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Datasheet for the decision of 19 December 2018

Case Number: T 0911/15 - 3.5.05

Application Number: 05740146.5

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IPC: H04L1/18, H04Q7/38

Language of the proceedings: EN

Title of invention:
Packet data transmitting method and mobile communication system using the same

Applicant:
LG Electronics Inc.

Headword:
ACK/NACK detection with softer handover/LG

Relevant legal provisions:
EPC Art. 123(2), 56, 111(1)

Keyword:
Added subject-matter - (no, after amendment)
Inventive step having regard to D1 - (yes, after amendment)
Remittal to the first instance for further prosecution - (yes)

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Case Number: T 0911/15 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 19 December 2018

Appellant: (Applicant)	LG Electronics Inc. 20, Yoido-dong Youngdungpo-gu Seoul 150-721 (KR)
Representative:	Ter Meer Steinmeister & Partner Patentanwälte mbB Nymphenburger Straße 4 80335 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 9 December 2014 refusing European patent application No. 05740146.5 pursuant to Article 97(2) EPC**

Composition of the Board:

Chair	A. Ritzka
Members:	K. Bengi-Akyuerek
	F. Blumer

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse the present European patent application for added subject-matter (Article 123(2) EPC) with respect to the claims of a main request as well as first and second auxiliary requests, for lack of clarity (Article 84 EPC) in respect of the first auxiliary request and for lack of inventive step (Article 56 EPC) with respect to the main and first auxiliary requests, having regard to the disclosure of

D1: WO-A-02/065797.

II. With its statement setting out the grounds of appeal, the appellant filed amended sets of claims according to a new main request and five new auxiliary requests. It requested that the examining division's decision be set aside and that a patent be granted on the basis of one of those claim requests.

III. In a communication annexed to the summons to oral proceedings pursuant to Article 15(1) RPBA, the board expressed its preliminary opinion on the appeal. In particular, it raised new objections under Articles 123(2), 84 and 83 EPC. It also cited the prior-art document

D6: US-A-2003/0171118,

introduced by the examining division in the course of the examination proceedings (see appealed decision, Facts and Submissions, point 12), and made some remarks on the questions of novelty and inventive step in view of that document.

IV. In reply to the summons, the appellant submitted further amended claims according to sixth to tenth auxiliary requests along with counter-arguments to the objections raised in the board's communication under Article 15(1) RPBA. In addition, it requested that the case be remitted to the examining division if the board intended to reject the case due to the recently introduced prior-art document D6.

V. Oral proceedings were held on 19 December 2018, during which the appellant filed a new main request in response to objections raised under Articles 123(2), 84 and 83 EPC by the board.

- The appellant's final request was that the decision under appeal be set aside and that the case be remitted to the department of first instance for further prosecution on the basis of the main request (claims 1 to 4) as filed during the oral proceedings before the board.

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

VI. Claim 1 of the **main request** reads as follows:

"A method for processing Hybrid Automatic Repeat Request, hereinafter HARQ, feedback information in a mobile terminal of a mobile communication system in softer handover, wherein the mobile terminal (120) communicates with one base station (110) via two or more sectors (yl-y3) associated with the one base station (110), the method comprising:

transmitting from the mobile terminal (120) the same data packet to the base station (110) through each of the two or more sectors (yl-y3) associated with the

one base station (110);

receiving at the mobile terminal (120) an ACK/NACK signal transmitted by the base station (110) for the transmitted data packet from each of the two or more sectors by applying a HARQ transmission scheme, wherein the ACK/NACK signals transmitted through the two or more sectors are the same in the softer handover, and

maximal ratio combining the received ACK/NACK signals into one ACK/NACK signal having the highest signal to noise ratio."

The further independent claim 3 is directed to a corresponding apparatus ("mobile terminal").

Reasons for the Decision

1. *The present invention*

The present application relates to the processing of acknowledgement/non-acknowledgement (ACK/NACK) signals in a HARQ (Hybrid Automatic Repeat Request)-based wireless communication network relying on "softer handover", where a handover of a mobile terminal ("UE") takes place between sectors of a cell associated with a single base station, as opposed to a "soft handover". In that "softer handover" case, the mobile terminal combines (according to the well-established "maximal ratio combining" algorithm which selects the signal with the highest signal-to-noise ratio) the respective ACK/NACK signals received from the base station via (i) one sector, (ii) all available sectors or (iii) the sectors through which a data packet to be acknowledged was sent. The alleged technical problem to be solved by the present invention is to reduce ACK/NACK signalling

errors, enable improved channel efficiency when using a dedicated channel for ACK/NACK transmission and to increase data transport rates (see paragraphs [0008] to [0010] as filed).

2. *Allowability of the MAIN REQUEST*

The claims of the new main request are evidently based on option (iii) of the present invention (see point 1 above).

2.1 *Amendments made in the appeal proceedings*

Claim 1 of the new main request comprises the following limiting features, as labelled by the board (amendments to claim 1 of the main request underlying the appealed decision indicated by the board):

A method for processing HARQ feedback information in a mobile terminal of a mobile communication system in softer handover, wherein the mobile terminal communicates with one base station via two or more sectors associated with the one base station, the method comprising:

A) transmitting from the mobile terminal ~~a~~ the same data packet to the base station through each of the two or more sectors associated with the one base station;

B) receiving at the mobile terminal ~~multiple~~ an ACK/NACK signal~~s~~ transmitted by the base station for the transmitted data packet from each of the two or more sectors by applying a HARQ transmission scheme, wherein the ACK/NACK signals transmitted through the two or more sectors are the same in the softer handover;

C) maximal-ratio combining the ~~multiple~~ received ACK/NACK signals into one ~~combined~~ ACK/NACK ~~information~~ signal ~~when the mobile terminal knows that the mobile terminal is communicating with the one base station through the two or more sectors~~ having the highest signal-to-noise ratio.

In sum, present claim 1 differs from claim 1 of the main request refused by the examining division essentially in that (emphasis added by the board)

(i) the mobile communication system supports **softer handover;**
(ii) the mobile terminal transmits the **same data packets** to the base station;
(iii) the mobile terminal transmits the data packets through **each of the** sectors **associated with the one base station;**
(iv) the base station transmits the **same ACK/NACK signals** through the sectors in the softer handover case;
(v) the mobile terminal receives, from **each of the** sectors, the ACK/NACK signals that have been **transmitted by the base station;**
(vi) the mobile terminal performs **maximal-ratio combining** of the **received** ACK/NACK signals into one ACK/NACK **signal having the highest signal-to-noise ratio.**

2.2 *Added subject-matter (Article 123(2) EPC)*

2.2.1 The examining division found that it was not directly and unambiguously derivable from the original application that the ACK/NACK signals of the receiving step of claim 1 then on file could be different and that the mobile terminal independently detected the

ACK/NACK signals received (see appealed decision, Reasons 3.4, 5.1 and 8.1).

2.2.2 Following the substantial amendments made to the present independent claims in response to the objections raised under Article 123(2) EPC by the examining division and by the board, the board is satisfied that those deficiencies are overcome, for the reasons set out below.

2.2.3 Amendment (i) is supported e.g. by paragraphs [0026] to [0033] of the application as filed and clarifies that the claimed method steps are executed in the "softer handover" mode.

2.2.4 Amendments (ii) and (iii) are supported by paragraph [0005] (fourth sentence), paragraph [0029] (second sentence) and paragraph [0007] of the application as filed, and make clear that *identical* data packets, i.e. having the same content, are actually transmitted through each of the base station's available sectors and not any general ones.

2.2.5 Amendments (iv) and (v) are supported by page 11, penultimate line to page 12, first line, in conjunction with Figure 2C, step S240c, of the application as filed, and imply that identical ACK/NACK signals are transmitted and are to be received through the same sectors as those through which the data packets have been transmitted.

2.2.6 Lastly, amendment (vi) is supported by paragraphs [0030] (penultimate sentence) and [0033] (third sentence) and specifies that maximal-ratio combining is performed at the receiver side.

2.2.7 Hence, the board concludes that present claim 1 now complies with Article 123(2) EPC.

2.3 *Inventive step having regard to D1 (Article 56 EPC)*

2.3.1 The examining division found that the subject-matter of claim 1 of the main request then on file did not involve an inventive step over prior-art document **D1** (see appealed decision, Reasons 4).

2.3.2 It is apparent to the board that D1 relates to ARQ (Automatic Repeat Request)-specific retransmissions in 3GPP-based mobile networks and is concerned with "soft handover" (rather than "softer handover"). In particular, it fails to disclose that

- the mobile terminal communicates with and transmits identical data packets to the base station through multiple sectors associated with it;
- the base station transmits identical ACK/NACK signals through those sectors via which the data packets were transmitted by the mobile terminal;
- the mobile terminal applies maximal-ratio combining to the ACK/NACK signals received through the sectors in order to obtain the signal with the highest signal-to-noise ratio.

Consequently, document D1 is devoid of any of method steps A) to C) of present claim 1 (see also appealed decision, Reasons 4.2).

2.3.3 As to the assessment of inventive step of claim 1 on file, the board, contrary to the finding of the decision under appeal, holds that D1 does not lend itself as a suitable starting point for evaluating inventive step. This is because it (1) does not relate

to the same technical purpose or objective (i.e. detecting signalling messages such as ACK/NACK signals in a softer handover scenario), (2) comprises very few features in common with the subject-matter claimed (see point 2.3.2 above) and (3) requires numerous structural and functional modifications to arrive at the solution of claim 1 (see point 2.3.4 below).

2.3.4 Even if D1 was selected as the starting point, the underlying objective technical problem, according to the decision under appeal, was to be framed as "how to apply the soft handover method disclosed in document D1 to softer handovers" (see appealed decision, Reasons 4.4, last paragraph).

Firstly, the board has some doubts whether the skilled person would realistically have been faced with such a problem in view of the fact that D1 is primarily concerned with the re-location of ARQ processes in wireless systems relying on "soft handover". Secondly, the person skilled in the field of mobile networks, starting from the teaching of D1 and confronted with the above objective problem, would have to implement several intermediary steps in adapting the system of D1, namely ensuring that

- the cells of the system of D1 are divided into *sectors* associated with only one base station;
- the system is enabled that a handover from one sector to another sector of the same base station may be performed in order to support *softer handover* (see also appealed decision, Reasons 4.4);
- a certain data packet is transmitted, by a mobile terminal, over *multiple* sectors to the base station;

- *identical* ACK/NACK signals, transmitted by the base station in return, are received by the mobile terminal through exactly those multiple sectors;
- "macro-diversity combining" (as incidentally referred to in D1, page 8, lines 11-16) is applied by the mobile terminal to the *ACK/NACK signals* received.

2.3.5 Overall, the board judges that in view of the large number of complex and non-obvious intermediary steps to be undertaken in the system of D1 in order to solve the above objective problem, only based on mere speculation and hindsight analysis would the skilled person "attempt to fill in the missing bits and pieces concerning the transmission and reception of ACK/NACK signals" (see appealed decision, Reasons 4.5) and arrive at the solution claimed.

2.3.6 As a consequence, the subject-matter of present claim 1 is held to be novel and to involve an inventive step having regard to D1 alone.

2.4 Hence, since the grounds for refusal no longer apply, the decision under appeal has to be set aside.

3. *Remittal of the case for further prosecution*

3.1 The appellant requested that the case be remitted to the examining division for further prosecution based on the claims of the present main request (see point V above).

3.2 The board notes that under the EPC there is no absolute "right to two instances" in the sense that a party in all circumstances is entitled to have every aspect of its case examined by two instances. However, given that

the amended claims according to the present main request were filed for the first time in the appeal proceedings in order to overcome all the objections raised under Article 123(2) EPC in the first- and second-instance proceedings, the board agrees with the appellant that under the present circumstances it is not appropriate to take a final decision on the matter of inventive step in these appeal proceedings.

As a matter of fact, amended features (i) to (vi) as such and their associated technical effects could evidently not be addressed at all by the examining division in the course of the first-instance proceedings. Moreover, in view of the fact that those features were taken from various passages of the application's description and from the figures (see points 2.2.3 to 2.2.6 above), the board notes that it is not clear whether they were covered by the original search.

3.3 In view of the above and in accordance with the appellant's request, the board has decided in the exercise of its discretion under Article 111(1) EPC to remit the case to the examining division for further prosecution.

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 the main request (claims 1 to 4) as filed during oral proceedings before the board on 19 December 2018.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated