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Datasheet for the decision of 9 October 2013

Case Number: T 0480/10 - 3.2.02

Application Number: 06804845.3

Publication Number: 1937147

IPC: A61B 5/103, G01N 3/22

Language of the proceedings: EN

Title of invention:
Method and device for measuring the local mechanical resistance of a porous body

Applicant:
AO Technology AG

Headword:
-

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0480/10 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 9 October 2013

Appellant: (Applicant)
AO Technology AG
Grabenstrasse 15
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Representative:
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Decision under appeal:
Decision of the Examining Division of the European Patent Office posted on 27 October 2009 refusing European patent application No. 06804845.3 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: E. Dufrasne
Members: D. Ceccarelli
P. L. P. Weber

Summary of Facts and Submissions

I. The appellant lodged an appeal against the decision of the Examining Division, dispatched on 27 October 2009, to refuse European patent application No. 06 804 845.3.

II. The notice of appeal was received on 2 January 2010 and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 27 February 2010.

III. In the statement setting out the grounds of appeal, the appellant requested annulment of the Examining Division's decision and that a patent be granted on the basis of a main request or, in the alternative, on the basis of one of the first to fifth auxiliary requests.

The appellant also requested oral proceedings should the main request not be granted.

IV. The Board summoned the appellant to oral proceedings and provided its provisional opinion.

V. Oral proceedings took place on 9 October 2013. During the oral proceedings, the appellant filed claims 1 to 9 and an adapted description according to a new main request.

The appellant's final requests were that the decision under appeal be set aside and that a patent be granted on the basis of the main request filed during the oral proceedings.

VI. The following documents are mentioned in the present decision:

D1: EP-A-1 491 294;
D4: GB-A-2 313 916.

VII. Claim 1 of the main request reads as follows:

"Device for measuring the local mechanical resistance inside of a porous bone structure having a variable density and/or porosity, comprising:
A) a tool (1) with a shank (4) designed in such a manner that it is insertable into a hole artificially drilled into said porous bone structure and that it is capable of exerting a torsional force on said porous bone structure surrounding said drilled hole by inserting said shank (4) of the tool (1) into said drill hole, said shank (4) having a central axis (2);
B) a measuring unit (20) for determining the elastic or destructive properties of said porous bone structure generated by the torsion force of said tool (1) in said porous bone structure;
C) displaying means for displaying the properties of said porous bone structure determined by said measuring unit (20), wherein
D) the measuring unit (20) is provided with a microprocessing unit (22) allowing to retrievably store the measured values; and
E) said tool (1) is provided with blades (5) at its front end (6), the blades (5) being capable of exerting the torsional force on said porous bone structure."

The other claims of the main request are dependent claims.

VIII. The appellant's arguments are summarised as follows.

Document D4 was concerned with a method and a device for testing the strength of metals. The sentence on its page 1, lines 3-5, not excluding materials other than metal did not add anything to the disclosure of document D4, since only the application to metal members was extensively discussed. In any case, among other differences with respect to the subject-matter of claim 1, the device of document D4 did not also disclose blades capable of exerting torsional force locally, in an inhomogeneous structure of a porous bone. It followed that document D4 had to be disregarded, in particular because it did not even belong to the field of the invention claimed.

Document D1 concerned a particular screw driver for implanting screws. In particular, it did not disclose blades on the tip of said screw driver. For the person skilled in the art there was also no motivation to provide blades on said tip, because they would have no purpose for the screw driver.

Reasons for the Decision

1. The appeal is admissible.

2. The subject-matter of claim 1 is based on claims 28 and 32 as well as the last two full sentences on page 5 and the last two sentences on page 7 of the original application in the published version. The Board is satisfied that the requirements of Article 123(2) EPC are fulfilled.

3. Document D1 discloses a device for implanting screws. Said device is in the form of a screw driver with a hexagonal distal tip for applying torque to the screw. The proximal side of the device is equipped with a display showing the value of the torque which is being applied. This can be used to make sure that the screws are implanted with the correct predetermined torque.

4. Document D4 discloses an apparatus for testing the strength of materials, in particular metal members in situ on structures. Said apparatus comprises a cylindrical testing tool with equispaced ridges along its surface, the tool being substantially harder than the material to be tested. In use, the tool is inserted into a complementary cavity obtained in the material to be tested. The tool cannot be freely rotated within the cavity, due to engagement between its ridges and the corresponding ridges of the cavity. When the tool is rotated, the necessary torque is registered and the maximum value reached is displayed by a lazy pointer. This value is a measure of the yield strength of the material in question.

5.1 Document D4 specifically mentions the use of its apparatus for measuring the yield strength in situ of metallic members of large fixed structures such as radio masts (page 1, lines 6 to 8) made of galvanised steel (page 4, lines 18 to 20). Although in D4 the use of the apparatus on other materials is in principle not excluded (page 1, lines 3 to 5), from the whole disclosure of document D4 one can at most infer that said other materials should have a yield strength of the same order of magnitude as said metallic members. The torque involved in the measurement of such yield strength is not comparable to that required for measuring the local mechanical resistance inside a porous bone structure as claimed. As a matter of fact, it is disputable whether the lazy pointer of the apparatus of document D4 would even register any torque, were the apparatus able to apply said torque in a porous bone structure, which has a far lower mechanical resistance.

The Board therefore concludes that document D4 does not disclose a device suitable for measuring the local mechanical resistance inside a porous bone structure.

Since there is also no hint in document D4 that its device could be suitable for any uses in technical fields closer to that of bone implants as in the present invention, the skilled man would not adapt it to such uses in view of any technical problem arising in such fields.

Hence, starting from document D4, the skilled person would not arrive at the subject-matter of claim 1

without exercising an inventive activity in accordance with Article 56 EPC.

5.2. Document D1 is concerned with implanting screws. In particular, its device can measure a torque related to the local mechanical resistance of the part (e.g. a bone) where these screws are implanted. It follows that the device of document D1 is for a use similar to that of the claimed invention.

Document D1 discloses a device suitable for measuring the local mechanical resistance inside a bone structure (column 1, lines 3 to 6 and 35 to 38), comprising a tool (figure 1) with a shank having a central axis (part 5, figure 1) and capable of exerting a torsional force onto a screw (column 3, lines 23 to 25), a measuring unit (coil 5 and rod 3, figure 3) for determining elastic properties of said bone structure generated by the torsional force of said tool (column 1, lines 39 to 48) and display means for displaying the properties of said bone structure determined by the measuring unit (pointer 4, figure 3 and column 1, lines 39 to 48).

The subject-matter of claim 1 differs from the disclosure of document D1 in particular in that the tool with a shank is capable of exerting a torsional force on a porous bone structure surrounding a drilled hole by inserting said shank into said hole, the tool being provided with blades at its front end, the blades being capable of exerting said force.

This differentiating feature has the effect of providing a measurement of the mechanical resistance at

the position of the blades, i.e. at the front end of the tool.

The objective technical problem to be solved is therefore how to more precisely establish the local mechanical resistance of the porous bone structure having a variable density and/or porosity.

Document D1 does not address this problem, as it is concerned with the implantation of screws with the correct predetermined torque. The measured torque is dependent on the properties of the material along the whole screw.

Document D4 is concerned with measuring the local yield strength of metals or materials with similar yield strength. Since a porous bone structure has a completely different yield strength, for that reason alone the skilled man would not consider document D4 in view of the above-defined technical problem. Further, document D4, as well as the other cited documents, fails to disclose blades capable of exerting a torsional force on a porous bone structure. Without entering into the question of whether the ridges on the cylindrical surface of the apparatus of document D4 can be considered as blades, as found by the Examining Division in the impugned decision, said ridges are disclosed to work with a complementary hole of a certain precision made in a metallic structure. It is however not disclosed that they could also apply a meaningful torque in a hole drilled in a porous bone structure. Due to the inhomogeneous porosity of the material involved, it is unlikely that the profile of

the hole obtained closely corresponds to the profile of the cylindrical surface of the apparatus of document D4.

It has therefore to be concluded that the skilled person, also starting from document D1, would not arrive at the subject-matter of claim 1 without exercising an inventive activity in accordance with Article 56 EPC.

6. The Board is also satisfied that the subject-matter of claim 1 is inventive over any other combination of the cited prior art.

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 on the basis of:

   - claims 1 to 9 of the main request filed during the oral proceedings;

   - adapted description, pages 1 to 10, filed during the oral proceedings; and

   - figures 1 to 3 of the application as published.

The Registrar: The Chairman:

D. Hampe E. Dufrasne