

The present invention relates to a securing arrangement for cladding panels which are suspended in front of an outer surface of a facade and consist of stone or similar material, as is described in Claim 1.

5 US-A-3 561 182 discloses a securing arrangement for cladding panels which are suspended in front of an outer surface of a facade of a structure. On a substructure comprising posts, load-bearing profiles are, for this purpose, rigidly connected to the posts via
10 connecting parts which are L-shaped in cross-section. At your [sic] free ends, the load-bearing profiles have retaining webs which extend vertically upwards and downwards and engage in receiving grooves provided in the edge region of the cladding panels. The rigid connection
15 between the load-bearing profiles and the posts is produced by screws which engage through the L-shaped connecting profile and are connected, via screw nuts, to the posts, on the one hand, and to the load-bearing profiles, on the other hand. As a result, it is possible
20 to align the load-bearing profiles horizontally and vertically before they are rigidly connected to the post.

Owing to the rigid connection between the posts and the load-bearing profiles, constraining forces, in particular moments, are channelled into the load-bearing
25 profile, for example due to wind loading, i.e. when exposed to wind suction or wind pressure, and/or owing to deformations of the substructure, i.e. for example due to thermal deformations and/or structural deformations. The moments lead to a deformation of the load-bearing pro-
30 files and thus also to the deformation of the retaining webs arranged at the free ends of the load-bearing profiles. This deformation of the retaining webs presents the danger that, owing to the relatively small thickness of the edge region of the cladding panels in the region
35 of the receiving grooves, the corresponding edges of the cladding panels would come out.

The object of the present invention is to provide a securing means for cladding panels which are suspended in front of an outer surface of a facade, consist, in

particular, of stone and in which the edge regions can be reliably prevented from coming out.

This object is achieved according to the invention by a securing arrangement having the features of
5 Claim 1. Advantageous developments are given in the subclaims.

Since the load-bearing profiles can be rotated at both ends, in each case about a vertical pin, and, in addition, are mounted at one end such that they can be
10 displaced, in the direction of the longitudinal axis of the load-bearing profile, to and from the rotary pin at the other end, a statically determined mounting is obtained for each cladding panel without moments impinging on the substructure. As a result, no constraining
15 forces can act on the cladding panel due to deformations of the substructure or wind loading or thermal deformations, since no moments can be transferred. The webs thus do not transfer any large forces to the edge regions delimiting the grooves in the cladding panel, with the
20 result that these edge regions are reliably prevented from coming out.

The securing arrangement according to the invention is particularly suitable for facade structures with posts and crossmembers, the bearing profiles then being
25 fastened on the posts or crossmembers.

In a development according to Claim 2, a lengthening web, together with a retaining web, forms an L-shape if the load-bearing profile is to be arranged on the upper edge of the uppermost cladding panel or on the
30 lower edge of the lowermost cladding panel. In contrast, the lengthening web, along with two retaining webs extending in opposite directions at its end, forms a T-shape if the load-bearing profile is to be used for securing two cladding panels arranged one beside the
35 other.

In a development according to Claims 2 and 3, the U-shaped design of the load-bearing profile, which engages, with its U-legs, around the associated bearing profile, results in a high resistance to warping, so that

large distances between posts or crossmembers of a facade structure may be spanned without impermissible deformation of the load-bearing profiles occurring.

The design of a bearing rotary pin as loose bearing being displaceable, transversely to its longitudinal axis, towards the associated, other bearing rotary pin or away therefrom serves so as to be able to absorb deformations in the substructure and/or the cladding panels without thereby transferring moments to the cladding panels. Owing to this design, it is possible, if retaining webs engage only in two opposite receiving grooves of each cladding panel, to support the inner walls of the receiving grooves on the retaining webs continuously, without any constraining forces. In order further to ensure freedom from constraint, there are provided preferably strips or profiles which consist of elastic material, such as rubber or plastic, which engage around the retaining webs and on which the latter support the side walls of the receiving grooves.

If the receiving grooves of the cladding panels, and thus the retaining webs thereof, are arranged at an angle to the horizontal, or are even arranged vertically, there is additionally provided a further support for each cladding panel, on which support the said cladding panel is supported exclusively by means of its dead weight.

The invention is described hereinbelow with reference to the drawing, by way of example, in which:

Figure 1 shows a vertical section through a load-bearing profile, with the end regions of two cladding panels arranged one beside the other, and

Figure 2 shows a section along the line II-II in Figure 1.

Figure 1 shows a post 10 of a facade structure. The outer side of the facade is closed off via cladding panels 12, 14 consisting of cast stone or natural stone. The panels 12, 14 are secured via load-bearing profiles 16. The load-bearing profile 16 is designed to be U-shaped in cross-section and to have a base 18 and two

legs 20, 22 perpendicular thereto. In continuation of the leg 20, a lengthening web 24, provided at its end with retaining webs 26 and 28 extending perpendicularly thereto, is provided beyond the base 18. The web 26
5 engages into a receiving groove 30 which is formed on the lower edge of the panel 12. The web 26 is arranged such that it runs along the groove 30 continuously. A strip 32 which consists of an elastic material, for example of rubber or plastic, is arranged on the web 26. The strip
10 32 is preferably designed as a U-profile which is pushed onto the web 26.

The downwardly directed web 28 engages into a receiving groove 34 which is formed in the upper edge of the cladding panel 14. A profile 36 consisting of rubber
15 or plastic is pushed into the web 28 for the flexible mounting of the panel 14. That edge region of the panel 12 located behind the web 26 is seated on a profile strip 38 which can be deformed within certain limits.

The load-bearing profile 16 is fastened, via
20 bearing profiles 40, on posts or crossmembers of the facade structure. In Figure 1, the bearing profile 40 is screwed to the post 10 via screws 42. The load-bearing profile 16 is fastened on the bearing profile 40 via a screw 44 which is guided through the legs 22 and 20 of
25 the load-bearing profile 16 and through the bearing profile 40.

As can be seen in Figure 2, the load-bearing profile 16 is fastened, at one end, in a rotatable manner on a bearing profile (fixed bearing) 46 and, by the other
30 end, in a displaceable manner on the bearing profile (loose bearing) 40. The bearing profile 46 which forms the fixed bearing is fastened on a post 58 via screws 60. Through the legs 22 and 20 of the load-bearing profile and through the bearing profile 46 there is provided a
35 bore 62 in which a bearing bolt is accommodated, the diameter of which is somewhat smaller than the internal width of the bore 62, with the result that rotation of the load-bearing profile 16 on the bearing profile 46 is possible. A slot 64 is formed in the legs 22 and 20 of

the load-bearing profile 16, with the result that the load-bearing profile 16 can be displaced on the screw or the bolt 44 which is guided through the bearing profile 40.

5 The longitudinal axis of each screw or of each bolt 44 or of each bearing bolt is thus arranged perpendicularly to the longitudinal axes of the webs 26, 28 of the associated load-bearing profile 16 and in parallel with the common plane of these webs 26, 28. The slot 64
10 is designed such that the bearing rotary pin which is inserted therein and is in the form of a loose bearing (40) can be displaced transversely in the direction towards the other bearing rotary pin, in the form of a fixed bearing (46), or away therefrom.

15 By virtue of the fact that the load-bearing profile 16 is fastened, by one end, in a rotatable manner on the fixed bearing (46) and, by the other end, in a displaceable manner on the loose bearing (40), constraining forces, due to deformations of the substructure or
20 due to deformations of the cladding panel 12 itself, are prevented from being able to be channelled onto the cladding panel 12, which consists, in particular, of stone, with the result that the edges of the cladding panel 12, in the region in which the groove [sic] 30, 34
25 for receiving the webs 26, 28 of the load-bearing profile 16 are formed, are prevented from coming out.

Patent Claims

1. Securing arrangement for cladding panels (12, 14) which are suspended in front of an outer surface of a facade, consist of stone or similar material and exhibit,
5 in each case on two opposite edge surfaces, receiving grooves (30, 34) for retaining webs (26, 28) which are provided on load-bearing profiles (16) which are fitted on an outer-wall structure of a building, the retaining webs (26, 28) in the receiving grooves (30, 34) being
10 continuously supported, without any constraining forces, on the side walls of said grooves and each load-bearing profile (16) being connected in its end regions in each case to a bearing rotary pin of a bearing block or bearing profile (40, 46), which is arranged perpendic-
15 ularly to the longitudinal axis of the retaining webs (26, 28) of the load-bearing profile (16) and in parallel with the common plane of the retaining webs (26, 28), a rotary pin being displaceable longitudinally in the direction of the longitudinal axis of the load-bearing
20 profile (16), in order to form a loose bearing (40).
2. Securing arrangement according to Claim 1, in which each load-bearing profile (16) is designed to be U-shaped in cross-section and to have a base (18) and two legs (20, 22) perpendicular thereto, one leg (20)
25 exhibits a lengthening web (24) extending beyond the base (18), and at least one retaining web (26, 28) at the end of the lengthening web (24) extends perpendicularly to the latter.
3. Securing arrangement according to Claim 2, in
30 which the legs (20, 22) of the load-bearing profiles (16) engage around the bearing profiles (40, 46).
4. Securing arrangement according to one of Claims 1 to 3, in which the bearing rotary pin, designed as a loose bearing (40), exhibits a slot arrangement (64)
35 which is formed in the associated bearing profile (40) and/or end region of the legs (20, 22).
5. Securing arrangement according to one of Claims 1 to 4, in which the constraint-free support is effected by strips or profiles (32, 36) which consist of elastic



material and engage around the retaining webs (26, 28).

6. Securing arrangement according to Claim 5, in which the strips or profiles (32, 36) consist of rubber or plastic.

5 7. Securing arrangement according to one of Claims 1 to 6, in which the bearing profiles (40, 46) are screwed to the posts (10, 58) or crossmembers.

8. Mounting [sic] arrangement according to one of Claims 1 to 7, in which the load-bearing profiles (16) consist of metal, such as aluminium or high-grade steel.

10 9. Securing arrangement according to one of Claims 1 to 8, in which the load-bearing profiles (16) are fastened on the posts (10, 58) or crossmembers of a facade structure.

15 10. Securing arrangement according to one of Claims 1 to 9, in which the load-bearing profiles (16) are fitted in a horizontally extending manner.

11. Securing arrangement according to one of Claims 1 to 10, in which the dead weight of the cladding panels (12, 14) is supported independently of the mounting of the latter by means of the retaining webs (26, 28) of the load-bearing profiles (16).



List of designations

	10	Post
	12, 14	Cladding panel
	16	Load-bearing profile
5	18	Base
	20, 22	Legs
	24	Lengthening web
	26,28	Retaining web
	30	Receiving groove
10	32	Strip/profile
	34	Receiving groove
	36	Strip/profile
	38	Profile strip
	40	Bearing profile (loose bearing)
15	42, 44	Screw
	46	Bearing profile (fixed bearing)
	58	Post
	60	Screw
	62	Bore
20	64	Slot

