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Datasheet for the decision of 6 December 2010

Case Number: T 0485/07 - 3.5.05

Application Number: 04700162.3

Publication Number: 1586172

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Language of the proceedings: EN

Title of invention:
Speed data receiver with detection of channel coding rate

Applicant:
Sony Ericsson Mobile Communications AB

Headword:
Detection of channel coding mode/SONY ERICSSON

Relevant legal provisions:
EPC Art. 54

Keyword:
"Main request and second auxiliary request - Novelty (no)"
"Remittal to the department of first instance for further prosecution on the basis of the first auxiliary request"

Catchword:
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Case Number: T 0485/07 - 3.5.05

D E C I S I O N
of the Technical Board of Appeal 3.5.05
of 6 December 2010

Appellant: Sony Ericsson Mobile Communications AB
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 12 October 2006 refusing European patent application No. 04700162.3 pursuant to Article 97(1) EPC 1973.**

Composition of the Board:

Chairman: A. Ritzka
Members: P. Cretaine
F. Blumer

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division to refuse European patent application No. 04 700 162.3, published as WO 2004/066546. The decision and written reasons were dispatched on 12 October 2006.

II. The application was refused because of lack of inventive step (Articles 52(1) and 56 EPC) of the independent claims 4 and 12 of the applicant's sole request, having regard to the disclosure of prior-art document

D1: US 2002/141516.

The examining division added as further remarks to the decision that the subject-matter of independent claims 1 and 9 did not involve an inventive step when departing from prior-art document

D2: WO 00/35137

III. The notice of appeal was submitted on 7 December 2006 and the appeal fee was paid on the same day. In the statement setting out the grounds of appeal, submitted on 9 February 2007, it was requested that the appealed decision be set aside and that a patent be granted on the basis of one of the four sets of claims defined as Main, First Auxiliary, Second Auxiliary, and Third Auxiliary Requests in the statement setting out the grounds of appeal. Oral proceedings were requested in case the board was not willing to grant the set of claims according to the Main Request.

IV. A summons to oral proceedings to be held on 6 December 2010 was issued on 24 September 2010. In an annex accompanying the summons the board expressed the preliminary opinion that the subject-matter of independent claims 4 and 12 of the Main Request, the First Auxiliary Request and the Third Auxiliary Request was not new (Article 54 EPC) having regard to the disclosure of D1. The subject-matter of the claims according to the Second Auxiliary Request had to be assessed with respect to the disclosure of D2 as closest prior art.

V. With a letter received 8 November 2010, the appellant filed a set of amended claims 1 to 16 as Main Request, a set of amended claims 1 to 6 as First Auxiliary Request and a set of amended claims 1 to 10 as Second Auxiliary Request. The appellant submitted arguments in support of these requests.

Furthermore in the same letter the appellant asked the board to:

"1. Cancel the upcoming Oral Hearing session, currently scheduled for 6 December, 2010;

2. To give consideration and render a decision based on the newly submitted claims with the present communication;

3. To continue to interact with the representatives of the Applicants in writing or by telephone, if necessary;

4. To continue these proceedings, in the current case, in writing, and

5. As an auxiliary request, to elect a new date for Oral Proceedings, should it be necessary for a speedy resolution of all outstanding issues in this case."

VI. In a communication sent per telefax on 9 November 2010, the board informed the appellant that the date fixed for the oral proceedings (6 December 2010) was maintained.

VII. Nobody appeared for the appellant at the oral proceedings on 6 December 2010. In response to a telephone enquiry by the registrar, the representative of the appellant informed the board and confirmed by fax that the appellant had decided not to attend the oral proceedings. Oral proceedings were then held in the absence of the appellant.

VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the Main Request, or, subsidiarily, on the basis of the First Auxiliary Request or the Second Auxiliary Request, all requests as filed with letter dated 8 November 2010.

After deliberation on the basis of the submissions and requests dated 8 November 2010, the board announced its decision.

IX. Independent claim 1 according to the Main Request reads as follows:

"1. A method of channel decoding speech frames wherein each received channel encoded speech frame comprises an inband data and speech data, wherein said inband data has a codec mode indication value, the method comprising the following steps:

(a) calculating (1002) a plurality of inband decode metrics, one for each speech code (1002) mode, for the inband data of a received speech frame to obtain for each codec mode an associated confidence level which indicates an inband decoding likelihood of said codec mode;
(b) partially decoding (1004) for each codec mode the speech data of the received speech frame up to a certain stage (M) of a trellis to calculate for each state within said stage a metric indicating a confidence level that the received speech data corresponds to a trellis path leading to said state, wherein the best metric for each channel decoding attempt is retained;
(c) combining (1008) the retained best metric with the calculated inband decode metrics to determine a likely channel codec mode;
(d) resuming decoding of the speech data using the determined channel codec mode."

Independent claim 4 according to the Main Request reads as follows:

"4. A method of channel decoding speech frames in a receiver capable of multiple (M) channel codec modes, wherein each received channel encoded speech frame comprises inband data and speech data wherein said inband data has a codec mode indication value, the method comprising the following steps:
(a) calculating (700) for each codec mode an inband decode metric from the inband data of a received speech frame to obtain for each codec mode a confidence level which indicates an inband decoding likelihood of said codec mode;

(b) choosing (704) the codec mode having the highest confidence level;
(c) decoding (712) the speech data of the received speech frame using the chosen codec mode;
(d) performing (720) a speech frame check to determine a quality of the decoded speech frame;
(e) determining (724) whether the decoded speech frame has a poor quality; and
(f) choosing (736) the codec mode with the next highest confidence level if the decoded speech frame is determined to be of poor quality and repeating steps (c) to (f)."

Independent claim 9 according to the Main Request reads as follows:

"9. A receiver for channel decoding speech frames, said receiver being capable of multiple (M) codec modes, wherein each received channel encoded speech frame comprises inband data and speech data, said receiver comprising:
(a) an inband bit decoder for calculating (1002) a plurality of inband decode metrics, one for each codec mode, from the inband data of a received speech frame to obtain for each codec mode an associate confidence level which indicates an inband decoding likelihood of said codec mode;
(b) a channel decoder for partially decoding (1004) for each codec mode speech data of the received speech frame up to a certain stage (M) of a trellis to calculate (1006) for each state within said stage a metric indicating a confidence level that the received speech data corresponds to a trellis path leading to said state, wherein the best metric for each channel

decoding attempt is retained; and for combining (1008) the retained best metric with the calculated inband decode metrics to determine a likely channel codec mode; and for resuming decoding of the speech data using the determined channel codec mode."

Independent claim 12 according to the Main Request reads as follows:

"12. A receiver for channel decoding speech frames, said receiver being capable of multiple (M) codec modes, wherein each received channel encoded speech frame comprises inband data and speech data, wherein said inband data has a codec mode indication value, wherein said receiver comprises:
(a) an inband bit decoder for calculating (700) for each codec mode an inband decode metric for the inband data of a received speech frame to obtain for each codec mode a confidence level which indicates an inband decoding likelihood of said codec mode; and for choosing (704) the codec mode having the highest confidence level; and
(b) a channel decoder coupled with the inband bit decoder for decoding (712) of the speech data of the received speech frame using the codec mode chosen by said inband bit decoder, and for performing (720) of a speech frame check to determine a quality of the decoded speech frame; and for determining (724) whether the decoded speech frame has a poor quality; and for choosing (736) the codec mode with the next highest confidence level until the decoded speech frame is determined to be not of poor quality."

Independent claims 1 and 4 according to the First Auxiliary Request are identical to independent claims 1 and 9 according to the Main Request, respectively. Independent claims 1 and 6 according to the Second Auxiliary Request are identical to independent claims 4 and 12 according to the Main Request, respectively.

Reasons for the Decision

1. *Admissibility*

The appeal complies with the provisions of Articles 106 to 108 EPC (see point III above). It is therefore admissible.

2. *Non-attendance of oral proceedings*

The appellant was duly summoned, but did not attend the oral proceedings. According to Article 15(3) RPBA the board shall not be obliged to delay any step in the proceedings, including its decision, by reason only of the absence at the oral proceedings of any party duly summoned who may then be treated as relying only on its written case.

In the present case, the board was in a position to take a decision at the end of the hearing.

3. *Novelty and Inventive step*

The set of claims 1 to 16 forming the Main Request relates to two embodiments of a method and receiver for channel decoding speech frames:

- a first embodiment, according to claims 1 to 3 and 9 to 11, using a partial decoding of a speech frame before a likely channel codec mode for that frame is determined;

- a second embodiment, according to claims 4 to 8 and 12 to 16, using a complete decoding of a speech frame before a channel codec mode achieving a good quality of the decoded frame is determined.

Claims 1 to 6 forming the First Auxiliary Request are identical to claims 1 to 3 and 9 to 11 of the Main Request related to the first embodiment.

Claims 1 to 10 forming the Second Auxiliary Request are identical to claims 4 to 8 and 12 to 16 of the Main Request related to the second embodiment.

Since the decision under appeal was only based on the finding that the claims relating to the second embodiment lacked inventive step, the board finds it appropriate to deal first with these claims, which are present both in the Main Request and in the Second Auxiliary Request.

3.1 *Prior art*

D1 discloses a method and a receiver for detecting the transmission format of a received data frame in a variable-format transmission scheme. According to D1, paragraph 5, transmission formats can vary according to, inter alia, the type of data (e.g. video, audio, data) or error protection schemes. Moreover, D1 mentions, in

paragraph 12, that the IS-95 standard is an example of a variable-format transmission scheme to which the detection method of D1 may be applied. A single service (voice) may efficiently be encoded using different formats. D1 teaches to calculate, upon reception of an encoded frame, a metric for each permissible format as a function of the format indication corresponding to the permissible format and the received format indication in the received frame. Formats are then prioritized according to the similarities between these format indications and applied to the data in the prioritized order. The first applied permissible format that results in a successful decoding of the frame is selected as the correct transmission format (see paragraphs 17, 18, 29 and 37).

D2 discloses a method and a receiver for decoding variably coded signals. A second field in the received signal indicates the code applied to a first field of the signal. The receiver selects a code based on a combination of a decoding metric of the estimate of the second field with likelihoods metrics generated by partially decoding the received signal according to possible codes. The receiver then fully decodes the signal using the selected code (see page 8, lines 14-27).

Since D1 discloses a complete decoding and D2 a partial decoding of the speech frame, D1 represents the closest prior art to the second embodiment and D2 the closest prior art to the first embodiment.

3.2 *Independent claims 4 and 12 according to the Main Request and independent claims 1 and 6 according to the Second Auxiliary Request (second embodiment)*

3.2.1 D1 discloses (the corresponding features and references in D1 being given in brackets), according to all the features of independent method claim 4 of the Main Request and independent method claim 1 of the Second Auxiliary Request, a method of channel decoding (paragraph 5) speech frames (paragraph 12) in a receiver capable of multiple channel codec modes, wherein each received channel encoded speech frame comprises inband data ("transport format combination indicator (TFCI)") and speech data wherein said inband data has a codec mode indication value (paragraphs 7 and 11), the method comprising the following steps:
(a) calculating for each codec mode an inband decode metric from the inband data of a received speech frame to obtain for each codec mode a confidence level which indicates an inband decoding likelihood of said codec mode (paragraphs 17, 18 and 33);
(b) choosing the codec mode having the highest confidence level (paragraph 37);
(c) decoding the speech data of the received speech frame using the chosen codec mode (paragraph 37);
(d) performing a speech frame check to determine a quality of the decoded speech frame (paragraphs 6 and 37);
(e) determining whether the decoded speech frame has a poor quality (paragraphs 6 and 37); and
(f) choosing the codec mode with the next highest confidence level if the decoded speech frame is determined to be of poor quality and repeating steps (c) to (f) (paragraph 37)."

The subject-matter of claim 4 according to the Main Request and claim 1 according to the Second Auxiliary Request is thus not new (Article 54 EPC).

Independent claim 12 according to the Main Request and independent claim 6 according to the Second Auxiliary Request contain the same features as claim 4 according to the Main Request but expressed in terms of a receiver. Since D1 discloses a system and a method for transmission format detection, these claims also do not meet the requirements of Article 54 EPC.

3.2.2 The appellant argued that the aim of the method of D1 is to determine a transmission format and not a codec mode as in the claimed invention. He based his argumentation on the assumption that the system of D1 is for receiving different types of data (e.g. video, audio, text, speech, picture) each being transmitted using its own particular format (e.g. MPEG for video, MP3 for audio, JPEG for picture). The wording "variable-format transmission scheme" should thus be construed, according to the appellant, as meaning that the transmission format is variable according to the type of data only. On the contrary, independent claim 4 according to the Main Request defined, in the appellant's view, a method and a receiver for decoding speech data having a determined transmission format, by using the most appropriate codec mode within this format.

The board is not convinced by the appellant's arguments on this point. In this respect, D1 (see paragraph 5) discloses that transmission formats can vary according

to transmission rate or error protection schemes as well. Moreover, D1 (see paragraph 12) mentions the IS-95 standard as a variable-format transmission scheme. In this scheme, a single service, voice, is encoded using four different transmission formats (full rate, 1/2 rate, 1/4 rate or 1/8 rate). Thus the board judges that the wording "transmission format" used in D1 can be construed as also encompassing a channel codec mode for speech frames.

The appellant further argued that the method of D1 was not able to *successfully* decode the frame until it determined the format the frame is in. In the board's view this is also true for the method claimed in claim 4 according to the Main Request: step (c) does not define that the frame is *successfully* decoded but only that it is decoded. If step (e) determines that the decoded frame is of poor quality, the decoding which happened in step (c) was clearly not successful.

The appellant also argued that the method of D1 determined a transmission format and if it failed, the data was lost in the sense that it could not be decoded at all. In the board's view this is however almost identical for the method of claim 4 according to the Main Request: if, after having successively used the M codec modes for decoding the frame, according to the loop defined by steps (d) to (f), all the decoding attempts have lead to a poor quality of the decoded frame, the data can only be decoded with a poor quality.

A further argument advanced by the appellant was that D1 only used an inband metric whereas claim 4 according to the Main Request used the determination of the

quality of the result of the speech decoding as a second metric for determining the codec mode. The board however judges that the successful decoding of the data as mentioned in paragraph 37 of D1 is equivalent to a decoding not leading to a poor quality as defined in step (e) of claim 4 according to the Main Request. Therefore, in the board's view, the method of D1 also uses two metrics, an inband decode metric and a decoded frame metric.

3.3 *Independent claims 1 and 9 according to the Main Request and independent claims 1 and 4 according to the First Auxiliary Request (first embodiment)*

In the board's view D2 represents the closest prior art to the first embodiment (see point 3.1 above) since D2 relates to the determination of a channel codec mode using a combination of metrics (see in particular on page 21, lines 3 to 11). The first metric is based on the estimate of a received codec mode indication value ("second field" in D2). The second metric is based on likelihood metrics generated in the partial decoding of the speech frame using MLSE decoding processes for each codec mode (see in particular page 13, lines 14 to 21 and page 16, lines 3 to 11).

The only difference between the subject-matter of claim 1 according to the Main Request and the disclosure of D2 appears to be that a plurality of first metrics based on the received codec mode indication value are calculated, one for each possible codec mode, instead of having a single metric calculated as in D2.

D1 however teaches to determine a plurality of metrics, i.e. one for each possible codec mode, based on the received channel codec mode indication value (see paragraph 18).

The appellant merely argued that D2 did not deal with speech data and that it was stated in the International Preliminary Report on Patentability (IPRP) that none of the cited documents (i.e. D1 and D2) disclose or give a hint to include the feature of "a plurality of inband decode metric is calculated, one inband decode metric for each speech codec mode" into the method of D2 and to determine the channel codec mode based upon the best metric of the partially decoded speech data and the plurality of calculated inband decode metrics.

As to the first argument, the board notes that D2 relates to a decoding process in a wireless communication system employed to provide voice and data communications to subscribers (see in particular on page 1, lines 11 to 22). Therefore the board is of the opinion that D2 unambiguously deals with speech data.

As to the second argument, the board notes that the IPRP is not binding for the examining proceedings. Moreover, in the board's view, the question whether the skilled person would not be inclined to combine the teachings of D1 and D2 to arrive at the subject-matter of claim 1 has not been discussed during the examining proceedings.

Since neither this issue nor the technical effects achieved by the above-mentioned distinguishing feature and the underlying objective technical problem it

solves have been dealt with in the examination procedure, the board remits the case to the department of first instance to preserve the appellant's right to have these matters decided at two instances.

4. The Main Request and the Second Auxiliary Request contains claims related to the second embodiment. They are thus not allowable for lack of novelty of their independent claims (Article 54 EPC).

The First Auxiliary Request contains only claims related to the first embodiment. The First Auxiliary Request should thus form the basis for the further prosecution of the application by the department of first instance.

Order

For these reasons it is decide that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution on the basis of the First Auxiliary Request (claims 1-6) as filed with letter dated 8 November 2010.

The Registrar: The Chair:

K. Götz A. Ritzka