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Case Number: T 0517/13 - 3.5.03

Application Number: 02718417.5

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Language of the proceedings: EN

Title of invention:
Apparatus, and associated method, for facilitating deletion of dictionary content pursuant to communication of signaling protocol messages

Applicant:
Nokia Technologies Oy

Headword:
Signalling message compression/NOKIA

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

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Case Number: T 0517/13 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 8 February 2017

Appellant: (Applicant)	Nokia Technologies Oy Karaportti 3 02610 Espoo (FI)
Representative:	Ruuskanen, Juha-Pekka Page White & Farrer Bedford House John Street London WC1N 2BF (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 11 October 2012 refusing European patent application No. 02718417.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	F. van der Voort
Members:	B. Noll
	P. Guntz

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division refusing European patent application No. 02718417.5 (international publication No. WO 02/076114 A1). The refusal was based on the ground that the subject-matter of claims 1, 15, 16 and 20 lacked novelty (Articles 52(1) and 54 EPC) having regard to document:

D1: Hans Hannu et al, "Application signaling over cellular links", Network Working Group, internet draft, 2 March 2001, pages 1 to 18.

II. The board issued a summons to oral proceedings. In a subsequent communication, the board gave a preliminary opinion and addressed the relevant issues to be discussed at the oral proceedings, in particular novelty and inventive step of the method of claim 16 having regard to D1.

III. By letter dated 6 January 2017, the appellant filed sets of claims of a main request and an auxiliary request, replacing the claims on file.

IV. Claim 16 of the main request reads as follows:

"A method for selectably facilitating deletion of dictionary content stored at a first-station dictionary (62, 56) associated with a first communication station (12, 32) in a communication system (10) which utilizes the first-station dictionary (62, 56) at the first communication station (12, 32) to compress a signal for communication to a second communication station (32, 12) where a second-station dictionary (56, 62) is used to decompress the signal, comprising:

detecting (94) an indication of additional dictionary content (84) to be added to the first-station dictionary (62, 56);

selecting (96), at least responsive to the indication detected during said operation of detecting, which, if any, portion of the dictionary content stored at the first-station dictionary (62, 56) is to be deleted; and

deleting (98) the same dictionary content at the first-station dictionary (62, 56) that is deleted at the second-station dictionary (56, 62), wherein a first selection criteria [*sic!*] for selecting the portion of the dictionary content for deletion at the first-station dictionary (62, 56) by the first dictionary content deletion selector is identical to a second selection criteria for selecting the portion of the dictionary content for deletion at the second-station dictionary (56, 62) by a second dictionary content deletion selector,

wherein said first dictionary content deletion selector is configured to be implicitly synchronized to the second dictionary content deletion selector (72, 74) during a communication session, free of explicit signaling between the first communication station (62, 56) and second communication station (56, 62) to identify what portions of the dictionary content are to be deleted, to maintain synchronization of dictionary content between the first-station dictionary and the second-station dictionary."

Claim 16 of the auxiliary request differs from claim 16 of the main request in that, at the end of the first paragraph before ", comprising", the following wording

has been inserted: "and the first station and the second station comprise a station *[sic]* and a base transceiver station".

V. Oral proceedings before the board were held on 8 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 main request or, in the alternative, of the auxiliary request, both requests having been filed with the letter dated 6 January 2017.

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

Reasons for the Decision

1. *Main request - inventive step (Articles 52(1) and 56 EPC)*

1.1 The application is in the field of transmitting text-based signalling protocol messages from a first to a second station. It relates in particular to the management and maintenance of the codebooks provided at the first station for compressing messages and at the second station for decompressing messages (see the application's abstract). In the following, a codebook for compression or decompression is referred to as a "dictionary".

1.2 D1 is in the same technical field (cf. page 4, section 1 "Introduction") and discloses that, in order to increase spectrum efficiency, text-based signalling protocol messages are compressed. In this context, D1 mentions the Lempel-Ziv algorithm as a widely used

compression algorithm (see page 12, section 7.1.2 "Binary compression", penultimate paragraph). This algorithm essentially consists in building up a dictionary during a communication session by adding to it messages sent from the first to the second station, in which character strings are replaced by references to occurrences of the string in one of the previous messages already in the dictionary (cf. section 7.1.2 and section 7.3 "Description of proposed solution", first paragraph). For the purpose of maintaining the dictionary, D1 further discloses two ways of updating the dictionary with content from previous messages, namely by appending all new messages or only new strings (cf. page 13, section 7.3, first and second asterisked paragraphs) and two ways of limiting the size of the dictionary, namely by removing a first message or the first x bytes from the beginning of the dictionary when a new message is appended (cf. page 13, third and fourth asterisked paragraphs).

Accordingly, D1 discloses a method for facilitating the selective deletion of dictionary content stored in a first-station dictionary associated with a first communication station in a communication system which utilises the first-station dictionary at the first communication station to compress a signal for communication to a second communication station (see D1, page 14, Figure 7-1, transmitted messages m1 to m4). A second-station dictionary is used to decompress the signal (i.e. in the "Entity 2" in Fig. 7.1). D1 further discloses that an indication of additional dictionary content to be added to the first-station dictionary is detected (detecting that there is a (n+1)th message which is to be added to the dictionary, cf. section 7.3, third asterisked paragraph) and that, in response to the indication detected during the

detection operation, a portion of the dictionary content stored at the first-station dictionary is selected to be deleted (the first message in the dictionary, cf. section 7.3, third asterisked paragraph).

As regards the relationship between the dictionary for compression and the dictionary for decompression, D1, page 14, second paragraph, states:

"A potential difficulty with binary compression based on previous messages is how to obtain robustness to packet loss. It is essential that the message is decompressed using the same dictionary as the message was compressed with, otherwise the decompression will fail."

This statement indicates to the skilled person that keeping the dictionaries for compression and decompression the same is a prerequisite for a correct decompression process. The skilled person would appreciate that this prerequisite is an inherent consequence of the compression process itself. After all, if a message were added solely to the dictionary for compression, but not to the dictionary for decompression (e.g. because the message was lost during the transmission), this would lead to a situation in which any subsequent message compressed by referring to the lost message could potentially not be decompressed at the second station because the lost message would be missing from the dictionary for decompression. The decompression of the subsequent message at the second station would fail. This potential source of failure in the decompression process is prevented in D1 by sending acknowledgements from the second to the first station for each received message (Figs 7.1 to 7.3). The

acknowledgement indicates to the first station that the message has actually been received and added to the dictionary for decompression at the second station.

1.3 D1 does not disclose specific measures to be taken in order to keep the content of the dictionaries for compression and decompression the same whenever the size of the dictionary for compression is to be limited and therefore old messages are deleted or removed from it.

Consequently, the subject-matter of claim 16 is distinguished from the method disclosed in D1 by the features according to the last two paragraphs of claim 1 (see point IV above).

1.4 The technical effect achieved by these distinguishing features is that the content of the dictionaries for compression and decompression is also kept the same when a dictionary is to be limited in size, by deleting old messages or memory portions upon arrival of a new message to be appended to the dictionary.

1.5 Hence, the objective technical problem underlying the claimed method, when starting out from D1, may be formulated as implementing the known text-based signalling protocol message compression method in a situation in which content is deleted from a dictionary.

1.6 The skilled person, solely by considering the nature of the compression process as described above, would realise that deleting content from the dictionary for compression in a way which differs from deleting content from the dictionary for decompression inevitably results in that the dictionaries are different, which would be in conflict with the above-mentioned prerequisite for a correct decompression as stated in section 7.3 of D1. Therefore, it would be obvious for the skilled person to apply the rule for limiting the size of one dictionary, e.g. by deleting the first message when a (n+1)th message is appended to it, in the same way to the other dictionary.

Therefore, the skilled person, solely by considering D1, would arrive at a method in which a first selection criterion for selecting the portion of the dictionary content for deletion at the first-station dictionary by the first dictionary content deletion selector is identical to a second selection criterion for selecting the portion of the dictionary content for deletion at the second-station dictionary by a second dictionary content deletion selector. This would result in a method in which dictionary content which is deleted at the second-station dictionary is also deleted at the first-station dictionary. In doing so, the first dictionary content deletion selector is configured to be implicitly synchronised with the second dictionary content deletion selector during a communication session, free of explicit signalling between the first and second communication stations to identify what portions of the dictionary content are to be deleted in order to maintain synchronization of dictionary content between the first-station and the second-station dictionary.

1.7 The appellant submitted the following arguments:

(a) D1 concerned the maintenance and synchronisation of dictionaries only in the phase of filling the dictionaries with new messages. D1 disclosed that, for this purpose, each message sent from the first to the second station was to be acknowledged. The acknowledgement of messages was necessary in order for the compression process to be highly robust against packet loss. Robustness against packet loss was however not an issue in the present application, which aimed at reducing the signalling required for synchronising the dictionaries. In fact, with the deletion mechanism as claimed, no signalling between the stations for synchronisation of message deletion operations was required at all.

(b) D1 disclosed that old messages were deleted from a single dictionary. D1 did not address the problem of synchronising dictionaries when a message was removed from one and, hence, did not disclose or render obvious a synchronisation between dictionary content deletion operations.

(c) The skilled person would understand the requirement that the dictionaries are "the same" in the context of D1 as meaning that the dictionaries for compression and decompression are to be filled with content in the same way. Therefore, the skilled person would not consider deletion operations to be encompassed by this requirement too. The skilled person would understand from the nature of the known compression process that deleting content solely from the dictionary for compression, but not from the dictionary for decompression, would not cause any harm to the compression process. Since, at the priority date,

memory space was limited for a mobile terminal, whereas it was not for a base station, the skilled person would have only limited the size of the dictionary for compression at a mobile terminal, without limiting the size of the dictionary for decompression at the base station.

1.8 The board is not convinced by these arguments for the following reasons:

Re (a): The present application neither requires that the reception of a message at the second station be acknowledged to the first station nor excludes this possibility. For the purpose of assessing inventive step of the method of claim 16, the fact that messages are acknowledged in D1 is therefore irrelevant. Further, in D1, the acknowledgement indicates solely that the message was received by the second station. The acknowledgement is not an indication that the message has been added to the dictionary for decompression. Adding a message to the dictionary for decompression is based only on the rule for updating the dictionary (e.g. appending all new messages or only new strings; see the first and second asterisked paragraphs on page 13 of D1) and on the fact that the message has actually been received at the second station. The acknowledgement serves to prevent the first station from adding messages to the dictionary for compression in the event that they are lost during transmission. These problems caused by loss of messages are however not addressed, let alone solved, by the claimed method.

Re (b): Even though D1 discloses deletion of content only in respect of a single dictionary, the requirement that the content of the dictionaries be the same

suggests correspondingly modifying the content of the other dictionary. Applying the same rules to both dictionaries does not therefore require the exercise of inventive skill.

Re (c): Contrary to the appellant's view, the requirement that the content of the dictionaries be the same is independent from the question of how the dictionaries are updated. Therefore, this requirement applies not only when a dictionary is filled with new content, but also when it is limited in size by deleting old messages. The skilled person might consider, as argued by the appellant, deleting content solely from the dictionary for compression and not from the dictionary for decompression as a further alternative. However, this alternative for which there is no disclosure in D1 or the present application, would not prevent the skilled person from considering, as another obvious alternative, applying the same rules for deleting content from the dictionaries for compression and decompression for the reasons set out above.

1.9 The board concludes that the method of claim 16 lacks inventive step having regard to D1 (Articles 52(1) and 56 EPC).

1.10 The main request is therefore not allowable.

2. *Auxiliary request - inventive step (Articles 52(1) and 56 EPC)*

2.1 The additional feature that the first station and the second station comprise a [mobile] station and a base transceiver station does not contribute to an inventive step. The rules for updating a dictionary defined in

D1, page 13, asterisked paragraphs, are independent from the type of station with which the dictionary is associated. Further, transmitting text-based signalling protocol messages between a mobile station and a base station in a communication system was common in the claimed priority year (2001). Therefore, the claimed association of the dictionaries with particular stations of a communication system does not contribute to an inventive step.

2.2 The appellant argued that the additional feature further distinguished the claimed subject-matter from D1, since message compression in D1 was disclosed for messages sent from one terminal station to another terminal station. Further, the appellant argued that dictionary management considerations for compressing terminal-to-terminal messages did not apply to dictionary management for compressing terminal-to-base-station messages.

2.3 The board does not agree. The rules defined in D1 in the four asterisked paragraphs on page 13 for updating a dictionary are independent of the type of station with which the dictionary is associated or of the types of stations between which the messages are exchanged. Therefore, there is no reason for the skilled person to consider the compression process for sending messages from a mobile terminal to a base station differently from the compression process for sending messages between mobile stations, i.e. between terminal stations.

2.4 In view of the above and the reasons set out in point 1, the method of claim 16 lacks inventive step (Articles 52(1) and 56 EPC).

2.5 The auxiliary request is therefore not allowable.

3. There being no allowable request, it follows that the appeal is to 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