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Datasheet for the decision of 2 August 2007

Case Number: T 1086/05 - 3.5.03

Application Number: 02252409.4

Publication Number: 1257068

IPC: H04B 1/713

Language of the proceedings: EN

Title of invention:
Enhanced frequency hopping method and associated wireless terminal

Applicant:
Lucent Technologies, Inc.

Opponent:
-

Headword:
Enhanced frequency hopping method/LUCENT

Relevant legal provisions:
EPC Art. 123(2), 113(1)
EPC R. 71(2)

Keyword:
"Added subject-matter - main and auxiliary request (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1086/05 **-** 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 2 August 2007

Appellant: Lucent Technologies, Inc.
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Decision under appeal: **Decision of the examining division of the European Patent Office posted 7 February 2005 refusing European application No. 02252409.4 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: A. S. Clelland
Members: F. van der Voort
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division refusing European patent application No. 02252409.4 (publication number EP 1 257 068 A) on the grounds of lack of clarity of the claims, Article 84 EPC.

II. In the notice of appeal the appellant requested that the decision be set aside and a patent granted. With the statement of grounds of appeal the appellant filed claims of a main request and an auxiliary request.

III. In a communication accompanying a summons to oral proceedings the board gave a preliminary opinion in which, *inter alia*, objections under Articles 84 and 123(2) EPC were raised.

IV. In response to the board's communication, the appellant filed new claims of a main request and an auxiliary request, replacing the previous requests on file, and submitted arguments in support. The appellant further informed the board that it would not attend the oral proceedings and requested that the oral proceedings be cancelled and the procedure be continued in writing.

V. In a subsequent communication the board informed the appellant that the request that the oral proceedings be cancelled could not be granted and that the date fixed for the oral proceedings was maintained. Reasons were given.

VI. Oral proceedings were held on 2 August 2007 in the absence of the appellant. The board understood from the

appellant's written submissions that the appellant requested that the decision be set aside and a patent be granted on the basis of the claims of the main request or, failing that, on the basis of the claims of the auxiliary request, both requests as filed in response to the summons to oral proceedings. After deliberation, the board's decision was announced at the end of the oral proceedings.

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

"A method for use in Global System for Mobile Communication wireless equipment, the method comprising the steps of:
transmitting signals using frequency hopping over a time period T,
CHARACTERIZED IN THAT said transmitting step includes, for each new hopping state, pseudo-randomly selecting frequencies from a predetermined set of frequencies of arbitrary size *N* without repetitively selecting any frequency within the pre-determined time period T that spans a duration of *N* frequency hops."

Claim 1 of the auxiliary request reads as follows:

"A method for use in Global System for Mobile Communication wireless equipment, the method comprising the steps of: transmitting signals using frequency hopping over a time period T,
CHARACTERIZED IN THAT said transmitting step includes:
initializing a hopping set to a size of *N* frequencies, the hopping set used to select therefrom hopping frequencies over a time period *T;*
determining a hopping index value;

modifying the hopping index value by at least the modulo of a number *F*, where *F* ≤ *N*;
for each new hopping state, pseudo-randomly selecting a hopping frequency from the hopping set as a function of the modified hopping index value;
adjusting the order of the hopping set such that the selected hopping frequency is now at a position corresponding to the value of *F*;
reducing the value of *F*;
determining whether the value of *F* reaches a predefined minimum value;
shifting the hopping set in a cyclical direction by a value equal to a difference between a predefined maximum value for *F* and the minimum value, modulo *N* when *F* reaches the predefined minimum value; and
returning to the determining step,
wherein the selection of the hopping frequencies occurs without repetitively selecting any frequency within the pre-determined time period T that spans a duration of *N* frequency hops."

Reasons for the Decision

1. *Procedural matters*

1.1 The board considered it to be expedient to hold oral proceedings for reasons of procedural economy (Article 116(1) EPC). The appellant, who was duly summoned, had informed the board that it would not attend the oral proceedings. The oral proceedings were thus held in the absence of the appellant (Rule 71(2) EPC).

1.2 In the communication accompanying the summons, objections under Articles 84 and 123(2) EPC were raised in respect of, ***inter alia***, claim 1 of the main and auxiliary request as pending at the time. The appellant was thereby informed that at the oral proceedings it would be necessary to discuss these objections and, consequently, could reasonably have expected the board to consider at the oral proceedings these objections not only in respect of the requests pending at the time but also in respect of the requests filed by the appellant in response to the summons to oral proceedings. In deciding not to attend the oral proceedings the appellant chose not to make use of the opportunity to comment at the oral proceedings on any of these objections but, instead, chose to rely on the arguments as set out in the written submissions, which the board duly considered below.

Under these circumstances the requirements of Article 113(1) EPC are met and the board is in a position to give a decision.

2. *Article 123(2) EPC - claim 1 of the main request*

2.1 Each of the independent claims as originally filed includes a feature which defines a constraint on the frequency selection over at least a portion of a time period T in terms of the number of frequencies then available.

More specifically, claim 1 as originally filed reads:

> "A method for use in wireless equipment, the method comprising the steps of:

transmitting signals using frequency hopping over a time period ***T***, by selecting a frequency from a set of ***N*** frequencies such that over at least a portion of the time period ***T***, the frequency selection is constrained to less than the ***N*** frequencies.";

claim 3 as originally filed reads:

"A method of frequency hopping for use in wireless equipment, the method comprising the steps of:
storing a set of hopping frequencies; and
selecting frequencies from the set of hopping frequencies over a time period ***T*** by limiting the available frequencies from the hopping set over at least a portion of the time period ***T***."

and claim 5 as originally filed reads:

"A wireless endpoint comprising:
means for storing a set of hopping frequencies; and
means for selecting frequencies-from ***[sic]*** the set of hopping frequencies over a time period ***T*** by limiting the available frequencies from the hopping set over at least a portion of the time period ***T***."

The summary of the invention also cites this feature, see paragraphs [0007] and [0008] of the application as published. Similarly, Fig. 6, which illustrates an example of the constrained frequency hopping method according to the invention, shows that the selection of frequencies over a time period including five bursts, numbered 0 to 4, is limited to a set of allowable frequencies, namely set **A**, which includes a number of frequencies which is reduced over time from 4 to 1, i.e. a number which is always

smaller than the total number of frequencies in the hopping set or hopping state **H**, namely N = 8. It is further noted that in Fig. 5, which illustrates in more detail a part of the method of Fig. 6, H_R represents "the currently hopped frequency" which in the example of Fig. 6 corresponds to the hop frequencies 3, 4, 1, 6 and 0 for the bursts 0 to 4, respectively, see column 6, lines 20 to 29 and 55 to 57.

2.2 However, claim 1 of the main request does not include the above-mentioned feature which defines a constraint on the frequency selection over at least a portion of the time period T in terms of the number of frequencies then available. Instead, claim 1 essentially includes the constraint that the frequencies are selected from the set of N frequencies without repetitively selecting any frequency within the time period T that spans a duration of N frequency hops. In the board's view, this constraint is met when the same frequency is selected again from the set of N frequencies if and only if all other frequencies of the set have been selected. For example, if N = 8 and f_0 to f_7 are the available frequencies, a selection of the frequencies f_3, f_1, f_4, f_0, f_7, f_8, f_5, f_6 in this order from the set of eight frequencies would meet the constraint. However, whereas the claim does include the step of transmitting signals using frequency hopping over a time period T, it does not exclude that the above selection is carried out *en bloc* at the start of the transmission, after which frequency hopping is used over the time period T in accordance with the selection made. Hence, there is no frequency selection required over at least a portion of the time period T, in which the selection is constrained to less than the N (in the above example less than 8) frequencies and neither need the frequencies be selected

over the time period T by limiting the available frequencies from the hopping set over at least a portion of the time period T, cf. claims 1, 3 and 5 as originally filed.

2.3 The board notes that claim 1 of the main request specifies that the constraint is "for each new hopping state".

In paragraph [0013] of the application as published it is stated that: "In accordance with the invention, a hopping state, ***H***, is defined to be: $H = \{H_0, H_1, ..., H_{F-1}, H_F, ..., H_{N-1}\}(1)$, which is a vector of length ***N***, where ***N*** is the total number of frequencies available to hop over, and ***F*** is $\leq N$ and is the number of frequencies in ***H*** over which the wireless endpoint is constrained to hop."

Since claim 1 refers to the selection of frequencies, i.e. multiple frequencies, this implies that a "new hopping state" does not relate to the selection of a single frequency, but rather to the selection of all N frequencies in order to be able to cover the time period T by N frequency hops. It follows that, even if, as argued by the appellant, the description were to be taken into account in order to interpret the claim, the added wording "for each new hopping state" does not contribute to overcoming the objection raised above.

2.4 Neither is a basis for the above-mentioned amendment to claim 1, see point 2.2 above, apparent from any other part of the application documents as originally filed. Claim 1 has therefore been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed, thereby violating

Article 123(2) EPC.

2.5 For the above reasons, the main request is not allowable.

3. *Article 123(2) EPC - claim 1 of the auxiliary request*

3.1 The appellant at least implicitly argued that the subject-matter of claim 1 of the auxiliary request was based on Figs. 5 and 6 and the corresponding passages in the description. The board notes however that the feature of "determining a hopping index value" is broader than as disclosed in the application as filed, since according to the description, see paragraphs [0014] and [0015], the hopping index value is pseudo-randomly generated using a specific GSM hopping algorithm. Further, the hopping value index S_i is modified according to the following equation:

$$S' = (S_i + \text{MAIO}) \text{ modulo } F$$

in which MAIO is the mobile allocation index offset as defined in the above-mentioned GSM algorithm and $F \leq N$ (see equation (11)). The corresponding feature in claim 1 is however broader, namely "modifying the hopping index value by at least the modulo of a number F, where $F \leq N$ " (underlining by the board). Further, according to claim 1 the hopping frequency is "pseudo-randomly" selected from the hopping set "as a function of the modified hopping index value" and the value of F is reduced by an unspecified amount. However, according to the description, the hopping frequency selected is that frequency which has an index value which is equal to the modified hopping index value and F is reduced by

1, see Fig. 6.

3.2 Neither is a basis for the above-mentioned features of claim 1 of the auxiliary request apparent from any other part of the application documents as originally filed. Claim 1 has therefore been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed, thereby violating Article 123(2) EPC.

3.3 The auxiliary request is therefore not allowable.

4. In view of the foregoing, it has not proved necessary to consider any of the further objections set out in the communication accompanying the summons to oral proceedings.

5. There being no allowable request, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Magliano A. S. Clelland