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Datasheet for the decision of 13 April 2018

Case Number: T 1180/14 - 3.5.05

Application Number: 10190387.0

Publication Number: 2375640

IPC: H04L12/28

Language of the proceedings: EN

Title of invention:
Method of scheduling an uplink packet transmission channel in a mobile communication system

Applicant:
LG Electronics, Inc.

Headword:
Scheduling assignments/LG

Relevant legal provisions:
EPC 1973 Art. 84, 56
EPC 1973 R. 67

Keyword:
Lack of essential features - main request (yes): definition of T 32/82 and T 2001/12 followed
Inventive step - auxiliary request (yes, after amendments)
Reimbursement of appeal fee - (no)

Decisions cited:
G 0002/88, G 0001/04, T 0032/82, T 2001/12, T 2131/12

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Case Number: T 1180/14 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 13 April 2018

Appellant: (Applicant)	LG Electronics, Inc. 20, Yoido-Dong, Youngdungpo-ku Seoul 150-721 (KR)
Representative:	Ter Meer Steinmeister & Partner Patentanwälte mbB Nymphenburger Straße 4 80335 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 19 December 2013 refusing European patent application No. 10190387.0 pursuant to Article 97(2) EPC**

Composition of the Board:

Chair	A. Ritzka
Members:	K. Bengi-Akyuerek
	G. Weiss

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse the present European patent application (divided from its parent application EP 05733388.2) for lack of inventive step (Article 56 EPC) with respect to the claims of a main and first to third auxiliary requests, having regard to the disclosure of

D1: EP-A-1 294 212,

and for lack of support of the claims by the description (Article 84 EPC) with respect to the claims of a fourth auxiliary request.

Furthermore, the set of claims of an amended fourth auxiliary request was not admitted into the examination proceedings under Rule 116 EPC on the grounds that it was late-filed and not clearly allowable under Article 84 EPC.

II. With the statement setting out the grounds of appeal, the appellant filed amended sets of claims according to a main request and first and second auxiliary requests. It requested that the examining division's decision be set aside and that a patent be granted on the basis of one of those claim requests. In addition, it contended that a substantial procedural violation had been committed by the examining division, but did not expressly request that the appeal fee be reimbursed.

III. In a communication under Rule 100(2) EPC, the board expressed its preliminary opinion on the appeal. In particular, it indicated that the independent claims of the pending claim requests did not contain the

essential features of the present invention (Article 84 EPC 1973). Furthermore, it noted that it could not recognise that any procedural violation, let alone a *substantial* one within the meaning of Rule 103(1)(a) EPC, had occurred in the examination proceedings, and gave its reasons therefor.

IV. With a letter of reply, the appellant filed further claims according to third to fifth auxiliary requests along with counter-arguments to the objections raised in the board's communication. It now also requested that the appeal fee be reimbursed on the basis of the alleged substantial procedural violation.

V. In an annex to the summons to oral proceedings pursuant to Article 15(1) RPBA, the board indicated that it maintained its objections under Article 84 EPC 1973 with regard to all the claim requests on file except for the third auxiliary request, to which it objected under Article 123(2) EPC. It further stated that, in view of the present objections, it was premature to conduct a conclusive assessment of novelty and inventive step. Furthermore, it noted that it was minded to refuse the appellant's request for reimbursement of the appeal fee.

VI. With a letter of reply, the appellant filed a further amended set of claims according to a sixth auxiliary request, and submitted additional counter-arguments to the board's objections under Article 84 EPC 1973.

VII. Oral proceedings were held on 13 April 2018, during which the appellant filed another set of claims according to an "amended fifth auxiliary request", replacing all the auxiliary requests on file.

The appellant's final request was that the decision under appeal be set aside and that a patent be granted on the basis of claims according to the main request, submitted with its statement setting out the grounds of appeal, or the amended fifth auxiliary request submitted at the oral proceedings before the board. Furthermore, the appellant maintained its request for reimbursement of the appeal fee.

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

VIII. Claim 1 of the **main request** reads as follows:

"A method of scheduling an uplink packet transmission channel for user equipment, hereinafter called UE, in a base station, the method comprising:

transmitting, by the base station, a scheduling assignment comprising scheduling contents for the uplink packet transmission and an identifier through an Enhanced Absolute Grant Channel, hereinafter called E-AGCH;

receiving, by the base station, an uplink data packet on an Enhanced Uplink Dedicated Channel, hereinafter called E-DCH, based on the scheduling contents of the scheduling assignment,

wherein the scheduling contents of the scheduling assignment comprises a scheduled power command for the uplink packet transmission,

the identifier is one of a first identifier for identifying only the UE and a second identifier for a plurality of UEs including the UE, and

the identifier is set to the first identifier when the scheduling assignment is for the UE corresponding to the first identifier, and to the second identifier when the scheduling assignment is for all of the

plurality of UEs."

Claim 1 of the **amended fifth auxiliary request** reads as follows (amendments to claim 1 of the main request underlined by the board):

"A method of scheduling an uplink packet transmission channel for user equipment, hereinafter called UE, in a base station, the method comprising:

transmitting, by the base station, a scheduling assignment based on noise/interference of an uplink packet transmission channel, the scheduling assignment comprising scheduling contents for the uplink packet transmission and an identifier through an Enhanced Absolute Grant Channel, hereinafter called E-AGCH; wherein the E-AGCH is a shared channel;

receiving, by the base station, an uplink data packet on an Enhanced Uplink Dedicated Channel, hereinafter called E-DCH, based on the scheduling contents of the scheduling assignment,

wherein the scheduling contents of the scheduling assignment comprises a scheduled power command for the uplink packet transmission,

the identifier is one of a first identifier for identifying only the UE and a second identifier for a plurality of UEs including the UE, and

the identifier is set to the first identifier when the scheduling assignment is for the UE corresponding to the first identifier, and to the second identifier when the scheduling assignment is for all of the plurality of UEs."

Independent claim 2 of the **amended fifth auxiliary request**, relating to the corresponding receiving process, reads as follows:

"A method of scheduling an uplink packet transmission channel for user equipment, hereinafter called UE, the method comprising:

receiving, by the UE, a scheduling assignment transmitted by a base station based on noise/interference of an uplink packet transmission channel, the scheduling assignment comprises comprising [sic] scheduling contents for the uplink packet transmission and an identifier through an Enhanced Absolute Grant Channel, hereinafter called E-AGCH, using either a first identifier for the UE or a second identifier for a plurality of UEs including the UE, wherein the E-AGCH is a shared channel;

acquiring, by the UE, the scheduling contents of the scheduling assignment when the identifier is a same as one of the first identifier or the second identifier; and

transmitting, by the UE, an uplink data packet on an Enhanced Uplink Dedicated Channel, hereinafter called E-DCH, according to the scheduling contents,

wherein the scheduling contents comprise a scheduled power command for uplink packet transmission, and

the identifier is the first identifier when the scheduling assignment is for the UE corresponding to the first identifier, and the second identifier when the scheduling assignment is for all of the plurality of UEs."

Further independent apparatus claims 7 and 8 of the amended fifth auxiliary request are directed to corresponding transmission and receiving apparatuses.

Reasons for the Decision

1. *Present invention*

The present invention relates to the transmission, by a base station (i.e. "Node B"), of so-called "scheduling assignments" to mobile terminals ("UEs") in a 3GPP-based wireless communication network. Such scheduling assignments (SAs) are commonly used for conveying to the mobile terminals information such as the power, duration and priority to be employed for later uplink packet transmissions from the individual mobile terminals to the base station.

To this end, for the downlink direction, the invention relies on the so-called "E-AGCH (Enhanced Absolute Grant Channel)" communication scheme, which constitutes a *shared-channel* scheme, and, for the uplink direction, on the so-called "E-DCH (Enhanced Dedicated Channel)" scheme, which is a *dedicated-channel* scheme involving specific channels dedicated to an ongoing uplink communication. In a typical shared-channel scheme, the mobile terminals can share the same communication channel established between the base station and themselves, such that all the available mobile terminals are able to receive the same transmitted SA message, while only those mobile terminals for which that message is actually intended (signalled e.g. by identifiers like "UE1", "UE2", etc.) are enabled to further process that message.

In particular, the corresponding SA packets may typically be sent to each of the mobile terminals separately (i.e. one-to-one), to a group of terminals (i.e. one-to-many) or to all of the available terminals (i.e. one-to-all) at once. According to the present

application's main embodiment, the above types of transmission are selected depending on the respective uplink-channel conditions, which are primarily reflected by "Rise-over-Thermal noise (RoT)" values (cf. paragraphs [0027] to [0032] in conjunction with Fig. 3 of the present application as published). In principle, the higher the RoT value, the lower the resulting noise/interference on an uplink communication channel (cf. paragraph [0029]).

2. MAIN REQUEST

Claim 1 of the present main request, apart from minor re-wordings, corresponds essentially to claim 1 of the main request underlying the appealed decision. It specifies *inter alia* that

A) a scheduling assignment (SA), including an identifier and scheduling contents, is transmitted by the base station through the E-AGCH;
B) the identifier is one of a first identifier for identifying only the UE and a second identifier for a plurality of UEs including the UE;
C) the identifier is set to the first identifier when the scheduling assignment is for the UE corresponding to the first identifier, and to the second identifier when the scheduling assignment is for all of the plurality of UEs.

2.1 *Lack of essential features (Article 84 EPC 1973)*

2.1.1 An independent claim should explicitly specify all of the *essential features* needed to define the invention in order to comply with the provisions of Article 84 EPC 1973 in combination with Rule 29(1)(a) EPC 1973, now Rule 43(1)(a) EPC (cf. G 2/88, OJ EPO 1990, 93,

Reasons 2.5; G 1/04, OJ EPO 2006, 334, Reasons 6.2). According to the jurisprudence of the Boards of Appeal, essential features are those features which are necessary to obtain the desired effect or to solve the technical problem with which the application is concerned (see e.g. T 32/82, OJ EPO 1984, 354, Reasons 15; T 2001/12 of 29 January 2015, Catchword a).

2.1.2 In the present case, the technical problem with which the application is concerned is that transmitting scheduling assignments (SAs) separately to individual mobile terminals (UEs) e.g. of a group of UEs causes "traffic congestion due to sudden increase in uplink traffic" (cf. paragraph [0006] of the present description as published). The present application in particular mentions the problem that since the SAs are typically transmitted from the base station to each mobile terminal separately, "a substantial amount of time is required to transmit the same scheduling assignment to a specified group of UEs or to all the UEs" (see paragraph [0005], last sentence).

2.1.3 In order to solve the above problem, the application essentially proposes that, depending on whether the determined RoT value exceeds a critical value (i.e. this being indicative of channel noise or interference), the base station (Node B) determines whether to transmit SAs to each UE, one or more groups of UEs or all the UEs (see e.g. paragraph [0028], in particular column 6, lines 12-15, of the description as published). More specifically, the application teaches consistently that the respective SAs may for that purpose include one of three distinct destination identifiers, namely (i) an identifier for an individual UE such as "UE ID", (ii) an identifier for a group of UEs such as "UE group ID" or (iii) an identifier for

all available UEs (see e.g. paragraph [0027], third sentence, in conjunction with paragraph [0031], last two sentences). In particular, according to the relevant embodiment (whose description starts with "An embodiment of the present invention ..." in paragraph [0027]), the same SA is transmitted (i) to each individual UE only if the determined RoT value is larger than or equal to a first threshold value RoT_{th1}, i.e. implying low noise (see paragraph [0030]; Fig. 3, steps S32 and S33), (ii) to a group of UEs only if the determined RoT value is larger than or equal to a second threshold value RoT_{th2} but smaller than RoT_{th1} (see paragraph [0031]; Fig. 3, steps S34 and S35) or (iii) to all the UEs only if the determined RoT value is smaller than RoT_{th2}, i.e. implying high noise (see paragraph [0032]; Fig. 3, steps S34 and S36). As a consequence, the use of the above-mentioned destination identifiers is consistently and exclusively dependent on the uplink-channel conditions, in order to indeed avoid that "a substantial amount of time is required to transmit the same scheduling assignment to a specified group of UEs or to all the UEs" (see point 2.1.2 above).

2.1.4 Feature B) of present claim 1 evidently encompasses options (i) and (ii) as defined in point 2.1.3 above, with the "first identifier" and "second identifier" corresponding to "UE ID" and "UE group ID" respectively. However, feature C) only indicates that the base station takes the "first identifier" as the destination identifier if the scheduling assignment is for the UE corresponding to the first identifier, and takes the "second identifier" if the scheduling assignment is for all of the plurality of UEs, i.e. a group of UEs, without any reference to the relevant channel noise/interference conditions. Consequently,

the board holds that claim 1 lacks the essential features for solving the underlying technical problem and thus for defining the present invention, contrary to Article 84 EPC 1973.

2.1.5 In that respect, the appellant argued first that present claim 1 did not lack its essential features since an independent claim of the parent application likewise did not include the missing features (see appellant's letter of 22 November 2017, section 1).

The board notes that the fact that an independent claim of a corresponding *parent* application does not include certain features cannot necessarily imply that those features do not qualify as essential features. Rather, the board finds that the essential features of an invention are primarily determined by the underlying description and the skilled person's common general knowledge.

2.1.6 More particularly, the appellant argued that several embodiments (i.e. referring to paragraphs [0017] to [0023]; [0024] to [0026], [0027] to [0032] and [0033] to [0037] of the description as published) disclosed in the present application did indeed use two or more kinds of identifier to transmit the respective scheduling assignments, without consideration of channel conditions, i.e. the RoT values.

The board is not convinced, for the following reasons:

- As to the general description of the shared-channel scheme E-AGCH in paragraphs [0017] to [0023] as published, the board notes that only one kind of identifier is disclosed there, i.e. "UE ID" (cf. paragraphs [0018] and [0020]). The included

indication that the example described "could also apply to groups of UEs", in the absence of any definition of specific group identifiers, also does not support the existence of a "second identifier". Moreover, "another UE identifier", as mentioned in paragraph [0021], does not relate to "a plurality of UEs including the UE" sent by the base station as required by feature B) but to an SA forwarded by another UE. Hence, there is no "second identifier for a plurality of UEs including the UE" disclosed in that "forwarding scenario" either.

- As to the teaching relating to the general description of the *dedicated-channel* scheme E-RGCH in paragraphs [0024] to [0026] as published, the board notes that this disclosure is not concerned with the *shared-channel* E-AGCH protocol. Thus, no specific identifier is transmitted at all here.

- As to the main embodiment relating to the present invention with respect to the shared-channel scheme E-AGCH in paragraphs [0027] to [0032], the board notes that according to paragraph [0027], third sentence, only one kind of identifier is disclosed, i.e. "UE IDs". Only in paragraphs [0030] and [0031] are two kinds of identifier used, namely "UE ID" as "first identifier" in the case of $RoT \geq RoT_{th1}$ and "UE group ID" as "second identifier" in the case of $RoT_{th2} \leq RoT < RoT_{th1}$, in accordance with the observations set out in point 2.1.3 above.

- As to the teaching associated with Figures 1 and 2 of the present application in paragraphs [0033] to [0037], the board notes that only one kind of identifier ("first identifier") is disclosed, i.e.

"specific UE ID(s)" apparently indicating the individual UE IDs of a specific group of UEs. No "UE group ID" and thus no "second identifier for a plurality of UEs including the UE" are disclosed there either.

2.1.7 The appellant further argued, referring to recent decision T 2131/12 of 20 March 2018, that a claim lacked the essential features of an invention only if the technical problem as defined in the respective description could not be solved without such features and if such features were considered to be essential for carrying out the invention. In the present case, the underlying problem of avoiding "traffic congestion due to sudden increase in uplink traffic" could, however, be solved without any consideration of uplink-channel conditions, and so the latter were not essential for carrying out the present invention.

The board is not persuaded by this argument either. Firstly, the board has doubts whether the facts underlying case T 2131/12 are directly comparable to those in the present case, since in the former case the examining division considered that a certain feature was essential based on its own assessment only, *without* providing any concrete basis in the corresponding description (see T 2131/12, Reasons 1.4). Secondly, in decision T 2131/12, the deciding board held that, irrespective of whether or not the relevant feature itself was derivable from the application documents, it could not deduce any hint that the feature concerned was indeed essential for *carrying out* the invention (see Reasons 1.5 and 1.6). However, this board follows the conclusions of T 32/82 and T 2001/12 that essential features are features which are necessary to "obtain the desired effect" and to "solve the technical problem

with which the application is concerned, rather than features considered to be necessary "to carry out the invention", as set out in T 2131/12 making reference to the Guidelines for Examination in the European Patent Office, F-IV, 4.5.2, in its November 2017 edition (see Reasons 1.3). The board believes that the latter definition is more related to the issue of sufficiency of disclosure (Article 83 EPC 1973) than to the issue of clarity of a claim (Article 84 EPC 1973). Thirdly, the board holds that if, in the case of high noise/interference (i.e. corresponding to low RoT values), a certain scheduling assignment was, for example, sent to the individual UEs of all available UEs separately, the problem of traffic congestion would even be aggravated significantly, contrary to the desired effect to be achieved by the present invention.

2.2 In conclusion, the main request is not allowable under Article 84 EPC 1973.

3. AMENDED FIFTH AUXILIARY REQUEST

Independent claims 1, 2, 7 and 8 of this auxiliary request differ from the independent claims of the present main request essentially in that they further specify that (emphasis added by the board)

D) said scheduling assignment is <u>based on noise/interference of an uplink packet transmission channel</u>;
E) the E-AGCH is a <u>shared channel</u>.

The board is satisfied that feature D) is supported by the disclosure of page 9, line 19 to page 10, line 3 and page 10, lines 16-21 of the present application as originally filed, while feature E) finds its basis e.g.

on page 6, lines 14-16 (Article 123(2) EPC).

Following the amendments made in particular to feature D), the board is also satisfied that claim 1 now implies that the transmission of the SAs to individual UEs or a group of UEs alongside the respective identifiers depends on the uplink-channel conditions and that it thus comprises the essential features of the underlying invention, in compliance with Article 84 EPC 1973.

3.1 *Novelty and inventive step*

3.1.1 The examining division considered prior-art document **D1** to be the closest prior art for the subject-matter of claim 1 then on file (cf. appealed decision, Reasons 1.1). This document, moreover, constituted the sole document cited in the decision under appeal. Hence, for the purpose of assessing novelty and inventive step, the board has to consider whether or not the present subject-matter claimed is novel and inventive over D1.

3.1.2 The board concurs with the decision under appeal (cf. Reasons 1.3) that D1, which mainly relates to controlling access to uplink/downlink channels for scheduling purposes based on measured uplink- and downlink-channel conditions in a *dedicated-channel* system (see e.g. D1, paragraph [0018] in conjunction with Fig. 2, referring to distinct "downlink channels 212, 214, 216 and 218"), fails to disclose that

(i) a shared-channel scheme, i.e. the E-AGCH scheme, is used for downlink SA transmissions;

(ii) the E-DCH scheme is used for uplink packet transmissions;
(iii) a scheduled power command is transmitted within the SAs;
(iv) a first or second identifier is set and transmitted within the SAs.

The board finds that D1 likewise fails to disclose that

(v) the identifiers are used to transmit SAs to individual UEs or a group of UEs based on the noise/interference of the uplink channel according to added feature D).

Hence, the subject-matter of present claim 1 is novel over D1 (Article 54 EPC 1973).

3.1.3 As to inventive step, the board holds that notably distinguishing features (i), (iv) and (v) do indeed contribute to an overall synergistic technical effect which solves the problem of reducing the amount of time required to transmit the same SA from the base station to a specific group of mobile terminals and thereby avoid traffic congestion. Moreover, it concludes that the skilled person in the field of 3GPP-based mobile networks, starting from the teaching of D1 and in order to eventually come up with a solution as claimed, would have to implement several intermediate steps in adapting the system of D1, such as

- changing a dedicated-channel scheme (as relied upon in D1) to a shared-channel scheme for the downlink direction;
- implementing the specific E-DCH scheme for the uplink direction

- defining at least two distinct identifiers for addressing individual or a group of mobile terminals for the downlink direction
- using one of those identifiers depending on the uplink-channel conditions.

However, the board holds that there are no hints towards incorporating all the above adaptations or modifications in the system of D1 in view of the large number of non-obvious intermediate steps to be taken in such a case. Rather, it is apparent to the board that the system of D1, apart from performing measurements of uplink-channel conditions for scheduling purposes (see e.g. Fig. 5, steps 502 and 504), comprises very few similarities with the present subject-matter claimed and that it relates entirely to a *dedicated-channel* system.

Moreover, the teaching of D1 is focused on determining, by means of a specific base-station scheduler, when a mobile terminal is to be given (possibly simultaneous) access to uplink/downlink channels based on the associated pre-measured channel conditions (see e.g. D1, paragraph [0024]). As a consequence, no incentives are discernible in D1 which could lead the person skilled in the field of 3GPP-based mobile networks to even think about the problem or necessity of avoiding additional transmission delays or traffic congestion in *shared-channel* systems, let alone about using different destination identifiers depending on the measured uplink-channel conditions. Hence, the board sees no reason why the skilled person, starting from the sole document cited in the appealed decision, would finally arrive at the solution of present claim 1. This would be the case only if the skilled person would extrapolate the teachings of D1 with impermissible

hindsight based on the teachings of the present application.

3.1.4 It follows from the above that, in the light of the cited prior art, the subject-matter of present claim 1 and of the corresponding independent claims 2, 7 and 8 of the present auxiliary request is held to be new and to involve an inventive step within the meaning of Articles 54 and 56 EPC 1973.

4. Since all the other requirements of the EPC are also found to be fulfilled, the board sees nothing that stands in the way of granting a patent on the basis of claims 1 to 12 according to the amended fifth auxiliary request.

5. *Reimbursement of the appeal fee*

5.1 The appellant contended that the examining division had committed a substantial procedural violation on the grounds that it had referred - for the first time at the oral proceedings before it - to the GSM standard as evidence of the common general knowledge regarding the use of shared and dedicated channels in mobile communication systems (see the minutes of those oral proceedings, point 13), and that it had therefore had no opportunity to verify this newly introduced prior art and to present his comments in this respect, contrary to Article 113(1) EPC 1973.

5.2 According to Rule 67 EPC 1973 (applicable here, now Rule 103(1)(a) EPC), the appeal fee is to be reimbursed only in the event that the board deems the appeal to be allowable. Since this is the case here (see point 4 above), the board has next to establish whether a substantial procedural violation did indeed occur in

the examination proceedings.

However, the board cannot recognise that any procedural violation, let alone any *substantial* one within the meaning of Rule 67 EPC 1973, occurred in the first-instance proceedings in view of the following observations:

- no documentary prior art relating to GSM systems was in fact introduced during the first-instance oral proceedings;
- the reference to the "GSM standard" during those oral proceedings was apparently made merely for illustrative purposes as an additional argument;
- "GSM systems" were not mentioned at all in the appealed decision;
- the issue of "shared channels" and "dedicated channels" was dealt with in the appealed decision without any reference to the common general knowledge as regards GSM systems (cf. Reasons 9 and 13).

The board concludes from the above that the reference made at the first-instance oral proceedings to GSM systems was not relevant to the outcome of the examining division's decision at all and that, consequently, reimbursement of the appeal fee is not considered equitable in the case at hand. The appellant did not further comment on this issue at the oral proceedings before the board.

5.3 In view of the above, the board has decided to refuse the appellant's request that the appeal fee be reimbursed.

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 with the order to grant a patent on the basis of
   - claims 1 to 12 of the amended fifth auxiliary request as submitted at the oral proceedings before the board;
   - description: pages 1, 2, 4 to 12 as originally filed and pages 3, 3a, 13 to 15 as submitted at the oral proceedings before the board;
   - drawings: figures 1 to 3 as originally filed.

3. The request for reimbursement of the appeal fee is refused.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated