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**Datasheet for the decision
of 19 February 2014**

Case Number: T 0863/09 - 3.5.07

Application Number: 03775670.7

Publication Number: 1567950

IPC: G06F17/30

Language of the proceedings: EN

Title of invention:

Generating entries for a database supporting a positioning of a mobile terminal

Applicant:

Nokia Corporation

Headword:

Database supporting positioning/NOKIA

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - after amendment - (yes)

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0863/09 - 3.5.07

**D E C I S I O N
of Technical Board of Appeal 3.5.07
of 19 February 2014**

Appellant: Nokia Corporation
(Applicant) Karakaari 7
02610 Espoo (FI)

Representative: Cohausz & Florack
Patent- und Rechtsanwälte
Partnerschaftsgesellschaft
Bleichstraße 14
40211 Düsseldorf (DE)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted on 9 December 2008 refusing European patent application No. 03775670.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: R. Moufang
Members: P. San-Bento Furtado
R. de Man

Summary of Facts and Submissions

I. The appeal lies from the decision of the Examining Division to refuse European patent application number 03775670.7. The application concerns generating entries for a database supporting a positioning of a mobile terminal.

II. The Examining Division decided that the subject-matter of the independent claims of the main request before it did not involve an inventive step over either prior-art document D1 in combination with the general knowledge of the skilled person, or prior-art document D3 in combination with D1 and common knowledge; document D6 was cited as illustrating common knowledge:

D1: WO 02/071781 A, 12 September 2002;

D3: WO 01/18765 A, 15 March 2001;

D6: WO 96/25830, 22 August 1996.

The independent claims of the first and second auxiliary requests before the Examining Division, as well as the dependent claims of all requests, were found not to fulfil the requirements of Articles 52(1) and 56 EPC either.

III. The appellant requested with the grounds of appeal filed with letter of 7 April 2009 that the decision be set aside and that a patent be granted on the basis of the main request or the first or second auxiliary request, all requests having been electronically filed on 21 October 2008 and considered in the appealed decision. With letter dated 23 December 2011 the appellant changed the order of the requests, by exchanging the main and the first auxiliary requests.

- IV. The Board summoned the appellant to oral proceedings. In the accompanying annex dated 11 December 2013, it summarised the issues to be discussed at the oral proceedings. The Board referred to document D7 cited in the application:
- D7: EP 1 237 009 A2, 4 September 2002;
and introduced document D8:
D8: US2002/0080063 A1, 27 June 2002.

The Board was of the preliminary opinion that the subject-matter of the independent claims of the main request was not novel over D7 or D8, and lacked inventive step over D1. The subject-matter of the independent claims of the first and second auxiliary requests lacked inventive step over D1, D7 or D8, and over D7 or D8, respectively. Furthermore, the subject-matter of the independent claims of the second auxiliary request was not clearly defined (Article 84 EPC) and extended beyond the content of the application as filed (Article 123(2) EPC).

- V. With letter dated 4 February 2014 the appellant submitted a new main and a new auxiliary request.
- VI. At the oral proceedings on 19 February 2014, the appellant submitted further requests, withdrawing previous requests. The final request of the appellant was that the decision under appeal be set aside and that the case be remitted to the department of first instance for further prosecution on the basis of the main request comprising claim 1 as filed during the oral proceedings at 14:05 and claims 2 to 68 of the auxiliary request filed with the letter dated 4 February 2014.

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

"A method comprising

- calculating positions (21;31,32;51,52;61,62;71,72;81,82) of a mobile terminal in a cell (2) of a cellular network, the calculation being based on satellite signals or on using a wireless local area network positioning or on using a Bluetooth™ positioning; and
- determining coordinates which belong to a location within said cell (2) based on at least one of said calculated positions (21;31,32;51,52;61,62;71,72;81,82) of said mobile terminal in said cell (2);

said method being **characterized by** the further actions of:

- estimating a cell range (36;56;66) for said cell (2) based on more than one of said calculated positions (21;31,32;51,52;61,62;71,72;81,82) of said mobile terminal in said cell (2);
- providing said estimated cell range (36;56;66) together with said determined coordinates and an identification of said cell (2) for storage in a database, said database supporting a satellite signal based positioning of a mobile terminal; and
- extracting said determined coordinates from said database for use as a reference location for a positioning of a mobile terminal in said cell and using said estimated cell range from said database as a basis for determining a reliability of said reference location."

Reasons for the Decision

1. The appeal is admissible.

The invention

2. The application relates to generating cell coordinates and cell ranges in a cellular network by a mobile terminal and storing the information in a database for supporting positioning of a mobile terminal (see page 1, first full paragraph; page 8, first paragraph, and page 9, penultimate paragraph, of the published application).

The cell coordinates and cell range are estimated based on positions of the mobile terminal in the cell and stored in the database together with the currently valid identification of the cell (see page 14, last paragraph, and page 17, third paragraph).

The estimated cell coordinates can be used as reference locations in assisted GPS (global positioning system) positioning, in order to support time recovery and sensitivity improvement methods (page 4, page 14). The description also mentions on pages 8 and 9 various advantages of the invention, including reducing the time-to-first-fix in assisted positioning, being able to perform assisted positioning under weak signaling conditions without having to poll the cellular network for reference locations, as well as avoiding the costs related to the delivery of reference locations by the operators.

Contested decision

3. In the contested decision, the Examining Division decided with respect to the applicant's then pending requests that document D1 did not disclose that (a) a cell range was estimated and (b) stored together with the geographical information and cell identification as

entries in a database, (c) which was destined to support a positioning of a mobile terminal. Features (a) and (b) were considered to provide the effects of giving more information about the cell sites and making the determined information available for reuse, respectively. Feature (c) was not considered to have any technical effect but to relate merely to the idea of reusing the determined information in an allegedly useful way. Features (a) to (c) were obvious options which the skilled person would choose in order to achieve the mentioned effects.

Furthermore, document D3 also disclosed, on page 3, page 4, first and last paragraphs, page 12, lines 9 to 10 and figure 2, reusing determined cell information, or the corresponding database, for supporting positioning of a mobile terminal. Additionally, in D3 the reference database was also continuously updated, as was described in the abstract, figure 2, page 3, paragraph c, and pages 4 and 5, in particular the second paragraph of page 5. The Examining Division was also of the opinion that the reference database of D3 stored geographic information on cells.

Reasons for the appeal

4. In the grounds of appeal the appellant submitted that with the approach of D1 it would not be obvious to additionally estimate and store a cell range. In the method of D1 another approach was used for calculating the reliability of the reference location, as was described on page 13, line 19, to page 14, line 18. An additional option was not needed.

The appellant also disputed that it was well known to reuse the determined cell information in document D1

for supporting positioning of a mobile terminal. D1 did not disclose any such use, and D3 was based on the assumption that the exact cell location information was provided by the network (the appellant cited page 6, paragraph 2, and page 9, paragraph 3) or stored in a read-only memory (as would be explained on page 12, paragraph 2).

The appellant did not agree with the Examining Division's interpretation of D3. The approach of D3 employed two databases; there might be a database storing and providing geographical information on cell sites; and in addition there was a reference database, like a digital street map, which was used for plausibility control. D3 did not provide any hint at updating geographic cell information.

Article 123(2) EPC

5. The subject-matter of claim 1 is based on original claim 1, in combination with the following passages of the application as originally filed: the features "calculation being based on satellite signals ..." and "coordinates which belong to a location within said cell" are disclosed on page 6, second full paragraph; the step of estimating the cell range is disclosed on page 9, fourth paragraph, and page 18, first full paragraph; the feature relating to providing said estimated cell range for storage in a database is described on page 14, first paragraph, and in claim 8; the step of extracting is also disclosed on page 14, first paragraph.

The Board is hence convinced that the subject-matter of claim 1 complies with Article 123(2) EPC.

Article 84 EPC

6. The objections under Article 84 EPC discussed in the appeal proceedings have been overcome by the amendments. The reference to BluetoothTM is considered to be allowable as its technical features are well defined by telecommunications industry specifications.

Inventive step

7. It is common ground that the relevant documents in the present appeal are D1, D3, D7 and D8. The Board has also considered the rest of the prior art cited in the international search report.
8. Document D1 discloses a method for calculating the location of fixed transmit cells in a cellular mobile telephone network from survey data measurements obtained by a test mobile phone on a drive route.

The Board agrees with the Examining Division that D1 does not disclose features (a) to (c) mentioned in point 3 above. It also agrees with the Examining Division that these features, when taken alone, are not inventive.

However, present claim 1 further differs from the method of D1 in that

- the cell range is estimated based on calculated positions of the mobile terminal in the cell,
- positioning supported by the database is satellite signal based,
- the cell coordinates and cell range are extracted from the database for using the cell coordinates as a reference location for positioning and

- the cell range is used as a basis for determining a reliability of said reference location.

Therefore, the present claim defines a concrete use of specific parameters for a concrete technical purpose. Document D1, contrary to the invention, is not concerned with using the data for positioning.

9. Document D3 discloses a positioning system for determining a position of a mobile terminal using cell information, timing advance (TA) values and an updatable reference database. The mobile terminal obtains, for each available station, the cell data, including cell identification, and at least three TA values sent to the mobile terminal by the base station (abstract; page 3, last paragraph; page 4, paragraphs 1 and 2). The position data (Ortinformation/Ortinformationsdaten) of the mobile terminal is then calculated on the basis of those values and information of the reference database (abstract; page 4, first paragraph). D3 also describes that the position data, in some embodiments together with motion information, is used to update the reference database (page 4, last paragraph; page 6, paragraph 4; page 9, paragraph 3; paragraph bridging pages 9 and 10).

However, document D3 does not clearly describe the content of the updatable reference database. It is not clear whether in D3 the cell coordinates are updated. Regarding those aspects, the Board agrees with the appellant's interpretation of D3 (see above, point 4).

The claimed method differs from that of D3 in that the cell coordinates are determined on the basis of at least one of the calculated positions and the further actions of the characterising part of claim 1 are

performed. In D3 the reference points are known in advance.

10. Documents D7 and D8 relate to building and using a database for supporting satellite based positioning.

10.1 Document D7 discloses a method for positioning a wireless communication device using position data of one or more reference points stored in a database. The database may include cell identifiers and approximate positions of the base station (paragraph [0046]), which can be used as reference points for satellite-based positioning (paragraph [0031]).

D7 explains that the position of the base stations can be estimated on the basis of the positioning information of the mobile devices, for example by calculating "a mean value, a geometric center or the like" (paragraph [0046]).

D7 also discloses most of the advantages mentioned in the application, including faster calculation of the position of the mobile device, creation of the position data of the base stations using the system, independently of the operator of the mobile communication network and avoiding costs (paragraphs [0023] and [0046]).

10.2 Prior-art document D8 discloses a method for determining the geographic location of a mobile terminal using a database. The database includes the cell identification number and the geographic information about the cell. D8 also describes that the centroid of a cell is calculated and updated on the basis of the positions received from mobile terminals, allowing positioning without prior information

regarding base station locations in the network (paragraph [0045]).

In paragraph [0017] it is explained that the data may be provided to improve the performance of the mobile terminal, such as reducing time-to-first-fix (TTFF), or increasing the sensitivity of the mobile terminal so that signals from the positioning satellite (e.g. a GPS satellite) may be acquired by the mobile terminal in difficult radio propagation environments. Providing a position of the current cell of the mobile terminal is helpful even if the position is relatively inaccurate.

- 10.3 The claimed subject-matter differs from the method of either D7 or D8 in that the cell range is estimated on the basis of calculated positions of the mobile terminal, stored in the database, and used in satellite-based positioning as a basis for determining the reliability of the reference location.

Since the disclosure of either D7 or D8 is closer to the claimed invention than that of any of the other cited documents, D7 and D8 represent the most relevant prior art.

The appellant argued in oral proceedings that the use of the cell range improved positioning over the prior art and, together with the other differentiating features, assisted in reducing the time to search satellite signals for positioning. The Board agrees that it is known in the art that reference locations are used in satellite-based positioning and that the time-to-first-fix can be reduced if an approximate location is known.

The differentiating features indicate how to modify the database of cell data for supporting estimation of the accuracy of the reference locations.

- 10.4 The solution results in improved support of positioning.

In the appeal proceedings the appellant argued that the skilled person, starting from either D7 or D8, would not estimate a cell range and, if arriving at the idea at all, he would rather calculate it differently, for example using TA values. In D7 it was simply assumed that the cell radius was approximately 30 km (page 9, lines 28 to 30; page 12, lines 4 to 8). D8 referred to an average expected cell size (paragraph [0033]). There was no hint in either D7 or D8 to compute cell ranges for individual cells.

The Board agrees that the skilled person would not arrive at the differentiating features. The skilled person might consider calculating cell ranges in the general context of positioning. However, there is no hint in any of the cited prior-art documents to calculate the cell ranges on the basis of the estimated positions of the mobile terminal or to use cell ranges for estimating reliability of the reference location when positioning a mobile terminal.

11. Therefore, the subject-matter of claim 1 of the appellant's new main request involves an inventive step.

Remittal

12. The new main request includes claims 2 to 68 of the then auxiliary request submitted with the letter dated

4 February 2014. Independent claims 20 and 43 and dependent claims 2 to 19, 21 to 42 and 44 to 68 have not been adapted to the new independent claim 1. Moreover, the description has not been adapted to the new claimed subject-matter either.

Therefore, the Board considers it appropriate to remit the case to the department of first instance for further prosecution (Article 111(1) EPC), and in particular for examination of claims 2 to 68 of the new main request.

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 for further prosecution on the basis of the appellant's new main request.

The Registrar:

The Chairman:



I. Aperribay

R. Moufang

Decision electronically authenticated