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**Datasheet for the decision
of 18 September 2012**

Case Number: T 0808/11 - 3.5.03
Application Number: 97113024.0
Publication Number: 822672
IPC: H04B 7/005, H04B 7/216
Language of the proceedings: EN

Title of invention:

Downlink transmission power control scheme for mobile communication system using site diversity

Patentee:

NTT DoCoMo, Inc.

Opponent:

Nokia Corporation

Headword:

Downlink power control/NTT

Relevant legal provisions:

EPC Art. 54, 84

Relevant legal provisions (EPC 1973):

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Keyword:

"Novelty (main request and auxiliary request I) - no";
"Clarity (other requests) - no"

Decisions cited:

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Catchword:

-



Case Number: T 0808/11 - 3.5.03

DECISION
of the Technical Board of Appeal 3.5.03
of 18 September 2012

Appellant: NTT DoCoMo, Inc.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
27 January 2011 concerning maintenance of
European patent No. 822672 in amended form.

Composition of the Board:

Chairman: A. S. Clelland
Members: T. Snell
R. Moufang

Summary of Facts and Submissions

- I. This appeal has been filed by the proprietor against the interlocutory decision of the opposition division which found that European patent No. 0822672 in amended form, in accordance with the claims of a third auxiliary request, met the requirements of the EPC.
- II. The opposition had been filed against the patent as a whole on the grounds of Articles 100(a), (b) and (c) EPC. However, only the ground under Article 100(a) EPC is relevant to the board's decision.
- III. In the impugned decision, the opposition division held, *inter alia*, that claim 1 of the main request (corresponding to the patent as granted) and claim 1 of the second auxiliary request (the first auxiliary request was not admitted to the proceedings) did not comply with the requirement of novelty with respect to document

O1: EP-A-0645940.

The opposition division however decided that the claims of the third auxiliary request met the requirements of the EPC.

- IV. The proprietor (appellant) lodged an appeal against the decision. The appellant requested that the decision of the opposition division be set aside and the patent be maintained in amended form on the basis of the claims of a main request or, alternatively, claims of one of first to fifth auxiliary requests ("auxiliary requests

I to V"), all requests as filed with the statement of grounds of appeal.

The appellant filed a conditional request for oral proceedings.

- V. In a response to the notice of appeal and statement of grounds, the opponent (respondent) requested "revocation of the European patent in its entirety (subject to *reformatio in peius*)". It was further requested that the appeal itself be deemed inadmissible (Rule 99(2) EPC), or alternatively that the amended requests be deemed inadmissible under Article 12(4) RPBA. It was further requested, should new requests be admitted, that the case be remitted to the opposition division and costs awarded. If the case were not to be remitted, referral to the Enlarged Board of Appeal was requested. The respondent also commented on the substantive issues, *inter alia*, the objection of lack of novelty.

Oral proceedings were conditionally requested.

- VI. In a communication accompanying a summons to attend oral proceedings, the board gave a preliminary opinion that the appeal was admissible. Further, the board drew attention, *inter alia*, to Article 84 EPC. As regards novelty (Articles 52(1) and 54 EPC), the board pointed out passages of document O1 which appeared to be particularly relevant.

- VII. With a response dated 8 August 2012, the appellant filed claims of a main and first to sixth auxiliary

requests ("auxiliary requests I to VI") to replace all the requests on file.

VIII. Oral proceedings took place on 18 September 2012.

During the oral proceedings, the appellant filed new auxiliary requests III and IV which replaced auxiliary requests III to VI on file.

The appellant requested that the decision under appeal be set aside and the patent be maintained on the basis of the main request or, in the alternative, auxiliary requests I and II, all requests as filed with the letter dated 8 August 2012, or auxiliary requests III and IV filed at the oral proceedings.

The respondent requested only that the appeal be dismissed, withdrawing all other requests.

At the conclusion of the oral proceedings, after due deliberation, the board gave its decision.

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

"A method of downlink transmission power control in a mobile communication system formed by a plurality of base stations (1, 2), a mobile station (5) to be connected with the base stations (1, 2) via radio channels, and a base station control station (11) for controlling the base stations, wherein the mobile communication system uses a plurality of simultaneous radio channels between the mobile station and the more than one base stations (1, 2), the method comprising the steps of:

carrying out a primary downlink transmission power control using a primary control signal which is transmitted from the mobile station terminated at each base station; and
characterized in that the method comprises the step of: carrying out an additional downlink transmission power control using additional control signals which are transmitted from the base station control station (11) to the base stations (1, 2) during a site diversity period."

X. Claim 1 of **auxiliary request I** reads as follows:

" A method of downlink transmission power control in a mobile communication system formed by a plurality of base stations (1, 2), a mobile station (5) to be connected with the base stations (1, 2) via radio channels, and a base station control station (11) for controlling the base stations, wherein the mobile communication system uses a plurality of simultaneous radio channels between the mobile station and, during a site diversity period, the more than one base stations (1, 2), the method comprising the steps of:
repeatedly carrying out a primary downlink transmission power control using a primary control signal which is transmitted from the mobile station and terminated at each base station of the more than one base stations;
and
characterized in that the method comprises the step of: repeatedly carrying out an additional downlink transmission power control using additional control signals which are transmitted from the base station control station (11) to each of the more than one base

stations (1, 2) during said site diversity period, wherein the primary downlink transmission power control is carried out at shorter time intervals than the additional downlink transmission power control."

XI. Claim 1 of **auxiliary request II** reads as follows:

" A method of downlink transmission power control in a mobile communication system formed by a plurality of base stations (1, 2), a mobile station (5) to be connected with the base stations (1, 2) via radio channels, and a base station control station (11) for controlling the base stations, wherein the mobile communication system uses a plurality of simultaneous radio channels between the mobile station and, during a site diversity period, a specific number of the plurality of base stations (1, 2), said specific number being more than one, the method comprising the steps of:

repeatedly carrying out a primary downlink transmission power control using a primary control signal which is transmitted from the mobile station and terminated at each base station of the specific number of the plurality of base stations (1, 2); and characterized in that the method comprises the step of: repeatedly carrying out an additional downlink transmission power control at the specific number of the plurality of base stations (1, 2) using additional control signals which are transmitted from the base station control station (11) to the specific number of the plurality of base stations (1, 2) during said site diversity period, wherein

the primary downlink transmission power control is carried out at shorter time intervals than the additional downlink transmission power control."

XII. Claim 1 of **auxiliary request III** reads as follows:

"A method of downlink transmission power control in a mobile communication system formed by a plurality of base stations (1, 2), a mobile station (5) to be connected with the base stations (1, 2) via radio channels, and a base station control station (11) for controlling the base stations, wherein the mobile communication system uses two simultaneous radio channels between the mobile station and, during a site diversity period, two of the plurality of base stations (1, 2), said site diversity period being a period characterized by the mobile station being simultaneously connected to only said two base stations, the method comprising the steps of: repeatedly carrying out a primary downlink transmission power control using a primary control signal which is transmitted from the mobile station and terminated at each base station; and characterized in that the method comprises the step of: repeatedly carrying out an additional downlink transmission power control at two of the plurality of base stations using additional control signals which are transmitted from the base station control station (11) to the two of the plurality of base stations (1, 2) during said site diversity period wherein the primary downlink transmission power control is carried out at shorter time intervals than the additional downlink transmission power control."

XIII. Claim 1 of **auxiliary request IV** is the same as claim 1 of auxiliary request III with the exception that the word "simultaneous" is omitted from "two simultaneous radio channels" and the wording "and wherein a diversity combining can be carried out among said two base stations" is inserted before "the method comprising the steps of".

Reasons for the Decision

1. *Reformatio in peius*

The respondent's initial request was for "revocation of the European patent in its entirety (subject to *reformatio in peius*)". In the course of the oral proceedings, the respondent accepted that because of the principle of *reformatio in peius*, there was no possibility of revoking the patent and changed its request to dismissal of the appeal.

2. *Admissibility of the appeal*

This issue, although subsequently withdrawn, was raised by the respondent. In any case, the board, *prima facie*, sees no reason to doubt the admissibility of the appeal (cf. Rule 101(1) EPC). In view of the board's decision to dismiss the appeal, it is not necessary to give the reasons in detail.

3. *Admissibility of the appellant's main request and auxiliary requests I and II*

The board decided to admit the main request and auxiliary requests I and II on the ground of procedural efficiency (Article 13(1) RPBA). In view of the board's decision to dismiss the appeal, it not necessary to go into detailed reasons in this respect either.

4. *Ground of opposition pursuant to Article 100(a) EPC*

4.1 *The patent - technical background*

The present patent concerns power control in a CDMA communications system (although the independent claims are not in fact limited to CDMA). As is well-known in CDMA systems, closed loop power control is necessary to reduce interference between channels. For the downlink (ie base station to mobile), this is conventionally provided using a control signal transmitted from the mobile station and terminated at the base station. In the patent, this is referred to as a "layer-1 control signal" (cf. paragraphs [0008] - [0010] of the patent specification).

In a CDMA system a mobile station may be in communication with more than one base station ("site diversity"), eg during handoff, although also at other times. The introductory part of the patent describes a second type of control signal, referred to as a "layer-3 control signal" which is transmitted from the mobile station to a plurality of base stations for diversity combining. The combined control signal is transmitted to a base station control station which, in response,

transmits control signals for controlling the power of the downlink signals transmitted from the base stations in diversity communication with the mobile station (cf. paragraphs [0004] and [0008] - [0010] of the patent specification).

The idea underlying the present invention is essentially to combine both these types of power control loops in one method (cf. paragraph [0033] - [0035] of the patent specification).

4.2 *Claim 1 - main request - novelty with respect to document O1*

4.2.1 Document O1, which incidentally is a patent application by the proprietor of the patent in suit, discloses a CDMA system having a "layer-1"-type power control loop as described above (cf. col. 6, lines 22-33). In addition, document O1 discloses diversity reception ("it is possible to communicate with a plurality of base stations simultaneously"; cf. col. 8, lines 7-9). It also discloses a base station control station for controlling the base stations ("diversity node"; cf. col. 10, lines 15-18). Thus document O1 discloses all the features of the preamble of claim 1; this point was not in dispute.

4.2.2 The characterising portion of claim 1 comprises the step of "carrying out an additional downlink transmission power control using additional control signals which are transmitted from the base station control station ... to the base stations ... during a site diversity period".

The board considers that this feature is disclosed by document O1 for the following reasons.

4.2.3 Fig. 1 of O1 shows that the target receiving level expressed in terms of the ratio E_b/N_0 (a type of signal-to-noise ratio) for a particular bit error rate changes according to the number of base stations M (M being from 1 to 4). This effect is used in O1 as follows (cf. col. 8, lines 19-26):

"the mobile station corrects its transmission power according to a variation of the number of connected base stations. To this end, the target level ... of the upward and downward transmission power control is changed according to the number of connected base stations".

Although it is the mobile station power that is explicitly referred to here, it follows implicitly from the reference to the "downward transmission power" that the base station power is also adjusted according to the number of connected base stations. This point is also clear when considering the detailed description of the downward transmission power control in col. 10, lines 25 - 51. In order to adjust its power, a signal related to the number of base stations is transmitted to each base station by the "diversity node", as set out in the passage at col. 10, lines 15-18, which reads as follows:

"Here, in a case the number of connected base stations for one and the same mobile station is more than one, this fact is notified to each base station by the diversity node ..".

This number information in the board's view is an additional control signal within the meaning of claim 1.

4.2.4 The appellant argued that this passage did not disclose that the actual number of base stations was notified; it was merely notified whether there was more than one base station connected.

4.2.5 The board however considers that when this admittedly ambiguous passage is read in the context of the entire disclosure of O1, the skilled person would conclude that it is the actual number of base stations that is notified here. This follows firstly from the general concept set out at several places in the description, eg in col. 8, lines 16-26, namely that the power varies according to the number of base stations, and secondly from Fig. 1, which shows that the target level varies for each change of the number of base stations up to 4. Consequently, there is no support for concluding that the power should remain fixed once the number of base stations exceeds one. The board also notes that the mobile station knows the number of simultaneously connected base stations (col. 10, lines 21-22). The board finds it illogical that the base stations would be provided with different information to that available at the mobile station, resulting in the uplink and downlink power control loops operating according to different criteria. Indeed, the disclosure gives no support for such an interpretation.

4.2.6 The appellant further argued that even if for the sake of argument it were assumed that in O1 the actual

number of base stations was communicated to each base station, this would not be an "additional" downlink power control within the meaning of claim 1 but merely part of the layer-1 control. The board however finds this argument unconvincing because the messages sent by the diversity node are clearly additional to the layer-1 control signals transmitted by the mobile station and are thus embraced by the wording of claim 1.

4.2.7 The board therefore concludes that the subject-matter of claim 1 is not new with respect to the disclosure of document O1 (Articles 52(1) and 54 EPC).

4.3 *Auxiliary request I - claim 1 - novelty*

4.3.1 This claim differs from claim 1 of the main request in the following respects: (i) the mobile communication system uses a plurality of simultaneous radio channels between the mobile station and, during a site diversity period, the more than one base station (the difference being shown by the board's underlining); (ii) the primary downlink transmission power control is carried out "repeatedly"; (iii) the additional downlink transmission power control is carried out "repeatedly ... during said site diversity period"; and (iv) the primary downlink transmission power control is carried out at shorter time intervals than the additional downlink power control.

4.3.2 Re (i): The board interprets the term "site diversity period" broadly as any period during which more than one base station is in diversity communication, irrespective of the number of base stations or whether this number changes. In the board's view it is implicit

in document O1 that a site diversity period may include a change in the number of base stations from two to three or four. This follows from Fig. 1, which considers the case of the number of base stations M changing from one to four, and col. 13, lines 18-28, which deals with a change of the triggering threshold for a soft handover in accordance with the number of base stations M. The mobile station is also explicitly adapted to communicate with more than two base stations simultaneously (cf. Fig. 3).

Re (ii): It was not in dispute that this is also the case in O1.

Re (iii): In O1, the number of connected base stations varies. Each time the number of connected base stations changes, the new number has to be communicated to each base station. It follows that this control information must be sent on a repeated basis (the board interprets the term "repeated" in its broadest sense to mean that the control information is sent on a number of occasions). Implicitly, this would occur during a site diversity period embracing a change in the number of connected base stations (see "Re (i)" above). Hence, the board concludes that in O1 the additional power control is also carried out "repeatedly ... during said site diversity period".

Re (iv): The board considers it implicit that in practice the primary ("layer-1") control signals would be transmitted more frequently than changes in the number of connected base stations, especially considering that the latter might change very infrequently, eg during a period when the mobile

station was moving slowly. Hence, this feature is also disclosed in O1. The appellant did not argue otherwise.

4.3.3 The appellant argued mainly that the "site diversity period" should be interpreted as a period in which a constant number of base stations was connected, which was not the case in document O1 since in document O1 the additional control signal is sent when the number of base stations changes. However, the board sees no reason to interpret the claim as requiring a constant number of base stations. The board therefore found this argument unconvincing.

4.3.4 The board therefore concludes that the subject-matter of claim 1 of auxiliary request I is not new either (Articles 52(1) and 54 EPC).

5. *Auxiliary request II - claim 1 - clarity*

5.1 This claim differs from claim 1 of the first auxiliary request in the following respects (differences being indicated by the board's underlining): (i) the mobile communication system uses a plurality of simultaneous radio channels between the mobile station and, during a site diversity period, a specific number of the plurality of base stations ... , said specific number being more than one; (ii) repeatedly carrying out an additional downlink transmission power control at the specific number of the plurality of base stations ... using additional control signals which are transmitted from the base station control station to the specific number of the plurality of base stations .. during said site diversity period.

5.2 The appellant's stated intention with these amendments was to limit the claim to the situation that throughout a site diversity period only the same specific number of base stations was in communication with the mobile station, in order to overcome the objection of novelty with regard to document O1 (which the appellant regarded rather as an "accidental" anticipation). However, in the view of the board, the intended limitation on the scope of the term "site diversity period" is not clear from the proposed wording. In particular it is not clear whether or not the site diversity period can extend beyond a period of communication with a specific number of base stations to include a subsequent period with a different number of base stations. The board also notes that this ambiguity cannot be resolved with the help of the description and drawings, since these allow either meaning to be given to the term "site diversity period". In this respect, paragraph [0008] of the patent uses the term "site diversity period" in connection with a general reference to a "plurality of base stations", whereas Fig. 8 shows a "diversity period" in which two base stations are in communication throughout the whole length of the period.

5.3 The board therefore concludes that claim 1 of the second auxiliary request does not clearly define the matter for which protection is sought, contrary to the requirement of clarity pursuant to Article 84 EPC.

6. *"New" auxiliary requests III and IV - clarity and admissibility*

6.1 In the light of the board's objections to claim 1 of the second auxiliary request, the appellant filed two new requests as auxiliary requests III and IV. Claim 1 of each of these requests is limited to an embodiment having two base stations in communication with the mobile station and contains the wording "said site diversity period being a period characterized by the mobile station being simultaneously connected to only said two base stations".

6.2 However, although this wording was obviously intended to convey the meaning that throughout the whole of the diversity period only two base stations are in communication with the mobile station (cf. Fig. 8), in the view of board the claim is still not sufficiently clear. In this respect, it is still ambiguous whether or not the site diversity period can extend beyond the period "characterized by the mobile station being simultaneously connected to only said two base stations" to include a portion during which, for example, three base stations are connected. Contrary to the view of the appellant, in the board's view such an extended period could still be considered to be "characterized by the mobile station being simultaneously connected to only said two base stations", since this requirement would be fulfilled at least over part of the diversity period.

Claim 1 of both auxiliary requests III and IV is therefore, *prima facie*, not clear within the meaning of

Article 84 EPC. In consequence, the board decided not to admit either of these requests (Article 13(1) RPBA).

7. *Costs, remittal and referral to the Enlarged Board*

The respondent, in its reply to the statement of grounds, filed certain conditional requests concerning matters related to costs, remittal of the case to the opposition division, and referral of a question to the Enlarged Board of Appeal. These requests were however withdrawn at the oral proceedings (cf. point VIII of the "Summary of Facts and Submissions"). It is therefore not necessary to consider these matters further, all the more so in view of the board's decision to allow the respondent's request to dismiss the appeal.

8. *Conclusion*

As there is no allowable request, the appeal must be dismissed, which has the consequence that the patent is to be maintained in amended form in accordance with the decision of the opposition division.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

A. S. Clelland