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(11) **EP 1 039 056 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.09.2000 Bulletin 2000/39

(51) Int. Cl.⁷: **E04B 1/00**

(21) Application number: **00201044.5**

(22) Date of filing: **21.03.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **24.03.1999 NL 1011662**

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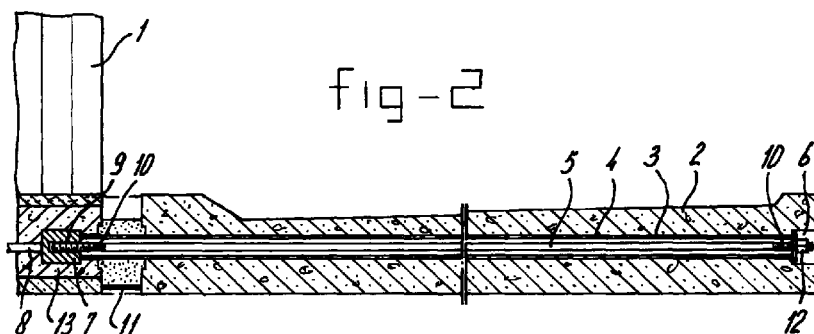
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(54) **Balcony slab - outside wall/facade/floor assembly**

(57) Balcony slab - outside wall/floor assembly. To be able to fix a balcony slab to an outside wall/floor, or to be able to remove it therefrom, at any desired point in time, a construction is proposed with which bores are made in the balcony slab, which bores extend perpendicularly to the outside wall when the balcony slab has

been fitted. Tensioning rods are fitted through these bores, which tensioning rods are screwed firmly into a fixing in the wall and tension is then applied to the tensioning rods from the other side, so that the balcony slab is forced against the wall/floor under pre-tension.



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Description

[0001] The present invention relates to a balcony slab comprising two (long) sides located opposite one another, one of said sides being arranged to be placed against an outside wall/floor for joining said balcony slab and outside wall/floor by means of fixing rods, which extend from the one side to the other side.

[0002] Such a balcony slab or balcony slab/outside wall assembly is disclosed in EP 0 784 127 A1. This publication describes a balcony slab with longitudinal and transverse reinforcement cast therein. The transverse reinforcement protrudes somewhat and is joined with the aid of a coupling construction to a threaded component that has been cast with the aid of a slab in an outside wall or the like. DE 29505093.4 U1 describes a concrete slab which during production is provided with tensioning rods which are cast in the concrete slab material. The protruding parts of these rods are inserted on site through holes in a fixing. The protruding parts are provided with a screw thread and the balcony slab is tightened against the outside wall or a floor slab with the aid of nuts. The fixing on the wall protrudes somewhat with respect to the wall/floor slab, as a result of which it is possible to tighten the nuts.

[0003] Such a construction has the disadvantage that during transport the protruding reinforcement components on the one hand appreciably increase the volume of the balcony slab and, on the other hand, appreciably increase the risk of damage to these protruding parts or injury to those working with them. The fact that the dimensions are larger plays a role in particular when transporting by road, where statutory maxima apply. As a result of damage it can be difficult to fit the nuts at a later stage because the thread has been damaged. Once the construction concerned has been installed, the part where the nuts are located is filled by pouring in concrete. As a result subsequent removal is not possible. Moreover, it is necessary always to install a balcony slab at the location of the fixing. If this is not done it is necessary to fill the space where the nuts ought to be located by pouring in concrete. That is to say, subsequent installation of a balcony slab on an outside wall is no longer possible.

[0004] The aim of the present invention is to avoid the disadvantages described above.

[0005] This aim is realised with a balcony slab as described above in that there are a number of bores located next to one another and extending through said balcony slab from the one side to the other side, for removably accommodating said fixing rods, and in that said other side is provided with support means for receiving the thickened ends of fixing rods inserted through said bores. As a result of the use of such a balcony slab in which bores extending from the one to the other side have been made, it is possible to fit the rods concerned only on site. These rods can be pre-tensioned and tightened from the free side of the balcony

slab, that is to say the side which faces away from the outside wall. It is necessary only to screw the rods into an existing fixing in the wall/floor slab. Tensioning can take place from the other side. As a result it is possible to make the fixing in the wall/floor slab flush with the outside wall, for example. In contrast to the construction according to EP 0 784 127, the reinforcing bars are not cast in but have been fitted such that they are removable. Consequently, tensioning from the other side, which has been described above, is possible. If a balcony slab is not fitted, only a number of openings, provided with screw thread, in which the rods concerned have to be screwed, remain visible from the outside. These openings can simply be sealed or hidden from view by a thin layer of concrete. Such a thin layer of concrete or the like can easily be removed later if the balcony slab has to be installed. It is, of course, possible to provide for fixing between the tensioning rods and the fixing in the outside wall in some other way instead of with screw thread. It is possible first to fit the balcony slab in place and, after supporting the latter, to fit the relevant tensioning rods. It is also possible first to couple the tensioning rods to the fixing and then to slide the balcony slab onto the tensioning rods. In any event after fitting of the tensioning rods in the balcony slab and coupling of the tensioning rods and the fixing in the outside wall are complete, tightening will always take place from the opposing side.

[0006] To prevent cold bridges it is possible to fit insulating spacers between balcony slab and outside wall. Optionally the gap produced in this way can be filled (by pouring in plastic). The same applies in respect of the space in the balcony slab in which the means for tensioning the tensioning rods have been accommodated. In the simplest embodiment, these means comprise nuts which engage on a thread present on the tensioning rods. Such a space can also be filled with concrete or plastic after tensioning has taken place.

[0007] With the construction according to the invention it is possible in a simple manner subsequently to install balcony slabs and to remove these again, if desired. Moreover, there is no longer the inconvenience of protruding reinforcement components during transport because the tensioning rods have to be fitted in the balcony slab only on site and during transport can be transported in the 'lengthwise direction'. A risk of damage or injury therefore also no longer exists.

[0008] The bores in the concrete slab can optionally be delimited by tubes. That is to say when the concrete slab is manufactured a number of tubes located some distance apart are placed in a mould and the whole is filled by pouring in concrete, as a result of which the bores through the slab are automatically produced. Instead of tensioning rods it is, of course, also possible to use tensioning cables. After the rods or cables have been tensioned, it is possible to inject the relevant tubes or drilled hole in the concrete slab with the aid of a plastic or the like.

[0009] Although reference has always been made above to a balcony slab, it must be understood that any protruding part of an outside wall can be fixed to said outside wall using the construction described above.

[0010] A preferred embodiment of the invention will be explained in more detail below with reference to the drawings. In the drawings:

Fig. 1 shows, diagrammatically, the balcony slab/outside wall assembly in plan view and partially in cross-section; and

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

[0011] In Fig. 2 an outside wall is indicated by 1 and a floor (slab) by 13. The floor slab 13 is provided with a fixing body 7, which has, for example, been cast in and which is joined to the other part of the construction, such as the floor section of a building or the like located behind it, with the aid of anchors 8. The fixing body 7 is provided with threaded holes 9. These threaded holes 9 extend to close to the outside of the outside wall/floor slab. These holes can have been plugged or protected against environmental influences in some other way.

[0012] A balcony slab is indicated by 2. The slab is provided with bores which extend perpendicularly to the outside wall and which are indicated by 3. These bores are delimited by tubes 4 and tensioning rods 5 can have been fitted in the latter. Tensioning rods 5 are provided at both ends with thread 10. The concrete slab is provided with a space 6 close to the side away from the wall. This space is so formed that a nut 12 can bear on it. The thread of nut 12 and hole 9 correspond to the thread 10.

[0013] The concrete slab described above is attached as follows to outside wall 1: a concrete slab, consisting of the concrete slab shown provided with the bores 3, is produced in the factory. The tensioning rods or other tensioning elements 5 are supplied separately with the slab, that is to say are not necessarily in bores 3 during transport. Threaded hole 9 is then exposed, that is to say such that it is accessible to tensioning rods 5, on site. The balcony slab is then manoeuvred into the correct position and the tensioning rods 5 are fixed to the fixing body 7 by screwing. Spacer blocks 11 are optionally fitted beforehand, but this can also be carried out after fitting the tensioning rods 5. A (quick-)setting mortar is then introduced into the gap between the wall and the balcony slab. This can, of course, also be carried out at a later point in time. The nuts 12 are then tightened, that is to say the tensioning rods 5 are pre-tensioned and press the balcony slab against outside wall 1, or floor slab 13. Space 6 can then be filled in some way or other to hide the nuts from view and to protect them against external influences. Optionally the bores 3 can be injected with some sort of material. It will be understood that since the size of the bores is suitably chosen the relative positions of the various threaded holes 9 is not very critical.

[0014] If the presence of a balcony slab is no longer desired, the balcony slab and the fixing 7 can be separated simply by making nuts 12 freely accessible or by (with support) breaking the join close to the spacers 11. The tensioning rods can then be removed from the holes 9 and another balcony slab can optionally be fitted. Moreover, with the above construction it is still possible to fit a balcony slab later, that is to say after a building construction is complete, in which case, of course, a fixing body 7 has then been fitted. It is also possible to make balconies larger or smaller without far-reaching modifications.

[0015] Although the invention has been described above with reference to a preferred embodiment, it must be understood that numerous modifications can be made thereto without going beyond the scope of the present application described in the appended claims.

Claims

1. Balcony slab comprising two (long) sides located opposite one another, one of said sides being arranged to be placed against an outside wall/floor for joining said balcony slab and outside wall/floor by means of fixing rods, which extend from the one side to the other side, characterised in that there are a number of bores (3) located next to one another and extending through said balcony slab (2) from the one side to the other side, for removably accommodating said fixing rods (5), and in that said other side is provided with support means for receiving the thickened ends (12) of fixing rods inserted through said bores.
2. Balcony slab - outside wall/floor assembly comprising a balcony slab as well as an outside wall (1) /floor (13), which is provided, at the location where the balcony slab has to be fitted, with a fixing (7), for said balcony slab (2), which is anchored in the wall/floor, the fixing comprising joining means (9) for joining to fixing rods (5) protruding from the balcony slab, characterised in that said balcony slab comprises a balcony slab according to Claim 1 and said fixing rods can be tightened from said other side of said balcony slab (2) in such a way that after joining said fixing rods to said fixing in said wall that part of said fixing rods which extends through said bores (3) is under pre-tension.
3. Balcony slab - outside wall/floor assembly according to Claim 1, wherein said fixing comprises a threaded hole (9) and said fixing rods (5) are provided with matching thread (10) at the end close to the one side.
4. Balcony slab - outside wall/floor assembly according to Claim 2 or 3, wherein the point of engagement of said fixing and said fixing means is

permanently accessible after removal of said balcony slab.

5. Balcony slab - outside wall/floor assembly according to one of Claims 2 - 4, wherein said fixing means are provided at the end close to said other side with screw thread for receiving a nut (12) bearing against said balcony slab. 5
6. Balcony slab - outside wall/floor assembly according to one of Claims 2 - 5, wherein a spacer (11) has been fitted between said wall and said balcony slab. 10
7. Method for fitting a balcony slab to an outside wall/floor, comprising providing an outside wall/floor with a fixing, providing a balcony slab according to Claim 1, fitting said balcony slab, with support, close to said wall, inserting fixing rods through openings made in said balcony slab, fixing said fixing rods to said fixing in said wall, providing a spacer between said wall and concrete slab and tensioning said fixing rods from the free side of the concrete slab. 15 20 25

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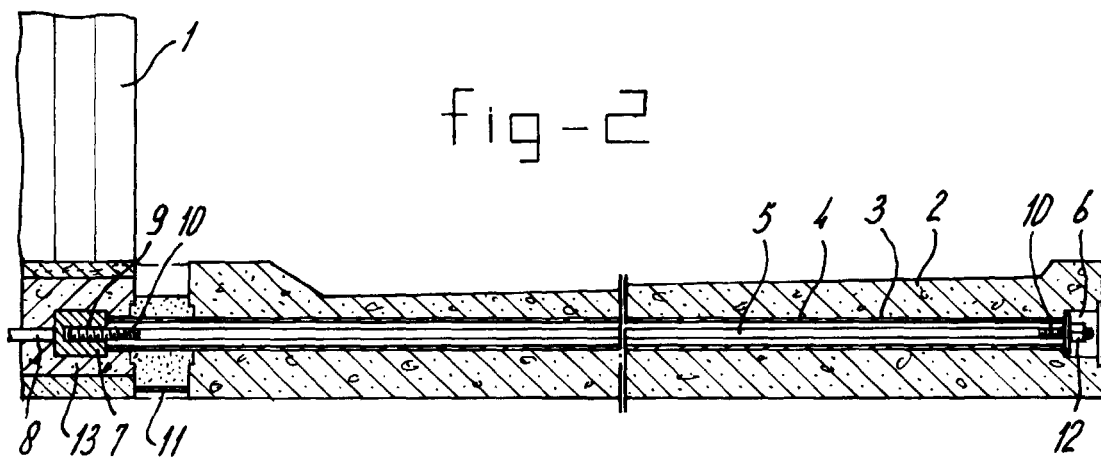
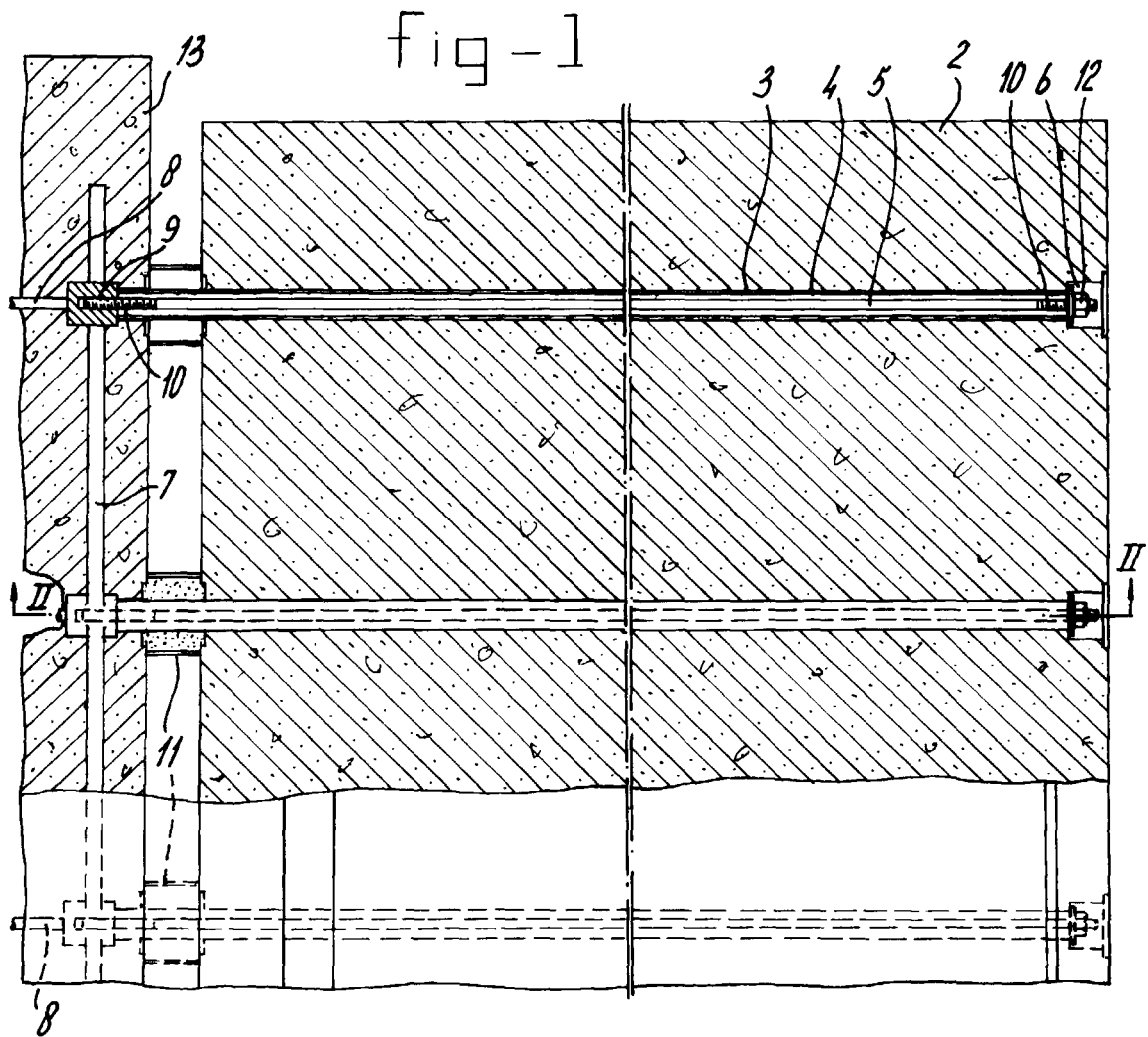
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European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 1044

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 784 127 A (BAM AG) 16 July 1997 (1997-07-16)	1-4,6,7	E04B1/00
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E04B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 June 2000	Examiner Vrugt, S
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			

EPO FORM 1503 03 82 (P04C01)

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

EP 00 20 1044

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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20-06-2000

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