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**Datasheet for the decision
of 24 June 2019**

Case Number: T 2073/15 - 3.5.05

Application Number: 06802656.6

Publication Number: 1929692

IPC: H04L1/06, H04L1/00, H04B7/06,
H04Q7/36, H04B7/04

Language of the proceedings: EN

Title of invention:
TRANSMISSION MODE SELECTION, PRECODING AND SDMA SUPPORT

Applicant:
Qualcomm Incorporated

Headword:
Multiple antennas transmission mode selection/QUALCOMM

Relevant legal provisions:
EPC Art. 83, 113, 123(2)
EPC R. 103(1)(a), 137(5)

Keyword:

Amendments - added subject-matter (no)

Amendments of application - amended claims relating to
unsearched subject-matter (no)

Sufficiency of disclosure - (yes)

Reimbursement of appeal fee - equitable by reason of a
substantial procedural violation

Decisions cited:

Catchword:



Beschwerdekammern
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Case Number: T 2073/15 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 24 June 2019

Appellant: Qualcomm Incorporated
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 15 May 2015
refusing European patent application No.
06802656.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair A. Ritzka
Members: P. Cretaine
F. Blumer

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division, posted on 15 May 2015, refusing European patent application No. 06 802 656.6. A claim set according to a main request was refused for non-compliance with the requirements of Rule 137(5) EPC. A claim set according to a first auxiliary request was refused for non-compliance with the requirements of Article 123(2) EPC, Rule 137(5) EPC, and Article 83 EPC. A procedural request for issuance of a decision concerning the findings of lack of unity (second auxiliary request) was not allowed. A claim set according to a new main request was not admitted into the proceedings for not being prima facie novel over the disclosure of

D1: US 2002/147953.

D2: US 2005/041611 was cited as an additional relevant prior-art document.

A further procedural request to continue the proceedings in writing (third auxiliary request) was not allowed.

II. Notice of appeal was received on 27 July 2015, and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 16 September 2015. The appellant requested that the decision be set aside and that a patent be granted based on the claims of the main request or auxiliary request I, both requests submitted with the statement setting out the grounds of appeal. The appellant further requested reimbursement of the appeal fee

pursuant to Rule 103(1)(a) EPC. Oral proceedings were also requested as an auxiliary measure.

- III. A summons to oral proceedings was issued. In a communication pursuant to Article 15(1) RPBA despatched on 10 January 2019, the board gave its preliminary opinion that the main request met the requirements of Articles 123(2) and 83 EPC and of Rule 137(5) EPC. The board however indicated that, since the issue of inventive step was not discussed during the first-instance proceedings, it considered it appropriate to remit the case to the department of first instance for further prosecution on the basis of the main request. Moreover, the board identified a substantial procedural violation in the first-instance proceedings and indicated that it would thus be in a position to remit the case to department of first instance for further prosecution on the basis of the main request and to order the reimbursement of the appeal fee, provided the appellant confirmed that it accepted the continuation of the appeal proceedings and the remittal for further prosecution. In that case, the oral proceedings could be cancelled.
- IV. By letter dated 31 January 2019, the appellant accepted the continuation of the appeal proceedings and the remittal of the case to the department of first instance, as suggested by the board.
- V. In a short communication dated 12 February 2019 the board announced that the oral proceedings had been cancelled.
- VI. Claim 1 according to the main request reads as follows:

"A method (600) at a base station (104) in communication with a mobile device (102) in a wireless communication system supporting beam-forming, comprising:
receiving (602) a user preference for a transmission mode from the mobile device (102);
associating (604) the user preference with an entry in a codebook (106), wherein the entry comprises precoding weights to be applied in conjunction with beam-forming to the beams; and
assigning (606) the user to a transmission mode corresponding to the entry."

Independent claim 5 according to the main request reads as follows:

" A method (700) at a mobile device (102) in communication with a base station (104) in a wireless communication system supporting beam-forming, comprising:
determining (702) channel characteristics of a user;
selecting (704) a transmission mode or modes from a codebook (106) to apply, wherein the codebook (106) is common to the mobile device (102) and the base station (104) and comprises precoding weights to be applied in conjunction with beam-forming by the base station (104) to the beams; and
transmitting (706) an identifier of the mode or modes selected to the base station (104)."

The request comprises further independent claims directed to corresponding devices at a base station (claim 8) and at a mobile station (claim 10), and to a computer program product (claim 11) for performing the method claims.

Due to the outcome of the appeal proceedings, there is no need to detail the claims of auxiliary request I.

Reasons for the Decision

1. The appeal is admissible (see point II).
2. Main request

The claims are based on the claims of the then first auxiliary request on which the decision was based. It was refused by the examining division for lack of compliance of its claim 1 with the requirements of Article 123(2) EPC, Rule 137(5) EPC, and Article 83 EPC.

2.1 Article 123(2) EPC

Claim 1 has been amended by replacing the feature of "associating the user preference with an entry or entries in a codebook comprising precoding weights to be applied in conjunction with beam forming directly to the beams", objected to under Article 123(2) EPC in the decision, by the feature of "associating the user preference with an entry in a codebook, wherein the entry comprises precoding weights to be applied in conjunction with beam-forming to the beams".

The amended feature specifies that the entry of the codebook which is associated with the received user preference comprises precoding weights to be applied in conjunction with beam-forming to the beams. It is described in the application document as originally filed that the transmission mode can be one of precoding, SDMA, SDMA precoding, MIMO, MIMO precoding,

MIMO-SDMA, and diversity (see in particular paragraphs [0008] to [0012]). It is not explicitly described that the transmission mode must be one of these. Paragraph [0032] describes that the number of entries in the codebook, corresponding to the transmission modes, may for example amount to sixty-four. Further, paragraph [0032] ("(e.g. precoding, ...MIMO-SDMA, etc.)"), together with paragraph [0071] ("These modes include SDMA, ..., and/or the like") and paragraph [0073] ("the modes include SDMA, ..., and/or the like") clearly teach that the list of possible transmission modes is not strictly limited to the above mentioned transmission modes. Moreover, among the cited transmission modes, at least precoding SDMA is a mode which uses precoding weights to be applied in conjunction with beam-forming to the beams (see paragraph [0067] and Figure 4). It is thus unambiguously disclosed that the transmission modes corresponding to the entries of the codebook may be modes which are based on precoding weights to be applied in conjunction with beam-forming to the beams.

The above-mentioned replaced feature in claim 1 was also objected to under Article 123(2) EPC in the decision because of the term "directly" in the wording "precoding weights to be applied...directly to the beams". The appellant has overcome this objection by deleting the term "directly" in claim 1. Independent claim 8, however, still contains the term "directly". Nevertheless, the board holds that the feature of applying the precoding weights directly to the beams is supported by the application documents as originally filed. In that respect, paragraphs [0049] and [0050] in combination with Figure 4 teach that the precoding weights are associated and applied to the virtual sectors 404, including a number of beams (five in Figure 4) of the SDMA beam space, i.e. to the virtual

sectors 404 formed by the beam-forming operation. Since no other operation on the virtual sectors 404, after they have been formed, is described, the application of the precoding weights to the beams of each virtual sector 404 can be defined as being performed "directly".

For these reasons the board holds that the claims meet the requirements of Article 123(2) EPC.

2.2 Rule 137(5) EPC

The board agrees with the appellant that the feature defining the application of the precoding weights to the beams in conjunction with beam-forming was included in the search.

In that respect, the board notes firstly that, in the search report issued by the EPO as International Searching Authority, the invention which was first defined in the originally filed claims, and which was the subject of the search, was defined as being related to "the set of different transmission modes contained in the codebook, of which one can be selected". This indicates the relevance of the transmission modes for the search.

Secondly, the potential special technical features which were identified at the search stage to make a contribution over prior-art document D1 were the features of originally filed claim 3 that the codebook also included an entry for SDMA. The problem solved by these features was formulated as "How to enhance the set of possible options for the mode selection?". This also clearly indicates that the kind of transmission mode was the subject of the search.

Thirdly, originally filed claim 3, which was included in the search, comprised a list of transmission modes, including SDMA precoding. With respect to SDMA precoding, which was thus included in the scope of the search related to the first invention, the description in paragraph [0067] teaches how sectors, virtual sectors, and beams within a virtual sector, are formed in this transmission mode. This description of SDMA precoding, a feature included in the scope of the search, corresponds fairly well to the description of paragraphs [0049] and [0050] in combination with Figure 4 related to precoding weights applied in conjunction with beam-forming to the beams.

The board therefore holds that the claims meet the requirements of Rule 137(5) EPC.

2.3 Article 83 EPC

The decision found that the whole description did not disclose how the precoding weights were applied to the beams formed by beam-forming.

The description, *inter alia* in paragraphs [0036], [0049] in combination with Figure 4, and [0050], clearly mentions that the precoding is applied in the beam space of SDMA beams, i.e. after the beams of the SDMA, shown as virtual sectors including a number of beams and referenced 404 in Figure 4, have been formed. The precoding coefficients, or weights, are thus applied to the beams of the virtual sectors after the data symbols have been multiplied with the beam-forming weights. As stated in the decision (see Reasons 17.3.1 and 17.3.2), both precoding and beam-forming, when performed separately, are based on transmitting the

same data symbol on multiple transmit antennas in parallel, wherein a different weight, namely a precoding weight or a beam-forming weight, is applied to the data symbol at each antenna before transmission.

The decision further acknowledged (see Reasons 17.3.4) that the skilled person would consider a multiplication of the weights at each antenna in order to combine precoding and beam-forming processes. It however raised the objection that the skilled person would not be able to implement a workable solution, not inferior to pure precoding and pure beam-forming, without knowledge of how to select the precoding and beam-forming weights.

The board however agrees with the appellant that the aim of beam-forming, known per se, is to create the virtual sectors 404 which focus the transmission towards the user device, while the aim of the precoding applied to the beams of the virtual sectors is to maximise the received signal power in the presence of radio-channel time dispersion. It is thus clear from the description that the selection of the precoding weights is performed depending on the selection of the beam-forming weights in order to achieve the desired effect. Therefore the skilled person would first be able to select beam-forming weights to apply standard beam-forming and create the desired virtual sectors (404 in Figure 4). The skilled person would then be able to select precoding weights applied subsequently to the virtual sectors in order to ensure, as argued by the appellant, that the signals arrive simultaneously at the user device.

For these reasons the board holds that the application meets the requirement of Article 83 EPC.

2.4 Inventive step

Since the issue of inventive step with regard to prior-art documents D1 and D2 on file has not been addressed in the summons to oral proceedings, during the oral proceedings, or in the decision, the board considers that it is appropriate to remit the case to the department of first instance for further prosecution in that respect (see point 4 below).

3. Procedural violations / Reimbursement of the appeal fee

The appellant requested reimbursement of the appeal fee under Rule 103(1)(a) EPC for violation by the examining division of its right to be heard under Article 113(1) EPC.

The appellant argued in substance that both the refusal of the request for continuation in writing (auxiliary request III) and the refusal of the "late-filed main request" (MR-OP) as inadmissible represent a substantial procedural violation of the right to be heard since these requests were filed in response to the objection under Article 83 EPC raised for the first time during the oral proceedings before the examining division.

The board understands that the "'late-filed main request' (MR-OP)" quoted by the appellant is the request filed by the appellant after the request for continuation in writing (auxiliary request III) was refused, and that it is indistinctively referred to as "latest non-considered request", "last late-filed claim set" and "late-filed main request (MR-OP)" in point 9

of the minutes of the oral proceedings. According to point 9 of these minutes, this request was not admitted into the procedure. The decision, however, does not mention this request (see point 26 and 27). Said "late-filed main request" needs to be distinguished from the "Main Request" and the "New Main Request", which were filed during the oral proceedings and before the "late-filed main request" was filed (see the requests attached to the minutes of the oral proceedings). The "New Main Request" was not admitted into the proceedings for the reasons given in points 20 to 24 of the decision (see also points 7 and 8 of the minutes).

The appellant did not have an *a priori* right to have the "late-filed main request" admitted into the first-instance proceedings. However, a party filing a request is always entitled to be heard on why it considers the request should be admitted. If the request is not admitted, this decision must be reasoned (Rule 111(2) EPC). From the minutes of the oral proceedings (point 9), it appears that the admissibility of the "late-filed main request" was briefly discussed before the request was filed. The request filed bears a handwritten remark "not considered by ExDiv" (see the corresponding annex to the minutes). At the end of point 9 of the minutes, a statement is made that the "*late-filed main request (MR-OP) is not admitted into the procedure, Rule 116(2) EPC*". It is not entirely clear whether this statement refers to the "late-filed main request" or the "New Main Request" as filed earlier during the oral proceedings and also referred to as "MR-OP" (see points 7 and 8 of the minutes). It is clear, however, that the decision does not contain any reference to the "late-filed main request", let alone any reasons as to why it was not admitted into the proceedings.

The board thus holds that the handling of the "late-filed main request" involved a violation of the appellant's right to be heard for the above reasons, and that the request for reimbursement of the appeal fee under Article 103(1)(a) EPC is justified.

On the other hand, the board does not see a procedural violation in the context of the then pending auxiliary request III (continuation in writing to allow consultation with the applicant on the objection under Article 83 EPC against then auxiliary request I). The board agrees with the examining division in that the request should have been made before the debate on the auxiliary request I was closed and before lower-ranking requests were discussed.

4. The board has decided that the main request complies with the requirements of Articles 83 and 123(2) EPC and of Rule 137(5) EPC. However, a remittal for further prosecution is appropriate since the issue of inventive step with regard to prior art documents D1 and D2 was not discussed during the first instance proceedings (see above point 2.4).

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.
3. The appeal fee is reimbursed.

The Registrar:

The Chair:



K. Götz-Wein

A. Ritzka

Decision electronically authenticated