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Datasheet for the decision of 29 May 2019

Case Number: T 1341/16 - 3.5.05

Application Number: 11167329.9

Publication Number: 2362568

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 II/QUALCOMM

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no): re-formulation of the objective problem necessary

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

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Case Number: T 1341/16 - 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 92121-1714 (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. 11167329.9 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 (divided from its parent application EP 06827064.4 underlying appeal case T 1280/16) 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 Article 56 EPC having regard to 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 3) as filed by letter dated 15 September 2014;
- first auxiliary request (claims 1 to 3), filed as "auxiliary request" by letter dated 15 September 2014;
- second auxiliary request (claims 1 to 3) as filed by letter dated 26 October 2015;
- third auxiliary request (claims 1 to 3) as filed by letter dated 26 October 2015.

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

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

"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; and

setting (504) reporting modes of the access terminal (402) based on CQIReportingMode value that indicates to set a Reverse Link CQI Reporting Mode to a

Single Code Word CQI Reporting Mode, a Multiple Code Word CQI Reporting Mode, or a Single Input and Single Output (SISO) CQI Reporting Mode."

Claim 1 of the **first auxiliary request** reads as follows (amendments to claim 1 of the main 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; and

setting (504) reporting modes of the access terminal (402) to a reporting mode selected from the 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 based on CQIReportingMode value that indicates to set a Reverse Link CQI Reporting Mode to the Single Code Word CQI Reporting Mode, the Multiple Code Word CQI Reporting Mode, or the Single Input and Single Output (SISO) CQI Reporting Mode."

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

"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) 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 and inventive step (Articles 54 and 56 EPC)*

2.1.1 The examining division held that the subject-matter of claim 1 of the main request was novel but did not involve an inventive step (Article 56 EPC) in view of prior-art document **D2** (see appealed decision, Reasons 19).

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 newly introduced prior-art documents D5 or D6 constitute better starting points for assessing inventive step than document D2 since they are both concerned with providing a reporting mode *value* from the base station to a mobile terminal.

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 <u>until a downlink packet is delivered successfully</u> ... 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 above 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 It follows from the above that the subject-matter of present claim 1 differs from the disclosures of documents D5 and D6 in that the "CQIReportingMode value" indicates to set the respective reporting mode to a Single Code Word (SCW), a Multiple Code Word (MCW) or a Single Input and Single Output (SISO) CQI Reporting Mode. Hence, the subject-matter of present claim 1 is novel over D5 and D6 (Article 54 EPC).

2.1.6 As to inventive step, the appellant argued at the oral proceedings before the board that the above distinguishing feature 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".

2.1.7 The board does not accept this formulation of the objective technical 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, this 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 setting the specific modes according to the above distinguishing feature relates to the objective problem of "how to extend the applicability of the scheme of D5 or D6 to different

wireless hardware structures".

2.1.8 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 of those teachings - 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 also to other possible wireless hardware scenarios. Thus, the skilled person would readily arrive at the solution of claim 1 in an obvious manner.

2.2 In view of the above, the main request is not allowable under Article 56 EPC.

3. AUXILIARY REQUESTS

Claim 1 of the first to 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 to be set is selected from the group comprising an SCW, an MCW and a SISO mode (**first to third auxiliary requests**);
D) the CQI reporting mode is set to the selected SCW, MCW or SISO mode (**second and third auxiliary requests**);
E) the CQI reporting mode is set to the selected SCW, MCW or SISO mode if the reporting-mode value indicates SCW, MCW or SISO mode respectively (**third auxiliary request**).

3.1 *Inventive step (Article 56 EPC)*

3.1.1 It is apparent to the board that added features C) to E) merely reflect in different words the setting step of claim 1 of the main request and therefore do not add anything of technical substance to the claimed subject-matter. This was not challenged by the appellant.

3.1.2 As a consequence, the reasoning set out in point 2.1 above applies *mutatis mutandis* to claim 1 of the auxiliary requests on file.

3.2 In sum, the first to third auxiliary requests are not allowable under Article 56 EPC either.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated