



(11) **EP 1 881 119 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.01.2008 Bulletin 2008/04

(51) Int Cl.:
E04B 1/00 (2006.01) E04C 5/02 (2006.01)

(21) Application number: **07013367.3**

(22) Date of filing: **16.07.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(71) Applicant: **Pontarolo Engineering S.p.a.**
33078 San Vito al Tagliamento (IT)

(72) Inventor: **Pontarolo, Valerio**
33078 San Vito al Tagliamento (PN) (IT)

(74) Representative: **Lotti, Giorgio et al**
c/o Ing. Barzanò & Zanardo Milano S.p.A.
Corso Vittorio Emanuele II, 61
10128 Torino (IT)

(30) Priority: **21.07.2006 IT TO20060540**

(54) **Support bracket for overhanging building elements**

(57) Support bracket (1) for overhanging building elements (4), the bracket being installable in correspondence with a joint (2) between a building and an overhanging building element (4) of the building itself, and being provided with two reinforcing elements (61, 62) for the

transmission of tensile and compression forces; with a central plate (7) made of metallic material and being integrally connected to the two reinforcing elements (61, 62), and with two tabs (9) for transmitting vertical loads by means of the joint (2) which is integral with the central plate (7).

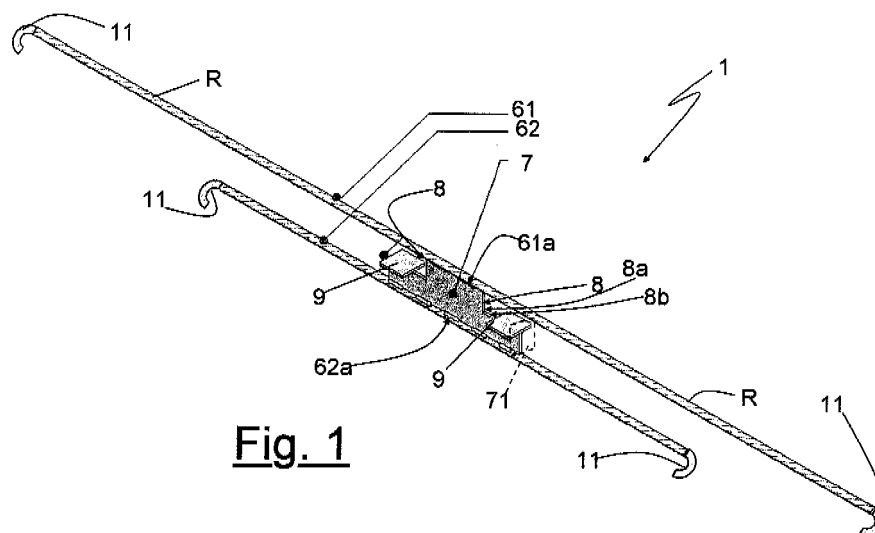


Fig. 1

Description

[0001] The present invention refers to a support bracket for overhanging building elements.

[0002] In the building field in general, the external points of a construction, such as beams or pillars, or overhanging building elements such as sills or balconies present thermal flows which are more rapid in comparison with the surrounding parts, or rather which give rise to so-called thermal bridges, which may not only be the cause of damage to the building and favourable to the creation of mould, but which may also cause the dispersion of heat thereby increasing heating costs and reducing the comfort level of day-to-day living.

[0003] In order to eliminate thermal bridges in the case of overhanging building elements in general and particularly in the case of balconies, this description will make specific reference - without losing any of its general nature - to well-known support structures, of the type, for example, referred to in the German patent for a utility model No. DE 29707378, which are installable in correspondence to a joint between the internal floor of the construction and the floor slab of the balcony, and which comprise an isolating body, and three reinforcing elements, which are arranged through the isolating body, and of which two reinforcing elements are suitable for transmitting tensile forces, and a further reinforcing element, which is provided with two mushroom-shape ends arranged opposite the isolating body, is suitable for compensating for compression forces.

[0004] While the support structure which has been described in the above-mentioned German utility model is produced with the aim of being both essential and economical, and while it is sold in modular elements, or of a pre-defined length or of a length which is adaptable by means of cutting, it has, however, been demonstrated that it is a structure which is neither economical, nor versatile.

[0005] The aim of the present invention is to produce a support structure for overhanging building elements, which will impede the formation of thermal bridges, while being extremely versatile, easily installable, and both economical and simple to produce.

[0006] According to the present invention, a support structure for overhanging building elements will be produced, the bracket being installable in correspondence to a joint between a building and an overhanging building element of the building itself, and comprising two reinforcing elements for the transmission of tensile and compression forces; the bracket being characterised by the fact of comprising connecting means which are integral with the said reinforcing elements, and transmission means for transmitting vertical loads by means of the said joint which is integral with the connecting means.

[0007] The present invention will now be described with reference to the attached drawings, which illustrate a non-limiting form of embodiment of the present invention, and in which:

- FIGURE 1 is a perspective view of a preferred form of embodiment of the support bracket for overhanging building elements which is produced according to the present invention; and
- FIGURE 2 shows an example of the bracket which is shown in FIGURE 2 being laid in position.

[0008] With reference to FIGURES 1 and 2 the number 1 refers to a support bracket, in its entirety, which is installable in correspondence with a joint 2 between an internal structure 3, or rather the structure dividing storeys, an overhanging building element 4, or rather a balcony, and a perimeter wall 5 of a building.

[0009] The bracket 1 comprises two reinforcing bars or rods 61 and 62 which are arranged parallel to each other for the transmission of tensile and compression forces between the dividing structure 3 and the balcony 4, and a central plate 7 which is made of hot galvanised iron and welded along respective borders 61a e 62a opposite the rods 61 e 62.

[0010] Both the rod 61 and the rod 62 present a diameter which is, preferably, but not necessarily, of 12 mm, and the rod 61 presents a longitudinal length L1 which is greater than a longitudinal length L2 of the rod 62. In the example of embodiment which is illustrated, the length L1 is equal to 1,800 mm, while the length L2 is equal to 1,000 mm.

[0011] The central plate 7 is arranged in a longitudinally median position in relation to both the rods 61 and 62, in such a way that each rod 61, 62 presents two free branches R1 and R2 which extend opposite the plate 7 itself and which are of an equal length in relation to each other.

[0012] According to a form of embodiment which is not illustrated at all, but which is also easily understandable from the foregoing description, the central plate 7 may also be arranged in a longitudinally asymmetrical position in relation to both the rods 61 and 62, in such a way that each rod 61, 62 presents two free branches R which extend opposite the plate 7 itself and which are of different lengths in relation to each other.

[0013] In this case, the support bracket 1 may be advantageously installed in correspondence with a joint 2 between the perimeter wall of a building and an overhanging building element 4 without any counterpart inside the building as has been described until now, and comprises a plate 71, which is arranged vertically and transversely to the plate 7 itself from the opposite side of the free branches R of greater length, and is suitable for being embedded in the casting of the wall 5 in order to compensate for compression forces. Preferably, but not necessarily, the plate 71 may completely replace the free branches R of inferior length which may, thus, be totally absent from the bracket 1 permitting the bracket 1 to be used in a construction with only the walls 5.

[0014] The plate 7 presents an upside down T shape, and the border 61a which is welded to the rod 61 presents a length which is of dimensions which are less than the

length of the border 62a which is welded to the border 62 in such a way as to form, with the rod 61 itself, two end housings or opening 8.

[0015] In addition, the bracket 1 comprises two tabs 9, which are welded to the plate 7 and which are each arranged in a respective housing 8 in a position which is transverse to the plate 7 itself. In particular, each housing 8 presents a border 8a which is transverse to and contiguous with the border 61a and a longitudinal free border 8b, which is arranged transverse to and contiguous with the relative border 8a in order to parallelly face the rod 61 and to be welded to the relative tab 9.

[0016] The tabs 9 present, preferably but not necessarily, a square shape with sides of 50 mm, they have a thickness which is equal to a thickness of the plate 7 and which is equal to 5 mm, and they are welded symmetrically onto the relative border 8a in such a way as to project in the same quantity from both the sides of the plate 7 itself.

[0017] Finally, the bracket 1 comprises a hooked element 11, which is obtained by folding the point of a free end of a branch R, and is suitable, when in position, for being either hooked or for hooking overlaps splices, or is suitable for simply being embedded in the dividing structure 3 or in the balcony 4. There may be one element 11 for each branch R, or only one for each element 61 and 62, or only one in all according to the necessities of the construction.

[0018] As is better illustrated in FIGURE 2, the bracket 1 is used together with other brackets 1 of the same type which are arranged side by side in order to cover the width of a balcony 4, and are placed in position partially embedded in the dividing structure 3, partially in the wall 5 and partially in the balcony 4 with the rod 61 in a position which is above the rod 62. In fact, the bracket 1 behaves like a "bracket" in that as a consequence of the weight of the balcony 4, to which is added a working load, there is an inflection of the balcony 4 itself with a consequent transfer of the stress on the two rods 61 and 62, where the upper rod 61 undergoes tensile stress, while the lower rod 62 undergoes compression stress.

[0019] The length L1 and L2 of the rods 61 and 62 is such as to permit the transfer of friction stress without causing any cracks.

[0020] The central plate 7 functions to maintain a space between the rods 61 and 62 and to absorb the cutting forces which are present in the structure, while the two tabs 9 which are welded perpendicularly to the central plate 7 guarantee the transfer of vertical loads onto the portion of the wall 5 below.

[0021] The part of the bracket 1 which is comprised in the dividing structure 3 has the function of balancing flexing moments and thus reducing any eventual forces on the wall 5 which are not compression forces.

[0022] Although it has been sufficiently well-described above, it is necessary to highlight that the bracket 1 is a structural element for connecting parts of a structure when there exists any constructive discontinuity between

them, or when there is a possibility that the above-mentioned thermal bridges might form and the use of the bracket 1 in the construction phase permits the extension of an insulation 10, alias "jacket", also in the area of the joint 2 so that it is insulated from external thermal activity, and to cast, in a subsequent phase, the balcony 4 or other overhanging structures.

[0023] Apart from the advantage of avoiding thermal bridges, the bracket 1 which has been described above presents the further advantage of eliminating infiltration caused by rainfall, or also eliminating any eventual cracks caused by differences in thermal dilation between the structures of the joint 2, and of having no point of contact with the cement where points of high or localised tension exist.

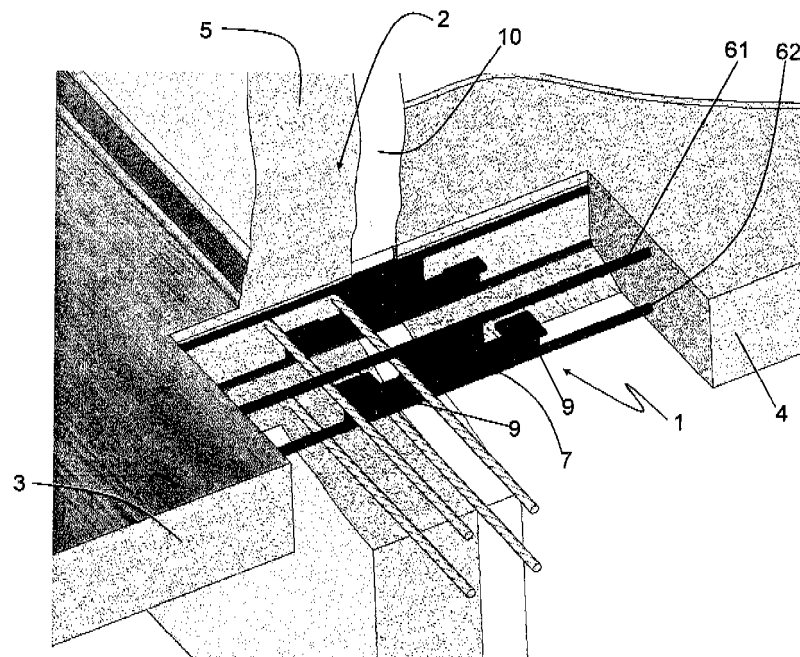
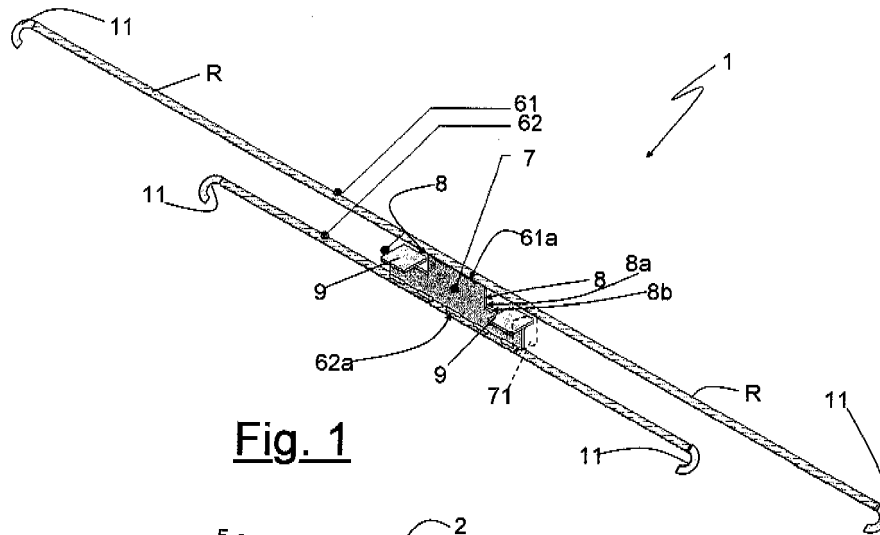
[0024] Finally, the above-described bracket 1 may be laid in position very quickly, and it has a high level of flexibility in terms of various planning needs in that the greater or lesser capacity of supporting loads is guided by inserting an easily variable number of elements per linear metre to the contrary of what happens with solutions which are currently present on the market, which are difficult to manage as they must be produced "off site" and according to pre-defined projects.

[0025] It is intended that the present invention should not be delimited to the forms of embodiment which are herein described and illustrated, which are to be considered as examples of forms of embodiment of the support bracket for overhanging building elements, and which may instead be subject to further modifications in terms of the shape and disposition of the parts, as well as to details pertaining to construction and assembly.

Claims

1. Support bracket (1) for overhanging building elements (4), the bracket (1) being installable in correspondence to a joint (2) between a building and an overhanging building element (4) of the building itself, and comprising two reinforcing elements (61, 62) for the transmission of tensile and compression forces; the bracket (1) being **characterised by** the fact of comprising connecting means (7) which are integral with the said reinforcing elements (61, 62), and transmission means for transmitting vertical loads by means of the said joint (2) which is integral with the connecting means (7).
2. Bracket according to Claim 1, **characterised by** the fact that the two reinforcing elements (61, 62) are each defined by a respective reinforcement bar.
3. Bracket according to Claim 2, **characterised by** the fact that the said connecting means (7) comprise a central plate (7) which is delimited by two end borders (61a, 62a) along which are connected the said two reinforcing elements (61, 62).

4. Bracket according to Claim 3, **characterised by** the fact that a first reinforcing element (61) of the said two reinforcing elements (61, 62) presents a longitudinal length (L1) which is greater than a longitudinal length (L2) of a second reinforcing element (62) of the said two reinforcing elements (61, 62). 5
5. Bracket according to Claim 4, **characterised by** the fact that the said central plate (7) is arranged in a median longitudinal position in relation to both the two reinforcing elements (61, 62), each of which presents two free branches (R) of an equal length. 10
6. Bracket according to Claim 4, **characterised by** the fact that the said central plate (7) is arranged in an asymmetrical longitudinal position in relation to the two reinforcing elements (61, 62), each of which presents two free branches (R) of different lengths. 15
7. Bracket according to Claim 6, **characterised by** the fact of comprising an anchoring plate (71) which is arranged transverse to the plate (7) itself opposite the free branches (R) of greater length. 20
8. Bracket according to Claims 5 or 6, **characterised by** the fact that a first end border (61a) of the said two end borders (61a, 62a) is connected to the first reinforcing element (61) and presents a length which is less than the length of a second end border (62a) of the said two end borders (61a, 62a) in order to form two housings (8) for the said transmission means (9). 25
30
9. Bracket according to Claim 8, **characterised by** the fact that the said transmission means (9) comprise two tabs (9) which are integral with the central plate (7) and which are each arranged in a respective housing (8) transverse to the central plate (7) itself. 35
10. Bracket according to Claim 9, **characterised by** the fact that each housing (8) presents a respective free border (8b) which is arranged parallel to and facing the said first reinforcing element (61); each tab (9) being welded in a symmetrical position on the free border (8b) of the relative housing (8). 40
45
11. Bracket according to any of the Claims from 2 to 10, **characterised by** the fact of comprising at least one hooked element (11) which is obtained at the end of at least a said reinforcing element (61, 62). 50
12. Bracket according to Claim 11, **characterised by** the fact of comprising two hooked elements (11) which are obtained at opposite ends of at least one said reinforcing element (61, 62). 55



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 29707378 [0003]