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Datasheet for the decision of 29 August 2019

Case Number: T 1473/15 - 3.5.05

Application Number: 09804964.6

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Language of the proceedings: EN

Title of invention:
RADIO COMMUNICATION SYSTEM, BASE STATION DEVICE, MOBILE STATION DEVICE, AND COMMUNICATION METHOD

Applicant:
Huawei Technologies Co., Ltd.

Headword:
OFDM frame power control/HUAWEI

Relevant legal provisions:
EPC Art. 56
RPBA Art. 13(3)

Keyword:
Inventive step - (no)
Late-filed auxiliary request - admitted (no)

Decisions cited:

Catchword:

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Case Number: T 1473/15 - 3.5.05

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

Appellant: (Applicant)	Huawei Technologies Co., Ltd. Huawei Administration Building Bantian Longgang District Shenzhen, Guangdong 518129 (CN)
Representative:	Körber, Martin Hans Mitscherlich PartmbB Patent- und Rechtsanwälte Postfach 33 06 09 80066 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 16 December 2014 refusing European patent application No. 09804964.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair	A. Ritzka
Members:	P. Cretaine
	D. Prietzel-Funk

Summary of Facts and Submissions

I. This appeal is against the decision of the Examining Division, posted on 16 December 2014, refusing European patent application No. 09804964.6. A main request and an auxiliary request 2 were refused for lack of inventive step (Article 56 EPC), having regard to the disclosure of

D1: NEC Group, "Clarifications on cell specific RS power boosting", 3GPP DRAFT; R1-081013, 3rd Generation Partnership Project (3GPP), Sophia-Antipolis, France, vol. RAN WG1, #52, Sorrento, Italy, 11-15 February 2008

in combination with

D3: Nokia et al., "Way forward on DRS EPRE", 3GPP DRAFT; R1-082607, 3rd Generation Partnership Project (3GPP), Sophia-Antipolis, France, vol. RAN WG1, #53bis, Warsaw, Poland, 30 June to 4 July 2008,

and taking into account the common general knowledge as illustrated by

D9: Nortel, "Modification on UE-Specific RS for extended CP", 3GPP DRAFT; R1-082508, 3rd Generation Partnership Project (3GPP), Sophia-Antipolis, France, vol. RAN WG1, #53bis, Warsaw, Poland, 30 June to 4 July 2008.

An auxiliary request 1 was refused for not meeting the requirements of Article 123(2) EPC.

Clarity objections were also raised against the main request under Article 84 EPC.

II. The notice of appeal was received on 24 February 2015 and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 27 April 2015. The appellant requested that the decision under appeal be set aside and that a patent be granted based on the claims of the main request on which the decision was based, or on the claims of auxiliary request 1 or auxiliary request 2 submitted with the statement setting out the grounds of appeal. Oral proceedings were requested in the event that none of the requests could be allowed in written proceedings.

III. A summons to oral proceedings was sent on 11 June 2019. In a communication pursuant to Article 15(1) RPBA issued on 18 June 2019, the board gave its preliminary opinion on the case. In its view, the main request did not meet the requirements of Article 56 EPC, having regard to D1 as closest prior art in combination with D3 and D9. The board further indicated that it was not inclined to admit auxiliary requests 1 and 2 into the proceedings (Article 12(4) EPC) and that even if these requests were admitted, they did not satisfy the requirement of Article 56 EPC.

IV. By letter of response dated 29 July 2019, the appellant submitted an auxiliary request and requested that a patent be granted based on the main request or this auxiliary request.

V. By letter dated 26 August 2019, the appellant informed the board that it would not attend the scheduled oral proceedings and requested that proceedings be continued in writing.

VI. Oral proceedings were held on 29 August 2019 in the absence of the appellant. The appellant had requested in writing that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request submitted with the letter dated 13 October 2014 or of the auxiliary request submitted with the letter dated 29 July 2019.

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

VII. Claim 1 according to the main request reads as follows:

"A control method for transmitting data from base stations (100a) to mobile stations (200a) by allocating to the mobile stations (200a) one or more third domains including a plurality of second domains configured by arranging, in a frequency direction, a plurality of first domains defined by frequency and time and using the allocated third domain(s), the control method including control in which, when one of the data, a reference signal specific to each of the base stations (100a), and a reference signal specific to each of the mobile stations (100a) is arranged in each of the first domains, the base stations (100a) adjust the power of each of the first domains and perform boosting of the transmit power of any of the first domains in which the reference signal specific to each of the base stations (100a) is arranged, within a specific second domain including the first domain in which the reference signal specific to each of the mobile stations (200a) is arranged, the first domain in which the reference signal specific to each of the base stations (100a) is arranged, and the first domain in which the data is arranged, wherein
the base stations (100a), within any of the specific

second domains, determine ratios of the power of the reference signal specific to each of the base stations (100a), of the data, and of the reference signal specific to each of the mobile stations (200a) by making the ratios of the transmit power of any of the first domains in which the reference signal specific to each of the mobile stations(200a) is arranged and of any of the first domains in which the data is arranged equal without boosting the transmit power of the first domain in which the reference signal specific to each of the mobile stations(200a) is arranged."

Claim 1 of the auxiliary request differs from claim 1 of the main request in that the wording "the base stations (100a), within any of the specific second domains" in line 15 is replaced by "the base stations (100a), within any of an OFDM symbol".

Each request comprises further independent claims directed to a corresponding control method for the mobile stations (claim 5), a corresponding mobile station (claim 6), a corresponding base station (claim 7) and a corresponding system comprising base and mobile stations (claim 11).

Reasons for the Decision

1. The appeal is admissible (see point II).

2. Main request - Inventive step

2.1 D1 represents the closest prior art and discloses, using the wording of claim 1, a control method for transmitting data from base stations ("eNodeB") to mobile stations ("UE"). This is done by allocating to

the mobile stations one or more third domains (see the OFDM "subframe" in Figure 3-1) including a plurality of second domains ("OFDM symbols") configured by arranging, in a frequency direction, a plurality of first domains (resource elements "REs") defined by frequency and time and using the allocated third domain(s) (see Figure 3-1 the OFDM "subframe"), the control method including control in which, when one of the data ("PDSCH" in D1; D in the Figures of the present application), and a reference signal specific to each of the base stations ("pilots", "cell specific RS", "RS" in D1; CRS in the figures of the application) is arranged in each of the first domains ("REs"), the base station adjusts the power of each of the first domains (see part 1, first bullet: "The eNodeB determines the down link transmit energy per resource element") and performs boosting of the transmit power of any of the first domains ("REs") in which the reference signal specific to each of the base stations is arranged (see part 3: "P_P is the RS power per RE"; see the Title: "Cell specific RS power boosting"; see part 4: "RS power boosting through P_P"), within a specific second domain (see in Figure 3-1 the first column representing an OFDM symbol which comprises data and RS signals) including the first domain ("RE") in which the reference signal ("pilot","RS") specific to each of the base stations is arranged and the first domain ("RE") in which the data is arranged, wherein the base stations ("eNodeB"), within any of the specific second domains, determine ratios of power (see part 3, fifth bullet: "P-A = P_D'/P_P ") of the reference signal specific to each of the base stations (see part 3, fourth bullet: "P_P is the RS power per RE") and of the data (see part 3, second bullet: "P_D' is the data power per RE for OFDM symbols with RS").

2.2 The differences between the subject-matter of claim 1 and the disclosure of D1 are thus that:
a) a reference signal specific to each of the mobile stations (DRS in figures of the present application) can be arranged in the first domains ("RE"),
b) a specific second domain further includes a reference signal specific to each of the mobile stations (DRS), and
- the base station, within a specific second domain, makes the ratio of the transmit power of any of the first domains in which the reference signal specific to each of the mobile stations (DRS) is arranged and of any of the first domain in which the data (D in the Figures of the application) is arranged, equal, without boosting the transmit power of the first domain in which the reference signal specific to each of the mobile stations (DRS) is arranged.

The technical effect of feature a) is that a better beam-forming to the mobile stations is enabled. The technical effect of feature b) is that, when CRS signals, DRS signals and D signals are present together in an OFDM symbol, the power of the DRS signals is constant over the OFDM symbol and not boosted with respect to the D signals.

The objective technical problem can thus be formulated as how to improve the beamforming while having enough power of the data signals to maintain the reproduction accuracy of the data.

2.3 The skilled person, starting from D1, and trying to solve this problem, is aware of the standardisation documents of the same 3GPP Working Group 1 and, in particular of such documents issued shortly after the publication date of D1 but before the priority date of

the present application. The skilled person would thus consider D3 which teaches using DRS signals in the OFDM frame for beamforming ("The presence of the DRS is motivated by beamforming") and introducing DRS for this aim in the OFDM frame of D1. D3 further teaches that DRS grids, i.e. the positioning of DRS signals in the OFDM frame, are defined for extended CP frame structures. The skilled person would thus look at the CP frame (OFDM frame) structure proposed by the standardisation documents at the time of publication of D3 and would consider document D9, presented during the same meeting (#53bis) as D3. The OFDM frame structure, defined in D9 as having been agreed by Working Group 1, allows the co-existence of DRS, CRS and D signals in OFDM symbols. The skilled person would thus assume that D3 uses this agreed structure and thus discloses the specific second domains in the terminology of claim 1.

With respect to the power of the DRS signals, D3 does not foresee DRS power boosting (see section 2. Discussion: "As there is no evidence of significant benefits from DRS boosting, we propose not to introduce it") and proposes to set the power of each resource element comprising a DRS signal equal to the power of the resource elements D comprising a data signal, that is D3 discloses that the ratio DRS power/D power should always be equal to 1 (see section 3. Proposal: "Specifying that the UE can assume that E-DRS = E-A (when DRS is present)). The power setting of the DRS signals as defined in claim 1 is thus disclosed in D3.

2.4 The appellant argued that the skilled person could equally consider using the modified frame structure shown in Figure 2 of D9, which did not foresee a co-existence of DRS, CRS and D signals in one OFDM symbol. The board is not convinced by this argument

since Figure 2 of D9 is a proposal filed during the same meeting as D3 (meeting #53bis in Warsaw), whereas D3 relies on a frame structure agreed before, i.e. the frame structure shown in Figure 1 of D9.

The appellant further argued that the skilled person would not have implemented CRS boosting, as required by claim 1, since D3 teaches that no benefit was observed from CRS boosting. However, in the board's view, D3, although mentioning that no benefit was observed in the single antenna case (section 2. Discussion), does propose (see section 5.2, fourth alinea) that for spatial multiplexing, the ratio D power/CRS power could be for instance -6dB, which represents a boosting of the CRS power with respect to the D power, as also disclosed in D1 and required by claim 1.

Moreover the appellant argued that part 5.2 and table 5.2-1 of D3 only disclose that the ratio D power /CRS power does not depend on the presence of CRS in the OFDM symbol but does not say anything about the ratio D power/DRS power, which is defined by distinguishing feature b). However, the board relies on D3, section 3, second bullet which teaches the skilled person to set the DRS power ("E-DRS") to be equal to the D power ("E-A").

2.5 For these reasons, the board holds that the subject-matter of claim 1 does not involve an inventive step, having regard to the disclosure of D1, D3 and D9 (Article 56 EPC).

Independent claims 5, 6, 7, and 11 contain in substance the same features as claim 1, but expressed in terms of a control method for a mobile station, a mobile station, a base station, and a system comprising base

and mobile stations, respectively. Thus these claims do also not meet the requirements of Article 56 EPC.

3. Auxiliary request - Admissibility

This request was late filed, after the summons to oral proceedings had been issued.

Claim 1 differs from claim 1 of the main request by specifying that the base station determines ratios of the power of the CRS signal, of the data signal, and of the DRS signal, within any ODFM symbol, instead of within a specific second domain.

However, the board notes that no OFDM symbol is defined in the other features of the claim. Furthermore, even if the skilled person could consider a second domain defined in the claim as an OFDM symbol, the claim now defines that ratios of the power of CRS, DRS, and data signals are determined within any OFDM symbol. It is however unclear how such ratios can be determined for the OFDM symbols which, as mentioned in the description and shown on the drawings, do not concurrently comprise the three kinds of signals. The arguments provided in writing by the appellant in favor of an inventive step of claim 1 do not help to resolve this contradiction.

Thus claim 1 prima facie does not meet the requirements of Article 84 EPC with respect to clarity.

Therefore the board has decided in oral proceedings not to admit the auxiliary request into the proceedings under the provisions of Article 13(3) RPBA.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated