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Datasheet for the decision of 22 October 2012

Case Number: T 0665/09 - 3.5.05

Application Number: 01307304.4

Publication Number: 1185048

IPC: H04L1/06, H04L5/02, H04L27/26, H04B7/06

Language of the proceedings: EN

Title of invention:
Preamble design for multicarrier transmission over channels with multiple inputs and outputs

Applicant:
Nortel Networks Limited

Headword:
Preamble design for multi-carrier transmissions/NORTEL

Relevant legal provisions:
EPC 1973 Art. 54
EPC Art. 123(2)

Keyword:
Added subject-matter - (yes)
Novelty - (no)
Oral proceedings - withdrawal of request for oral proceedings

Decisions cited:

Catchword:

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Case Number: T 0665/09 - 3.5.05

D E C I S I O N
of the Technical Board of Appeal 3.5.05
of 22 October 2012

Appellant: (Applicant)	Nortel Networks Limited 2351 Boulevard Alfred-Nobel St. Laurent, QC H4S 2A9 (CA)
Representative:	Mackenzie, Andrew Bryan Scott & York Intellectual Property Limited 45 Grosvenor Road St. Albans Hertfordshire AL1 3AW (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted 7 October 2008 refusing European patent application No. 01307304.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair: A. Ritzka
Members: K. Bengi-Akyuerek
G. Weiss

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division, posted on 7 October 2008, refusing European patent application No. 01307304.4 on the grounds of lack of novelty (Article 54 EPC 1973) and inventive step (Article 56 EPC 1973), having regard to the disclosure of

D5: US-A-5 914 933,

and lack of clarity (Article 84 EPC 1973) with respect to a sole request.

II. Notice of appeal was received on 5 December 2008. The appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 9 February 2009. The appellant requested that the decision of the examining division be set aside and that a patent be granted on the basis of a new set of claims (claims 1 to 20) as a sole request submitted with the statement setting out the grounds of appeal. In addition, oral proceedings were requested as an auxiliary measure.

III. A summons to oral proceedings scheduled for 13 November 2012 was issued on 4 June 2012. In an annex to this summons pursuant to Article 15(1) RPBA, the board gave its preliminary opinion on the appeal. In particular, objections were raised under Articles 123(2) and 52(1) EPC in conjunction with Articles 54 and 56 EPC 1973, mainly having regard to D5.

IV. With a letter of reply dated 12 October 2012, the appellant informed the board that the appellant's representative would not be attending the scheduled

oral proceedings and that the appellant withdrew its request for oral proceedings so that a decision might be issued based on the papers on file.

V. With a communication dated 22 October 2012, the appellant was informed that the oral proceedings appointed for 13 November 2012 were cancelled.

VI. Independent claim 1 of the present application reads as follows:

"A method of configuring a preamble portion of a data signal for transmission over a plurality of sub-carriers by at least two antennas of a transmitter device, said method characterised by:

for each of said at least two antennas, assigning a respective different pseudo-noise, PN, code;

assigning a respective disjoint subset of the plurality of sub-carriers to each of the at least two antennas;

modulating each of said plurality of sub-carriers with said respective pseudo-noise (PN) code that is assigned to a same one of said at least two antennas as said each of said plurality of sub-carriers such that a plurality of modulated sub-carriers are obtained that are each assigned to a respective one of said at least two antennas;

delivering each of said plurality of modulated sub-carriers to its assigned antenna; and

transmitting, at substantially a same time, each of said plurality of modulated sub-carriers using its assigned antenna."

The further independent claims 8 and 15 of the present application are directed to a corresponding apparatus

and a corresponding computer program, respectively.

Reasons for the Decision

1. Admissibility of the appeal

The appeal complies with the provisions of Articles 106 to 108 EPC (cf. point II above) and is therefore admissible.

2. Sole Request

In the present case, the appellant did not submit any comments on the objections raised in the board's communication under Article 15(1) RPBA. The board reconsidered and maintained these objections, and was in a position to take a decision without holding oral proceedings.

2.1 Article 52(1) EPC: Novelty and inventive step

In the board's judgment, the subject-matter of independent claims 1, 8, and 15 does not meet the requirements of Article 52(1) EPC for the following reasons:

2.1.1 The board concurs with the examining division and the appellant in considering D5 as the closest prior art.

2.1.2 D5 is related to frame synchronisation in wireless multiple-antenna OFDM systems and discloses, with regard to the terminology of claim 1, the configuration of a frame synchronisation word as a preamble (*viz.* "synch 120"; see Fig. 10) of a data signal for transmission over a plurality of sub-carriers (*viz.*

"tones") by antennas (*viz.* "antenna 60a", ... ,"antenna 60M") of a transmitter device (see Fig. 1A).

D5 also discloses that the frame synchronisation words may be embodied by pseudo-random number sequences and that separate pseudo-random number sequences are supposed to be transmitted simultaneously on all transmitter antennas 60a-60M (see column 8, lines 33-44). Furthermore, different sub-carrier subsets (i.e. "cluster 27a", ... ,"cluster 27M") are assigned to the respective antennas 60a-60M (see e.g. Fig. 1A) according to a one-to-one correspondence, while Fig. 10 of D5 also exhibits that the underlying system uses clusters with different non-overlapping frequencies (*viz.* "f1", ... ,"f4"), i.e. disjoint clusters as claimed.

Based on D5, the separate frame synchronisation words (i.e. the pseudo-random number sequences) are transmitted over the respective separate antennas 60a-60M by modulating each of the N sub-carriers in each of the M clusters with the respective synchronisation word in addition to a timing signal and the actual data (see e.g. column 3, lines 14-17 and column 8, lines 33-44 in conjunction with Fig. 10).

2.1.3 Hence, all the limiting features of claim 1 are found to be disclosed in D5.

The above observations also apply *mutatis mutandis* to independent claims 8 and 15.

2.1.4 In view of the above, the subject-matter of claims 1, 8, and 15 lacks novelty (Article 54 EPC 1973).

2.1.5 The appellant argued that the use of pseudo-random number sequences as taught in document D5 would not necessarily be equatable to assigning each antenna a different pseudo-noise code as reflected in claim 1 and that D5 would not provide a clear disclosure that the sub-carriers of a same antenna were modulated by such a pseudo-random number sequence.

In this regard, the board notes that the simultaneous transmission of separate pseudo-random sequences on all cluster antennas in D5 (see column 8, lines 33-44) inherently necessitates that separate pseudo-random codes are assigned to the respective antennas of D5 as claimed. Moreover, according to D5, all the available sub-carrier clusters are modulated by the data frames to be transmitted via the respective antenna (see e.g. column 3, lines 14-17). In addition, D5 is also anticipatory of "modulating each of said plurality of sub-carriers with said respective pseudo-noise code" as claimed since the separate pseudo-random number sequences are supposed to be transmitted simultaneously on the respective cluster antennas therein (see e.g. column 8, lines 33-37 and Fig. 10).

2.1.6 The appellant further submitted that D5 only disclosed the use of contiguous sub-carrier subsets rather than "disjoint subsets" as claimed.

In the board's judgment, however, at least Fig. 10 of D5 clearly evidences that different non-overlapping frequencies (i.e. "f1" to "f4") are used for different sub-carrier clusters such that these clusters may be considered as "disjoint subsets" in accordance with the claimed subject-matter.

2.2 Article 123(2) EPC

The board judges that dependent claims 7, 14, and 20 do not comply with the provision of Article 123(2) EPC based on the reasons set out in section 3 of the board's communication under Article 15(1) RPBA.

2.3 In conclusion, the sole request is not allowable under Article 123(2) EPC and Article 54 EPC 1973.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz A. Ritzka

Decision electronically authenticated