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D E C I S I O N
of 30 November 2005

Case Number: T 0009/03 - 3.5.03

Application Number: 00306044.9

Publication Number: 1073301

IPC: H04Q 7/38

Language of the proceedings: EN

Title of invention:
Medium allocation method

Applicant:
LUCENT TECHNOLOGIES INC.

Opponent:
-

Headword:
Time slot allocation/LUCENT

Relevant legal provisions:
EPC Art. 52(1), 56, 52(2)(c), 52(3)

Keyword:
"Inventive step - yes"

Decisions cited:
T 1173/97

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0009/03 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 30 November 2005

Appellant: LUCENT TECHNOLOGIES INC.
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Murray Hill
New Jersey 07974-0636 (US)

Representative: Sarup David Alexander
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 9 September 2002 refusing European application No. 00306044.9 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: A. S. Clelland
Members: D. H. Rees
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. This is an appeal from the decision of the examining division, dispatched on 9 September 2002, to refuse the European patent application number 00 306 044.9, publication number 1 073 301. The reason given for the refusal was that amendments had introduced subject-matter extending beyond the content of the application as filed, in violation of Article 123(2) EPC. In addition it was argued that the claimed subject-matter did not involve an inventive step with respect to the disclosure of document

D1: T. Ikeda et al., "TDMA-Based Adaptive Modulation with Dynamic Channel Assignment (AMDCA) for High Capacity Multi-media Microcellular Systems", IEEE Vehicular Technology Conference, NY, US, IEEE, vol. CONF. 47, 4 May 1997, pages 1479 to 1483.

II. Notice of appeal was filed and the fee paid with a letter dated 28 and received 30 October 2002. A statement setting out the grounds of the appeal was submitted with a letter dated 4 and received 7 November 2002.

III. In response to a communication from the board, the appellant resubmitted a set of claims 1 to 12 corresponding to claims originally filed during examination.

IV. The appellant requests that the decision under appeal be set aside and a patent granted on the basis of the following text:

claims 1 to 12 filed with a letter dated 21 and received 26 October 2005;

description pages
4 and 7 as originally filed;
1, 1a, 2, 3, 5, 6 and 8 filed with a letter dated 21 and received 23 March 2001;
with page 2, line 19 to page 3, line 27 deleted according to the request set out in a letter dated 21 and received 26 October 2005;

drawing sheets 1 to 3 as originally filed.

V. The independent claims read as follows:

"1. A method for use in wireless transmission in a system that has available to it a plurality of data modulation schemes, each said scheme mapping a different number of bits per symbol, the method comprising the steps of:
determining a new data rate requirement for a user; and
assigning time slots to match said user's data rate requirement;
wherein, said assigning step comprises the steps of analyzing a current data rate for said user by determining a data rate capable of being carried by each time slot currently assigned to said user given a current modulation scheme therefor; and

altering the number of time slots assigned to said user when necessary to insure that the combined data rate of the time slots assigned to said user matches said user's new data rate requirement;
the method being characterized in that said current modulation scheme is determined independently for each time slot assigned to said user.

9. Apparatus for use in wireless transmission in a system that has available to it a plurality of data modulation schemes, each said scheme mapping a different number of bits per symbol, said apparatus comprising:
means [303, 405] for determining a new user data rate requirement; and
means [409, 411, 413, 415] for assigning time slots to match said user data rate requirement;
wherein, said means for assigning comprises
means [407] for analyzing a current user data rate by determining a data rate capable of being carried by each time slot currently assigned to said user given a current modulation scheme therefor; and
means [411, 415] for altering the number of time slots assigned to said user when necessary to insure that the combined data rate of the time slots assigned to said user matches said new user data rate requirement;
said apparatus being characterized in that said current modulation scheme is determined independently for each time slot assigned to said user.

12. Software for use in wireless transmission in a system that has available to it a plurality of data modulation schemes, each said scheme mapping a different number of bits per symbol, said software

being in computer readable form, said software being for causing a processor to perform functions comprising:
determining a new user data rate requirement; and
altering a current assignment of time slots so as to better match an accumulated data rate of all channels assigned to said user to said user data rate requirement than said current assignment of time slots matches said user data rate requirement, said assigning being a function of a maximum data rate achievable for each time slot assignable to said user by employing a one of said modulation schemes employable for said time slot;
said software being characterized in that said current modulation scheme is determined independently for each time slot assigned to said user."

Reasons for the Decision

1. The basis for the examining division's objection under Article 123(2) EPC has been removed by the appellant's reversion to the claim set originally filed with the letter dated 21 March 2001. No objection under Article 123(2) EPC was raised to these claims by the examining division and the board also sees no such objection. The claims in particular correspond to combinations of the originally filed claims. The board also concurs with the examining division's opinion that the claims are clear and, by implication, supported, as required by Article 84 EPC.

2. However, the board does not share the examining division's view that the claimed subject-matter does not involve an inventive step over the teaching of document D1.

3. The invention relates to wireless transmission of data using TDMA (Time Division Multiple Access). The transmitter may use different modulation schemes in different slots, depending on the reception quality, and may assign multiple slots to a single user, in order to accommodate higher data transmission rates than can be achieved using only one slot. The examining division argued, and the appellant has not disputed, that D1 shows these features. The feature which the appellant argued was new and involved an inventive step (and which is therefore specified as characterising the invention in the claims) was that the modulation scheme is determined independently for each time slot assigned to a user. The effect is that plural time slots assigned to a user may use different modulation schemes.

4. The examining division argued firstly that document D1 did not exclude the possibility of such assignment on a "per-slot" rather than a "per-user" basis. Secondly, it was argued that the skilled person would understand that the same user may be assigned different modulation schemes since different time slots are assigned to him, and the different time slots may have different modulation schemes, citing D1 page 1479, column 1, lines 5 to 9, and column 2, lines 42 to 45, as well as page 1480, column 2, lines 12 to 14. This would appear to the board to lead to an objection of lack of novelty rather than lack of an inventive step; the question is moot however, since the board does not agree with the

argument. On the contrary, it would appear that D1 does not contemplate anything other than one modulation scheme being used for each user. In D1 the information transmitted is voice, and a data rate of 7.2 kbps must be achieved. It is stated that this requires two slots when 64QAM is assigned as the modulation scheme, three if it is 16QAM, six if it is QPSK, and twelve for 1/2-rate QPSK (page 1480, column 1, lines 12 to 19). No combination of different modulation schemes is contemplated. Moreover, the algorithm employed, the "first max method", only assigns a set of time slots using just one modulation scheme - page 1481, column 1, lines 5 to 8: "2. When two slots that have higher average C/(N + I) than the threshold value for 64QAM are obtained, these two slots and 64QAM are assigned to the terminal at that time," and lines 17 to 20, "5. If the quality of received signal is getting degraded and the BER goes below the BER_{th} during a call, new time slots that can satisfy the required transmission quality are reassigned, which is called intra-cell handoff." D1 is, like many technical documents, not very clearly expressed; however, the board is convinced that the skilled person working through it would understand that it discloses a scheme in which a voice transmission is sent using the modulation scheme offering the highest data-rate possible, and the appropriate number of slots which can carry data at that data-rate are assigned to the transmission.

5. Neither does any other document available to the board disclose or suggest a data transmission which uses multiple slots, the slots being encoded in different modulation schemes. In the view of the board therefore, it would not have been obvious to adapt the system of D1 to assign slots in this way.

6. Following T 1173/97 (OJ 1999, 609), the subject-matter of claim 12 for "Software ... in computer readable form" adapted to carry out the steps specified in claim 1 shows the required further technical effect and is therefore not excluded from patentability by the provisions of Articles 52(2)(c) and 52(3) EPC. No other objections being apparent, the board concludes that the present application satisfies the requirements of the EPC.

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 12 filed with the letter dated 21 and received 26 October 2005;

description pages
4 and 7 as originally filed;
1, 1a, 2, 3, 5, 6 and 8 filed with the letter dated 21 and received 23 March 2001;
with page 2, line 19 to page 3, line 27 deleted according to the request set out in the letter dated 21 and received 26 October 2005;

drawing sheets 1 to 3 as originally filed.

The Registrar: The Chairman:

D. Magliano A. S. Clelland