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Datasheet for the decision of 29 May 2019

Case Number: T 1280/16 - 3.5.05

Application Number: 06827064.4

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IPC: H04L1/00

Language of the proceedings: EN

Title of invention:
A method and apparatus for setting reverse link CQI reporting modes in wireless communication system

Applicant:
QUALCOMM Incorporated

Headword:
Channel reporting modes I/QUALCOMM

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
Novelty - main and first auxiliary request (no)
Inventive step - second and third auxiliary requests (no): reformulation of the objective problem necessary

Decisions cited:
T 0013/84, T 0039/93, T 1639/07

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Case Number: T 1280/16 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 29 May 2019

Appellant: (Applicant)	QUALCOMM Incorporated 5775 Morehouse Drive San Diego, CA 92121 (US)
Representative:	Witte, Weller & Partner Patentanwälte mbB Postfach 10 54 62 70047 Stuttgart (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 23 December 2015 refusing European patent application No. 06827064.4 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 lack of inventive step (Article 56 EPC) with respect to the claims of a main request and first to third auxiliary requests, having regard to the disclosure of

D2: Qualcomm Europe: "MIMO proposal for MIMO-WCDMA evaluation", TSG-RAN WG1 #42 meeting, document R1-050912, pp. 1-23, August 2005,

combined with the skilled person's common general knowledge as exemplified by

D2bis: Qualcomm Europe: "Link level evaluation of MIMO-WCDMA schemes", TSG-RAN WG1 #42 meeting, document R1-050913, pp. 1-13, August 2005.

II. In its statement setting out the grounds of appeal, the appellant requested that the examining division's decision be set aside and that a patent be granted on the basis of one of the main request and first to third auxiliary requests underlying the appealed decision.

III. In a communication annexed to the summons to oral proceedings pursuant to Article 15(1) RPBA, the board gave its preliminary opinion on the appeal. It introduced the following prior-art documents into the appeal proceedings in reaction to the appellant's arguments submitted with the statement setting out the grounds of appeal:

D5: WO-A-2004/098072;
D6: US-A-2004/0057394.

In particular, the board raised objections under Articles 54 and 56 EPC, mainly having regard to documents D5, D6 and D2.

IV. Oral proceedings were held on 29 May 2019, during which the allowability of all the pending claim requests was discussed.

The appellant's final request was that the decision under appeal be set aside and that a patent be granted on the basis of one of the

- main request (claims 1 to 6) as filed by letter dated 15 September 2014;
- first auxiliary request (claims 1 to 6), filed as "auxiliary request" by letter dated 15 September 2014;
- second auxiliary request (claims 1 to 3) as filed by letter dated 23 October 2015;
- third auxiliary request (claims 1 to 3) as filed by letter dated 23 October 2015.

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

V. Claim 1 of the **main request** and the **first auxiliary request** reads as follows:

"Method (500) of setting Reverse Link Channel Quality Indicator (CQI) Reporting Modes in an access terminal in a wireless communication system (100), characterized by:

determining (502) a value for CQIReportingMode; and

setting (504) reporting modes of the access terminal (402) based on CQIReportingMode value."

Claim 1 of the **second auxiliary request** reads as follows (amendments to claim 1 of the main and the first auxiliary request highlighted by the board):

"Method (500) of setting Reverse Link Channel Quality Indicator (CQI) Reporting Modes in an access terminal (402) in a wireless communication system (100), characterized by:

determining (502) a value for CQIReportingMode;

selecting, based on the determined CQIReportingMode value, a Reverse Link CQI Reporting Mode from a group comprising a Single Code Word CQI Reporting Mode, a Multiple Code Word CQI Reporting Mode, and a Single Input and Single Output (SISO) CQI Reporting Mode; and

setting (504) reporting modes of the access terminal (402) ~~based on CQIReporting Mode value~~ to the selected Reverse Link CQI Reporting Mode."

Claim 1 of the **third auxiliary request** reads as follows:

"Method of setting Reverse Link Channel Quality Indicator (CQI) Reporting Modes in an access terminal (402) in a wireless communication system, comprising:

determining (502) a value for CQIReportingMode; and

setting (504) a Reverse Link CQI Reporting Mode of the access terminal based on CQIReportingMode value that indicates a Reverse Link CQI Reporting Mode to implement selected from a group consisting of a Single Code Word CQI Reporting Mode, a Multiple Code Word CQI Reporting Mode, and a Single Input and Single Output (SISO) CQI Reporting Mode, wherein:

the Reverse Link CQI Reporting Mode of the access terminal is set to be Single Code Word CQI Reporting Mode if the CQIReportingMode value indicates

Single Code Word CQI Reporting Mode;

the Reverse Link CQI Reporting Mode of the access terminal is set to be Multiple Code Word CQI Reporting Mode if the CQIReportingMode value indicates Multiple Code Word CQI Reporting Mode; and

the Reverse Link CQI Reporting Mode of the access terminal is set to be Single Input and Single Output (SISO) CQI Reporting Mode if the CQIReportingMode value indicates Single Input and Single Output (SISO) Reporting Mode."

Reasons for the Decision

1. *The present invention*

The present application is concerned with setting a reporting mode for a mobile access terminal in a 3GPP-based wireless system. More specifically, channel quality indicators (CQIs) related to the reverse link (i.e. the path from a mobile terminal to the associated base station) of a wireless communication system are to be reported by an access terminal, where the modes of the access terminal for such a reporting are to be set in the access terminal and the setting is done on the basis of a particular value for the respective reporting mode, called "CQIReportingMode". The possible reporting modes are called "Single Code Word (SCW) CQI Reporting Mode" in the case of *vertical* encodings in MIMO systems, "Multiple Code Word (MCW) CQI Reporting Mode" in the case of *horizontal* encodings in MIMO systems, and "Single Input and Single Output (SISO) CQI Reporting Mode" in the case of single-antenna systems.

2. MAIN REQUEST

The main request on file is the one on which the appealed decision is based.

2.1 *Novelty (Article 54 EPC)*

2.1.1 The examining division held that the subject-matter of claim 1 of the main request was new but did not involve an inventive step (Article 56 EPC) in view of prior-art document **D2** (see appealed decision, Reasons 24).

2.1.2 It is common ground that D2 fails to disclose any of the method steps of present claim 1 (see features A) and B) in points 2.1.3 and 2.1.4 below). However, the board holds that the claimed subject-matter is not new over prior-art document **D5** or **D6** (Article 54 EPC). The reasons are as follows:

2.1.3 Document **D5** discloses the following limiting features of present claim 1:

A method of setting reporting modes for reverse-link channel quality indicator ("channel quality reports") in an access terminal ("remote station 102") in a wireless communication system (see e.g. Fig. 1), comprising the steps of:

A) determining a value (e.g. value in "PERSISTENCE field" of Fig. 2) for the reporting mode (see e.g. page 9, lines 28-29: *"PERSISTENCE - indicates whether more than one channel quality report message should be sent in response to the channel quality request message"*; page 10, lines 9-11: *"... the base station sends the PERSISTENCE field to instruct the remote station ..."*);

B) setting reporting modes (e.g. modes for sending reports with different stop events) of the access terminal based on the reporting mode value (see e.g. page 10, lines 9-14, emphasis added: *"... the base station sends the PERSISTENCE field to instruct the remote station to continue transmission of channel quality reports until a downlink packet is delivered successfully ... the PERSISTENCE field instructs the remote station to continue transmission of channel quality reports until the base station's associated remote-unit specific queue is empty"*).

2.1.4 Document **D6** likewise discloses the limiting features of present claim 1:

A method of setting reporting modes for reverse-link channel quality indicators ("carrier-to-interference (C/I) ratio" reports; see [0018]) in an access terminal ("mobile station 102") in a wireless communication system (see e.g. Fig. 1), comprising the steps of:

A) determining a value (e.g. "control signal") for the reporting modes (see e.g. page 4, right-hand column, first paragraph: *"... the base station determines the reverse link channel conditions and transmits a control signal to the remote station ..."*);

B) setting reporting modes (e.g. modes for sending reports with different rates) of the access terminal based on the reporting mode value (see e.g. page 4, right-hand column, first paragraph: *"... wherein the control signal informs the remote station as to whether the re-synch subchannel should operate at a reduced rate or not ..."*).

2.1.5 Hence, all the limiting features of claim 1 are anticipated by D5 or D6.

2.1.6 The appellant did not provide any comments on the novelty issue.

2.2 In view of the above, the main request is not allowable under Article 54 EPC.

3. FIRST AUXILIARY REQUEST

Claim 1 of the first auxiliary request is identical to claim 1 of the main request.

3.1 *Novelty (Article 54 EPC)*

3.1.1 Given that claim 1 of the first auxiliary request is identical to claim 1 of the main request, the observations set out in point 2.1 above apply equally to claim 1 of the present auxiliary request.

3.1.2 The appellant did not provide any comments on the novelty issue.

3.2 Consequently, the first auxiliary request is not allowable under Article 54 EPC either.

4. SECOND AND THIRD AUXILIARY REQUESTS

Claim 1 of the second and third auxiliary requests differs from claim 1 of the main request essentially in that it further specifies that (emphasis added by the board)

C) the CQI reporting mode is <u>selected</u>, based on the determined reporting-mode value, from a group

comprising a single code word (SCW), a multiple code word (MCW) and a single input and single output (SISO) mode (**second and third auxiliary requests**);

D) the CQI reporting mode is set to SCW, MCW or SISO mode if the reporting-mode value indicates SCW, MCW or SISO mode respectively (**third auxiliary request**).

4.1 *Novelty (Article 54 EPC)*

Documents D5 and D6 evidently fail to disclose the specific modes according to added features C) and D). Hence, the subject-matter of claim 1 of the second and third auxiliary requests is novel based on those distinguishing features (Article 54 EPC).

4.2 *Inventive step (Article 56 EPC)*

4.2.1 As to inventive step, the appellant argued at the oral proceedings before the board that distinguishing feature C) had the technical effect of giving the base station further control over the access terminal and thus of providing additional flexibility, which was not hinted at in D5 and D6. On the basis of that technical effect and the fact that the claimed transmission modes (i.e. SCW, MCW, SISO modes) implied the use of distinct numbers of active antennas and thus a different hardware structure of the underlying wireless system, the objective technical problem to be solved was "how to enhance the flexibility of the reporting from the access terminal".

4.2.2 The board does not accept this formulation of the objective problem in the present case. In particular, the objective technical problem must be derived from

technical effects that are based on objectively established facts and are directly and causally related to the technical features of the claimed invention (see e.g. T 13/84, OJ EPO 1986, 253, Reasons 11; T 39/93, OJ EPO 1997, 134, Reasons 5.3.3; T 1639/07, Reasons 2.5).

In fact, the allegedly underlying problem of enhancing the flexibility of reporting is already solved by the teachings of D5 and D6 since both documents rely on controlling the desired reporting mode by the base station (see points 2.1.3 and 2.1.4 above). As a consequence, such a problem cannot qualify as a valid *objective* problem in the framework of the problem-solution approach in the present case. Rather, the board holds that distinguishing features C) and D) relate to the objective problem of "how to extend the applicability of the scheme of D5 or D6 to different wireless hardware structures".

4.2.3 In the present case, the skilled person, starting e.g. from D5 (see e.g. page 8, lines 22-25, emphasis added: *"... there may be a third format defined ..., such as could be used for a closed-loop multiple antenna system"*) or from D6 (see e.g. Fig. 2), would seek feasible ways of adapting the available reporting modes addressed in those documents - besides the conventional single-antenna (SISO) case - to (preferrably standardised) modes of multi-antenna systems such as MIMO, i.e. involving different numbers of active antennas in the system, in order to find a solution to the above objective problem.

The person skilled in the field of 3GPP-based wireless systems would, for example, consult the 3GPP-related document **D2**, which teaches that, in the case of MIMO-based systems (besides SISO-based systems), there

are basically two relevant modes for CQI reporting, namely the SCW and MCW modes (see e.g. D2, section 2.1 and Figs. 1 and 2). As a consequence, the skilled person would additionally apply those MIMO-based reporting modes to the system of D5 or D6 in order to extend the applicability of those basically single-antenna systems to other possible wireless hardware scenarios. Thus, the skilled person would readily arrive at the solution of claim 1 of the second auxiliary request in an obvious manner (Article 56 EPC).

4.2.4 As to the further distinguishing feature D) of the third auxiliary request, the appellant argued at the oral proceedings before the board that it was related to the objective problem of "when to activate a particular transmission mode".

However, this problem is not considered to be appropriate in the present case either. Firstly, no exact timing of any mode activation is derivable from the claimed subject-matter. Further, it is not inferable from the wording of the present claims that the relevant "value" is indeed transferred from the base station, i.e. from an external device, to the access terminal. Secondly, and more importantly, the above problem would provide an explicit pointer ("activate a particular transmission mode") to the solution which would likewise not be compatible with a proper application of the problem-solution approach.

4.3 In sum, the second and third auxiliary requests are not allowable under Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated