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Datasheet for the decision of 14 September 2017

Case Number: T 1589/14 - 3.5.05

Application Number: 09707705.1

Publication Number: 2291940

IPC: H04L1/16, H04L1/18, H04W72/04, H04W72/12

Language of the proceedings: EN

Title of invention:
METHODS AND DEVICES RELATING TO DOWNLINK ASSIGNMENTS

Patent Proprietor:
Telefonaktiebolaget LM Ericsson (publ)

Opponent:
KELTIE LLP

Headword:
Bundled ACK for TDD transmission mode/ERICSSON

Relevant legal provisions:
EPC Art. 54, 56, 83, 84, 87, 123(2)
RPBA Art. 13

Keyword:
Priority - main request (no)
Novelty - main request (no)
Inventive step - auxiliary request (yes)

Decisions cited:
G 0002/98

Catchword:

Europäisches Patentamt
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Beschwerdekammern

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Case Number: T 1589/14 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 14 September 2017

Appellant: (Patent Proprietor)	Telefonaktiebolaget LM Ericsson (publ) 164 83 Stockholm (SE)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Appellant: (Opponent)	KELTIE LLP No.1 London Bridge London SE1 9BA (GB)
Representative:	Lawrence, Richard Anthony Keltie LLP No.1 London Bridge London SE1 9BA (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 23 May 2014 concerning maintenance of the European Patent No. 2291940 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, despatched on 23 May 2014, to maintain European patent No. 2 291 940 in amended form according to claims 1 and 2 of a first auxiliary request filed during the oral proceedings on 3 April 2014.

The opposition was based on the grounds of Article 100(a), (b) and (c) EPC. The opposition division found that the independent claims of a main request, corresponding to the independent claims as granted, were not entitled to the priority of the first application:

D9: US provisional patent application No. 61/026,601,

and lacked novelty (Article 54 EPC) over prior-art documents:

D7: LG ELECTRONICS: "Bundled ACK/NACK in TDD", 3GPP TSG RAN WG1 #53, Kansas City, USA, R1-081815, 5-9 May 2008, or

D8: LG ELECTRONICS: "Handling problem with uplink ACK/ NACK bundling", 3GPP TSG RAN WG1 #52bis, Schenzhen, China, R1-081256, 31 March to 4 April 2008, or

D13: 3GPP TS 36.212, V8.4.0, Sophia-Antipolis, France, September 2008, considered jointly with

D14: 3GPP TS 36.213, V8.4.0, Sophia-Antipolis, France, September 2008.

The opposition division decided that the claims of the first auxiliary request were entitled to the priority of the first application D9 and fulfilled the requirements of Article 84 EPC and that their subject-matter involved an inventive step (Article 56 EPC) having regard to the prior art disclosed in:

D4: Nokia & Nokia Siemens Networks: "Multi-ACK transmission in PUCCH for TDD", 3GPP TSG RAN WG1 Meeting #51bis, R1-080316, Sevilla, Spain, 14 - 18 January 2008, or in

D18: Ericsson: "Multiple ACK/NACK transmissions on PUCCH for TDD", TSG-RAN WG1 #51bis, R1-080344, Sevilla, Spain, 14 - 18 January 2008, in combination with

D1: US 2003/0128681.

A request of the proprietor not to admit inter alia the above-cited documents D4, D7, D8, D13, D14 and D18 was refused.

II. The opponent's notice of appeal was received on 22 July 2014, and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 2 October 2014. The opponent (appellant) requested that the decision be set aside and that the patent be revoked on the grounds of Article 100(a), (b) and (c) EPC, and further because the claims of the first auxiliary request, as amended in the opposition proceedings before the opposition division, lacked clarity (Article 84 EPC). In particular the opponent objected that the claims of the first auxiliary request were not entitled to the

priority date of the first application D9. Oral proceedings were requested on an auxiliary basis.

III. The proprietor's notice of appeal was received on 31 July 2014, and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 19 September 2014. The proprietor (appellant) requested that the decision be set aside and that the patent be maintained on the basis of claims 1 to 4 according to a main request filed with the statement setting out the grounds of appeal and identical respectively to independent claims 1, 12, 16 and 17 as granted or, as a further auxiliary request, on the basis of claims 1 and 2 as maintained by the opposition division. In particular the proprietor argued that the claims of the main request were entitled to the priority date of the first application D9. Oral proceedings were requested on an auxiliary basis in case the main request were not allowed.

IV. By letter of 10 February 2015, the proprietor responded to the statement setting out the opponent's grounds of appeal and requested that the opponent's appeal be dismissed as inadmissible and unfounded and that the patent be maintained in accordance with the main request or the further auxiliary request. Further, the proprietor filed claim sets according to auxiliary requests I to VI.

V. By letter of 13 February 2015, the opponent responded to the statement setting out the proprietor's grounds of appeal and requested that the proprietor's appeal be rejected in its entirety.

VI. With letter dated 10 July 2015, the proprietor filed a new set of claims 1 to 4 according to a first auxiliary

request consisting of claims 1 and 2 as maintained by the opposition division and corresponding device claims 3 and 4, and requested in hierarchical order that:

- the decision be set aside and the patent maintained according to claims 1 to 4 filed as main request with the statement setting out the grounds of appeal;
- the patent be maintained according to claims 1 to 4 of the first auxiliary request;
- oral proceedings be held;
- the patent be maintained according to claims 1 and 2 as maintained by the opposition division, as a further auxiliary request;
- the patent be maintained according to the claims of auxiliary requests I to VI filed with letter of 10 February 2015.

VII. A summons to oral proceedings was issued on 6 July 2017. In an annex to the summons, the board indicated the points which would be discussed during the oral proceedings. It also expressed its preliminary opinion that the claims according to the main request were not entitled to the priority of the first application D9 (Article 87 EPC) and were not novel (Article 54 EPC) having regard to the disclosure of D7, D8 or D13 considered jointly with D14. Further, the board expressed the view that claims 1 and 2 of the first auxiliary request and of the further auxiliary request were entitled to the priority of the first application D9.

VIII. By letter dated 14 August 2017, the opponent responded to the summons and provided further arguments in favour of its requests.

IX. Oral proceedings were held before the board on

14 September 2017.

The opponent requested that the decision under appeal be set aside and that the patent be revoked.

The proprietor requested that the decision under appeal be set aside and that the patent be maintained on the basis of:

- the main request as filed with the statement setting out the grounds of appeal of 19 September 2014;
- the first auxiliary request as filed with letter dated 10 July 2015, consisting of claims 1 and 2 as maintained by the opposition division and corresponding device claims 3 and 4;
- the further auxiliary request according to the statement setting out the grounds of appeal of 19 September 2014, consisting of claims 1 and 2 as maintained by the opposition division; or
- auxiliary requests I to VI as filed with letter dated 10 February 2015.

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

X. Claim 1 of the main request reads as follows:

"A method in a first communication device for receiving control information and data over a radio channel from a second communication device comprising the steps of:

- receiving (C2) at least part of a downlink subframe (DL1-DL4) over the radio channel,
- detecting (C4) whether the downlink subframe (DL1-DL4) is a subframe with a downlink resource assignment intended for the first communication device,

characterized in that

- when that being the case, determining (C8) whether at least one downlink resource assignment for data being sent from the second communication device before the downlink subframe (DL1-DL4) has been missed by analyzing an indicator associated to the subframe; the indicator providing information about previous downlink subframes with downlink resource assignments intended for the first communication device".

Claim 1 of the first auxiliary request reads as follows:

"A method in a first communication device being a terminal operating in TDD mode, for receiving control information and data over a radio channel from a second communication device being a base station operating in TDD mode, comprising the steps of:

- receiving (C2) a control channel in a downlink subframe (DL1-DL4) over the radio channel,
- detecting (C4) whether the downlink subframe (DL1-DL4) is a subframe with a downlink resource assignment intended for the first communication device, and if a downlink resource assignment intended for the first communication device is detected, decoding the corresponding data,

wherein

- the first communication device bundles into a single uplink subframe acknowledgements or non-acknowledgements from all received downlink subframes within a group of downlink subframes;

characterized by

- when it is detected that a downlink subframe (DL1-DL4) is a subframe with a downlink resource

assignment intended for the first communication device, determining (C8) whether at least one downlink resource assignment for data being sent from the second communication device before the downlink subframe (DL1- DL4) has been missed by analyzing an indicator associated to the subframe; the indicator providing information about previous downlink subframes with downlink resource assignments intended for the first communication device,
the information providing knowledge about previous downlink resource assignments intended for the first communication device;

- wherein the first communication device uses an uplink control channel resource associated with the last detected downlink resource assignment in said group for transmitting said bundled acknowledgements or non-acknowledgements".

The main request and the first auxiliary request both comprise further independent claims directed to a corresponding receiving device (claim 3) and corresponding transmitting method (claim 2) and device (claim 4).

Claim 1 and claim 2 according to the further auxiliary request are identical to claims 1 and 2 respectively of the first auxiliary request.

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

Reasons for the Decision

1. Admissibility of the appeals

1.1 The proprietor's appeal complies with the provisions of Articles 106 to 108 EPC (cf. point III above) and is therefore admissible.

1.2 The proprietor challenged the admissibility of the opponent's appeal because the opponent allegedly did not address the decision rendered by the opposition division but rather referred to its notice of opposition. The board cannot follow this argument. The opponent addressed in detail the amendments made in the opposition proceedings and tailored its objections in respect of Article 100(a), (b) and (c) EPC to the claims maintained by the opposition division. The board therefore judges that the opponent's appeal complies with the provisions of Articles 106 to 108 EPC and is admissible.

2. Main request

Claims 1 to 4 of this request are identical to granted independent claims 1, 12, 16 and 17, respectively.

2.1 Article 87 EPC

According to G 2/98, a claim of a European patent application is entitled to claim priority of a previous application only if the skilled person can derive the subject-matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole.

The opposed patent claims priority from US provisional application No. 61/026,601, cited as D9, which comprises a description and drawings but no claims. In the "BACKGROUND" section of the description, it is

disclosed that the TDD and FDD modes of the LTE standard both schedule transmissions dynamically by using DL assignments in downlink (DL) subframes, indicating which terminals are supposed to receive data and upon which resources in the current DL subframe, and further make use of a HARQ protocol by sending ACK/NACK in uplink (UL) subframes. This section further discloses that in the TDD mode there are usually more DL subframes than UL subframes, such that the LTE standard foresees the "bundling" of ACK/NACK, a technique which involves transmitting a single ACK, or NACK, in a UL subframe for a group of scheduled DL subframes (see from page 5, line 9, to page 6, line 17). On page 6, lines 18 ff., the "BACKGROUND" section further identifies the problem with ACK/NACK bundling that a bundled ACK may be erroneously transmitted in case the terminal missed a DL assignment but correctly decoded all other DL subframes in the group. D9 illustrates the problem by referring to the example involving two consecutive DL subframes, the DL assignment in the first DL frame having been missed.

In the "DETAILED DESCRIPTION" section, D9 suggests broadly that the network unit provides to the terminal "knowledge about previous scheduling assignments" (see page 8, lines 4 to 6). D9 then mentions that this feature will solve the above-mentioned problem with respect to the above-mentioned example related to the ACK/NACK bundling context (see page 8, lines 11 to 14). The embodiments thereafter disclosed in D9 define more precisely how the "knowledge about previous scheduling assignments" is indicated to the terminal, in the form of subframe numbers or, alternatively, by adding appropriately chosen cyclic redundancy checks (CRCs). These embodiments are all described within the context of ACK/NACK bundling (see page 8, line 19; page 9,

lines 23 to 25; page 11, lines 17 to 18). Since the use of ACK/NACK bundling is, according to the "BACKGROUND" section of D9, limited to the TDD mode of the LTE standard, it follows that the step of providing to a terminal "knowledge about previous scheduling assignments" is disclosed in D9 only with respect to the TDD mode using ACK/NACK bundling. The skilled person would not derive from D9 that this feature could be implemented in the FDD mode, since this mode does not make use of ACK/NACK bundling.

The claims of the main request however define the use of an indicator providing information about previous downlink subframes with downlink resource assignments intended for the terminal, but are not limited to transmission in the TDD mode using ACK/NACK bundling. Therefore, for this reason at least, the board judges that the claims of the main request are not entitled to the priority of the first application D9.

2.2 Article 54 EPC

Since the priority claim is invalid as regards the main request, documents D7, D8, D13 and D14, published before the filing date of 5 February 2009, are prior art in the sense of Article 54 EPC.

D7 in particular relates to ACK/NACK bundling in the LTE TDD mode. Section 2.1 discloses transmission of a physical downlink shared channel (PDSCH) together with a scheduling assignment to a user equipment. Section 2.2 discloses that the PDSCH and the control channel for carrying the scheduling assignment are received by the user equipment in a single subframe. It is obvious that the skilled person will, based on the whole description of D7, construe the term "scheduling

assignment" as a synonym of the term "downlink resource assignment" used in the claims and the description of the present application (see for example page 3, lines 27 to 29, of the application as published). It is further implicit from D7 that this scheduling assignment is detected by the user equipment, which is corroborated by the fact that D7 discloses that such a scheduling assignment may be missed. Consequently, the pre-characterising part of claim 1 is already disclosed in D7.

Moreover, D7 in Section 2.1 further discloses transmitting, as part of the scheduling assignment, a counter that indicates the number of the PDSCH transmission to the user equipment within the ACK/NACK bundling window. Based on this counter, the user equipment acquires information concerning the number of previously scheduled downlink subframes within the bundling window and uses this counter to detect if it has missed a PDSCH transmission within an ACK/NACK bundling window (see the last paragraph of Section 2.1). Thus, the features of the characterising part of claim 1 are also already disclosed in D7.

Therefore, the subject-matter of claim 1 is not new, having regard to the disclosure of D7. The main request is thus not allowable under Article 54 EPC.

3. First auxiliary request

3.1 Claims 1 and 2 of the request are identical to claims 1 and 2 as maintained by the opposition division. Claims 3 and 4 contain the same features as claims 1 and 2, respectively, but expressed in terms of claims for a device.

3.2 Admissibility

This request was late-filed by the proprietor after its statement setting out the grounds of appeal and after its response to the opponent's grounds of appeal. Therefore its admissibility under Article 13 RPBA was challenged by the opponent and discussed during the oral proceedings.

The opponent argued that the introduction of device claims 3 and 4 could not be considered as a response to objections raised in the decision or by the opponent since it does not aim at overcoming any of these objections. In particular, it pointed out that device claims 3 and 4 were already present in the opposition proceedings but were cancelled in then auxiliary request I during the oral proceedings because they were found by the division not to enjoy the priority of the first application D9, unlike method claims 1 and 2 (see in this respect section 2 of the handout annexed to the minutes of the oral proceedings before the opposition division), and that the proprietor did not address these issues when reintroducing claims 3 and 4 with its submission dated 10 July 2015. If the introduction of claims 3 and 4 was meant as a reaction to the oral proceedings before the opposition division, they should have been submitted with the statement setting out the grounds of appeal.

In the proprietor's view, the request should be admitted under Article 13 RPBA for the reasons that neither the board nor the opponent could have been surprised by the reintroduction of claims already on file in the opposition proceedings and that this request did not impose any additional burden on the procedural efficiency of the appeal proceedings, as the

same issues needed to be dealt with for both the method and the device claims. Further, the request was not withdrawn, but only reordered as auxiliary request 10 during oral proceedings before the opposition division in reaction to objections raised by the opposition division for the first time in those oral proceedings. Moreover, the issues had been addressed in the statement setting out the grounds of appeal.

The board however, taking into account the apparent lack of support for a structural configuration in D9 and the fact that this request was filed ten months after the statement of grounds of appeal, exercised its discretion under Article 13 RPBA and decided not to admit the first auxiliary request into the appeal proceedings. The board agrees with the opponent's argument that the reintroduction of claims 3 and 4 constitutes a reaction to the proceedings before the opposition division rather than to the opponent's appeal or the opponent's submissions in reply to the proprietor's appeal. This request should therefore have been submitted with the statement setting out the grounds of appeal. Moreover, the board agrees with the opponent's argument that claims 3 and 4 raise additional issues as to the validity of the priority claim.

4. Further auxiliary request

4.1 Article 87 EPC

The opponent contended that the term "downlink resource assignment" used in the claims lacked support in the first application D9, which only referred to "DL assignments", i.e. "downlink assignment". The board is not convinced by this argument for the reason that the

skilled person would immediately and unambiguously recognise from the whole disclosure of D9, and in particular from the passage on page 4, lines 3 to 14, that a "DL assignment" in a downlink subframe indicates to a terminal if it is supposed to receive data in that subframe and on which resources. The term "downlink resource assignment" is thus supported by D9.

The opponent further argued that *certain features* [sic] of claims 1 and 2 were generalisations extending beyond the disclosure of D9 and mentioned as a single example the feature of the "indicator" defined in claims 1 and 2, which was allegedly a generalisation of the "subframe counters" and "CRC checks" described in D9. The board however holds that the skilled person will unambiguously appreciate that the overall teaching of D9 is to send from the network unit to the terminal "knowledge about previous scheduling assignments" in order for the terminal to appropriately transmit ACK/NACK (see page 8, lines 4 to 11). The term "scheduling assignment" is however equivalent to "downlink assignment of a resource", which is control information that the network unit transmits in each downlink subframe about which terminals are supposed to receive data and upon which resources in the current downlink subframe, as is clear from page 4, lines 3 to 14. Therefore, D9 discloses that the network unit communicates, i.e. indicates, to the terminal information about previous downlink subframes with downlink resource assignments intended for the terminal, this information providing knowledge about previous downlink resource assignments intended for the terminal. The board is thus satisfied that the features of claims 1 and 2 relating to the provision of the "indicator" are unambiguously disclosed in the first application D9.

The board therefore judges that the claims according to the further auxiliary request are entitled to the priority of the first application (Article 87 EPC).

4.2 Article 84 EPC

The opponent argued that the wording "downlink resource assignment" lacked a clear technical meaning. However, since this wording was already present in the granted claims, the board holds that this objection is not founded. Moreover, it is clear for the skilled person from the whole description and in particular from the paragraph on page 3, line 27, to page 4, line 3, of the application as published that a downlink resource assignment is control information transmitted in each downlink subframe and indicating to a terminal if it is to receive data and upon which resources in the current downlink subframe.

The opponent further argued that the wording "an indicator associated to the subframe" was not clear since it did not specify whether the indicator should be within the subframe, within the frame but not within the subframe, or somewhere else. This wording was also already present in the granted claims; so this objection is not founded. Furthermore, the board holds that this wording clearly specifies that the indicator is received by the terminal when receiving the downlink subframe.

The opponent also objected that the features defining "information" and "knowledge" provided by the indicator were not clear because they were unspecific and vague. The first feature defining the "information" was already present in the granted claims; so the

opponent's objection is not founded. Moreover, it is clear for the skilled person that these features, in accordance with the whole description, specify that the indicator informs the terminal about the previous assignments which have been intended for it in previous downlink subframes. The board holds that there is no lack of clarity in the definition of information provided by the indicator.

The opponent further objected that the feature of claim 2 defining that the base station "takes appropriate action if it detects that nothing was transmitted on this uplink control channel resource", in particular the term "appropriate action", lacked clarity. The board however agrees with the proprietor that no lack of clarity arises from the fact that the exact nature of the action taken by the base station in this specific situation is not specified. The skilled person could consider various possibilities for the base station to handle this situation, for instance retransmitting the data that was transmitted in the downlink subframe in which the terminal missed the downlink resource assignment, or retransmitting the whole group of subframes.

The board therefore judges that the claims of the further auxiliary request meet the requirements of Article 84 EPC.

4.3 Article 123(2) EPC

The opponent first argued that the term "downlink resource assignment" used in the claims had no basis in the application documents as originally filed. The board however holds that this term correctly reflects the technical teaching of the description as originally

filed (see in particular page 3, lines 27 to 34, of the WO publication).

The opponent further disputed that the feature defining information provided by the indicator was an intermediate generalisation not supported by the application documents. The board however agrees with the proprietor that the passages on page 6, lines 28 to 32, page 8, lines 1 to 6, page 9, lines 1 to 7 and 15 to 18, and Figure 7 of the WO publication directly and unambiguously disclose this feature.

The opponent also contended that the feature of claim 2 defining that the base station "takes appropriate action if it detects that nothing was transmitted on this uplink control channel resource" was not supported by the application documents. The board however agrees with the proprietor that the passage on page 15, lines 22 to 25, of the WO publication directly and unambiguously discloses this feature.

Thus, the board judges that the claims of the further auxiliary request meet the requirements of Article 123(2) EPC.

4.4 Article 83 EPC

The opponent objected to the sufficiency of disclosure of the application on the ground that the LTE standard to which the description solely related was not a well-defined system with final specifications available at the priority date. The opponent however did not indicate which specific aspect of the patent could not be put into practice by the skilled person, due to the alleged missing standard specifications. The board thus holds that the relevant properties of the LTE standard,

as known at the priority date, were sufficient for the skilled person to carry out the invention according to the claims of the further auxiliary request.

Therefore, in the board's judgment, the further auxiliary request meets the requirements of Article 83 EPC.

4.5 Article 56 EPC

4.5.1 Since the priority claim is valid (see point 4.1 above), only D1, D4, D15, D16 and D18 are to be considered as prior art.

4.5.2 D4 and D18 have substantially the same technical content and relate to a method for ACK/NACK bundling in the TDD transmission mode. It was common ground between the parties that D4, or D18, as closest prior-art document disclosed the features of the preamble of claim 1.

The differences between the subject-matter of claim 1 and the disclosure of D4, or D18, are that:
(a) when it is detected that a downlink subframe is a subframe with a downlink resource assignment intended for the first communication device, determining whether at least one downlink resource assignment for data being sent from the second communication device before the downlink subframe has been missed by analysing an indicator associated with the subframe; the indicator providing information about previous downlink subframes with downlink resource assignments intended for the first communication device, the information providing knowledge about previous downlink resource assignments intended for the first communication device, and

(b) wherein the first communication device uses an uplink control channel resource associated with the last detected downlink resource assignment in said group for transmitting said bundled acknowledgements or non-acknowledgements.

The technical effects of these distinguishing features are that:

(1) the terminal device is able to detect, based only on the indicator in the last downlink subframe it received, and without any a priori knowledge about which of the downlink subframes in the bundling window contain a downlink resource assignment for the terminal, if it has missed previously sent downlink frames in the bundle of subframes addressed to it and is inhibited from sending an ACK in the case where all other detected subframes were correctly decoded, and

(2) the base station is able to detect that the terminal has missed the last downlink resource assignment in a bundle of subframes addressed to it, when the bundled ACK/NACK for the group of subframes is not transmitted on that resource.

The objective technical problem can thus be formulated as how to handle missed downlink subframe resource assignments when ACK/NACK bundling is used.

The skilled person starting from D4, or D18, and seeking to solve this problem will first notice that D4 mentions that the missed detection of a DL grant leads to a DTX-to-ACK problem when TDD with ACK/NACK bundling is used, DTX referring to a discontinued transmission in the LTE standard. This problem, although not clearly defined in D4, is however related

to the handling of missed downlink subframe resource assignments. D4 presents two different solutions to this problem: either to improve the encoding of the acknowledgements (see section 2: "if we use separate coding for these ACK/NACKs and transmit each ACK/NACK with the corresponding ACK code, the DTX-to-ACK problem caused by the DL grant reception failure can be avoided"), or to jointly code and spread the ACK/NACKs for a bundle of subframes with a ZC sequence, i.e. a Zadoff-Chu sequence (see section 2: "the multiple ACK/ NACK bits are jointly coded and spread with a ZC sequence"). D18 too points in the direction of an encoding scheme for the ACK/NACKs (see the last line on page 1: "the possibility to encode also missed DL assignments").

The skilled person would thus be driven by D14 or D18 to find a better encoding scheme suitable for bundled ACK/NACKs but not to use an indicator according to feature (a) and to transmit the bundled ACK/NACKs in the uplink resource defined by feature (b).

The skilled person would also not find in the other prior-art document D1 cited by the opponent any pointer to the solution of the problem. D1 discloses the transmission from a base station to a terminal of Media Access Control (MAC) layer protocol data units (PDUs), each PDU being provided by the base station with a sequence number. The terminal determines from the received sequence numbers if any PDUs were missing in a received message and includes the missing sequence numbers in an ACK message back to the base station, which uses them to re-send the missing PDUs (see the abstract and the Ethernet frame with ARQ INFORMATION field in Figure 2). D1 however deals with the transmission of data units on the MAC layer (see

paragraph [0045]), which is not based on the specific asymmetrical uplink downlink subframes configuration of a TDD transmission on the physical layer, as is the case in D14, or D18, and the present application. D1 is therefore silent on ACK/NACK bundling. The skilled person would thus not be inclined to combine D4, or D18, with D1 contrary to what the opponent asserted.

Moreover, even if the skilled person were to consider such a combination, they would not arrive at the subject-matter of claim 1 for at least the following reasons. Firstly, D1 teaches to receive and CRC-check the entire frame of PDUs before any missed PDUs are reported to the base station in a NACK message (see paragraphs [0059] to [0061]), whereas in claim 1 only the control channel in the subframes has to be monitored by the terminal to detect a missed subframe, which provides lower latency and decision-making complexity. Secondly, applying the teaching of D1 in respect of sequence numbers of PDUs would not lead to the use of an uplink resource associated with the last detected PDUs for sending an ACK/NACK message since D1 rather discloses sending an ACK message, including missed sequence numbers, on an uplink resource which is not related to any of the transmitted PDUs (see paragraphs [0025], [0031] and [0061]).

For these reasons, the board judges that the subject-matter of claim 1 involves an inventive step, having regard to the combination of D4, or D18, with D1 (Article 56 EPC). Independent claim 2 corresponds to claim 1 in terms of a transmission method from a base station to a terminal. Thus, claim 2 also meets the requirements of Article 56 EPC, having regard to the prior art disclosed in D4, D18 and D1.

4.5.3 The opponent further argued that claims 1 and 2 lacked inventive step having regard to the combination of D4 with D15 and D16, considered jointly as a single document. In support of its argumentation, the opponent merely referred to its submissions made in its notice of opposition.

The board however fully agrees with the proprietor that, starting from D4 as closest prior art, the skilled person will not find in D15/D16 any technical teaching to solve the objective technical problem. In that respect the board holds that D15/D16 relates to separately and individually acknowledging MAC PDUs in a TDMA/GSM system with fixed time slots, i.e. resources, assigned to a terminal through a separate Access Grant Channel. Accordingly, D15/D16 does not hint at ACK/NACK bundling in TDD mode, and the problem of a terminal missing a downlink resource assignment in a downlink subframe does not arise in D15/D16.

For these reasons, the board judges that the subject-matter of claims 1 and 2 involves an inventive step having regard to the disclosure of D4 in combination with D15 and D16, considered jointly as a single document (Article 56 EPC).

4.6 In conclusion, the board judges that the further auxiliary request meets the requirements of the EPC and that the patent is to be maintained according to this request.

Order

For these reasons it is decided that:

1. The appeal of the patent proprietor is dismissed.

2. The appeal of the opponent is dismissed.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated