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**Datasheet for the decision  
of 15 July 2009**

**Case Number:** T 0664/06 - 3.4.02

**Application Number:** 96850176.7

**Publication Number:** 0774678

**IPC:** G02B 6/255

**Language of the proceedings:** EN

**Title of invention:**

Methods and devices at optical fibres

**Applicant:**

TELEFONAKTIEBOLAGET LM ERICSSON (publ)

**Opponent:**

-

**Headword:**

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**Relevant legal provisions:**

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**Relevant legal provisions (EPC 1973):**

EPC Art. 54, 56

**Keyword:**

"Novelty device claim - yes"

"Inventive step device claim - yes"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0664/06 - 3.4.02

**D E C I S I O N**  
of the Technical Board of Appeal 3.4.02  
of 15 July 2009

**Appellant:**

TELEFONAKTIEBOLAGET LM ERICSSON (publ)  
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**Representative:**

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**Decision under appeal:**

Decision of the Examining Division of the  
European Patent Office posted 2 December 2005  
refusing European patent application  
No. 96850176.7 pursuant to Article 97(1) EPC  
1973.

**Composition of the Board:**

**Chairman:** A. G. Klein  
**Members:** M. Rayner  
B. Müller

## Summary of Facts and Submissions

I. The present appeal was lodged against the decision of the examining division refusing European patent application number 96 850 176.7. The patent application is concerned with determining angular position of axial optical symmetry of an optical fibre.

II. During the examination proceedings, the examining division objected against method claim 1, in point 1.2 of the communication dated 13.08.2004, that it was not clear from the claim that difference curves were derived such as by, firstly, computing the correlation functions of measured intensity difference curve with several simulated reference intensity difference curves of different type, secondly, computing the correlation function to choose the angular position of the highest computed factor. In the same communication, it was nevertheless acknowledged in point 3 that a claim including all essential features of the invention would fulfil the requirements of the EPC in relation to novelty and inventive step because an interpolation step is eliminated.

In its reply of 23.12.2004, the applicant argued that recitation of an exact way of making the comparison was unnecessary and in the decision under appeal, the examining division did not deal with independent method claim 1.

III. In the decision under appeal itself, the examining division made reference to the following document:

D1 WO-A-95/14945.

According to the examining division, the independent device claim 12 presented to it was directed to subject matter which is not novel in the sense of Article 54 EPC 1973 having regard to document D1. The device disclosed the features claimed, in particular storing means for storing a simulated profile, having substantially the same basic shape as a measured profile, as storing means for a measured curve is suitable and adapted for storing a simulated profile. The division explained, in point 3 of its reasons for the decision, that it had never questioned that the subject matter of the application showed clear differences with respect to the prior art methods, however these differences were not reflected in claim 12.

- IV. The appellant requested that the decision under appeal be set aside and the patent application be further processed. A set of claims 1-19 and a second set 1-11 were filed with the letter dated 17.03.2009, which second set the board understands from the last paragraph of the letter dated 03.04.2006 to be an auxiliary request. The appellant argued in support of its case that the storing means claimed was novel and a simulated profile not mentioned in document D1 as used by the comparing means. The comparing means and angle determining means perform operations which are completely different to those of the comparing means and angle determining means of document D1. The subject matter of the claim was therefore both novel and inventive.

V. Independent claims 1 and 12 are worded as follows.

"1. A method of determining the angular position about an longitudinal axis of at least one axial optical asymmetry located in parallel to the longitudinal axis of an optical fiber (1, 1'), the at least one axial asymmetry of the optical fiber located in an arbitrary angular start position about the longitudinal axis of the optical fiber, comprising the steps of:

- illuminating (7) the optical fiber with a light beam, the light beam comprising light for which the optical fiber is transparent,
- rotating (3) the optical fiber through a predetermined angular interval from the start angular position about the longitudinal axis thereof, and
- determining during the rotation, for a number of different angular positions, the difference between the intensity of light, which has passed through the optical fiber and in its position corresponds to the central portion of the optical fiber as seen in the longitudinal direction of the optical fiber, and the intensity of light, which has passed through the optical fiber and in its position corresponds to regions located most close to and outside the optical fiber, to provide a measured profile formed by the determined differences as a function of the rotation angle from the start angular position, characterized by the additional steps of
- selecting a simulated profile having substantially the same basic shape as the measured profile,
- comparing the determined differences of the measured profile to values of the selected simulated profile for the same angular positions, the comparison being made for a plurality of translational positions of the

selected simulated profile, the translational positions formed by adding different angular translational values to the argument of the selected simulated profile to give corresponding translated simulated profiles, and

- determining, from the comparing, that of the translated simulated profiles, which gives the best agreement between the determined values of the measured profile and the values of the translated simulated profile, the angular translational value of the determined translated simulated profile being a measure of the angular rotational position of the optical fiber from a fixed or reference angular position.

12. A device for determining the angular position about an longitudinal axis of at least one axial optical asymmetry of an optical fiber (1, 1'), the at least one axial optical asymmetry located in parallel to the longitudinal axis of the optical fiber and in an arbitrary angular start position about the longitudinal axis of the optical fiber, the device comprising

- illuminating means (7) for illuminating the optical fiber with a light beam, and
- rotating means (3) for rotating the optical fiber a predetermined angular interval, and
- difference determining means for determining, during the rotation, for different angular positions in relation to the start angular position the difference between the light intensity of light which has passed through the optical fiber and in its position corresponds to the central longitudinal portion of the optical fiber and of light which has passed through the optical fiber and in its position corresponds to the region adjacent to or substantially at the longitudinal

central portion of the optical fiber to provide a measured profile formed by the determined differences as a function of the rotation angle from the start angular position,

the device further characterized by

- selecting means for selecting a simulated profile having substantially the same basic shape as the measured profile,
- comparing means for comparing the determined differences of the measured profile to values of the selected simulated profile for the same angular positions, the comparison being made for a plurality of translated positions of the selected simulated profile, the translated positions formed by adding different angular translational values to the argument of the selected simulated profile to give translated simulated profiles, and
- angle determining means for determining, from the comparing made by the comparing means, that of the translated simulated profiles, which gives the best agreement between the determined differences of the measured profile and the values of the translated simulated profile for the same angular positions, the angular translational value of the determined simulated profile being a measure of the angular rotational position of the optical fiber from a fixed angular position or reference angular position."

The board observes that there are also two "use" claims, one, claim 8, being directed to use of the method according to any of claims 1-7, and the other, claim 18, being directed to use of the device according to any of claims 12-17.

## Reasons for the Decision

1. The appeal is admissible.
2. Method Claim 1
  - 2.1 The board considers the amendment offered to claim 1 concerning the recitation of "selecting..." and "comparing..." in the characterising part of claim 1 to meet the clarity objection set out in the communication of the examining division dated 13.08.2004, concerning derivation of the differences. In particular, the board can accept the appellant's view, that this is clear to the skilled person from the wording of the claim without recitation of a specific function.
  - 2.2 The examining division acknowledged substantive patentability of the subject matter of the claim and the board has seen no reason to diverge from this viewpoint. In particular, the board considers the problem solved to be improving the method and concurs with the examining division that selecting and comparing in relation to simulated profiles offers the improvement of dispensing with an interpolation step.
  - 2.3 Accordingly, the subject matter of claim 1 can be considered to involve an inventive step within the meaning of Article 56 EPC.
3. Device Claim 12
  - 3.1 Since simulated profiles are not used according to the teaching of document D1, no disclosure of selecting means for selecting a simulated profile having



substantially the same basic shape as the measured profile is present in document D1. For the same reason it cannot be disclosed by the teaching of document D1, exactly how the splicing machine can be characterised by means for performing as claimed, for instance, adding different angular translational values to the argument of the selected simulated profile. Therefore, the splicing machine known from document D1 is not suitable for carrying out the features as claimed without further modification to reach the subject matter of claim 12, which subject matter is therefore novel.

3.2 Since the features of the device claim correspond to those of method claim 1, a corresponding positive conclusion had to be reached by the board in relation to inventive step.

4. Claims 2 to 11 and 13 to 19

All the remaining claims, including use claims 8 and 18, are restricted to the subject matter of claim 1 or claim 12 and, for this reason, can also be considered directed to subject matter involving an inventive step.

5. Second set of claims

Since the board reached a positive view in relation to the set of claims presented, it is not necessary to deal with the second set in the present decision.

6. Conclusion

Upon reviewing the application papers, the board concluded that these comply with the requirements of the EPC in its respective applicable version and that therefore grant of a patent can take place.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to grant a patent based on the following application documents:

#### Description

Pages 7 to 9, 11, 14, 15 as originally filed  
Pages 1 to 6, 10, 12, 13 filed with the letter  
dated 17th March 2009

#### Claims

1-19 filed with the letter dated 17th March 2009

#### Drawings

Sheets 1/5 to 5/5 as originally filed.

The Registrar

The Chairman

T. Buschek

A. G. Klein