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**Datasheet for the decision
of 28 February 2013**

Case Number: T 1601/10 - 3.5.03

Application Number: 04005476.9

Publication Number: 1469697

IPC: H04Q 7/38

Language of the proceedings: EN

Title of invention:

Handover requested and controlled by the mobile station in a
broadband wireless access communication system

Applicant:

Samsung Electronics Co., Ltd.

Opponent:

-

Headword:

Handover method/SAMSUNG

Relevant legal provisions:

EPC Art. 56

Relevant legal provisions (EPC 1973):

-

Keyword:

"Inventive step - yes (following amendment)"
"Remittal"

Decisions cited:

-

Catchword:

-



Case Number: T 1601/10 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 28 February 2013

Appellant: Samsung Electronics Co., Ltd.
(Applicant) 129, Samsung-ro
Yeongtong-gu
Suwon-si
Gyeonggi-do, 443-742 (KR)

Representative: Grünecker, Kinkeldey
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 30 December 2009
refusing European patent application
No. 04005476.9 pursuant to Article 97(2) EPC.

Composition of the Board:

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

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division refusing European patent application No. 04005476.9, with publication number EP-A-1469697.

The refusal was based on the ground that the subject-matter of claim 1 of the main request and a second auxiliary request did not meet the requirement of inventive step pursuant to Article 52(1) in combination with Article 56 EPC in the light of the disclosure of the document:

D1: Kitrosa et al, "IEEE 802.16e Mobility Enhancements", IEEE 802.16 Broadband Wireless Access Working Group, 10 January 2003, Internet citation with URL:
www.ieee802.org/16/tge/contrib/C80216e-03_05.pdf, pages 1-13.

Claim 1 of a first auxiliary request was held not to comply with Article 123(2) EPC (added subject-matter).

II. The appellant filed a notice of appeal against the above decision. Claims of a main request and three auxiliary requests were subsequently filed together with a statement of grounds of appeal.

In the statement of grounds, the appellant requested that the decision be set aside and, implicitly, that a patent be granted on the basis of the claims of one of the aforementioned requests.

Oral proceedings were conditionally requested.

III. In a communication accompanying a summons to oral proceedings the board expressed a preliminary opinion that the subject-matter of claim 1 of each of the requests did not involve an inventive step (Article 52(1) in combination with Article 56 EPC).

IV. Oral proceedings were held on 28 February 2013. At the oral proceedings the appellant submitted a new main request and withdrew all the requests on file. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1-12 of the sole request submitted during the oral proceedings.

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

V. Claim 1 of the appellant's request reads as follows:

"A handover method in a communication system comprised of a serving BS, a Subscriber Station, SS, and a plurality of neighbor BSs adjacent to the serving BS, comprising the steps of:

transmitting (1100) from the serving BS, to the SS, information of the neighbor BSs;

measuring (1006) at the SS a Carrier to Interference Noise Radio [sic], CINR, of a pilot signal of the neighbor BSs;

receiving (1104) by the serving BS, from the SS, a handover request message having the CINR information of pilot signals of the neighbor BSs;

arranging (1106) by the serving BS the neighbor BSs according to magnitude of the CINR information;

transmitting (1108) from the serving BS to the neighbor BS having the greatest CINR from among the arranged neighbour BSs a request message related to handover for the SS, where the request message includes information of the SS;

receiving (1110) at the serving BS from the neighbor BS having the greatest CINR from among the arranged BSs, a response message including information of determining whether the neighbor BSs [sic] supports the handover for the SS or not in response to the request message;

if the neighbor BS having the greatest CINR from among the arranged neighbor BSs does not support the handover, transmitting from the serving BS the request message related to handover for the SS to a neighbor BS with the second greatest CINR from among the arranged neighbor BSs; and

transmitting (1116) from the serving BS to the SS in response to the handover request message, a handover response message having information on a target BS supporting the handover.

VI. Claim 7 of the main request reads as follows:

A handover apparatus in a Broadband Wireless Access, BWA, communication system, the system comprising:

a plurality of neighbor Base Stations;

a Subscriber Station, SS, (630) adapted to measure a Carrier to Interference Noise Radio [sic], CINR, of a pilot signal of the neighbor BSs;

a serving Base Station (610), BS, adapted to transmit to the SS (630) information of neighbor BSs neighboring the serving BS (610), receive, from the SS (630), a handover request message containing the CINR information of signals of the neighbor BSs, arrange the neighbor BSs according to the magnitude of the CINR information, transmit to the neighbor BS having the greatest CINR from among the arranged neighbor BSs a request message related to handover for the SS (630), where the request message includes information of the SS (630), receive from the neighbor BS having the greatest CINR from among the arranged neighbor BSs a response message including information of determining whether the neighbor BS supports the handover for the SS (630) or not in response to the request message, transmit if the neighbor BSs [sic] having the greatest CINR from among the arranged neighbor BSs does not support the handover, the request message related to handover for the SS to a neighbor BS with the second greatest CINR from among the arranged neighbor BSs, and transmit in response to the handover request message a handover response message having information on a target BS.

Reasons for the Decision

1. *Admissibility of the appellant's request filed during oral proceedings*

As the board was in a position to discuss the request in relation to document D1 without undue difficulty, and as the appellant contributed to procedural expediency by withdrawing all the requests previously on file, the board used its discretion to admit the request (Article 13(1) RPBA).

2. *Clarity (Article 84 EPC)*

In the board's view claims 1 and 7 are clear within the meaning of Article 84 EPC, subject to the following minor corrections which the board considers best dealt with by the examining division:

(i) The term "Carrier to Interference Noise Radio" appearing in claims 1 and 7 should apparently read "Carrier to Interference and Noise Ratio".

(ii) In claim 1, in the feature "receiving (1110) ... whether the neighbor BSs ...", the term "BSs" should apparently read "BS". The same applies to the feature of claim 7 "transmit if the neighbor BSs ...".

3. *Amendments - Article 123(2) EPC*

- 3.1 Claim 1 has been amended to incorporate matter from paragraphs [0061] and [0084] to [0086] of the

description together with Figs. 10 and 11 (referring to the published application EP-A-1469697):

The feature "measuring (1006) at the SS a Carrier to Interference [and] Noise Ratio, CINR, of a pilot signal of the neighbor BSs" is disclosed in paragraph [0061], first two lines and Fig. 10.

The feature "arranging (1106) by the serving BS the neighbor BSs according to magnitude of the CINR information" is disclosed in paragraph [0084], second and third lines.

The feature "transmitting (1108) from the serving BS to the neighbor BS having the greatest CINR from among the arranged neighbour BSs a request message related to handover for the SS" is disclosed in paragraph [0085] and Fig. 11.

The feature "if the neighbor BS having the greatest CINR from among the arranged neighbor BSs does not support the handover, transmitting from the serving BS the request message related to handover for the SS to a neighbor BS with the second greatest CINR from among the arranged neighbor BSs" is disclosed in paragraph [0086] and Fig. 11.

The feature "transmitting (1116) from the serving BS to the SS in response to the handover request message, a handover response message having information on a target BS supporting the handover" is disclosed in claim 6 as filed, features c) and d).

The board concludes that claim 1 complies with Article 123(2) EPC.

3.2 These comments apply, *mutatis mutandis*, to independent claim 7.

4. *Inventive step*

4.1 The present invention relates to a handover (also called handoff) procedure in a Broadband Wireless Access system, eg a MAN ("Metropolitan Area Network"), although claim 1 is not limited to any particular type of communication system. Hitherto in such networks governed by the IEEE 802.16a standard there was no provision for mobility and thus no handoff requirement. The IEEE launched a working group for a new standard, to be called IEEE 802.16e, which would support subscriber mobility and made a call for contributions. Document D1 was evidently submitted in response to the call for contributions (cf. page 13, reference [7]), and is the closest prior art document on file.

4.2 Document D1 describes a handoff method which may be initiated by the subscriber station (SS) (cf. page 3, section 2.4.1, "Handoff initiation"). Prior to requesting a handoff, the serving base station transmits information of the neighbouring base stations, and the SS measures the signal quality (S/N) of the signals received from these base stations (cf. page 3, section 2.4.1, 2nd paragraph and page 6, Fig. 3). The handoff includes the following steps:

(i) the SS sends a handoff request message including S/N measurements of candidate new base stations (cf. page 5, section 2.4.2, "Handoff-request" and Fig. 3);

(ii) the serving base station sends a "Handoff-notification" message to all neighbouring base stations (cf. page 7, "Handoff-notification");

(iii) the neighbouring base stations reply with a "Handoff-notification-response" message including a "measure of the capability of the sender BS to support the service flows associated with the SS" (cf. page 7, "Handoff-notification-response");

(iv) the serving base station sends a "Handoff-response" message indicating a recommended new host base station (cf. page 5, section 2.4.2, "Handoff-response").

4.3 The subject-matter of claim 1 differs from the disclosure of document D1 in the way messages are sent between the serving base station and the neighbouring base stations (ie steps (ii) and (iii) are modified). In this respect, in accordance with claim 1, the method includes the following steps not disclosed in document D1:

arranging (1106) by the serving BS the neighbor BSs according to magnitude of the CINR information;

transmitting (1108) from the serving BS to the neighbor BS having the greatest CINR from among the arranged neighbor BSs a request message related to handover for

the SS, where the request message includes information of the SS;

receiving (1110) at the serving BS from the neighbor BS having the greatest CINR from among the arranged BSs, a response message including information of determining whether the neighbor BS supports the handover for the SS or not in response to the request message; and

if the neighbor BS having the greatest CINR from among the arranged neighbor BSs does not support the handover, transmitting from the serving BS the request message related to handover for the SS to a neighbor BS with the second greatest CINR from among the arranged neighbor BSs.

4.4 This iterative method avoids sending a "Hand-off-notification" message to all neighbouring base stations at once, as is done in accordance with document D1 (cf. step (ii) above). Consequently, traffic on the backbone network connecting the base stations is reduced as compared with D1. The problem to be solved starting out from document D1 is therefore how to reduce traffic on the backbone network.

4.5 The skilled person receives no hint in document D1 to solve this problem by carrying out an iterative method of communication between the serving and neighbouring base stations. The board also has no evidence that such a method formed part of the common general knowledge of the skilled person. In the light of document D1 and common knowledge, the subject-matter of claim 1 therefore involves an inventive step (Articles 52(1) and 56 EPC).

4.6 These comments apply, *mutatis mutandis*, to independent claim 7.

5. *Conclusion*

In view of the above, the ground for the refusal of the application, ie lack of inventive step with respect to document D1, has been overcome by amendment. The decision accordingly has to be set aside.

However, the board was not in a position at the oral proceedings to consider the amended claims with respect to the other prior art documents on file. Moreover, the new features added to the independent claims were taken from the description and drawings, and may consequently require a further search. The board has also not examined the dependent claims. The case is therefore remitted to the department of first instance for examination to be resumed (Article 111(1) EPC).

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 examination on the basis of claims 1 to 12 of the sole request filed at the oral proceedings.

The Registrar:

The Chairman:

G. Rauh

A. S. Clelland