costs in die fabrication.

Furthermore, the brackets known from the prior art such as, for example, the wall support known from EP 0 901 549 B1, only have a horizontal or, alternatively, a vertical
10 possible means for fastening support or mounting profiles, to which in turn facade elements can be attached.

A wall bracket having the features of the preamble of claim 1 has become known from WO 2016/165741 A1. With such a wall
15 bracket, mounting of support or mounting profiles for attachment of facade elements can be made possible both horizontally on the first connecting portion and vertically on the second connecting portion. Thus provision of different brackets in each case for horizontal and vertical
20 mounting can be avoided. However, in tests on the wall bracket known from WO 2016/165741 A1, it has been found that the necessary stability is still insufficient, in particular in the case of suspended, rear-ventilated facades which have particularly heavy claddings, such as,
25 for example, stone claddings. At the same time, however, the wall bracket should continue to meet the cost requirements in the construction industry, even in the case of particularly heavy, suspended, rear-ventilated facades.

The object of the invention, therefore, is to provide a bracket, in particular a wall bracket, with which fastening of support or mounting profiles on a building wall is possible in a simple, inexpensive and yet secure way.

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This object is achieved by a bracket having the features of claim 1. Such a bracket is characterized in that the first connecting portion is arranged on a first sheet metal portion having a first base surface which is substantially rectangular in plan view, and in that the second connecting portion is arranged on a second sheet metal portion having a second base surface which is substantially rectangular in a plan view, wherein at least one bead and/or at least one impression is/are arranged in the first sheet metal portion and/or in the second sheet metal portion. In this case, the first connecting portion is advantageously arranged in the same plane as the first sheet metal portion, wherein the second connecting portion is arranged in the same plane as the second sheet metal portion. By provision of the at least one bead and/or impression, the static and/or dynamic load bearing capacity of the facade fastening portion as well as the moment of resistance thereof against bending can be increased. Overall, the bracket is consequently formed as a bent sheet metal part, preferably made of stainless steel, with the in particular one-piece base part, which comprises the wall fastening portion and the facade fastening portion. In this case it is conceivable, in order to further increase the load capacity or the moment of resistance to bending, that the second sheet

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metal portion has a width which is greater than the width of the first sheet metal portion.

Advantageously, the first sheet metal portion is integrally
5 connected to the second sheet metal portion at a first
bending line and is bent by a bending angle of about 90°
from the second sheet metal portion, wherein the first and
the second connecting portion are arranged at a free end of
the bracket. In this case the free end of the bracket is
10 the end facing away from the wall fastening portion. The
first and the second connecting portion each have at least
one fixing and sliding point. In a preferred further
development, the first connecting portion in each case has
one single fixing and sliding point, the second connecting
15 portion having three fixing points and two sliding points,
wherein the fixing and sliding points are arranged
alternately. In this case, a fixing point is understood to
be a circular hole or bore, a sliding point being
understood to be a slot.

20 The wall fastening portion of the bracket is preferably
flat and has at least one wall mounting hole. The first and
the second connecting portion and thus also the first and
second sheet metal portion are arranged orthogonally to an
25 abutment surface of the wall mounting portion, which is
designed for mounting on a building wall and has the wall
mounting hole. It has proven to be advantageous if the
bracket is designed in the region of the abutment surface
of the wall fastening portion as a double-layered sheet, so
30 that the wall fastening portion has an upper sheet metal

portion and a lower sheet metal portion, wherein the upper sheet metal portion forms the abutment surface. In order to increase the load capacity or the moment of resistance to bending, the abutment surface has a height which is greater than a width of the abutment surface, wherein the width of the abutment surface corresponds approximately to the width of the first sheet metal portion and wherein the height of the abutment surface corresponds approximately to the width of the second sheet metal portion. The base part of the bracket advantageously designed as a bent sheet metal can thus be constructed as follows: The first sheet metal portion of the facade fastening portion is integrally connected to the upper sheet metal portion of the wall fastening portion, wherein the second sheet metal portion of the facade fastening portion is integrally connected to the lower sheet metal portion of the wall fastening portion.

In order to avoid thermal bridges, a thermal element may be provided which is designed for thermal insulation with respect to a building wall and has a lower heat transfer coefficient than the wall fastening portion.

Advantageously, the thermal element is designed such that it is detachably connected to the wall mounting portion.

A first advantageous embodiment of the bracket provides that the at least one bead and/or impression in the first sheet metal portion is designed as a linear bead and that the at least one bead and/or impression in the second sheet metal portion is designed as a triangular bead. In this

case, the linear bead advantageously has a longitudinal extent in a direction from the wall fastening portion towards the free end.

- 5 It is particularly preferred if a plurality of beads and/or impressions are provided, wherein a plurality of linear beads and/or triangular beads can then be provided which are fitted into one another, i.e. arranged in the immediate vicinity of each other.

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In a further advantageous embodiment, the bracket has a reinforcing element with a U-shaped cross-section, which is designed to reinforce the bracket in the region of the wall fastening portion, for better force distribution or

15 introduction of force on the wall fastening portion.

Advantageously, the reinforcing element is designed as a separate part from the base part and also has a wall mounting hole, which in an installed position of the reinforcing member is arranged axially aligned with the

20 wall mounting hole of the wall fastening portion.

It is also conceivable that both the wall fastening portion and also the reinforcing element have fastening holes, which are designed for fastening a thermal element.

- 25 However, it is also conceivable that the wall fastening portion and the reinforcing element are screwed or riveted in the region of the fastening holes. It is also possible for the wall fastening portion and the reinforcing element to be welded or glued to one another, or for the
- 30 reinforcing element to be arranged in a stationary manner

only by means of the wall mounting hole on the wall fastening portion of the bracket by screwing a fastening anchor, in particular a screw, through it.

- 5 In order to increase a moment of resistance of the reinforcing element against bending, it is conceivable that the reinforcing element has a flat base portion and two legs projecting at an angle of approximately 90° from the base portion, so that the reinforcing element overall has a
10 U-shaped cross section.

According to a further advantageous embodiment of the bracket, it is provided that the second sheet metal portion has, on its edge facing away from the first sheet metal
15 portion, an angled support portion which is supported at least partially on the wall fastening portion. Advantageously, the support portion is angled about a second bending line and possibly even about a third bending line, which is or are arranged parallel to the first
20 bending line, and extends in the direction of the second sheet metal portion almost to the free end of the bracket, but not into the region of the second connecting portion.

A further advantageous embodiment of the bracket has at
25 least one tension member, which is designed for vertical and/or horizontal support of the facade fastening portion, wherein the tension member has a connecting portion which can be connected to the facade fastening portion and a mounting portion which faces away from the connecting
30 portion and is designed for mounting on a wall. In this

case it is conceivable that two tension members are provided, so that both a vertical and also a horizontal support of the facade fastening portion can be made possible. Advantageously, the length of the connecting
5 portion is designed such that a hole of the mounting portion of the tension member is arranged at a distance of approximately 250mm from the wall mounting hole when the tension member is fastened to the bracket.

10 Advantageously, the connecting portion of the tension member is designed as a twisted sheet metal strip.

In order to be able to mount the tension member, in particular without tools, on the facade fastening portion,
15 the facade fastening portion can have at least one tension member mounting hole, which is arranged in the second sheet metal portion. Advantageously, the tension member mounting hole has the shape of a keyhole with a circular keyhole and a key slot, the key slot facing the free end of the bracket
20 and the circular keyhole facing the wall fastening portion.

It has proved to be particularly advantageous if a first tension member mounting hole is provided, which is designed for vertical support of the bracket, and if a second
25 tension member mounting hole is provided, which is designed for horizontal support of the bracket. It is conceivable that the key slot of the first tension member mounting hole is arranged at an angle of approximately 45° to the extension of the first sheet portion, wherein the key slot
30 of the second tension member mounting hole is arranged

approximately parallel to the extension of the first sheet metal portion.

Further details and advantageous further embodiments of the invention can be found in the following description, on the basis of which an embodiment of the invention is described and explained in more detail.

In the drawings:

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Figure 1 shows an oblique view from the front of a base part of a bracket according to the invention;

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Figure 2 shows an oblique view from the rear of the base part of the bracket according to Figure 1;

Figure 3 shows an oblique view of a reinforcing element of a bracket according to the invention;

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Figure 4 shows an oblique view from the rear of a bracket according to the invention in installation position; and

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Figure 5 shows an oblique view from the front of the bracket according to Figure 4 in the installation position.

In Figures 1 to 5 a bracket according to the invention, in particular a wall bracket 10 according to the invention, for fastening of facade elements of in particular

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suspended, rear-ventilated facades is shown as a whole. In this case the bracket 10 is shown with all components in an installation position in Figure 4 from the rear and in Figure 5 from the front. The bracket 10 has a base part 12,
5 a reinforcing element 14 and at least one tension member 16. The individual components will be described in more detail below with reference to individual figures.

Figures 1 and 2 show the base part 12 of the bracket 10,
10 which is formed as a one-piece bent sheet metal part made of stainless steel, by itself respectively each in an oblique view from the front (Figure 1) and from the rear (Figure 2). The base part 12 has a wall fastening portion 18, which is designed for mounting the bracket 10 on a
15 building wall. The base part 12 further includes a facade fastening portion 20 which is designed for mounting of support or mounting profiles of a suspended, rear-ventilated facade. The facade fastening portion 20 includes a first sheet metal portion 22 and a second sheet metal
20 portion 24. The first sheet metal portion 22 is integrally connected to the second sheet metal portion 24 on a first bending line 26 (see Figure 2) and is bent away from the second sheet metal portion 24 by a bending angle 28 of approximately 90°.

25 The first and the second sheet metal portions 22, 24 each have a base area 30, 32 that is substantially rectangular in a plan view.

A first connecting portion 34, which is designed for horizontal mounting of support or mounting profiles of a suspended, rear-ventilated facade, is arranged on the first sheet metal portion 22, wherein a second connecting portion 36, which is designed for vertical mounting of support or mounting profiles of a suspended, rear-ventilated facade, is arranged on the second sheet metal portion 24. The first connecting portion 34 is arranged in the same plane as the first sheet metal portion 22, wherein the second connecting portion 36 is arranged in the same plane as the second sheet metal portion 24. According to the arrangement of the first and second sheet metal portions 22, 24, the first and the second connecting portions 34, 36 are arranged orthogonally to one another. The first and second connecting portions 34, 36 are arranged at a free end 38 of the bracket 10 facing away from the wall fastening portion 18.

The first and the second connecting portions 34, 36 each have at least one fixing and sliding point 40 (see Figures 1 and 2). In this case, the first connecting portion 34 in each case has a single fixing point 42 designed as a circular bore and a single sliding point 44 formed as a slot. The second connecting portion 36 has three fixing points 42 likewise designed as circular bores, and two sliding points 44 designed as slots, wherein the fixing points 42 and the sliding points 44 are arranged alternately. For mounting of support or mounting profiles, the first and the second sheet metal portions 22, 24 are not fully connected at the first bending line 26; rather,

the base part has a slot 46 at the free end 38 which adjoins the first bending line 26 and into which a metal sheet of a support or mounting profile can be inserted, which can then be connected or screwed to the bracket 10 by means of fixing or sliding point screws 47 shown in Figures 4 and 5.

In order to increase the static and/or dynamic load capacity of the facade fastening portion 20 and the moment of resistance thereof against bending, a plurality of beads or impressions 48 which are designed as linear beads, and are fitted into one another or are arranged in close proximity to each other, is provided in the first sheet metal portion 22. In addition, a plurality of beads or impressions 50, which are fitted into one another or are arranged in close proximity to each other, are provided in the second sheet metal portion 24.

To further increase the load capacity or the moment of resistance against bending, the second sheet metal portion 24 has a width 52 that is greater than a width 54 of the first sheet metal portion 22 (see Figure 2).

The wall fastening portion 18 of the base part 12 is flat and has a wall mounting hole 54 (see Figure 1). The first and the second connecting portions 34, 36 and thus also the first and second sheet metal portions 22, 24 are arranged orthogonally to an abutment surface 56 of the wall fastening portion 18, which is designed for mounting on a building wall and has the wall mounting hole 54. In the

region of the abutment surface 56 of the wall fastening portion 18, the base part 12 is formed as a double-layered metal sheet, so that the wall fastening portion 18 has an upper sheet metal portion 58 and a lower sheet metal portion 60, the upper sheet metal portion 58 forming the abutment surface 56. In order to increase the load capacity or the moment of resistance against bending, the abutment surface 56 has a height 60 which is greater than a width 62 of the abutment surface 56, wherein the width 62 of the abutment surface 56 corresponds approximately to the width 54 of the first sheet metal portion 22 and wherein the height 60 of the abutment surface 56 corresponds approximately to the width 52 of the second sheet metal portion 24. The first sheet metal portion 22 of the facade fastening portion 20 is integrally connected to the upper sheet metal portion 58 of the wall fastening portion 18 and is folded along a bending line 64, wherein the second sheet metal portion 24 of the facade fastening portion 20 is integrally connected to the lower sheet metal portion 60 of the wall fastening portion 18 and is bent along a bending line 66 (see Figure 1).

The reinforcing element 14, which is shown by itself in Figure 3 and in the installation state in Figure 5 and is formed as a separate part from the base 12, is provided for better distribution or introduction of force on the wall fastening portion 18. The reinforcing element 14 has a flat base portion 68 and two legs 70 projecting from the base portion 68 at an angle of approximately 90° , so that the reinforcing element, which is designed to reinforce the

bracket in the region of the wall fastening portion, has overall a U-shaped cross section. The reinforcing element 14 likewise has a wall mounting hole 72 which, in the installation position of the reinforcing element 14 shown in Figure 5, is arranged axially aligned with the wall mounting hole 54 of the wall fastening portion 18. In the installation position, the base portion 68 of the reinforcing element abuts flat on the lower sheet metal portion 60 of the wall fastening portion 18, i.e. the legs 70 are arranged on the side of the reinforcing element 14 facing away from the wall fastening portion 18.

As can be seen clearly in Figures 1 and 3, both the wall fastening portion 18 and the reinforcing element 14 have fastening bores 74 which are arranged in axial alignment in the installation position and are designed for fastening a thermal element 76 shown in Figures 4 and 5. Such a plastic thermal element 76 may be provided to avoid thermal bridges between a suspended rear-ventilated facade and a building wall. The thermal element 76 is designed for thermal insulation against a building wall and has a lower heat transfer coefficient than the wall fastening portion 18. In this case it may, for example, be clipped onto the wall fastening portion 18 or, as shown in Figure 5, may be screwed to the wall fastening portion 18 at the fastening bores 74 by means of suitable screws 78.

Furthermore, the wall fastening portion 18 and the reinforcing element 14 may be screwed or riveted in the region of the fastening bores 74. However, it is also

possible that the wall fastening portion 18 and the reinforcing element 14 are welded or glued together, or that the reinforcing element is arranged stationary only by means of the aligned wall mounting holes 54, 72 on the wall fastening portion 18 of the base part 12 of the bracket 10 by screwing in a fastening anchor 80 shown in Figures 4 and 5, in particular by screwing in a screw.

The second sheet metal portion 24 has on its edge 82 remote from the first sheet metal portion 22 an angled support portion 84 which is supported on the wall fastening portion 18 or on its region 86. The support section 84 is angled around a second bending line and possibly even around a third bending line, which is or are arranged parallel to the first bending line 26. For clarity, the second and the third bending line carry no reference signs. The support portion extends in the direction of the second sheet metal portion 24 almost to the free end 38 of the base part 12, but not into the region of the second connecting portion 36.

In order to be able to support the bracket 10 also horizontally and/or vertically, it has at least one tension member 16, shown completely in Figure 4 and only partially in Figure 5, which is designed for vertical and/or horizontal support of the facade fastening portion 20. The tension member 16 has a connecting portion 86 connectable to the facade fastening portion 20 and which is formed as a twisted sheet metal strip, and a connecting portion 86 facing away from the mounting portion 88, which is designed

for mounting on a wall. The length of the connecting portion 86 of the tension member 16 is designed such that a hole of the mounting portion 88 of the tension member 16, in which a screw 89 is arranged in Figure 4, is arranged at a distance 91 of approximately 250mm from the wall mounting hole 54 when the tension member 16 is fastened to the bracket 10 or to the base 12.

For tool-free mounting of the tension member 16 on the second sheet metal portion 24, the facade fastening portion 20 of the base part 12 has two tension member mounting holes 90 in the form of a keyhole, in each case with a circular keyhole 92 and a key slot 94 (see Figure 2). The key slot 94 is in each case facing the free end 38 of the base part 12 of the bracket 10, with the key slot 92 facing the wall fastening portion 18. The tool-free mounting of the tension member 16 can be done by inserting the tension member into the tension member mounting hole 90 and then turning the tension member 16 in the direction of the arrow 96 shown in Figure 4, so that the tension member 16 engages behind the second sheet metal portion 24.

A first tension member mounting hole 90 which is designed for vertical support of the bracket 10 is provided on the left in Figure 2. In addition, a second tension member mounting hole 90 which is designed for horizontally supporting the bracket 10 is provided on the right in Figure 2. In this case, the key slot 94 of the first tension member mounting hole 90 is arranged at an angle of approximately 45° to the extension of the first sheet metal

portion 22, wherein the key slot 94 of the second tension member mounting hole 90 is arranged approximately parallel to the extension of the first sheet metal portion 22.

- 5 It is conceivable (contrary to the representation according to Figures 4 and 5) for two tension members 16 to be provided, so that both a vertical and also a horizontal support of the facade fastening portion 20 can be made possible.

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Overall, a bracket 10, in particular a wall bracket, can be provided by which fastening of support or mounting profiles to a building wall can be made possible in a simple, inexpensive and yet secure manner.

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Claims

- 5 1. A wall bracket (10) for fastening facade elements of in particular suspended, rear-ventilated facades, having a wall fastening portion (18) which is designed for mounting the bracket (10) on a building wall, and having a facade fastening portion (20) which is
10 designed for mounting of support or mounting profiles, wherein the facade fastening portion (20) has a first connecting portion (34) which is designed for horizontal mounting of support or mounting profiles, and a second connecting portion (36) which is designed
15 for vertical mounting of support or mounting profiles, wherein the second connecting portion (36) is arranged orthogonally to the first connecting portion (34), **wherein** the first connecting portion (34) is arranged on a first sheet metal portion (22) having a first
20 base surface which is substantially rectangular in plan view, and in that the second connecting portion (36) is arranged on a second sheet metal portion (24) having a second base surface which is substantially rectangular in a plan view, wherein at least one bead and/or at least one impression (48, 50) is/are
25 arranged in the first sheet metal portion (22) and/or in the second sheet metal portion (24), characterized in, that the bracket (10) has a reinforcing element (14) with a U-shaped cross section, which is designed
30 to reinforce the bracket (10) in the region of the

wall fastening portion (18), that the reinforcing element (14) has a planar base portion (68) and two legs (70) projecting at an angle of approximately 90° from the base portion (68), and that in the installation position, the base portion (68) of the reinforcing element abuts flat on the lower sheet metal portion (60) of the wall fastening portion (18) and the legs (70) are arranged on the side of the reinforcing element (14) facing away from the wall fastening portion (18).

2. The bracket (10) according to claim 1, wherein the at least one bead and/or impression (48, 50) in the first sheet metal portion (22) is formed as a linear bead (48), and wherein the at least one bead and/or impression (48, 50) in the second sheet metal portion (24) is designed as a triangular bead (50).

3. The bracket (10) according to claim 1 or 2, wherein a plurality of beads and/or impressions (48, 50) are provided.

4. The bracket (10) according to at least one of the preceding claims, wherein the second sheet metal portion (24) has, on its edge (82) facing away from the first sheet metal portion (22), an angled support portion (84) which is at least partially supported on the wall fastening portion (18).

5. The bracket (10) according to at least one of the preceding claims, wherein the bracket has at least one tension member (16) which is designed for vertical

and/or horizontal support of the facade fastening portion (20), wherein the tension member (16) has a connecting portion (86) which can be connected to the facade fastening portion (20) and a mounting portion (88) which faces away from the connecting portion (86) and is designed for mounting on a wall.

6. The bracket (10) according to claim 5, wherein the connecting portion (86) is designed as a twisted sheet metal strip.

7. The bracket (10) according to claim 5 or 6, wherein the facade fastening portion (20) has at least one tension member mounting hole (90), which is arranged in the second sheet metal portion (24), for tool-free mounting of the tension member (16).

8. Bracket (10) according to at least one of the preceding claims, wherein a first tension member mounting hole (90) is provided, which is designed for vertical support of the wall bracket (10), and wherein a second tension member mounting hole (90) is provided, which is designed for horizontal support of the wall bracket (10).