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Datasheet for the decision of 9 February 2007

Case Number: T 0731/05 - 3.5.03

Application Number: 02252090.2

Publication Number: 1289182

IPC: H04L 1/06

Language of the proceedings: EN

Title of invention:
Signal detection by a receiver in a multiple antenna time-dispersive system

Applicant:
LUCENT TECHNOLOGIES INC.

Opponent:
-

Headword:
Signal detection/LUCENT

Relevant legal provisions:
EPC Art. 123(2)
RPBA Art. 11(3)

Keyword:
"Added subject-matter - all requests"

Decisions cited:
G 0010/93

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0731/05 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 9 February 2007

Appellant: LUCENT TECHNOLOGIES INC.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 4 February 2005 refusing European application No. 02252090.2 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: A. S. Clelland
Members: D. H. Rees
R. Moufang

Summary of Facts and Submissions

I. This is an appeal against the decision of the examining division, dispatched on 4 February 2005, to refuse patent application number 02 252 090.2, publication number 1 289 182. The reasons given for the refusal were that amendments had introduced subject-matter which extended beyond the content of the application as filed, contrary to Article 123(2) EPC, and that the claimed subject-matter was not clear, in violation of Article 84 EPC.

II. Notice of appeal was filed in a letter dated 29 March 2005 and received on 5 April 2005. The fee was paid on 26 March 2005. A statement setting out the grounds of the appeal was submitted in a letter dated 14 and received 16 April 2005. An auxiliary request claim set was enclosed, the claims as refused being maintained for the main request.

III. The board issued, of its own motion, a summons to attend oral proceedings to be held on 9 February 2007. In the accompanying communication the board cited the following documents from the examination procedure:

D1: WO 01/33761 A

D2: J.-K. Hwang et al., "Performance Analysis of MIMO-MMSE-DFE Multiuser Receiver for TDMA Mobile Systems with Spatial Diversity," Proceedings of VTC 2001 Spring, IEEE VTS 53rd. Vehicular Technology Conference, Rhodes, Greece, 6 to 9 May 2001, volume 1 pages 142 to 146.

The following document was introduced by the board of its own motion in accordance with Article 114(1) EPC:

D3: A.J. Paulraj et al., "Space-Time Processing for Wireless Communications," IEEE Signal Processing Magazine, November 1997, pages 49 to 83.

The board raised a number of potential objections under Articles 84, 83 and 123(2) EPC, against the claims of both requests, as well as a novelty objection with regard to the disclosure of D1, and an objection that there was a lack of an inventive step with regard to a combination of the teachings of D1 and D3 or with regard to D2 and the common knowledge in the field.

IV. In a submission on 9 January 2007 the appellant's representative informed the board that he would not attend the oral proceedings. It was requested that the oral proceedings be cancelled and that the procedure be continued in writing. Two new claim sets were submitted to replace the claim sets of the previous main and auxiliary requests, together with arguments in their favour.

V. In response to a communication from the board informing the appellant that the oral proceedings would not be cancelled and noting that the submission of 9 January 2007 referred to a second auxiliary request which had not been filed, the appellant submitted another set of claims on 19 January 2007.

VI. The independent claims of the main request read as follows:

"1. A method for compensating for time dispersion in a receiver of a wireless code-division multiple access (CDMA) multiple-input multiple-output (MIMO) system comprising a transmitter [101, 501] and a receiver [105, 107, 109, 111, 113, 115, 505, 507, 521, 523, 525, 527, 529, 531, 533] said receiver having a plurality of colocated receive antennas [105, 505] coupled thereto, said receive antennas receiving signals transmitted from a plurality of colocated transmit antennas [103, 503] of said transmitter, said signals being transmitted from each of said transmit antennas being a substream that was divided out from an original data stream at said transmitter, the method being performed in said receiver and being Characterized by the steps of:
receiving samples at each said receive antenna;
determining a joint equalizer solution for at least one of said transmit antenna [sic] and its pairings with all of said receive antennas, said joint equalizer solution using channel information for all of said transmit antennas and all of said receive antennas; and
applying said determined joint equalizer solution to said received samples from at least one of said receive antennas to develop equalized samples.

11. A multiple-input multiple-output (MIMO) system, said system including a receiver [105, 107, 109, 111, 113, 115, 505, 507, 521, 523, 525, 527, 529, 531, 533] and a plurality of colocated signal sources [103, 503] that are supplied from a single transmitter [101, 501], wherein each signal being transmitted from each of said

data sources is a substream that was divided out from an original data stream at said transmitter, said receiver being Characterized by:
a plurality of colocated signal detectors [105, 505] that receive said signals transmitted by said plurality of colocated signal sources; and
a joint equalizer [109, 523] that develops a joint equalizer solution for at least one of said signal sources and its pairing with all of said signal detectors and supplies as an output a signal that includes at least said equalizer solution applied to a signal received by at least one of said signal detectors, wherein said joint equalizer solution uses channel information for all of said signal sources and all of said signal detectors."

The independent claims of the first auxiliary request differ from the main request in that:

(a) the word "colocated" has been deleted from both claims;

(b) the reference signs have been removed from claim 1;

(c) in claim 11, "signal sources [103, 105] that are supplied from a single transmitter" has become "signal sources [103, 105] that belong to and are supplied from a single transmitter," the phrase "signal detectors [105, 505] that receive said signals" has been amended to read "signal detectors [105, 505] that belong to said receiver and receive said signals", and the phrase "that develops a joint equalizer solution for at least one of said signal sources" has become "that develops a joint equalizer solution one of said signal sources."

(The board takes the last of these amendments to be a typographical error.)

The independent claims of the second auxiliary request differ from those of the main request only in that "colocated" has been replaced by "substantially colocated" throughout.

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

Claims 1 to 21 of the main or alternatively of the first auxiliary request set filed on 9 January 2007 or the second auxiliary request set filed on 19 January 2007;

description pages
2 to 23 as originally filed,
1 and 1A filed with the letter dated 17 and received on 18 November 2003,
with a correction to equation (2) on page 10 requested in the submission of 9 January 2007; and

drawing sheets 1 to 9 as originally filed.

VIII. The appellant was not represented at the oral proceedings, during which the board deliberated and the chairman announced the decision taken.

Reasons for the Decision

1. The function of a board of appeal is to reach a decision on the issues presented to it, not to act as an alternative examining division (G 10/93, OJ 1995, 172, in particular Point 4).

According to Article 116(1) EPC, oral proceedings shall take place either at the instance of the European Patent Office if it considers this to be expedient or at the request of any party to the proceedings. Oral proceedings are an effective way to discuss cases mature for decision, since the appellant is given the opportunity to present its concluding comments on the outstanding issues (Article 113(1) EPC), and a decision can be made at the end of the oral proceedings (Rule 68(1) EPC).

The need for procedural economy dictates that the board should reach its decision as quickly as possible while giving the appellant a fair chance to argue its case. In the present appeal the holding of oral proceedings was considered by the board to meet both these requirements. A summons was therefore issued. The appellant gave no reasons to support the request to cancel the oral proceedings scheduled by the board and to continue the procedure in writing. In accordance with Article 11(3) of the Rules of Procedure of the Boards of Appeal the board shall not be obliged to delay any step in the proceedings, including its decision, by reason only of the absence at the oral proceedings of any party duly summoned who may then be treated as relying on its written case. The board considered that, despite the appellant's announced

intention not to attend, the twin requirements of fairness and procedural economy were still best served by holding the oral proceedings as scheduled. The request to cancel the scheduled oral proceedings was therefore refused.

The board interprets the appellant's request to continue the procedure in writing as being a request not to reach a final decision in oral proceedings, but rather to issue a further communication. However, the mere choice by the appellant not to attend is not sufficient reason to delay the board's decision. If the appellant had attended the oral proceedings, it would have had an opportunity to present its comments. Moreover the board considers that its reasons for coming to its decision do not constitute a departure from grounds or evidence previously put forward, requiring that the appellant be given a further opportunity to comment. The board concludes that Article 113(1) EPC has been satisfied. This request is therefore also refused.

2. *Added subject-matter in the new claims*

2.1 Claim 1 of all three requests contains the feature, "determining a joint equalizer solution for at least one of said transmit antenna and its pairings with all of said receive antennas, said joint equalizer solution using channel information for all of said transmit antennas and all of said receive antennas." This feature was apparently amended in response to an objection by the board that an earlier formulation ("determining a joint equalizer solution using channel information for at least one pairing of at least one of

said transmit antennas and said receive antennas") encompassed using channel information for just one pairing, which was not consistent with the description of the invention. The board had pointed out that the application consistently states that the invention utilises all of the transmit antenna - receive antenna pairings, and noted that the appellant should take care not to introduce new subject-matter by way of an intermediate generalisation (Points 4.1.3 to 4.1.6 of the board's annex to the summons to oral proceedings).

2.2 The new formulation of this feature does specify that the joint equalizer solution uses channel information for all of the transmit antennas and all of the receive antennas, as consistently specified in the description. However it further introduces a new definition that the "joint solution" is "for at least one of said transmit antenna and its pairings with all of said receive antennas." This clearly discloses that the solution may be confined to a subset of the transmit antennas although it must involve all of the receive antennas. No source in the original application is put forward by the appellant; indeed, there is no mention of this specific aspect of the amendment in the appellant's submissions, unless this is what is referred to in the remark, "Note that the entire solution need not be arrived at at once, but the part that is arrived at is a function of all the transmit antennas and receiver antennas," an assertion for which no support in the application is cited (appellant's submissions of 9 January 2007, page 5 second paragraph). At any rate there is no reference in the appellant's arguments to the asymmetry between the set of transmit antennas and the set of receive antennas which has been introduced.

2.3 The description refers (e.g. at Paragraph [0006] of the published application) to symbols being determined from one transmit antenna at a time. However this relates not to determining a joint solution but to applying it. Claim 1 specifies determining the joint equalizer solution and applying it as separate steps, so that there is no possibility that the appellant intended "determining a joint solution" to mean performing the final estimation of the sample values. In each embodiment the "joint solution" is determined as a separate step from the application of the resulting weights (Fig. 2 Step 203, Fig. 4 Step 403, Fig. 7 Step 705), and in the mathematical steps carried out (e.g. Paragraphs [0023] to [0026] and Fig. 3) all of the transmit antennas are treated together, as are all of the receive antennas.

2.4 Claim 9 of the application as published specifies that the determining and applying steps are both iterated a number of times, each time for a different transmit antenna. However this is in contradiction to the description as far as the determining step is concerned (see Paragraph 2.3) and the claim moreover specifies that there is one iteration for each transmit antenna, i.e. that the joint solution is still determined for all the transmit antennas. Thus even taking the claim alone the skilled person would not infer that a single iteration could be considered as the "joint equalizer solution" reduced to a single transmit antenna or could constitute an invention in isolation.

2.5 The board therefore concludes that this amendment introduces subject-matter which extends beyond the content of the application as filed, in violation of Article 123(2) EPC. Since this conclusion applies to all of the present requests, there are no allowable requests and the appeal must be dismissed.

3. While no further ground is required for dismissing the appeal, the board notes that the latest submission also does not overcome various of the objections raised in the communication accompanying the summons to oral proceedings. For example, the board objected that there was a lack of clarity in that the independent claims to a receiver included features of the transmitter, and similarly *mutatis mutandis* for the method claims (Point 4.1.8). The present independent claims have been amended to mention a "system" embracing both transmitter and receiver. However claim 1 of all the requests is still directed to "a method for compensating for time dispersion in a receiver," still specifies "the method being performed in said receiver," and by including "a substream that was divided out from an original data stream at said transmitter" remains unclear as to what steps are actually claimed to be part of the matter for which protection is sought.

The board is further not convinced by the appellant's arguments relating to the clarity of and support in the application for the "colocation" feature, which in turn has repercussions for the question of whether the claimed subject-matter is novel and involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Magliano A. S. Clelland