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Datasheet for the decision of 2 April 2008

Case Number: T 1078/05 - 3.2.03

Application Number: 00307351.7

Publication Number: 1079044

IPC: E04G 23/02

Language of the proceedings: EN

Title of invention:
Structural support

Applicant:
H & H Property Management Limited

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - (yes) after amendment"

Decisions cited:
-

Catchword:
-

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Case Number: T 1078/05 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 2 April 2008

Appellant: H & H Property Management Limited
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 21 March 2005 refusing European application No. 00307351.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
K. Garnett

Summary of Facts and Submissions

I. European patent application EP-A-1 079 044 relates to structural supports, which are commonly used for supporting concrete roof panels. According to the application, a hollow tube or bag is placed between a support and a sagging roof panel, which is then inflated to raise the roof; a self-setting material such as concrete is then inserted into the space around the inflated bag to hold the roof panel in position.

II. This appeal arises from the decision of the Examining Division to refuse the application for lack of inventive step with respect to the following documents:

D1: FR-A-2 722 819
D2: US-A-5 397 103
D5: US-A-3 822 861

III. The decision was posted by the Examining Division on 21 March 2005; the Appellant (applicant) filed notice of appeal on 23 May 2005, having already paid the appeal fee on 20 May 2005; a statement containing the grounds of appeal was received 21 July 2007.

IV. In accordance with Article 11(1) (now Article 15(1)) of the Rules of Procedure of the Boards of Appeal, the Board issued a preliminary opinion, which set out, amongst other things, its views on inventive step. In a letter dated 13 November 2007, the Appellant's representative replied to the preliminary opinion, and following a telephone discussion on 11 February 2008 with the Rapporteur, confirmed that the sole request is

to have a patent granted on the basis of the following documents:

Claims 1 to 18, as filed with the letter dated 13 November 2007:

Description pages 1 to 11, as filed with the letter dated 13 November 2007;

Figures, sheets 1 to 6, as originally filed.

V. Claim 1 reads as follows:

"1. A method comprising inserting in a space between a constructional component (10) and a structural component (2) a hollow element (20), and introducing a fluid into said hollow element (20), such that it acts between the two components (2,10) to generate a force therebetween deflecting said constructional component (10) away from said structural component (2) and thus pre-stressing said constructional component (10), characterised in that said hollow element (20) is inflated from a deflated or partially deflated condition to act between the two components (2,10) as aforesaid and in that, once said constructional component (10) has been deflected away by a required degree, spacing means (6) comprising a self-setting material is placed in at least a part of the remainder of said space not occupied by said hollow element (20) and in engagement with said two components (2,10) and in that said self-setting material subsequently sets rigidly."

Independent claim 12 defines a structure:

"12. A structure comprising: a constructional component (10); an associated structural component (2) supporting said constructional component (10); and a hollow element (20) inserted in a space between the constructional component (10) and the structural component (2) and deflecting said constructional component (10) away from said structural component (2), characterised in that said hollow element (20) is in an inflated condition and in that the structure includes rigid spacing means (6) comprised of self-set material in at least part of a remainder of said space not occupied by said hollow element (20) and in engagement with both of the components (2,10)."

Dependent claims 2 to 11 and 13 to 18 concern preferred embodiments of the method and structure respectively.

VI. Appellant's Submissions

(a) Document D1

The present invention is distinguished over D1 by at least the fact that in D1 the tube is expanded by filling with wet cement, whereas according to claim 1 the self-setting medium eg cement is placed outside the inflated element.

This leads to several advantages, which are summarised as follows:

a) the self-setting material is not under any pressure until it has fully hardened;

b) air or gas can be used to inflate the hollow means, which requires a simpler pumping means;
c) it is not necessary to have access to both ends of the hollow element, as is required by D1;
d) after use, the hollow element may be deflated for re-use;
e) if air is used as the inflating medium, it is freely available on-site, unlike cement or resin which must be transported to the application site;
f) a fluid provides a more responsive inflating medium than wet cement, which enables a greater control of the deflection.

Since the invention provides a useful contribution over the art, the requirements of Article 52 EPC are met.

(b) Documents D2 and D5

D2 relates to lifting a storage tank in its entirety; there is no suggestion that the tank is pre-stressed by the lifting forces. Consideration of D2 in the context of the present invention can be made only with the benefit of hindsight. The same applies to D5, which concerns the removal of forms from moulded concrete.

Reasons for the Decision

1. The appeal is admissible.

2. *Article 123(2) EPC*

The present claim 1 is a result of extensive amendment of claim 1 as originally filed.

The "two spaced components" referred to in the original set of claims are now defined as "constructional component (10)" and "structural component (2)". The distinction was made by the Appellant to clarify that it is the constructional component (10) (for example, a roofing panel) that is deflected relative to structural component (2). In Board's view both expressions really mean the same thing, namely a component of a structure. However, this is disclosed throughout the application (see, for example, paragraphs [0006], [0016] and [0030]), hence the amendment does not add subject-matter beyond that originally filed.

Claim 1 now refers to a "hollow element (20)", which is further defined as being inflated. This does not add anything beyond original claim 2, upon which the present claim 1 is largely based, which defined an "inflatable element", ie indicating that the element is hollow to some degree.

Claim 1 has also been amended to require that a fluid is introduced into the hollow element (20). Since it is implicit that when "inflating" an object, fluid (usually air or gas) is introduced into the object, this amendment does not add any new subject-matter.

Concerning the dependent claims, pumping of the self-setting material is disclosed in paragraph [0037] of the published application (claim 2). Structural cement, concrete, mortar and grout are disclosed as examples of the spacing means in paragraph [0016] (claim 3). The use of more than one inflatable element is disclosed in paragraphs [0030] and [0031] (claim 4). The features of

dependent claims 5 to 8 are disclosed in claims 4 and 6 to 8 respectively of the original application. The limitation of the constructional element (10) to one comprising reinforced, autoclaved, aerated concrete (claim 9) is described throughout the application, for example in paragraph [0006]. The subject-matter of claims 10 and 11 is disclosed in paragraphs [0019] and [0017] respectively.

The references set out above likewise provide support for independent product claim 12 and dependent claims 13 to 18.

Consequently, the amendments meet the requirements of Article 123(2) EPC.

3. *Novelty (Article 54 EPC)*

3.1 Document D1 discloses a method of deflecting or pre-stressing constructional components by expanding a hollow element. According to D1, a self-setting material such as cement or resin is used to expand a tube and force the two components apart; the self-setting material then hardens to hold the components in position. The method of claim 1 differs in that once the tube has been inflated, a self-setting material (eg concrete) is placed in at least part of the remaining space not occupied by the hollow element.

3.2 D2 concerns the lifting of large storage tanks for inspection, repair and reconstruction purposes, so the method of D2 is not one of pre-stressing constructional components. In addition, the rigid spacing means of D2

(support members 20) is of a temporary nature, and one comprising a self-setting material is not disclosed.

3.3 D5 describes a method for stripping moulding forms from solidified concrete, which uses an inflatable device. D5 does not disclose a method of pre-stressing components, since the panels are simply stripped from the surface of the concrete; there is also no disclosure of a rigid spacing means comprising a self-setting material.

3.4 The method of claim 1 is therefore novel with respect to the cited documents.

4. *Inventive Step (Article 56 EPC)*

4.1 D2 concerns lifting large storage tanks, and D5 describes stripping concrete moulds. D1 discloses a method of deflecting and pre-stressing constructional components by inflating a hollow element; the components are then held in position by a self-setting material. D1 thus provides the most appropriate starting point for the assessment of inventive step.

4.2 According to D1 a self-setting material having liquid-like properties, such as cement or synthetic resin, is pumped into a hollow element in the form of a long flexible bag.

Starting from D1, the technical problem to be solved is seen as how to improve the method of expanding a hollow element to deflect or pre-stress constructional components.

4.3 The solution, as defined in claim 1, lies in placing the self-setting medium in at least part of a remainder of the space between the constructional component (10) and the structural component (2) that is not occupied by the inflated hollow element (2).

This means that, unlike the method of D1, it is not necessary to use a self-setting material, such as cement, as the medium for expanding the tube, which has the advantages mentioned by the Appellant, the most relevant of which are as follows.

The claimed method requires the hollow element to be inflated by a fluid, such as air or a gas, which provides a more responsive medium giving greater control over the degree of deflection. It is also difficult to pump cement under pressure and specialist equipment is needed for this task; this can be avoided by the method of claim 1, since only a conventional compressor is required for pumping air or gas.

According to D1, the hollow element has two openings, one at each end (4a and 4b in Figure 1 of D1). The wet cement is pumped into the tube through the first opening until it is observed flowing out of the second, which is then closed; further pumping pressurises the tube. It is thus necessary to have access to both ends of the tube, which may be an inconvenience in some situations. Since the hollow element of claim 1 is inflated using a fluid, only one opening is required, and this disadvantage is avoided.

The method of claim 1 also has the effect that in the initial stages, the pressure can be borne solely by the

inflatable element, and only when the self-setting material has hardened does it take over support from the inflatable element; thus, the cement can be applied relatively easily, whereas in the case of D1 the wet cement in the tube is under constant pressure.

4.4 Since none of the available prior art documents hint at providing these advantages by applying the self-setting material outside of the hollow element, the method of claim 1 has an inventive step.

4.5 Claims 12 to 18 define a structure that comprises a hollow element in an inflated condition and a rigid spacing means in the form of a self-set material in the space not occupied by the hollow element. The subject-matter of these claims is novel and has an inventive step for the same reasons given above for the method of claim 1.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent in the following version:

   Claims 1 to 18, as filed with the letter dated 13 November 2007

   Description pages 1 to 11, as filed with the letter dated 13 November 2007;

   Figures, sheets 1 to 6, as originally filed.

The Registrar: The Chairman:

A. Counillon U. Krause