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**Datasheet for the decision
of 19 June 2024**

Case Number: T 1497/22 - 3.5.05

Application Number: 14886105.7

Publication Number: 3122094

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Language of the proceedings: EN

Title of invention:

Mobile communication system, base station, and user device

Applicant:

NTT DOCOMO, INC.

Headword:

Beam tracking using synchronisation signals/NTT

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - all requests (no)



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Case Number: T 1497/22 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 19 June 2024

Appellant: NTT DOCOMO, INC.
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 9 March 2022
refusing European patent application
No. 14886105.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair K. Bengi-Akyürek
Members: J. Eraso Helguera
C. Almberg

Summary of Facts and Submissions

I. The appellant lodged an appeal against the decision of the examining division to refuse the present European patent application for, *inter alia*, lack of an inventive step (Article 56 EPC) with respect to a main request and an auxiliary request.

II. The decision under appeal referred, *inter alia*, to the following prior-art document:

D1: US 2013/0215844 A1.

Moreover, the appellant submitted the following document with its reply to the board's preliminary opinion:

E2: NTT DOCOMO Technical Journal Vol. 20 No. 3, January 2019.

III. Oral proceedings before the board were held on 19 June 2024.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of one of three claim requests: a **main request** and **auxiliary requests 1 and 2**. The appealed decision is based on the main request and auxiliary request 2 (then labelled "Auxiliary Request 1"). The present "auxiliary request 1" was first filed with the statement of grounds of appeal.

At the end of the oral proceedings, the board announced its decision.

IV. Claim 2 of the **main request** reads as follows:

"A terminal (30) comprising:

a receiver adapted to receive a data signal from a base station (10) through a first beam, and receive a plurality of synchronization signals through a plurality of second beams;

a measurement unit adapted to measure a synchronization signal transmitted through the first beam and the plurality of synchronization signals transmitted through the plurality of second signals; and

a controller adapted to select one or more beams from the first beam and the plurality of second beams and transmit a result of the selection to the base station."

Claim 1 of **auxiliary request 1** is the same as claim 2 of the main request.

Claim 2 of **auxiliary request 2** differs from claim 2 of the main request (and claim 1 of auxiliary request 1) in the insertion of the phrase "directed to a vicinity of the first beam" right after the wording "through a plurality of second beams".

Reasons for the Decision

1. MAIN REQUEST, AUXILIARY REQUESTS 1 AND 2

Every claim request presented in the appeal proceedings comprises at least a claim directed to a "terminal". Auxiliary request 1 differs from the main request by

the deletion of the claim to a "system". Its admittance into the appeal proceedings is subject to the board's discretion under Article 12(4) and (6) RPBA.

Claim 2 of the **main request** and claim 1 of **auxiliary request 1** are identical and comprise the following limiting features (board's outline):

A terminal comprising:

- (a) a receiver adapted to receive a data signal from a base station through a first beam, and receive a plurality of synchronisation signals through a plurality of second beams;
- (b) a measurement unit adapted to measure a synchronisation signal transmitted through the first beam and the plurality of synchronisation signals transmitted through the plurality of second signals;
- (c) a controller adapted to select one or more beams from the first beam and the plurality of second beams and transmit a result of the selection to the base station.

Claim 2 of **auxiliary request 2** differs from claim 2 of the main request and claim 1 of auxiliary request 1 in the following addition at the end of feature (a):

- (d) directed to a vicinity of the first beam.

1.1 Terminal claims - inventive step (Article 56 EPC)

1.1.1 First of all, the board observes that the reference to "the plurality of second signals" in feature (b) lacks

a proper antecedent. For the purposes of this assessment, the board interprets this as "the plurality of second beams" previously introduced in feature (a), by analogy with the terminology used for corresponding features of the system claim.

1.1.2 Using the wording of claim 2 of **auxiliary request 2**, document **D1** discloses:

A terminal (Figs. 2, 3: "MS 210, 220, 230") comprising:

- (a) a receiver (Fig. 11: "RECEIVER 1104") adapted to receive a data signal ([0102]: "DL HARQ burst") from a base station (Figs. 2, 3: BS 200) through a first beam ([0101]: "best BS transmit/receive beams"), and receive a plurality of ~~synchronisation~~ signals ([0100]: "DL reference signals") through a plurality of second beams ("[0100]: "for each BS transmit beam") directed to a vicinity of the first beam (Figs. 2, 3);
- (b) a measurement unit adapted to measure a ~~synchronisation~~ signal ("DL reference signal") transmitted through the first beam and the plurality of ~~synchronisation~~ signals transmitted through the plurality of second beams ([0100]: "The MS measures the channel state for the pairs with MS receive beams by scanning the DL reference signals for each BS transmit beam.");
- (c) a controller (Fig. 11: "CONTROLLER 1100") adapted to select one or more beams from the first beam and the plurality of second beams ([0100]: "the MS determines the best BS transmit beams depending on the channel measurement results") and transmit a result of the selection to the base station

([0100]: "the MS reports the best BS transmit beam information to the BS").

1.1.3 The board concurs with the examining division and with the appellant (see point 4.2 of the statement of grounds of appeal) in that the "terminal" of claim 2 of auxiliary request 2 - and consequently also the "terminal" of claim 2 of the main request and claim 1 of auxiliary request 1 - differs from that of document **D1** in that the signals received through the plurality of second beams and the signal measured are "synchronisation signals".

1.1.4 As to the technical effect associated with this difference and the corresponding objective technical problem, the board notes the following:

- The concerned claims do not establish any relationship between the measurement of a "synchronisation signal" by the measurement unit of feature (b) and the selection of beams by the controller of feature (c). Thus, contrary to the appellant's interpretation, the breadth of the claim is not limited to scenarios where the selection of the respective beams is made on the basis of measurements performed specifically on a "synchronisation signal". Rather, it covers embodiments where the beam selection is based on measurements carried out on a separate, distinct "reference signal". Still, in the appellant's favour and for the sake of argument, the board will consider the scenario where the selection of feature (c) is somehow related to the measurement of feature (b).

- Although paragraph [0022] of the published application - or page 8, lines 13 to 33, as cited by the examining division in Reasons 36 of the appealed decision - mentions indeed some "synchronisation signals" known from the existing LTE or LTE-Advanced systems, there are no actual embodiments showing how the teachings of the application are actually to be carried out when those synchronisation signals are used to replace purpose-specific "reference signals". Thus, the board must assume that the alleged contribution would be limited to the very idea of using one and the same signal for both purposes, i.e. *synchronisation* and *beam measurement*. But its specific implementation - for instance, whether or which fields need to be added to the known LTE or LTE-A synchronisation signals - was a matter of customary skills.

- The board is not convinced that the mere conglomeration of two separate functionalities under the cloak of a single label can credibly bring about any technical effects *per se*. Such technical effects - if present - should be ascribed to the specific implementation of the resulting common signal. Even more so when considering that the appellant has not convinced the board that measuring the reception strength of the known and unaltered "synchronisation signals" alone would eliminate the need for a purpose-specific "reference signal". Rather, it appears that modifications would have been required, for instance, to take account of the different "beam indexes". However, neither the claim nor the description discloses the extent of such modifications. Nor is the board convinced that the

mere measurement of a synchronisation signal - whichever its implementation - for beam-tracking purposes should necessarily provide a tangible technical contribution.

It follows that, as indicated by the examining division, no credible technical contribution can be derived from the distinguishing feature. Consequently, no inventive step can be acknowledged.

- 1.1.5 The appellant submitted that this distinguishing feature allowed for an easy implementation of "beam tracking", since no new signals needed to be introduced and the efficiency of beam management was increased. Synchronisation signals already existed in mobile communication systems. Therefore, the implementation of "beam tracking" could be simplified for both the base station and the terminal when already defined or existing signals were used for such "beam tracking". Accordingly, the appellant framed its objective technical problem as "how to increase the efficiency of the beam management procedure of D1". But the distinguishing feature was not rendered obvious by D1. This document only described *reference* signals for beam measurement. It did not provide any motivation for the skilled person to use *synchronisation* signals for beam measurement. It was well-known to the skilled person that reference signals and synchronisation signals were used for very different purposes. "Reference signals" were typically used to perform some kind of measurement, whereas "synchronisation signals" were used during an initial access to establish synchronisation between the terminal and the base station. For these reasons, the 3GPP standard to which document D1 relates made a clear distinction between synchronisation signals and reference signals.

In response to the board's preliminary opinion, the appellant added that the proposed "dual use" of the synchronisation signals led to a more efficient beam tracking. Point 5.1 at page 89 of document **E2** proved that a technical effect could be obtained from the distinguishing feature such that, by using the synchronisation signal instead of the CRS, resource overhead could be reduced and interference to other cells could be reduced in the case that traffic levels were low. As to the board's observations on the lack of detailed embodiments, it was clear from the description that one possibility would be to add "index beam" information to the synchronisation signals. And even if no technical effect was recognised, the objective technical problem could still be defined as "how to use an alternative signal for beam-measurement purposes in D1". There, the skilled person would have found no motivation to use the synchronisation signal for a different goal.

1.1.6 These arguments fail to convince the board. In particular, document E2, *prima facie* and irrespective of its admittance into the appeal proceedings, lacks any relevant probative value in support of the presence of inventive step in the present application. Notwithstanding the fact that it would constitute "post-published evidence" at most, the allegations in E2 concerning reduced resource overhead relate to a specific implementation for 5G (NR) where "the cell quality is measured by using SS/PBCH Blocks (SSB)". The present application however uses as examples "synchronisation signals" known from earlier standards - LTE and LTE-A - and refers to 5G only in speculative terms (see paragraph [0006] of the published application: "... [c]onsidering the future mobile communication technology on and after the fifth

generation (5G ..."). In short, document E2 concerns 5G terminals and its conclusions cannot apply to the present application. If anything, E2 shows that the "dual purpose" was achieved by developing new "synchronisation signals" beyond those suggested in the present application. Further, the appellant's alternative definition of the objective technical problem does not involve any technical considerations.

- 1.2 In consequence, and regardless of the admittance issues as to auxiliary request 1, none of the claim requests is allowable under Article 56 EPC.
2. Since there is no allowable claim request on file, the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chair:



B. Brückner

K. Bengi-Akyürek

Decision electronically authenticated