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Datasheet for the decision
of 2 October 2008

Case Number: T 1611/06 - 3.5.03

Application Number: 03388044.4

Publication Number: 1401117

IPC: H04B 1/707

Language of the proceedings: EN

Title of invention:
Method and device for detection of a UMTS signal

Applicant:
TELEFONAKTIEBOLAGET LM ERICSSON (publ)

Opponent:
-

Headword:
Detection of a UMTS signal/ERICSSON

Relevant legal provisions:
EPC Art. 84, 111(1)

Keyword:
"Clarity (yes)"
"Remittal (yes)"

Decisions cited:
-

Catchword:
-

Case Number: T 1611/06 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 2 October 2008

Appellant:	TELEFONAKTIEBOLAGET LM ERICSSON (publ) S-164 83 Stockholm (SE)
Representative:	Hendriksen, David Zacco Denmark A/S Hans Bekkevolds Allé 7 DK-2900 Hellerup (DK)
Decision under appeal:	Decision of the examining division of the European Patent Office posted 11 May 2006 refusing European application No. 03388044.4 pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman:	A. S. Clelland
Members:	F. van der Voort
	R. Moufang

Summary of Facts and Submissions

I.   This appeal is against the decision of the examining
       division refusing European patent application
       No. 03 388 044.4 (publication number EP 1 401 117 A).

II.   The reason given for the refusal was that two out of
       three independent claims, i.e. method claim 1 and device
       claim 11, were not clear (Article 84 EPC).

       More specifically, it was held that the feature
       "applying a weight factor $(x_1, ..., x_J; \hat{C}_j)$ of two or
       more weight factors $(x_1, ..., x_J; \hat{C}_j)$ ..." was defined by
       a result to be achieved in that the weight factors were
       "selected to preserve an orthogonality relation ... in
       order to compensate for the presence of fading of the
       received digital communications signal (y)". It was
       unclear which orthogonality relation was to be preserved
       and according to which reference the preservation was to
       be defined. Further, the definition by a result to be
       achieved would only be allowable if the invention could
       only be defined in such terms, or could not otherwise be
       defined precisely without unduly restricting the scope
       of the claims, and only if the result was one which
       could directly and positively be verified by tests or
       procedures adequately specified in the description or
       known to the skilled person (Guidelines, C-III, 4.7 (as
       in force in May 2006)). None of these conditions were
       fulfilled in the present case and reasons were given.

III.   With the statement of grounds of appeal the appellant
       filed sets of claims of a main and an auxiliary request
       and submitted arguments in support. The appellant
       requested that the decision under appeal be set aside and

that a patent be granted on the basis of the main request or, in the alternative, on the basis of the auxiliary request. Oral proceedings were requested in the event that the board intended to reject the main request.

IV.   The appellant was summoned to oral proceedings. In a communication accompanying the summons, the board drew attention to issues to be discussed at the oral proceedings. Objections under Article 84 EPC (clarity) were raised.

V.   In preparation for the oral proceedings, the appellant filed a new main request and presented arguments in support.

VI.   Oral proceedings were held on 2 October 2008, in the course of which the appellant withdrew the requests on file, submitted a new set of claims, and requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims as submitted at the oral proceedings.

      At the end of the oral proceedings, after deliberation, the board's decision was announced.

VII. The present set of claims includes three independent claims, namely claims 1, 9 and 17.

      Independent claim 1 reads as follows:

      "A method of detecting a first signal in a received digital communications signal (y) using one of a number of orthogonal patterns (ŝ), the received signal (y) comprising at least two signal groups ($y^{(1)}$, ..., $y^{(J)}$),

each signal group comprising a number (K) of signal
symbols, the pattern ($\hat{s}$) comprising at least two pattern
groups ($\hat{s}^{(1)}$, ..., $\hat{s}^{(J)}$), each pattern group comprising at
least a number (K) of pattern symbols, wherein the
method comprises the steps of:

- for each signal group ($y^{(1)}$, ..., $y^{(J)}$)
  multiplying each signal symbol with a
  corresponding pattern symbol of a pattern group
  ($\hat{s}^{(1)}$, ..., $\hat{s}^{(J)}$) and deriving a sum (Σ_1, ..., Σ_J;
  A_j) of the products of multiplication,
- multiplying each sum (Σ_1, ..., Σ_J; A_j) with a
  weight factor (x_1, ..., x_J; $\hat{C}_j$) of two or more
  weight factors (x_1, ..., x_J; $\hat{C}_j$) in order to
  remove the effect of fading, giving a weighted
  sum ($x_1\Sigma_1$, ..., $x_J\Sigma_J$; $A_j/\hat{C}_j$), where said weight
  factors (x_1, ..., x_J; $\hat{C}_j$) are scaled with the
  corresponding signal to interference ratio
  calculated for a common pilot channel (CPICH) or
  estimated on the basis of symbols of the received
  signal (y) that should be zero, and
- determining if said first signal is detected or
  not based on said weighted sums ($x_1\Sigma_1$, ..., $x_J\Sigma_J$;
  $A_j/\hat{C}_j$)."

Independent claim 9 reads as follows:

"A device for detecting a first signal in a received
digital communications signal (y) using one of a number
of orthogonal patterns ($\hat{s}$), the received signal (y)
comprising at least two signal groups ($y^{(1)}$, ..., $y^{(J)}$),
each signal group comprising a number (K) of signal
symbols, the pattern ($\hat{s}$) comprising at least two pattern
groups ($\hat{s}^{(1)}$, ..., $\hat{s}^{(J)}$), each pattern group comprising at
least a number (K) of pattern symbols, wherein the

device comprises:

- means (201, 201a, 201b) adapted to, for each signal group ($y^{(1)}$, ..., $y^{(J)}$), multiply each signal symbol with a corresponding pattern symbol of a pattern group ($\hat{s}^{(1)}$, ..., $\hat{s}^{(J)}$) and to derive a sum (Σ_1, ..., Σ_J; A_j) of the products of multiplication,

- means (202, 202a, 202b) for multiplying each sum (Σ_1, ..., Σ_J; A_j) with a weight factor (x_1, ..., x_J; $\hat{C}_j$) of two or more weight factors (x_1, ..., x_J; $\hat{C}_j$) in order to remove the effect of fading, giving a weighted sum ($x_1\Sigma_1$, ..., $x_J\Sigma_J$; $A_j/\hat{C}_j$), where said weight factors (x_1, ..., x_J; $\hat{C}_j$) are scaled with the corresponding signal to interference ratio calculated for a common pilot channel (CPICH) or estimated on the basis of symbols of the received signal (y) that should be zero, and

- means (102; 103) for determining if said first signal is detected or not based on said weighted sums ($x_1\Sigma_1$, ..., $x_J\Sigma_J$; $A_j/\hat{C}_j$)."

Independent claim 17 reads as follows:

"A computer readable medium having stored thereon instructions for causing one or more processing units to execute the method according to any one of claims 1 - 8."

Reasons for the Decision

1.   *Article 123(2) EPC*

1.1   The amendments made to the independent claims do not
        result in the application containing subject-matter
        which extends beyond the content of the application as
        filed for the following reasons:

1.2   Claim 1 is based on claim 1 as originally filed, in
        which a number of amendments were made:

        The insertion of "digital communications" in "a received
        digital communications signal (y)" is based on
        paragraphs [0001], [0003] and [0038] (reference is made
        to the application as published).

        The replacement of "a pattern (ŝ)" by "one of a number
        of orthogonal patterns (ŝ)" is based on paragraphs [0057]
        and [0066].

        The replacement of "at least one" by "at least two" in
        connection with the signal groups ($y^{(1)}$, ..., $y^{(J)}$), the
        pattern groups ($ŝ^{(1)}$, ..., $ŝ^{(J)}$) and the weight factors
        (x_1, ..., x_J; $\hat{C}_j$) is based on originally filed claim 10
        and paragraph [0021].

        The reformulation of the second step, i.e. the weighting
        step, is based on paragraphs [0072] and [0083] and
        originally filed claim 6.

1.3   Claim 9 is based on claim 11 as originally filed, in
        which a number of amendments were made, all of which
        correspond to the amendments made in claim 1.

1.4   Claim 17 is based on claim 21 as originally filed and
       now refers to method claims 1 to 8, wherein the
       dependent claims 2 to 8 are merely adapted to the
       wording of present claim 1.

1.5   The board is therefore satisfied that the amendments to
       the independent claims do not give rise to objections
       under Article 123(2) EPC.

2.   *Article 84 EPC*

2.1   Independent claims 1 and 9 are clear for the following
       reasons:

2.2   In the communication accompanying the summons the board
       raised a clarity objection since the independent claims
       did not specify the entities between which the
       orthogonality relation was to be preserved. Further, the
       preservation of the orthogonality relation using weight
       factors in order to compensate for the presence of fading
       was considered to be a definition in terms of a result to
       be achieved. A person skilled in the art would however not
       understand how to select the weight factors in order to
       achieve the claimed result without detailed reference to
       at least the description, since the claim did not define
       any relationship between the selection of the weight
       factors, the orthogonality relation and the fading.

       This objection has now been overcome by deleting the
       wording concerning the preservation of an orthogonality
       relation and by making it clear that the patterns ($\hat{s}$) are
       orthogonal.

Further, the weight factors are now specified as being scaled with the corresponding signal to interference ratio which is either calculated for a common pilot channel (CPICH) or estimated on the basis of symbols of the received signal (y) that should be zero. This makes it clear that, e.g., a low signal to interference ratio for the received signal or the common pilot channel signal, e.g. as caused by fading, is correspondingly given a low weight factor, thereby reducing the effect of fading on the detection of the first signal, and thus reducing the risk of a false detection of the first signal.

The above reasoning applies *mutatis mutandis* to independent claim 9, since claim 9 includes amendments which correspond to those made to claim 1.

2.3   The objections set out by the examining division in the decision under appeal (see point II above) in respect of claims 1 and 11, which correspond to present claims 1 and 9, are no longer applicable for the same reasons as set out at point 2.2 above.

2.4   Since no other objections under Article 84 EPC against claims 1 and 9 are apparent to the board, the board concludes that these claims meet the requirements of Article 84 EPC.

3.   The board notes that the decision under appeal only dealt with a lack of clarity of independent claims 1 and 11. It is therefore considered appropriate, in accordance with Article 111(1) EPC, to set the decision aside and to remit the case to the department of first instance for further prosecution on the basis of the present set of claims.

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 claims 1 to 17
      of the new request filed at the oral proceedings.

The Registrar: The Chairman:

D. Magliano   A. S. Clelland