

Internal distribution code:

- (A) [-] Publication in OJ
- (B) [-] To Chairmen and Members
- (C) [-] To Chairmen
- (D) [X] No distribution

**Datasheet for the decision
of 28 February 2017**

Case Number: T 0719/13 - 3.5.03

Application Number: 04771058.7

Publication Number: 1662686

IPC: H04B7/06

Language of the proceedings: EN

Title of invention:

RADIO TRANSMISSION CONTROL METHOD, RADIO RECEIVER APPARATUS,
AND RADIO TRANSMITTER APPARATUS

Applicant:

mitsubishi denki kabushiki kaisha

Headword:

Radio transmission control method/MITSUBISHI

Relevant legal provisions:

EPC Art. 123(2)

Keyword:

Added subject-matter (yes)

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0719/13 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 28 February 2017

Appellant: MITSUBISHI DENKI KABUSHIKI KAISHA
(Applicant) 7-3, Marunouchi 2-chome
Chiyoda-ku
Tokyo 100-8310 (JP)

Representative: Sajda, Wolf E.
Meissner Bolte Patentanwälte
Rechtsanwälte Partnerschaft mbB
Postfach 86 06 24
81633 München (DE)

Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 31 October 2012
refusing European patent application No.
04771058.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman F. van der Voort
Members: T. Snell
S. Fernández de Córdoba

Summary of Facts and Submissions

- I. This appeal is against the decision of the examining division refusing European patent application No. 04771058.7, with publication number EP 1 662 686 A.

The refusal was based on the grounds that claims 1 and 3 of a main request did not comply with Article 123(2) EPC and that the subject-matter of claims 1 and 3 of an auxiliary request lacked an inventive step.

- II. The appellant filed an appeal against the above decision. In the statement of grounds of appeal, the appellant requested that the decision under appeal be set aside and a patent granted on the basis of the claims of the auxiliary request filed during the examining procedure.

- III. In a communication accompanying a summons to oral proceedings, the board gave a preliminary view that claim 1 did not comply with Article 123(2) EPC. The board also considered that the subject-matter of claim 1 did not involve an inventive step.

- IV. Together with a letter of response, the appellant submitted claims of a new request replacing the request on file.

- V. Oral proceedings were held on 28 February 2017.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the request as filed with the letter dated 27 January 2017.

At the end of the oral proceedings, the chairman announced the board's decision.

VI. Claim 1 reads as follows:

"A radio communication method by a MIMO radio communication system in which output signals are generated from a plurality of information signals and then transmitted respectively by a plurality of sub-carriers generated in multi-carrier transmission to the system of the communication partner from N antennas, N being an integer of 2 or larger, wherein the output signals are received by the system of the communication partner from M antennas, M being an integer of 2 or larger the method comprising:

- receiving control information transmitted by the system of the communication partner; and
- transmitting transmission signals respectively at the plurality of subcarriers from the N antennas based on the received control information, the transmission signals each being generated based on a first operation result, which is obtained by multiplying a first information signal by a first N-dimensional weight vector, and a second operation result, which is obtained by multiplying a second information signal by a second N-dimensional weight vector,

wherein the control information is used for selecting a beam to be used in transmission out of beam formed by a first weight and a beam formed by a second weight, and wherein the control information is common to the plurality of sub-carriers."

Reasons for the Decision

1. *Claim 1 - added subject-matter (Article 123(2) EPC)*
- 1.1 The present application concerns a radio transmission control method for a MIMO ("Multiple-Input-Multiple-Output") system in which a radio receiver apparatus and a radio transmitter apparatus respectively use a plurality of antennas to perform SDM ("Space Division Multiplexing") transmission.
- 1.2 The description describes eight embodiments ("Embodiment 1" to "Embodiment 8"). Embodiments 1 to 5 are concerned with SDM in single-carrier transmission, whereby a feedback control signal is used to select which antennas are to be used for transmission ("antenna switching"). Embodiment 6 extends this idea to multi-carrier transmission, whereby antenna switching for each carrier or sub-carrier is carried out independently (cf. paragraph [0085], lines 1-2 (reference is made to the application as published)).
- 1.3 In accordance with Embodiment 7, multi-carrier transmission is provided in which, unlike Embodiment 6, all sub-carriers are treated in common. In this respect, the description includes the following passages (board's underlining):

"[0092] In the multi-carrier transmission, encoding/decoding is generally performed over a plurality of sub-carriers in most cases. In this case, the multi-carrier reception characteristics greatly depend upon an average SINR, and the transmission characteristics can be substantially grasped based on the average SINR. Thus, in the multi-carrier transmission, by using an averaging parameter with respect to all the sub-carriers, efficient signal selection can be performed with a small control amount."; and

"[0093] In this embodiment, a combination of signals to be used is selected using an average SINR, and the terminal A is notified of the combination with a control signal. In this case, the control signal is common to all the sub-carriers, and the control amount can be greatly reduced compared with Embodiment 6 in which a control method is required for each sub-carrier."

- 1.4 It follows directly and unambiguously from these passages that the common treatment of all sub-carriers relies on computing an average SINR ("Signal-to-Interference-plus-Noise Ratio"), or at the very least, "an averaging parameter with respect to all sub-carriers". This feature is therefore regarded as inherent to this embodiment.
- 1.5 Embodiment 8 concerns single-carrier transmission. Instead of antenna switching, the method is based on determining a transmission beam to be used (obtained using a vector of weight multipliers in the transmitter). This method can be referred to as "beam switching". As stated in paragraph [0098], for transmission between terminals A and B, terminal B "notifies the terminal A of a transmission beam to be used with a control signal". It is then stated (cf. paragraph [0099]) that ".. all the procedures of Embodiments 1 to 7 can be extended to the case of using [i.e. selecting (board's note)] a transmission beam".
- 1.6 Claim 1 includes features related, on the one hand, to multi-carrier transmission in which all sub-carriers are processed using a common control signal, and, on the other hand, to beam switching. It therefore combines elements of Embodiments 7 and 8. It therefore has to be examined whether the application as filed

provides a basis for the combination of features of claim 1.

1.7 The established test for compliance with Article 123(2) EPC is that an amendment must be directly and unambiguously supported by the application as filed. In the board's view, there is no direct and unambiguous disclosure in the application as filed of the combination of features of claim 1 for the following reasons:

(i) The simple statement in paragraph [0099] that, inter alia, Embodiment 7 can be extended to the case of using a transmission beam does not amount to a direct and unambiguous disclosure of such an embodiment, since the skilled person has to take steps not disclosed in the application such as deciding which features of Embodiment 7 are to be modified and/or replaced, and which features of Embodiment 8 are to be included. For example, in order to arrive at the claimed subject-matter, the skilled person would have to omit the feature of Embodiment 7 noted above (see point 1.4 above) "an averaging parameter with respect to all sub-carriers" (e.g. average SINR), even though this is presented as an inherent part of this embodiment.

The appellant argued that determining the SINR was not essential to the beam switching embodiment, and that it was only necessary to include the common control signal. However, in view of paragraph [0093], which refers to both features together, the board considers that there is no support for including only the latter feature. If the skilled person did decide that this feature could be left out, that would be his own idea extending beyond the content of the application as filed.

(ii) The board can find no direct and unambiguous support for a method in which a selection between two beams is made (claim 1: "selecting .. out of a beam formed by a first weight and a beam formed by a second weight"). The description in relation to Embodiment 8 in paragraphs [0094] to [0100] is either not specific as regards the number of beams ("a plurality of transmission signals", cf. paragraph [0097]), or, when specific, mentions an embodiment with four beams (cf. paragraph [0100]). Further, Figure 25 shows an embodiment with at least three beams.

(iii) The board can find no direct and unambiguous disclosure of the feature of claim 1 "wherein the control information is used for selecting a beam ...". In paragraph [0098] of the description, it is stated that "terminal B ... notifies the terminal A of a transmission beam to be used with a control signal". Claim 9 as originally filed similarly contains the feature "the step of notifying comprises notifying the radio transmitter apparatus of the transmission beam to be used with a control signal". The transmission of control information notifying the transmitter of a transmission beam to be used is more specific than claim 1, which embraces any control information which could be used for selecting a beam, such as antenna weights, signal to noise values, or channel estimates.

1.8 The board therefore concludes that claim 1 does not comply with Article 123(2) EPC.

2. *Conclusion*

As the only request is not allowable, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



G. Rauh

F. van der Voort

Decision electronically authenticated