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**Datasheet for the decision  
of 20 December 2016**

**Case Number:** T 0396/14 - 3.5.05

**Application Number:** 06124204.6

**Publication Number:** 1758286

**IPC:** H04L1/18

**Language of the proceedings:** EN

**Title of invention:**

Avoiding stall conditions and sequence number ambiguity in an automatic repeat request protocol

**Patent Proprietor:**

Telefonaktiebolaget LM Ericsson (publ)

**Opponent:**

Keltie LLP

**Headword:**

Packet transmission and retransmission windows/ERICSSON

**Relevant legal provisions:**

EPC Art. 83, 100(b), 111

**Keyword:**

Sufficiency of disclosure - main request (yes)  
Remittal to the department of first instance - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 0396/14 - 3.5.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.05**  
**of 20 December 2016**

**Appellant:** Telefonaktiebolaget LM Ericsson (publ)  
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**Representative:** Ahmad, Sheikh Shakeel  
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**Decision under appeal:** **Interlocutory decision of the Opposition**  
**Division of the European Patent Office posted on**  
**13 December 2013 maintaining European Patent No.**  
**1758286 in amended form.**

**Composition of the Board:**

**Chair** A. Ritzka  
**Members:** P. Cretaine  
F. Blumer

## Summary of Facts and Submissions

I. This appeal is against the interlocutory decision of the opposition division, dispatched on 13 December 2013, to maintain European patent No. 1 758 286 in amended form according to a first auxiliary request filed during the oral proceedings on 20 November 2013. The opposition was based on the grounds of Article 100(a), (b) and (c) EPC and the main request (patent as granted) was considered to be non-compliant with the requirements of Article 83 EPC. The opposition division decided that the first auxiliary request met the requirements of Articles 83 and 123(2) and (3) EPC and that the subject-matter of its claims involved an inventive step (Article 56 EPC), having regard to the disclosure of

D1: "COMPUTER NETWORKS", A. S. Tanenbaum, 1996, Preface, pages 182, 183, 202 to 207, 209, 215 to 215 and 218 to 219,

D2: ITU-T Recommendation X.75, "Packet-switched signalling system between public networks providing data transmission services", October 1996,

and

D3: WO 00/57594.

The opposition division further decided not to admit document

D11: EP 1 440 534, the parent application of the present patent,

into the proceedings, because it was not considered prima facie relevant under Article 54(3) EPC.

- II. The proprietor's notice of appeal was received on 20 February 2014 and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 22 April 2014. The proprietor (appellant) requested that the decision be set aside and that the patent be maintained on the basis of the claims as granted. Oral proceedings were requested on an auxiliary basis.
  
- III. The opponent's notice of appeal was received on 20 February 2014 and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 23 April 2014. The opponent (appellant) requested that the decision be set aside, and the patent revoked in its entirety. Further, the opponent requested that D11 be admitted into the proceedings. Oral proceedings were requested on an auxiliary basis.
  
- IV. By letter dated 3 September 2014, the opponent responded to the proprietor's statement setting out its grounds of appeal.
  
- V. By letter dated 9 September 2014, the proprietor responded to the opponent's statement setting out its grounds of appeal. The proprietor further requested that the opponent's appeal be dismissed, and submitted new sets of claims according to a first auxiliary request A, a first auxiliary request B and second to seventh auxiliary requests. The first auxiliary request A was identical to the first auxiliary request underlying the decision to maintain the patent.

- VI. With letter of 14 September 2015, the proprietor responded to the last submission of the opponent and maintained its requests of 22 April 2014.
- VII. A summons to oral proceedings scheduled to be held on 20 December 2016 was issued on 10 October 2016. In a communication dated 14 October 2016, the board indicated the points which would be discussed during the oral proceedings.
- VIII. With a letter of response dated 18 November 2016, the proprietor maintained all its previous requests and further submitted new sets of claims according to a first auxiliary request C, a fourth auxiliary request C, a fifth auxiliary request C, a sixth auxiliary request C and a seventh auxiliary request C.
- IX. With a letter of response dated 21 November 2016, the opponent requested that the first auxiliary request B and the second to seventh auxiliary requests not be admitted into the proceedings for being late-filed and not substantiated.
- X. During the oral proceedings held before the board on 20 December 2016, the issue of sufficiency of disclosure (Articles 100(b) and 83 EPC) in respect of the main request was first discussed. After the Chair announced the board's conclusion that claim 1 of the main request fulfilled the requirements of Article 83 EPC, the possibility of a remittal to the opposition division was discussed between the parties and the board.

The proprietor requested that the decision under appeal be set aside and that the patent be maintained as granted (main request) or, subsidiarily, on the basis

of any of the first auxiliary request A, the first auxiliary request B, the second, third, fourth, fifth, sixth and seventh auxiliary requests as filed with letter dated 9 September 2014, or on the basis of any of the first auxiliary request C, the fourth auxiliary request C, the fifth auxiliary request C, the sixth auxiliary request C and the seventh auxiliary request C as filed with letter dated 18 November 2016.

The opponent requested that the decision under appeal be set aside and that the patent be revoked. The opponent further requested that the case be remitted to the opposition division for further prosecution.

At the end of the proceedings, the decision of the board was pronounced.

XI. Claim 1 of the main request (claims as granted) reads as follows:

"A method in a transmitter (310) for use in data unit transmissions between a transmitter (310) and a receiver (500), where each data unit includes a corresponding sequence number and is transmitted in sequence modulo-N, N being the largest sequence number, including the step of establishing a retransmission window (430) having a size corresponding to a number of data units less than N; and **characterized by** using said retransmission window (430) to avoid sequence number ambiguity in the receiver between originally-transmitted data units and retransmitted data units by only permitting (64,66,68) retransmission of one or more data units having a sequence number within a current position of the retransmission window (430) in the sequence;

positioning an upper end of the retransmission window (430) at a sequence number that is less than or equal to a difference between a highest sequence number most recently transmitted and the window size; and moving the retransmission window (430) to a next sequence number position in the modulo-N sequence after each data unit is transmitted."

Independent claim 2 of the main request reads as follows:

"A method in a receiver (500) for use in data unit transmissions between a transmitter (310) and a receiver (500), where each data unit includes a corresponding sequence number and is transmitted by the transmitter in sequence modulo-N, N being the largest sequence number, the receiver comprising a receiving window (630) corresponding to a number of data units less than N in order to avoid sequence number ambiguity in the receiver (500) between originally transmitted data units and retransmitted data units, characterized by discarding (92) a recently-received data unit inside the receiving window (630) if said data unit has been previously received (90Yes); storing (94) a recently-received data unit in a reordering buffer (610) in a position corresponding to the recently-received data unit sequence number if said data unit has not been previously received (90No); and, if a recently-received data unit is outside the receiving window (80No), advancing (96) the receiver window (630) so that the sequence number of the recently-received data unit forms the upper end and removing (98) from the buffer (610) any data units



having a sequence number less than the lower end of the receiver window."

The main request further comprises independent claims directed to a corresponding transmitter (claim 5) and a corresponding receiver (claim 6).

Due to the outcome of the appeal, there is no need to detail the claims according to the auxiliary requests.

### **Reasons for the Decision**

#### 1. Admissibility of the appeals

The appeals of the proprietor and of the opponent both comply with the provisions of Articles 106 to 108 EPC (cf. points II and III above) and are therefore admissible.

#### 2. Main request - Article 83 EPC

2.1 The breakdown of granted claim 1 into features A - F and the breakdown of granted claim 2 into features G - M, used throughout the opposition and appeal proceedings (see in particular the opponent's letter of 3 September 2014), will be used in the following.

2.2 The opposition division has found that claim 1 of the main request and consequently the main request as a whole did not meet the requirements of Article 83 EPC. The reasons given in the decision under appeal were in substance that the skilled person would not be able to carry out the invention defined in claim 1, because the teaching of the description in respect of the wording "upper end of the retransmission window" was in contradiction with what was stated in that claim.

According to the opposition division, the general understanding was that the "upper end" of a sliding window in HARQ protocols corresponded to a sequence number transmitted later in time, and that a retransmission or receiving window was moved in the ascending direction, i.e. to positions corresponding to higher sequence numbers. The skilled person would read the description and the claims having only this interpretation in mind (Reasons 11.2). Further, according to the opposition division, there was no hint in the patent to think that a different understanding of lower end corresponding to lower sequence numbers, i.e. numbers having a smaller value than higher numbers, and of upper end corresponding to higher sequence numbers, was applicable (Reasons 11.3). Still further, according to the opposition division, the embodiment described with respect to the transmitter window was inconsistent with claim 1 (Reasons 11.4), whereas the embodiment described with respect to the receiver window supported the opposition division's understanding of "upper end" (Reasons 11.5). Lastly, according to the opposition division, the terms used in the patent document should be given their normal meaning in the relevant art unless the description gave them a special meaning, which was not the case here. Thus, according to the opposition division, the skilled person had to apply the same general and common interpretation to both windows, namely that the "upper end" of both the retransmission and the receiving window was associated with the data unit last transmitted or received (Reasons 11.7 and 11.8).

2.3 The board however agrees with the proprietor that the description and drawings disclose the invention defined in claim 1, in particular feature E, in a manner

sufficiently clear and complete for it to be carried out by a skilled person.

Firstly, there is no explicit definition of the term "upper end" for a retransmission window since this term appears only once in the description in a passage summarising claim 1 ([0018]). It is also clear that a simple definition based on the sequence numbers of the data units present in the window is not possible, due to the repetitive nature of the modulo-N numbering. Similarly, a definition based on the position of a data unit at the top of a vertical representation of the retransmission window, as shown in Figures 5A and 8A, would be unsatisfactory since the figures could be turned to represent the retransmission window horizontally or in the other vertical direction without changing the technical teaching of the description. Therefore neither the general understanding of the skilled person nor the description and drawings limit the meaning of an "upper end" of a retransmission window to the highest sequence number in the window or the top of the window when represented in the vertical direction along the time line.

Even more to the point, the meaning of the term "upper end" in respect of a retransmission window is to be determined on the basis of the whole technical teaching of the patent, including the claims, description and drawings. The skilled person trying to carry out the invention in respect of the claimed retransmission window has to determine which end of the window is to be regarded technically as the "upper end" in the disclosure of the patent. Figure 6 and the corresponding paragraphs [0031] to [0033] show that, when the most recently transmitted sequence number is SN, the retransmission window permits only

retransmission of data units having a sequence number between SN minus the window size and SN (see for instance step 64 in Figure 6 where SN = 4 and the window of size 4 comprises the numbers 1 to 4). Similarly, Figure 8A and the corresponding paragraph [0037] show that at time t1 the most recently transmitted data unit has the sequence number SN = 7 and the retransmission window of size 4 permits the retransmission of data units having a sequence number between 2 and 5, i.e. an end of the window of size 4 is positioned at a sequence number which is less than SN minus the window size. It is thus clear from the description passages and figures related to the retransmission window that the "upper end" in claim 1 corresponds to the sequence number which should have been transmitted earliest in time and which is usually, but not necessarily, due to the modulo-N numbering, the lowest sequence number of the window, as in the illustrated embodiments of Figures 6 and 8A.

The board is convinced that the above understanding of the term "upper end" in the context of the retransmission window in independent claim 1 is the only one which makes technical sense for the skilled person, taking into account the whole disclosure of the patent with respect to the retransmission. The fact that the term "upper end" has a different meaning with respect to a receiving window in independent claim 2 does not affect the above reasoning, since the two claimed methods operate independently of each other, even if they may be implemented in the same transmission system. Contrary to the opponent's arguments based on the observation that claims 1 and 2 had not been challenged for non-unity, the board judges that claims 1 and 2 indeed do not define interrelated products in the sense of Rule 43(2)(a) EPC, since the

positioning of the retransmission window is performed independently of the positioning of the receiving window.

The board further notes that the opposition division itself, by acknowledging in the decision that the description "leads to think that SN-window corresponds in fact to the lower end of the window, and SN to the upper end of the window" (Reasons 11.4), correctly understood claim 1 based on the description. The opposition division went on to assess novelty and inventive step with respect to the retransmission window, based on the amended claims according to the first auxiliary request. All this emphasises that a meaningful interpretation of the invention in respect of the retransmission window defined in claim 1, based on the whole disclosure, is readily possible for a person skilled in the art.

The opponent further argued that, due to the use of the expression "less than or equal to" when defining the positioning of the upper end of the retransmission window in claim 1, different positions of the retransmission window were possible, such that the technical teaching could not be achieved across the full scope of claim 1. The opposition division held that, in view of the wording "less than", it was impossible to avoid ambiguity (Reasons 11.9).

However, the board is persuaded that ambiguity is avoided due to the limited size of the retransmission window which is moved in time, and that different positions of the retransmission window are possible, as supported by paragraphs [0031] and [0032] of the patent specification and as argued by the patent proprietor.

For these reasons the board judges that claim 1 of the main request complies with Article 83 EPC.

3. Procedural matters

3.1 During the oral proceedings, after the Chair had announced that claim 1 of the main request complied with Article 83 EPC, the opponent declared that it maintained its further objections against the main request, in particular with respect to claim 2 and under Article 100(a) and (c) EPC. The opponent stated that these objections had not been dealt with in the appeal proceedings, since the scope of claim 1 as granted was different from the scope of claim 1 as maintained according to the first auxiliary request, in particular due to the wording "less than" in the retransmission window positioning step in claim 1 as granted, which had been deleted from claim 1 of the first auxiliary request. The opponent therefore requested that the file be remitted to the opposition division in order to have said objections examined by two instances, if necessary, and added that it was willing to help expedite the proceedings after remittal.

The proprietor requested that the request for remittal be refused, firstly because the opponent should have been prepared to discuss the issues of novelty/inventive step and added-matter also with respect to the main request, and secondly because of the age of the patent: fifteen years had now elapsed since its filing date.

3.2 Taking into account the arguments of both parties, the board decided that remittal under Article 111 EPC was the most appropriate course of action in the present

case. The board considers that since the decision under appeal is based solely on Article 83 EPC with respect to the main request, the opponent may legitimately expect to have two instances decide if necessary, on the other issues under Article 100(a) and (c) EPC. The board further notes that the patent is based on a divisional application filed as such in 2006.

## 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 prosecution.

The Registrar:

The Chair:



K. Götz-Wein

A. Ritzka

Decision electronically authenticated