Datasheet for the decision of 6 March 2009

Case Number: T 0758/06 - 3.5.05
Application Number: 01304860.8
Publication Number: 1211840
IPC: H04L 1/18

Language of the proceedings: EN

Title of invention:
Hybrid ARQ with parallel packet transmission

Applicant:
LUCENT TECHNOLOGIES INC.

Headword:
Incremental redundancy with encoder packet identifier/LUCENT

Relevant legal provisions:
EPC Art. 123(2)
RPBA Art. 15(3)

Relevant legal provisions (EPC 1973):
EPC Art. 56, 84, 113(1)

Keyword:
Clarity and support by the description (no)
Inventive step (no)

Decisions cited:
-

Catchword:
-
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DECISION
of the Technical Board of Appeal 3.5.05
of 06 March 2009

Appellant: LUCENT TECHNOLOGIES INC.
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Composition of the Board:
Chairman: D. H. Rees
Members: M. Höhn
G. Weiss
Summary of Facts and Submissions

I. This appeal is against the decision of the examining division dispatched 30 November 2005, refusing European patent application No. 01304860.8 for lack of an inventive step according to Article 56 EPC 1973, based on prior art document (following the numbering in the first instance):


II. In the notice of appeal filed with letter dated 05 January 2006 it was requested that the decision to refuse be set aside and that a patent be granted.

III. A summons to oral proceedings to be held on 6 March 2009 was issued on 3 December 2008. In an annex accompanying the summons the board expressed the preliminary opinion that the subject-matters of the independent claims 1 and 10 lacked novelty (Article 54(2) EPC 1973) over the stop-and-wait (SaW) protocol disclosed in D1 or, depending on the interpretation, were considered at least obvious in the light of this disclosure (Article 56 EPC 1973). The board gave its reasons for these objections and why the appellant's arguments were not found convincing.

IV. With a letter dated 27 January 2009 the appellant filed an amended set of claims 1 to 13 as its sole request together with arguments that this request involved an
inventive step. In addition, the board was informed that the appellant would not be present at the oral proceedings and was asked to take the written submission into consideration.

V. As announced, nobody appeared to represent the appellant at the oral proceedings on 06 March 2009, which were then held in the appellant's absence.

VI. The appellant had requested in writing that the decision to refuse be set aside and that a patent be granted on the basis of claims 1 to 13 received with the letter dated 27 January 2009.

VII. Independent claim 1 reads as follows:

"1. A method of transmitting a sub-packet (32) in a parallel channel encoder packet transmission system CHARACTERIZED BY the steps of: attaching a sequence identifier, a user identifier and an encoder packet identifier that corresponds to at least the number of parallel channels in the packet transmission system to a first sub-packet (32) to produce a first sub-packet (32) with identifiers; and transmitting the first sub-packet (32) with identifiers to a user (x) indicated by the user identifier."

Independent claim 11 is directed to a corresponding method of receiving a sub-packet.

VIII. After deliberation the board announced its decision.
Reasons for the Decision

1. The appellant was duly summoned, but did not appear in 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. Further the appellant was informed in the board's communication that if amendments to the appellant's case were filed, it would be necessary at the oral proceedings to discuss their admissibility and their compliance with the EPC, including Articles 123(2), 84 and 52(1). In the light of Article 15(3) RPBA, the board may consider these issues and announce a decision based on new objections arising from such newly submitted amendments even if the appellant chooses not to attend. There can be no question of the appellant being taken by surprise and the appellant's right to have an opportunity to be heard has been observed (Article 113(1) EPC 1973).

2. The appellant's arguments

The appellant argued in the submission accompanying the new set of claims that prior art document D1 does not disclose an encoder packet identifier that corresponds to at least a number of parallel channels in the packet transmission system, a feature of the new claim 1, which was therefore novel over D1. Furthermore, there was nothing in D1 that recognized a solution to the problem of how to inform a receiver regarding a number of parallel channels in a packet transmission system.
The present invention included such information in the encoder packet identifier. This information was useful to a receiver for processing a received communication for reasons that one skilled in the art would appreciate from the description. Given that D1 and the other prior art documents on record did not even recognize the solution recited in the amended claims, they involved an inventive step.

3. Original disclosure - Article 123(2) EPC

Amended claim 1 is originally disclosed in original claim 1 and on page 8, lines 1 to 10 of the original application (corresponding to paragraph 26 of the application as published). The requirements of Article 123(2) EPC are therefore fulfilled.

4. Clarity and support by the description - Article 84 EPC 1973

Claim 1 has been amended by adding that the encoder packet identifier "corresponds to at least the number of parallel channels in the packet transmission system". It is not clear what is meant by this phrase.

4.1 Firstly from the term "at least" the board understands that the encoder packet number does not necessarily equal "the number of parallel channels in the packet transmission system". In these circumstances it is not clear what information it might convey. In particular it is not apparent how this number might "inform a receiver regarding a number of parallel channels in a packet transmission system," which is the problem which the appellant alleges that the feature solves. Moreover,
apparently the encoder packet number does not have the function of a "channel identifier", because the encoder packet identifier may apparently be higher than the number of parallel channels in the transmission system. Thus it is unclear what the function of the added feature actually is.

4.2 Leaving aside the "at least", the literal meaning of the wording "corresponds to ... the number of parallel channels" would be that the "encoder packet identifier" defines the number of channels available for transmission in the system, i.e. it would be the same for all packets, e.g. 4 in a four channel system. This however does not make any technical sense; there would be no reason to send this static data with every packet. The board speculates that what was intended was that the "encoder packet identifier" indicates the actual channel used for the particular packet. However this would contradict both the normal meaning of "encoder packet identifier" and that of the qualifier ("number of parallel channels") which has been introduced. The added feature therefore lacks clarity for this reason as well.

4.3 When interpreting the amendment in the light of the description and the drawings the embodiment in figure 4 is pertinent. It shows the special case of four packets A11, A21, A31, A41 for the same user A in the format Xij (whereby X characterizes the user, i the encoder packet number and j the sub-packet) being sent over four parallel channels (see also paragraph 30 of the A1-publication). In this special case indicator i corresponds to the number of the parallel channel used for transmission. If, however, in the same four
parallel channel transmission system first packets of different users A11, B11, C11, D11 are sent over the four channels, indicator i does not correspond to the number of the channel used, because, since they are parallel packets, they cannot all be sent using channel 1. On the other hand, if the same packets were named A11, B21, C31, D41, i.e. identified according to the number of the channel used, the encoder packet identifier i would no longer identify the encoder packet number, but merely the channel used for transmission. Hence, the added feature in claim 1, even if interpreted (against its plain meaning) as "an encoder packet identifier that corresponds to the number of the parallel channel used" does not specify a general teaching, but only works under special conditions as shown in figure 4 of the application and, in addition, the amended feature is not supported by the description for the whole range claimed in amended claim 1.

4.4 Thus the added feature does not actually solve the problem formulated by the appellant in the letter dated 27 January 2009, i.e. "solution to the problem of how to inform a receiver regarding a number of parallel channels in a packet transmission system". If the sixth packet for a user was identified A61 the receiver would apparently be informed by the encoder packet identifier that there are 6 parallel channels, which would of course be wrong in the example of a four parallel channel transmission system. What would actually be conveyed by the encoder packet number would be an indication of the block boundaries. On the other hand, if the sixth packet was identified with the same identifiers as the second packet, i.e. as A21 again (as
described in paragraph 39 of the A1-publication), the encoder packet number would be nothing but a channel indicator and no longer identify the packet number. Therefore, either the "at least" does not make sense or the term "encoder packet number" is misleading giving rise to a further lack of clarity.

Claim 1 therefore does not fulfil the requirements of Article 84 EPC 1973. Since the appellant's sole request is therefore not allowable, the appeal must be dismissed.

5. The board considered whether there were nonetheless any arguments in favour of continuing the procedure in writing. However it does not appear possible to overcome the above objection since neither "encoder packet identifier" nor "the number of parallel channels in the packet transmission system" is actually defined in the application as a whole. The board can only speculate that what was intended by "the number of parallel channels in the packet transmission system" is actually the number of parallel channels between the transmitter and each user. The board, however, is of the opinion that if claim 1 were to be amended in this direction it would prima facie violate Article 123(2) EPC.

6. Even if that were the intended meaning, and the "encoder packet identifier" were in reality a user channel identifier, then the idea of having subchannels for a user and identifiers for the subchannels would be considered commonplace, so that altogether the claimed subject-matter would still apparently lack an inventive
step and therefore the prospects of further amendment leading to an allowable claim would be too remote to justify continuing the procedure in writing. The reasons for this conclusion with respect to the question of inventive step are given below. They correspond, with the exception of the reference to the new feature, to the arguments laid out in the communication accompanying the summons to oral proceedings. The appellant's submissions of 27 January 2009 did not contain any rebuttal of these arguments.

7. **The closest prior art**

7.1 The invention relates to hybrid automatic repeat-request (HARQ) technology. HARQ uses incremental redundancy, where user data is transmitted multiple times using different encodings. When a corrupted packet is received, the user device saves it and later combines it with the retransmissions, to recover the error-free packet as efficiently as possible. Even if the retransmitted packets are corrupted, their combination can yield an error-free packet. D1 deals with HSDPA which is part of the UMTS standards and is in the same field of HARQ as the application. According to an embodiment describing the stop-and-wait (SaW) protocol, a code block is coded into sub-blocks. One or more encoded sub-blocks are transmitted in one or more time slots, i.e. D1 discloses parallel channel encoder packet transmission (see e.g. D1, section 4, p. 2, last paragraph). The SaW protocol in D1 is also asynchronous as in the application (see e.g. the title). From figure 2 it can be understood that there are parallel channels in form of time slots and - in contrast to what is expressed in point 2 on p. 2 of D1, which is
only referring to the point of view of the user entity - for example after time slot 10 the transmitter has more than one code block outstanding (in this case code blocks A1, B1 and C1, because none of them has been successfully received yet at this time).

7.2 As shown in figure 1 of D1 a code block A1 is encoded into sub-blocks A11-A14. It is clear from the disclosure of D1 that the whole information content of code block A1 is found in every single one of sub-packets A11 (NEW sub-packet) and A12-A14 (CONTINUE sub-packets). However, sub-packets A12-A14 are either repetitions, i.e. re-transmissions, or redundant information that has been encoded in a different form (see e.g. section 3, point 4 "continuation (redundant information)"; section 4, first paragraph "On receiving a NACK, the sender sends redundant information (or repetition) by transmitting additional encoded sub-blocks"). The receiver operation is described in section 6 and the flow chart of figure 3 in D1. In case a NEW encoded sub-block (e.g. A11) has successfully been decoded it is acknowledged ACK and the next NEW coded sub-block (e.g. A21) is sent. This shows that all the information for code block A1 has been transmitted and the next code block A2 can be sent. Only in case the decoding has been unsuccessful, a negative acknowledgement NACK is followed by sending a CONTINUE encoded sub-block (e.g. A12). This clearly shows that a CONTINUE encoded sub-block is nothing but a redundant version of code block A1 that is only sent in case the transmission has not been successful. Also according to the application, sub-packets A12 and A11 are not necessarily identical (see col. 9, l. 40-41 in paragraph 33 of the A1-publication).
7.3 If one compares figure 4 of the application with figure 2 of D1, it becomes apparent that not only the way of encoding packets is similar, but also the indicators used when describing a sub-packet in the form "Xij", whereby X=user, i=packet number and j=sub-packet (1=NEW sub-block and 2...4=CONTINUE sub-block, thereby indicating whether it is a first transmission or a re-transmission of redundant information; see D1, p. 2, point 4 and section 6). This is identical to what is described in the application (see end of paragraph 29 of the A1-publication).

7.4 The purpose of the sequence identifier is to indicate a first transmission or a re-transmission of a sub-packet. Hence the board disagrees with the appellant's argument made in the statement setting out the grounds of appeal that D1 does not disclose a sequence identifier.

7.5 The user identifier serves the purpose of indicating that the associated sub-packet is intended for this user (see e.g. paragraph 26 and col. 9., l. 1-2 of the A1-publication). D1 also discloses an user identifier (see section 5, p. 3, "The preamble is used to identify encoded sub-blocks for different users").

7.6 It was common ground before the first instance that D1 discloses all the features of the independent claims except for an encoder packet identifier. The expression "encoder packet identifier" in its broadest meaning would be anything which identifies an encoder packet. On one approach, the board could simply discard the unclear qualifying phrase ("that corresponds to at least the number of parallel channels in the packet
transmission system") which has been added to this feature.

7.7 In this case according to the above analysis of D1 the identifier i of a sub-packet Xij has the function of an encoder packet identifier, since it identifies an encoder packet. All this information of D1 is found in a single embodiment, i.e. the stop-and-wait protocol SaW.

7.8 Even if one interprets D1 in a way that because of the mention on p. 2, point 2 there is no explicit disclosure of attaching an encoder packet identifier to a sub-packet, the board considers this obvious. Since D1 shows parallel channels in form of time slots and also mentions to transmit one or more encoded sub-blocks in one or more time slots (see e.g. D1, section 4, p. 2, last paragraph), D1 at least hints at the use of the identifier i for identifying an encoder packet in a parallel channel encoder packet transmission.

7.9 If the board takes the effect of the qualifying phrase to mean that the "encoder packet identifier" is in reality a channel identifier, it considers that the skilled person would understand that, because of identifier i, the SaW protocol as shown in figure 2 of D1 would work the same way if three code blocks A1, A2, A3 were sent to the same user instead of three code blocks A1, B1, C1 to different users. The fact that such a separate identifier i is foreseen in figure 2 would prompt the skilled reader to think of it as necessary in order to solve the problem of a parallel channel encoder packet transmission where more than one
code block is outstanding. In the board's judgment it would be obvious to the skilled reader that the identifier i serves the purpose of identifying an encoder packet in case several code blocks are sent to the same user (e.g. A1, A2, A3...) before the first code block has been positively acknowledged, thereby rendering obvious the idea of having subchannels for a user and identifiers for the subchannels.

7.10 Therefore, the subject-matter of claim 1, even if interpreted in the way as explained in section 6 above, is considered obvious over the SaW embodiment disclosed in D1.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar

The Chairman

K. Götz

D. H. Rees