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**Datasheet for the decision
of 19 April 2011**

Case Number: T 0888/07 - 3.5.05

Application Number: 02028666.2

Publication Number: 1376972

IPC: H04L 29/06

Language of the proceedings: EN

Title of invention:

System and method for mobility management of mobile IP terminals

Applicant:

LG Electronics, Inc.

Headword:

Registering new location information and paging of mobile nodes in idle mode/LG

Relevant legal provisions:

EPC Art. 52(1), 54(2), 56, 84, 113(1)(2), 123(2)

Relevant legal provisions (EPC 1973):

EPC Art. 106, 107, 108

EPC R. 68(2), 86(3)

Keyword:

"Independent claims specifying all essential features of the invention - main request (no)"
"Clarity and support by the description - main request (no)"
"Justification for negative limitation in the independent claims - auxiliary request I (no)"
"Clarity - auxiliary request I (no)"
"Novelty and inventive step - auxiliary request II (yes - after amendment)"
"Right to be heard observed during first instance proceedings (yes)"
"Reimbursement of the appeal fee (no)"

Decisions cited:

G 0012/91, G 0007/93, J 0010/07, R 0011/08, T 0004/80,
T 0278/88, T 0647/93, T 1050/93, T 0237/96, T 0946/96

Catchword:

1. If from the wording of an independent claim it must be concluded that a solution of the problem of the invention is achieved by not needing a step, whereas this very feature according to the description cannot be abolished, but is necessary for a workable solution, the board considers such a feature an essential feature of the invention. An independent claim missing this feature is therefore considered to be neither clear, nor supported by the description (see reasons 3.2).
2. If the examining division refuses consent to the latest submitted amended set of claims which had been put forward in substitution for the claims on file before under Rule 86(3) EPC 1973 the previous set of claims that the examining division had consented to consider but was not maintained as an auxiliary request is not automatically revived. In accordance with Article 113(2) EPC and established case law (see e.g. T 0237/96) a decision cannot be based on the previous set of claims (see reasons 8.2).



Case Number: T 0888/07 - 3.5.05

D E C I S I O N
of the Technical Board of Appeal 3.5.05
of 19 April 2011

Appellant: LG Electronics, Inc.
20, Yoido-Dong, Youngdungpo-gu
Seoul (KR)

Representative: Katérle, Axel
Wuesthoff & Wuesthoff
Patent- und Rechtsanwälte
Schweigerstrasse 2
D-81541 München (DE)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 27 December 2006
refusing European application No. 02028666.2
pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman: A. Ritzka
Members: M. Höhn
F. Blumer

Summary of Facts and Submissions

- I. This appeal is against the decision of the examining division, dispatched 27 December 2006, refusing European patent application No. 02028666.2.
- II. The notice of appeal was received on 27 February 2007. The appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 4 May 2007. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the two sets of claims according to a main request, submitted with the statement setting out the grounds of appeal, or an auxiliary request I, submitted as an auxiliary request with the statement setting out the grounds of appeal. Oral proceedings were requested on an auxiliary basis. It was further requested that the appeal fee be reimbursed in view of a substantial procedural violation committed during the first-instance proceedings.
- III. A summons to oral proceedings to be held on 19 April 2011 was issued on 25 January 2011. In an annex accompanying the summons the board expressed the preliminary opinion that the subject-matter of independent claim 1 according to the main request did not fulfil the requirements of Articles 83 and 84 EPC. The subject-matter of independent claim 1 according to auxiliary request I did not fulfil the requirements of Articles 84 and 56 EPC in view of the prior art on file, i.e. (the numbering is that used in the first-instance proceedings):

- D1: CAMPBELL A T ET AL: "DESIGN, IMPLEMENTATION, AND EVALUATION OF CELLULAR IP" IEEE PERSONAL COMMUNICATIONS, IEEE COMMUNICATIONS SOCIETY, US, vol. 7, no. 4, August 2000, pages 42-49, ISSN: 1070-9916,
- D2: VALKO A ET AL: "Cellular IP" IETF INTERNET DRAFT, 18 November 1998, Retrieved from the Internet: URL:<http://comet.ctr.columbia.edu/cellularip/pub/draft-valko-cellularip-00.t>> [retrieved on 2000-03-20],
- D3: HAVERINEN H ET AL: "Internet-Draft; Mobile IP Regional Paging" IETF INTERNET DRAFT, June 2000, Retrieved from the Internet: URL:<http://comet.ctr.columbia.edu/micromobility/pub/draft-haverinenmobileip-reg-pag>> [retrieved on 2001-11-02],
- D4: GUSTAFSSON E, JONSSON A, PERKINS C: "Mobile IP Regional Registration; draft-ietf-mobileip-reg-tunnel-02.txt" IETF INTERNET DRAFT, [Online] 6 September 2000, pages i-28, Retrieved from the Internet: URL:www.globecom.net/ietf> [retrieved on 2003-05-16],
- D5: PERKINS C: "IP Mobility Support for IPv4, revised" IETF INTERNET DRAFT, [Online] 27 January 2000, pages 1-93, Retrieved from the Internet: URL:www.globecom.net/ietf> [retrieved on 2003-05-16].

The board gave its reasons for the objections and stated that the appellant's arguments were not convincing.

In addition, the board expressed the preliminary view that the procedural issues referred to by the appellant

did not constitute a substantial procedural violation which would justify the reimbursement of the appeal fee.

- IV. With a letter dated 17 March 2011 the appellant submitted two additional sets of claims according to auxiliary requests II and III, together with arguments that these claims fulfilled the requirements of Articles 83 and 84 EPC, were novel and met the requirements of Article 56 EPC.
- V. Oral proceedings were held on 19 April 2011 during the course of which the appellant presented a set of claims 1 to 13 according to an amended auxiliary request II.
- VI. Independent claim 1 according to the main request reads as follows:
"1. A system for supporting mobile IP, comprising:
a controlling foreign agent (CFA1, CFA2) managing communications in a service region (RA1, RA2); and
at least one paging foreign agent (PFA1, PFA2, PFA3, PFA4, PFA5, PFA6) managing at least one paging area within the service region, the paging foreign agent configured to register new location information of a mobile node (MN) upon the mobile node moving into the paging area of one paging foreign agent from the paging area of another paging foreign agent;
characterized in that the paging foreign agent is configured to transmit the new location information to the controlling foreign agent based on a current mode of the mobile node."

Independent claim 1 according to auxiliary request I reads as follows:

"1. A system for supporting mobile IP, comprising:

- a controlling foreign agent (CFA1, CFA2) managing communications in a service region (RA1, RA2); and
- a plurality of paging foreign agents (PFA1, PFA2, PFA3, PFA4, PFA5, PFA6) managing respective paging areas within the service region, the paging foreign agents configured to register new location information of a mobile node (MN) upon the mobile node moving into the paging area of one of the plurality of paging foreign agents from the paging area of another of the plurality of paging foreign agents; characterized in that the paging foreign agents are configured to transmit the new location information to the controlling foreign agent if the mobile node is in an active mode at the time of entering the respective paging area and to withhold transmission of the new location information to the controlling foreign agent if the mobile node is in an idle mode at the time of entering the respective paging area."

Independent claim 1 according to auxiliary request II reads as follows:

"1. A system for supporting mobile IP, comprising:

- a controlling foreign agent (CFA1) managing communications in a regional area (RA1); and
- a plurality of paging foreign agents (PFA1, PFA2, PFA3) each comprising a visitor list, and managing respective paging areas within the regional area, the paging foreign agents being configured to register new location information of a mobile node (MN) upon the mobile node moving into the paging area of one of the plurality of paging foreign agents from the paging area of another of the plurality of paging foreign agents;
- the paging foreign agents are configured to register the new location information to both the respective

paging foreign agent and the controlling foreign agent if the mobile node is in an active mode at the time of entering the respective paging area, and to register the new location information only to the respective paging foreign agent if the mobile node is in an idle mode at the time of entering the respective paging area;

- the controlling foreign agent (CFA1) is configured to broadcast a paging request to the plurality of paging foreign agents when data is to be transmitted from a home agent (HA) of the mobile node (MN) to the mobile node (MN) being in the idle mode; and
- the paging foreign agents (PFA1, PFA2, PFA3) are further configured to search their visitor lists for a home address of the mobile node being in idle mode, wherein only the paging foreign agent (PFA1) having the home address of the mobile node sends a paging request to its paging area when the data is to be transmitted from the home agent to the mobile node."

VII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request (claims 1-9 and description pages 1-3, 3a, 3b, 4-18, filed with letter dated 4 May 2007, together with drawing sheets 1/7 - 7/7 as filed during the oral proceedings before the Board), or, subsidiarily, on the basis of auxiliary request I (claims 1-15, description pages 1-3, 3a, 3b, 4-18, filed as an auxiliary request with letter dated 4 May 2007, together with drawing sheets 1/7 - 7/7 as filed during the oral proceedings before the Board), or on the basis of auxiliary request II (claims 1-13, description pages 1-3, 3a, 3b, 4-18 and drawing sheets 1/7 - 7/7 as filed during the oral proceedings before

the Board), or on the basis of auxiliary request III (claims 1-11) as filed with letter dated 17 March 2011.

VIII. After due deliberation the board announced its decision.

Reasons for the Decision

1. Admissibility

The appeal complies with the provisions of Articles 106 to 108 EPC 1973, which are applicable according to J 10/07, point 1 (see Facts and Submissions, point II above). The appeal is therefore admissible.

Main request

2. Articles 84 and 123(2) EPC

2.1 The amendments made to claim 1, in particular the expression "based on a current mode", are originally disclosed in claims 12 and 26 as filed, complying with the requirements of Article 123(2) EPC.

2.2 According to paragraph [0009] of the published application the technical problem to be solved is to provide a combinatorial system and method of managing mobility of IP terminals which achieves improved performance in terms of efficiency and costs compared with conventional mobile IP systems. This aim is achieved by introducing the concept of regional registration and local registration as disclosed with reference to figures 6 and 7 in paragraphs [0060] to

[0070] of the published application and the use of paging (see paragraph [0072]).

The subject-matter of claim 1 is considered to be so broad in scope that it encompasses embodiments which are not supported by the disclosure in the application as originally filed. The expression "based on a current mode" in the characterising portion of claim 1 comprises *inter alia* the fact that the paging foreign agent transmits new location information if the current mode is the idle mode. This does not, however, solve the technical problem of improved performance in terms of efficiency and costs compared with conventional mobile IP systems (see paragraph [0009] of the published application) and even goes against the teaching of the present application (see e.g. paragraphs [0043] and [0062] of the published application), which limits the transmission according to the regional registration to the active mode. Transmission according to the regional registration in the idle mode is not supported by the description.

- 2.3 Moreover, claim 1 does not specify the step of paging nodes in idle mode, which is regarded as an essential feature for carrying out the invention. Otherwise the advantages of the invention regarding reduced signalling costs are not necessarily achieved. According to paragraph [0072], last sentence of the published application "the benefits of the present invention result from the separation of local and regional registrations and the use of paging" (emphasis added).

2.4 The board does not agree with the appellant's reasoning in sections IV.4 and IV.5 of the statement setting out the grounds of appeal. The appellant's arguments contradict the disclosure in paragraph [0072] of the application. Arguing on the basis of merely a majority of cases, as the appellant did, is not considered to be sufficient, because without that feature of paging the claimed subject-matter of the independent claims is not a workable solution to the mobility management of mobile IP terminals. For this reason alone, the claimed subject-matter cannot be considered to be a complete solution to the technical problem of improved performance in terms of efficiency and costs compared with conventional mobile IP systems, in particular because conventional IP systems provide a complete signalling system for all possible cases. Only when the claimed solution also provides complete signalling for all cases can its signalling costs be compared to those of conventional IP systems.

On page 9, second paragraph of the statement setting out the grounds of appeal the appellant argued that the signalling traffic associated with paging always adds to the overall signalling costs. The goal of the present invention is to reduce signalling costs and claim 1 fails to specify a feature related to a reduction in signalling costs, whereas this very feature according to the description cannot be abolished, but is necessary for a workable solution and is therefore considered to be essential.

In the light of this fact, the board considers it to be misleading if it can be concluded from the wording of claim 1 that a reduction in signalling costs is

achieved by not needing a paging step. The wording of claim 1 therefore lacks clarity which is required from the wording of the claim in itself.

The board therefore considers the feature of paging a mobile node according to original claim 2 to be an essential feature of the invention which is missing from the independent claims, which are therefore neither clear, nor supported by the description.

The requirements of Article 84 EPC are therefore not fulfilled.

Auxiliary request I

3. Claim 1 of this request still comprises the wording "withhold transmission..." which was objected to during the first-instance proceedings because it was a negative feature.
- 3.1 The board is of the opinion that a feature with such wording is originally disclosed (see e.g. original claim 14), in contrast to the examining division's argument presented in point 1.2 of the communication dated 1 April 2005. Such a negative limitation can therefore be deduced from the application as filed (see T 278/88, not published in OJ).
- 3.2 However, negative limitations may be used only if adding positive features to the claim either would not define more clearly and concisely the subject-matter still protectable (see T 4/80, OJ 1982, 149) or would unduly limit the scope of the claim (see T 1050/93, not published in OJ). Both of the cited cases relate to a

chemical process and use a negative limitation to clearly define a chemical substance used as an agent in the process.

In the present case the negative limitation relates to a registration step which may be omitted under specific circumstances. These circumstances contribute to the claimed solution. Therefore the subject-matter should be specified in this case by using positive features such as for example the principle of regional registration and local registration as disclosed in Figures 6 and 7 and in paragraphs [0060] to [0070] of the published application.

Claim 1 of auxiliary request I therefore does not fulfil the requirements of clarity pursuant to Article 84 EPC.

Auxiliary request II

4. Articles 84 and 123(2) EPC

Claim 1 according to auxiliary request II specifies the claimed subject-matter by the use of positive features, based on Figures 6 and 7 and paragraphs [0060] to [0070] of the application as published. Thus, it complies with the provisions of Articles 84 and 123(2) EPC.

5. Articles 52(1), 54 and 56 EPC - Novelty and inventive step

5.1 Prior art publication D3 discloses a system with Mobile IP Regional Paging (MIRP) which, *inter alia*, serves the purpose of reducing routing state information. In this

system, when a mobile node is in idle mode its location is known with only a coarse accuracy defined by a paging area. Downlink routes to such nodes in idle mode terminate in a paging foreign agent, which re-establishes them on demand by means of paging (see abstract). The system disclosed in D3 therefore belongs to the same technical field, tries to solve the same technical problem and applies the same basic technical concept as the subject-matter of claim 1. D3 is therefore considered to be the closest prior art on file.

- 5.2 D3 specifically discloses that a node in active mode operates with regional registrations. A "paging foreign agent" maintains the state and location of active nodes in its paging area (see section 2, paging foreign agent, active mode and idle mode). Each of the paging foreign agents corresponds to the controlling foreign agent according to claim 1 of this request. D3 discloses a hierarchy of such paging foreign agents according to a tree structure (see e.g. "lower foreign agent" or "child foreign agent" in section 3.3, first paragraph) ending in so-called "leaf foreign agents" (see e.g. section 3.1, first sentence) which correspond to the paging foreign agents according to claim 1, because they have the same place in the structure and the same function as, in particular, paging mobile nodes in idle mode (see section 3.2, fifth paragraph).

The regional registration in D3 is similar to the regional registration according to paragraph [0060] and Figure 6 of the published application, which is the basis for the feature of claim 1 referring to transmission of location information of mobile nodes in

active mode. The paging foreign agents have a so called "visitor list" in which location information about mobile nodes in active and idle mode are maintained (see D3, section 3.2, third paragraph). D3 further discloses that no complete routing information is needed for mobile nodes in idle mode (see section 3.2 of D3). It also discloses the use of paging an idle mobile node in order to send data to such a node (see section 3.3 of D3).

- 5.3 It is, however, regarded as a difference between the teaching of D3 and the subject-matter of claim 1 that according to D3 the "upper" paging foreign agents (comparable to controlling foreign agents in the language of claim 1) rather than leaf foreign agents (comparable to paging foreign agents in the language of claim 1) are provided with a visitor list in which location information is stored. As a consequence, D3 requires a transfer of location information to paging foreign agents (corresponding to controlling foreign agents in the language of claim 1) also for mobile nodes in idle mode. If there is data to be sent to an idle mobile node from the home agent, according to the teaching of D3 the paging foreign agent (corresponding to controlling foreign agents in the language of claim 1) having the address of the idle node in its visitor list has to send a paging request to all its foreign agents which all have to send a paging call over the wireless interface in order to find the leaf foreign agent having the required idle mobile node in its paging area.

This, however, is in contrast to the feature of claim 1 according to which "only" the paging foreign agent

(i.e. the leaf foreign agent in the wording of D3) stores the location of a mobile node in idle mode in its visitor list. If there is data to be sent from the home agent to an idle mobile node, the controlling foreign agent (corresponding to the paging foreign agent in the wording of D3) sends a paging request to all its paging foreign agents (corresponding to the foreign agent in the wording of D3), which all search their visitor list for the home address of the respective idle mobile node. Only the one having this address in its visitor list sends a paging call over the air interface.

- 5.4 The technical effect of this difference with regard to D3 is considered to be that less signalling is needed according to the claimed solution, because the location information does not need to be transported to the controlling foreign agent and, what is much more important, the wireless interface has less data traffic to transport since only a single paging call is sent instead of the plurality needed according to the teaching of D3.

The objective technical problem underlying this difference between D3 and the claimed solution according to claim 1 is considered to be to reduce the signalling cost.

- 5.5 The skilled person when starting with D3 as the closest prior art would consider the content of D4 and D5 since both publications are standardisation documents in the same technical field and are referred to in D3 (see abstract and references). In Figure 1, D4 discloses a structure similar to Figure 2 of the present

application. Figures 2 and 3 of D4 disclose a distinction between global registrations and regional registrations, similar to Figures 5 and 6 as well as paragraphs [0056-0061] of the present application. Foreign Agent FA is considered to correspond to the paging foreign agent PFA, and Gateway Foreign Agent GFA to the controlling foreign agent CFA according to claim 1. However, neither D4 nor D5 discloses the use of local registrations only at the paging foreign agent during idle mode of a mobile node.

5.6 Also further prior art documents D1 and D2 do not disclose the solution of the objective technical problem according to claim 1. According to D1, paging occurs when a packet is addressed to an idle mobile node, and the gateway or base station does not find valid routing information for the destination. Storing corresponding routing information rather depends on whether a routing cache exists or not (see D1, page 46, right hand column). D2 explicitly discloses that routing caches are configured along the way from the new Base Station to the Gateway (see D2, section 2.3). There is no disclosure in either prior art publication to use local registrations during idle mode only at the paging agents according to the claimed solution.

5.7 Hence, neither the closest prior art D3 nor the further prior art publications D1, D2, D4 and D5 disclose or suggest to register new location information only to the respective paging foreign agent if the mobile node is in idle mode at the time of entering the respective paging area, and to only send a paging request by the paging foreign agent having the home address of the mobile node according to claim 1.

The subject-matter of claim 1 of this request is therefore novel and involves an inventive step in view of the prior art on file.

6. The same reasoning applies to the other independent claims 7 and 13, the subject-matter of which also comprises a corresponding feature for solving the objective technical problem. The dependent claims, because of their reference to one of the independent claims, also fulfil the requirements of Articles 52(1), 54(2) and 56 EPC.
7. Since auxiliary request II fulfils the requirements of the EPC, the board does not have to deal with auxiliary request III.

Request for reimbursement of the appeal fee

8. Alleged substantial procedural violation
 - 8.1 The appellant argued that after non-admission of the main request filed during oral proceedings, the version previously standing would have remained in the previous state and was still pending. The examining division therefore would have had to give reasons according to Rule 68(2) EPC 1973 for this request. Failing to do so constituted a substantial procedural violation.
 - 8.2 This point of view is, however, not correct. By replacing a request, the former request is no longer pending.

According to Rule 86(3) EPC 1973, last sentence, no further amendment may be made without the consent of the examining division. Also according to the case law an examining division has a discretion to allow amendments until the issue of the decision to grant (see G 7/93, order 1, OJ EPO 1994, 775 and G 12/91, OJ EPO 1994, 285). If a request for amendment is refused, the examining division must inform the applicant of the reasons for not admitting the amendments such that the applicant has the opportunity to comment on them in order to satisfy the right to be heard according to Article 113(1) EPC. If the applicant maintains his request for amendment, the application has to be refused under Article 97(2) EPC, since there is no text which has been approved by the applicant and allowed by the examining division (see Article 113(2) EPC, decisions T 647/93, OJ EPO 1995, 132; T 946/96 and T 237/96). Article 113(2) EPC states that the European Patent Office shall consider and decide upon the European patent application or the European patent only in the text submitted to it, or agreed, by the applicant or the proprietor of the patent.

In the present case the examining division refused to consent to the introduction into the procedure of the claims submitted during oral proceedings, which had been put forward in substitution for the claims on file before. Deciding to refuse an application on the grounds that the claims previously on file were not allowable would have contravened Article 113(2) EPC 1973, since these claims were no longer pending. If the examining division refuses consent to the latest amended set of claims under Rule 86(3) EPC 1973 this does not automatically revive the previous set of

claims that the examining division had consented to consider, unless the applicant has indicated that he was relying on these as an auxiliary request. There was no such indication here, since the appellant did not even mention that the claims filed on 12 December 2006 and/or the claims filed on 29 July 2005 constituted auxiliary requests.

8.3 As can be seen from the minutes of the oral proceedings (see point 8), the chairman explicitly brought the legal situation and the corresponding consequences to the attention of the appellant's representative, who did not present any observations (see minutes point 9) and apparently did not react according to his intentions (e.g. by referring to the auxiliary requests believed to be pending or by filing a further request). The appellant did not question the correctness of the minutes after they were sent to the party and before the appeal proceedings. The correctness of the minutes is therefore not formally in doubt and the board has to consider the minutes as correctly reflecting the course of the oral proceedings (see R 11/08, reasons point 16 on page 22). The appellant's representative could be expected to be aware of the legal situation, in particular after having actually been warned of the legal consequences.

8.4 Therefore, the board comes to the conclusion that the applicant's right to be heard (Article 113(1) EPC 1973) has been observed. In the board's view, the procedural issues referred to by the appellant do not constitute a substantial procedural violation which would justify the reimbursement of the appeal fee.

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 auxiliary request II as filed during the oral proceedings before the Board (claims 1-13, description pages 1-3, 3a, 3b, 4-18, drawing sheets 1/7 - 7/7).

The Registrar:

The Chair:

K. Götz

A. Ritzka