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(54) **Method for placing a mounting device on an already placed foundation element, and a mounting device intended for use in the method**

(57) The present invention relates to a method for placing a mounting device on an already placed foundation element in order to enable correction for a deviating position of the foundation element, the method comprising the following steps of:

a) determining a deviation between the actual position of the placed foundation element and the desired position

of the foundation element,

b) placing the mounting device on the foundation element such that the deviation determined in step a) is corrected.

The invention also relates to a mounting device intended for use in this method.

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Description

[0001] The present invention relates to a method for placing a mounting device on an already placed foundation element in order to enable correction for a deviating position of the foundation element, the method comprising the following steps of:

- a) determining a deviation between the actual position of the placed foundation element and the desired position of the foundation element,
- b) placing the mounting device on the foundation element such that the deviation determined in step a) is corrected.

[0002] The invention also relates to a mounting device intended for use in the method.

[0003] Such a method is known from the earlier patent application NL 1028061 of applicant.

[0004] The known method relates to the placing of a column on a pile. After the pile has been driven at a predetermined position and depth, a formwork is arranged at the correct height on the head of the pile, wherein correction is made for the deviating height of the pile. The column is then arranged on the pile, wherein the protruding reinforcement on the underside of the column drops into a hole arranged for this purpose in the upper side of the pile. After positioning of the column, wherein correction is made for a deviating position of the pile, the column is finally connected fixedly to the pile by filling the arranged formwork with concrete. This method has the drawback that it takes a great deal of time to arrange the formwork on the pile and to place the column on the pile. The cast concrete must then first cure before it is possible to continue with placing of the building elements on the column.

[0005] The invention has for its object to provide an alternative, simpler method of the type stated in the preamble which does not have the above stated drawbacks.

[0006] The method according to the invention has for this purpose the feature that the method further comprises the following steps of:

- b-1) determining one or more anchoring positions for anchoring the mounting device to the foundation element, wherein correction is made for the deviation determined in step (a);
- b-2) making one or more holes in the foundation element at the position of the anchoring positions determined in step (b-1); and
- b-3) placing the mounting device in the one or more holes stated in step (b-2).

[0007] According to a first preferred embodiment of the method according to the invention, the height of the mounting device relative to the foundation element can further be adjusted. Correction can hereby be made for a possible deviating height of the already placed foundation element relative to the desired height of the foundation element.

foundation element relative to the desired height of the foundation element.

[0008] The space possibly resulting between the foundation element and the mounting device after adjusting the height of the mounting device can be supported, preferably with a pressure-resistant material such as non-shrink grout.

[0009] According to a further preferred embodiment of the method according to the invention, the deviation determined in step (a) is defined by determining the desired geometric centre (centre position) of the foundation element on the already placed foundation element.

[0010] In a further preferred embodiment of the method according to the invention this centre position coincides with the one or more anchoring positions determined in step (b-1), whereby only one hole need be made in the foundation element in step (b-2). For this purpose the mounting device will be anchored with only one anchor to the foundation element.

[0011] Finally, in the final preferred embodiment of the method according to the invention, the mounting device can be built up in parts on the foundation element in step (b-3).

[0012] The invention also has for its object to provide a mounting device intended for use in the method.

[0013] The mounting device according to the invention consists of a mounting part with a substantially flat top side and anchoring means for anchoring the mounting part to a foundation element.

[0014] The mounting device according to the invention can be applied in conventional building, but is highly suitable for accommodating building elements as described in the earlier non-prepublished filed Netherlands patent application "system of building elements for forming a building" of applicant.

[0015] In a first preferred embodiment of the mounting device according to the invention the mounting part comprises one or more coupling means for coupling a building element to the mounting part.

[0016] In a second preferred embodiment of the mounting device according to the invention the mounting part is plate-like.

[0017] In a third preferred embodiment of the mounting device according to the invention the above mentioned coupling means for coupling a building element to the mounting part is of the insertion type, in particular the coupling means as described in the earlier non-prepublished filed Netherlands patent application with the title "system of building elements for forming a building" of applicant.

[0018] The coupling means is preferably embodied as a releasable coupling pin. The building element which has to be coupled to the mounting device will consequently be provided with a coupling hole for receiving this coupling pin.

[0019] In a practical embodiment of the mounting device according to the invention the releasable coupling pin is provided with screw thread, and the mounting part

is provided with at least one hole provided with an arresting means for fixing the coupling pin to the mounting part. A cap nut is preferably welded to the underside of the mounting plate. In this way a coupling pin to which a building element will be coupled can be mounted in a simple manner.

[0020] According to a further preferred embodiment of the mounting device according to the invention, the mounting part and the anchoring means have adjusting means for adjusting the height of the mounting part relative to the foundation element. These adjusting means are necessary to compensate for a variation in height of the already placed foundation element relative to the intended height of the foundation element.

[0021] In a practical embodiment of the mounting device according to the invention the anchoring means are embodied as releasable anchoring pins, each provided with screw thread, and the mounting part comprises holes for receiving the anchoring pins.

[0022] The invention will now be discussed in more detail with reference to the drawings, in which

Figure 1 shows an exploded view of the preferred embodiment of the mounting device according to the invention.

Figure 2 shows a schematic view of the result of placing a preferred embodiment of the mounting device according to the invention on the head of a pile after following the method for placing a mounting device according to the invention.

[0023] The mounting device 1 according to Figure 1 consists substantially of a mounting part 3, an anchoring means 2 and four coupling means 6.1,...,6.4 for coupling the building elements to mounting part 3.

[0024] Mounting part 3 is preferably plate-like and preferably made from a stainless material such as stainless steel. Situated in the geometric centre of mounting part 3 is a hole for receiving anchoring means 2. Anchoring means 2 is preferably rod-like and provided at the top with screw thread. The height of mounting part 3 relative to the foundation element can be adjusted by means of a nut 4 attached to anchoring means 2. In order to prevent rotation of mounting part 3 a second nut can optionally be rotated onto anchoring means 2 such that mounting part 3 is located between the two nuts.

[0025] Mounting part 3 is further provided with four holes 7.1,...,7.4 into which the coupling means 6.1,...,6.4 are inserted. Each coupling means 6 is preferably embodied as a rod-like element provided on one side with screw thread. In order to attach coupling means 6.1,...,6.4 fixedly to mounting part 3, mounting device 1 is further provided with arresting means 5.1,...,5.4. Cap nuts are preferably welded fixedly to mounting part 3 for this purpose.

[0026] The mounting device according to the invention as shown in Figure 1 is described on the basis of a mounting device with one anchoring means suitable for receiv-

ing four building elements. The mounting device according to the invention is however in no way limited to one anchoring means and/or the arranging of four building elements.

[0027] The method according to the invention will be described on the basis of a preferred embodiment of the mounting device according to the invention which is placed on a pile as shown in Figure 2. The pile is chosen as an example of a foundation element.

[0028] A driven pile will in most cases not be driven precisely at the intended position. A first step of the method according to the invention is to determine this deviation in position. This deviation can best be determined in the case of a pile on the basis of the geometric centre of the pile. In the case of other foundation elements it is possible to opt for other geometric characteristics in order to determine the deviation in position. Use can be made to determine the deviation of measurement systems known in the construction industry, such as for instance a Total Station.

[0029] After determining this deviation of the driven pile 8 the desired geometric centre of pile 8 is marked on the driven pile 8. Since the preferred embodiment of mounting device 1 has one anchoring means 2 and anchoring means 2 engages in the middle of the mounting device, the marked desired geometric centre of the pile coincides with the anchoring position 12 of mounting device 1. After drilling an anchoring hole 9 in the line of pile 8 at the anchoring position 12, anchoring means 2 is placed in anchoring hole 9. Pile 8 and anchoring means 2 are preferably connected fixedly to each other, for instance by using glue. Other methods of fixed connection of pile 8 and anchoring means 2 can however also be envisaged, for instance by using plugs.

[0030] Once anchoring means 2 has been placed, the height of the mounting part 3 to be placed is determined on anchoring means 2. Mounting part 3 is brought to the determined height by means of nut 4.

[0031] After placing of mounting part 3 on anchoring means 2 coupling pins 6.1,...,6.4 are placed on mounting part 3 and tightened into the fixedly welded cap nuts 5.1,...,5.4.

[0032] The space between the top side of the pile and the mounting part 3 can then optionally be supported. This space is preferably filled with non-shrink grout 13. This common building material is simple to arrange and is pressure-resistant.

[0033] A building element 10, for instance floor slab 10 with corner anchor or other building element from the "system of building elements for forming a building" from the stated Netherlands patent application of the inventor, can then be placed on the mounting device, wherein for instance coupling element 6.3 has to enter the corresponding hole 11.

Claims

1. Method for placing a mounting device on an already placed foundation element in order to enable correction for a deviating position of the foundation element, the method comprising the following steps of:

a) determining a deviation between the actual position of the placed foundation element and the desired position of the foundation element,
b) placing the mounting device on the foundation element such that the deviation determined in step a) is corrected,

characterized in that step (b) of the method comprises the following further steps of:

b-1) determining one or more anchoring positions (12) for anchoring the mounting device (1) to the foundation element (8), wherein correction is made for the deviation determined in step (a);
b-2) making one or more holes (9) in the foundation element at the position of the anchoring positions (12) determined in step (b-1); and
b-3) placing the mounting device in the one or more holes (9) stated in step (b-2).
2. Method as claimed in claim 1, wherein step (b) of the method comprises the following further step of:

b-4) adjusting the desired height of the mounting device (1).
3. Method as claimed in claim 2, wherein the method comprises the following further step of:

b-5) supporting the mounting device (1) on the foundation element (8).
4. Method as claimed in claim 3, wherein in step (b-5) the space between the foundation element (8) and the mounting device (1) is supported by filling with non-shrink grout.
5. Method as claimed in any of the foregoing claims, wherein the deviation stated in step (a) is defined by determining the desired geometric centre (centre position) of the foundation element (8) on the already placed foundation element (8).
6. Method as claimed in claim 5, wherein the centre position coincides with one of the anchoring positions (12) determined in step (b-1).
7. Method as claimed in any of the foregoing claims, wherein the mounting device (1) is built up in parts on the foundation element (8) in step (b-3).
8. Mounting device intended for use in the method as claimed in any of the foregoing claims, comprising a mounting part (3) with a substantially flat top side and anchoring means (2) for anchoring the mounting part (3) to a foundation element (8).
9. Mounting device as claimed in claim 8, wherein the mounting part comprises at least one coupling means (6.1,6.n) for coupling a building element (10) to the mounting part.
10. Mounting device as claimed in any of the foregoing claims, wherein the mounting part is plate-like.
11. Mounting device as claimed in claims 9 and 10, wherein said coupling means (6.1,6.n) for fixing a building element (10) is of the insertion type.
12. Mounting device as claimed in claims 9 and 11, wherein the coupling means (6.1,6.n) is formed by a releasable coupling pin.
13. Mounting device as claimed in claim 12, wherein said coupling pin (6) is provided with screw thread, and the mounting part (3) is provided with at least one hole (7.1,7.n) provided with an arresting means (5.1,5.n) for fixing the coupling pin (6) to the mounting part (3).
14. Mounting device as claimed in claims 8-13, wherein the mounting part (3) and the anchoring means (2) comprise adjusting means for adjusting the height of the mounting part (3) relative to the foundation element.
15. Mounting device as claimed in any of the foregoing claims, wherein the anchoring means (2) are embodied as anchoring pins which are provided with screw thread, and the mounting part (3) comprises holes (7.1,7.n) for receiving the anchoring pins.

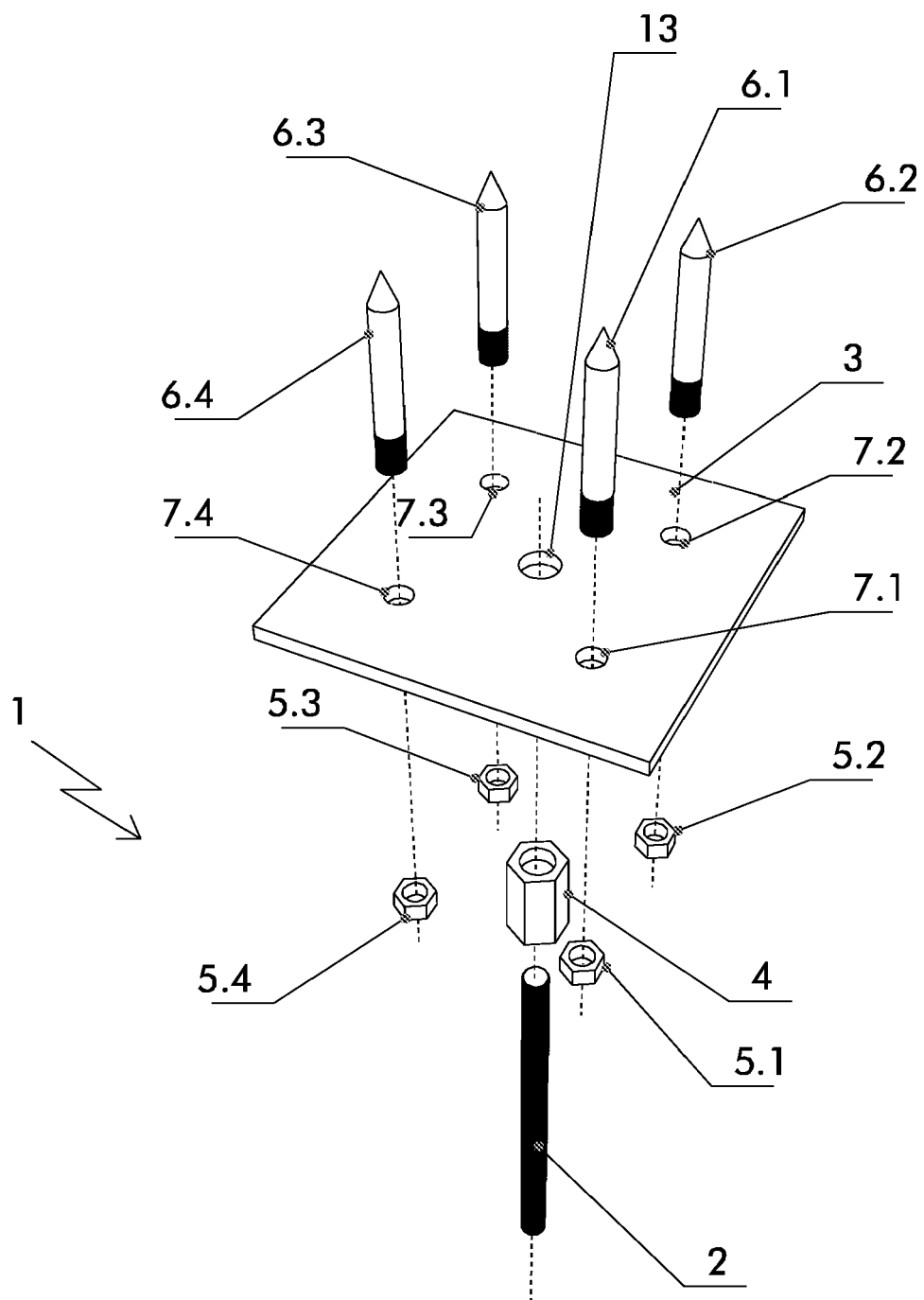


Fig.1

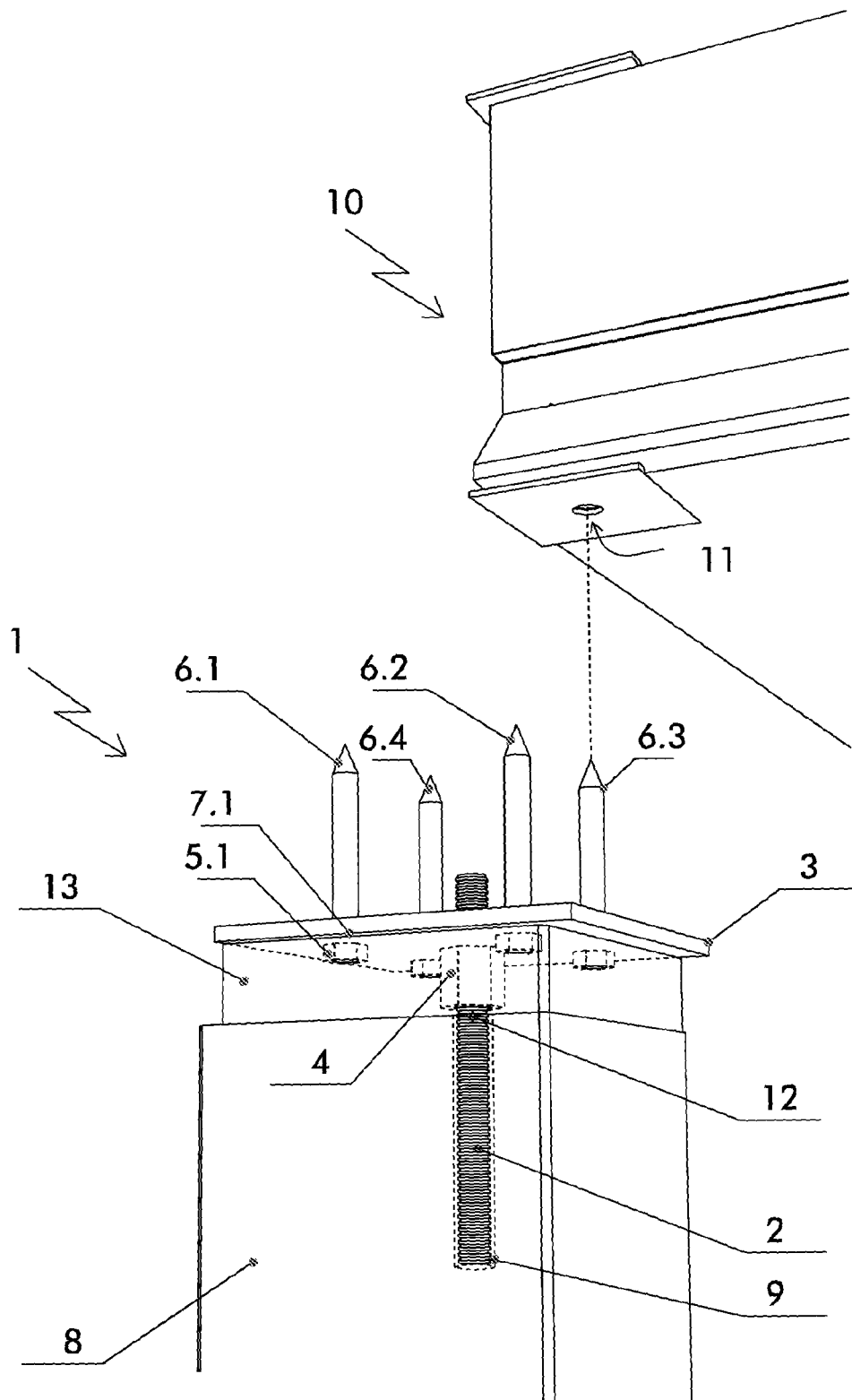


Fig.2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 9705

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 58 004030 A (SHIMIZU CONSTRUCTION CO LTD) 11 January 1983 (1983-01-11) * abstract; figures *	1,8	INV. E02D27/00 E02D27/12 E04B1/00
X	----- AU 30476 67 A (E. D. PERRY; W. C. HART) 5 June 1969 (1969-06-05) * page 10, line 13 - page 13, line 20; figures 4-9 *	8,9, 11-15	
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			TECHNICAL FIELDS SEARCHED (IPC)
			E02D E04B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 September 2007	Examiner Delzor, François
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 10 9705

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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25-09-2007

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 58004030	A	11-01-1983	NONE	

AU 3047667	A	05-06-1969	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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