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D E C I S I O N
of 21 February 2006

Case Number: T 0580/03 - 3.5.02

Application Number: 96113768.4

Publication Number: 0763807

IPC: G08G 1/0967

Language of the proceedings: EN

Title of invention:
Traffic information estimation and reporting system

Patentee:
AT&T WIRELESS SERVICES, INC.

Opponent:
Vodafone Holding GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 123(2), 123(3)

Keyword:
"Added subject-matter (yes) - main request"
"Extension of protection (yes) - auxiliary requests A, B and A1"
"Novelty and inventive step (yes) - auxiliary request C"

Decisions cited:
G 0001/93

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0580/03 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 21 February 2006

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 18 March 2003 concerning maintenance of European patent No. 0763807 in amended form.**

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: M. Rognoni
P. Mühlens

Summary of Facts and Submissions

I. Both the opponent and the patent proprietor appealed against the interlocutory decision of the opposition division concerning the maintenance of the European patent number 0 763 807 in amended form in accordance with the patent proprietor's auxiliary request C.

II. In the decision under appeal, the opposition division held, *inter alia*, that claims 11, 16 and 18 of the patent as granted had been amended in such a way that they contained subject-matter extending beyond the content of the application as originally filed (Article 100(c) EPC), and that the deletion of the feature "*wireless traffic monitor*" from claims 11, 16 and 18 of the granted patent in accordance with auxiliary requests A and B constituted an amendment extending the protection conferred (Article 123(3) EPC).

Furthermore, the opposition division considered that the subject-matter of claims 1 to 10 as granted (auxiliary request C) was new and involved an inventive step with respect to the following prior art documents:

O1: WO-A-94/27 160,

O3: C.A. Cragg *et al.*: "Intelligent Vehicle-Highway System (IVHS) Activities in the Virginia Department of Transportation", April 1994, Virginia Transportation Research Council, Technical Assistance Report, pages 1 to 25, and

O7: EP-A-0 631 453.

III. Oral proceedings were held before the Board on 21 February 2006.

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

V. The patent proprietor requested:

- that the patent be maintained as granted (main request); or

- that the patent be maintained in amended form according to one of the auxiliary requests A, B and C filed in the proceedings before the opposition division, in alphabetical order of descending preference; or

- that the patent be maintained in amended form in accordance with auxiliary request A1, *i.e.* in accordance with the application as filed; or

- to refer to the Enlarged Board of Appeal the question whether a patent proprietor may in a case where he finds himself in the trap of Article 123(2), (3) EPC return to the original claims as originally filed, if the Board is of the opinion that it cannot answer this question itself.

The patent proprietor also requested that document O7 be disregarded.

VI. Claim 1 according to the patent proprietor's main request reads as follows:

"A method of determining road traffic conditions in thoroughfares located in the radio coverage areas served by a wireless communications network (20) including a plurality of base stations (1 - 12), each serving a cell in the radio coverage areas and a wireless switch (50) coupled to the plurality of base stations (1 - 12), said method comprising the steps of:

receiving from each of a plurality of cells, via said wireless switch (50) coupled to a base station (9, 10) associated with a cell, real-time registration and cell activity data from active mobile end-user devices (90, 91) currently located in each of said plurality of cells served by the wireless communications network (50); and estimating road traffic conditions in at least one thoroughfare located in at least one of said radio coverage areas based on a comparison (401, 501) of said real-time registration and cell activity data to past analogous equivalent information previously collected by said wireless communications network (50) for said at least one of said radio coverage areas."

Claims 2 to 10 are dependent on claim 1.

Claim 11 of the patent proprietor's main request reads as follows:

"A system for determining road traffic conditions in a geographic area corresponding to a plurality of radio coverage areas served by a wireless communications system (20) including a plurality of base stations (1 - 12) each serving a cell in the radio coverage areas and a wireless switch (50) coupled to the base stations each associated with a cell, the system comprising;

a wireless traffic monitor which is coupled to said wireless switch (50) and which tracks a current flow of active mobile end-user devices (90, 91) entering and exiting at least one of a plurality of radio coverage areas which are served by the wireless communications system (20), a plurality of roads being located in the plurality of radio coverage areas;

a processor (55) which compares said current flow for said at least one radio coverage area to a past average flow previously collected by said wireless communications system (20) for said at least one radio coverage area under substantially similar time conditions; and means responsive to said comparison for assessing road traffic conditions in said at least one radio coverage area."

Claims 12 to 19 are dependent on claim 11.

The claims according to the patent proprietor's auxiliary request A differ from the claims according to the main request essentially in that the wording *"the system comprising a wireless traffic monitor which is coupled to said wireless switch (50) and which tracks …..."* recited in claim 11 of the main request has been deleted and replaced by *"wherein said wireless switch (50) tracks…"*, and in that the term *"wireless traffic monitor"* in claims 16 and 18 has been amended as *"wireless switch"*.

The claims according to the patent proprietor's auxiliary request B differ from the claims according to the main request essentially in that the wording *"a*

wireless traffic monitor which is coupled to" recited in claim 11 as granted has been replaced by *"a processor (55) which is coupled to and provided within",* and in that in claims 16 and 18 the term *"wireless traffic monitor"* has been replaced by *"processor (55)".*

The patent proprietor's auxiliary request C is based on claims 1 to 10 of the patent as granted.

The claims according to the auxiliary request A1 correspond to the claims of the application as originally filed. In particular, claim 11 reads as follows:

"A system for determining road traffic conditions, said system comprising:
a wireless switch which tracks a current flow of active mobile end-user devices entering and exiting at least one of a plurality of radio coverage areas which are served by a wireless communications system, and in which a plurality of roads are located;
a processor which compares said current flow for said at least one radio coverage area to a past average flow previously collected by said wireless communications system for said at least one radio coverage area under substantially similar time conditions; and
means responsive to said comparison for assessing road traffic conditions in said at least one radio coverage area."

VII. The opponent's arguments can be summarised as follows:

Claims 11, 16 and 18 of the contested patent comprised a feature, *"wireless traffic monitor"*, which was not disclosed in the application as originally filed, had technical meaning and limited the protection conferred by the corresponding claims. In particular, the wording of claim 11 left no doubt that the *"wireless traffic monitor"* was an independent unit, coupled to the *"wireless switch"*, and had a functionality which was originally attributed to the wireless switch. As they recited undisclosed subject-matter, claims 11, 16 and 18 violated Article 123(2) EPC. The amendments proposed by the patent proprietor by way of auxiliary requests A, B and A1, which aimed at deleting or replacing the added feature in claims 11, 16 and 18, broadened the scope of protection conferred and thus were not admissible under Article 123(3) EPC.

Document O7 related to a method for locating a mobile station in a wireless communications network and for estimating road traffic located within the areas covered by said communications network on the basis of data which, in existing wireless telecommunications systems, mobile phones continuously transmitted to the base stations. The teaching in O7 concerning the use of reference models for determining road traffic conditions necessarily implied a comparison of data indicative of cellular phone activity with analogous data previously collected. Thus, O7 disclosed all the steps recited in claim 1 of the granted patent (Article 54 EPC).

Furthermore, the step of comparing actual measured data with reference data in the context of a method for estimating road traffic conditions was also disclosed

in O1 and O3. Even if it were assumed that O7 did not anticipate the last step of claim 1, the claimed method would lack an inventive step within the meaning of Article 56 EPC because it resulted from a straightforward application of the teaching O1 or O3 to the method known from O7.

VIII. The patent proprietor argued essentially as follows:

The application documents as originally filed lacked an explicit disclosure of a "*wireless traffic monitor*", as indeed this expression could not be found literally in the application as originally filed. However, there could be no doubt that the application documents provided sufficient support for a wireless traffic monitor for tracking a current flow of active mobile end-user devices, since such wireless traffic monitor was a component part of the *"wireless switch"* disclosed in the original application. In particular, the essential difference between the originally filed and the granted versions of claim 11 was that in the former the functionality of tracking a current flow of active mobile end-user devices was attributed to a wireless switch which thus was not a "conventional" wireless switch. The patent as granted, however, clarified that this functionality was performed by a wireless traffic monitor connected to a conventional switch. When claim 11 as granted was read in the light of the description in accordance with Article 69 EPC, there could be no doubt that the combination of a wireless traffic monitor and a wireless switch recited in the contested patent corresponded to the wireless switch of the application as originally filed. The inclusion of the feature of the *"wireless traffic monitor"* during

the granting procedure was therefore not meant to limit the protection conferred. It was merely dictated by a desire to clarify the wording of the claim. As the amendment in question was indeed only of a linguistic nature, and did not affect the patentability of the claimed subject-matter, the findings of G 1/93 applied and the amendment was admissible under Article 123(2) EPC.

In claim 11 according to the auxiliary request A, the feature of the wireless traffic monitor was deleted and the wireless switch tracked the current flow of active mobile end-user devices. Thus, the amendment made to the granted claim 11 consisted in replacing the combination of a wireless traffic monitor and a wireless switch with a wireless switch having the same functionality.
As the description of the contested patent specified that monitoring was performed by the wireless switch, the only meaningful interpretation of the granted claim was that the wireless traffic monitor constituted a part of the wireless switch of the original application. Thus, claim 1 of the auxiliary request A did not extend the protection conferred by the corresponding claim of the patent in suit and was admissible under Article 123(3) EPC.

According to the auxiliary request B, the feature of the *"wireless traffic monitor"* was replaced by a *"processor (55)"* which was *"coupled to and provided within said wireless switch".* The skilled person would realize that in the system of the invention the processor was coupled to the wireless switch in the sense that it was coupled to practically all components

comprised within the wireless switch, as illustrated in Figure 1. An objection under Article 123(3) should also be rejected for the same reasons given above with respect to the auxiliary request A.

Auxiliary request A1, as an alternative to auxiliary request A, asked for the restoration of the claims as originally filed. A comparison of the different wording used in claims 11 of the different requests showed that the functionality of the system of the present invention had remained the same.

The EPO, in granting a patent with an amendment which was later found not admissible under Article 123(2) EPC, made a very serious mistake and thus contributed to a large extent to the patent proprietor's misfortune in later proceedings. By allowing the patent proprietor to return to his original text, the EPO would contribute to overcoming said mistake and ensure that the patent proprietor got what he was entitled to since the filing of the application. Furthermore, the requirement of Article 123(3) would be fulfilled, since the functionality of the claimed system was not altered by any amendment.

As to the objections under Articles 54 and 56 EPC raised by the opponent, document O7 had been filed after the nine month period for filing an opposition and should be disregarded. Both O7 and O1 related to a method for locating mobile stations in a digital telephone network and were not concerned with a method for determining road traffic conditions by comparing data indicative of phone activity within a cell with previously collected data. O3 was merely a brief

description of a test for evaluating the use of a cellular telephone infrastructure to estimate road traffic congestion and offered no explicit teaching as to how to achieve this objective. Thus, the method according to claim 1 of the contested patent was new and involved an inventive step over the cited prior art.

Reasons for the Decision

1. The appeal is admissible.

2. *Late-filed document*

2.1 Document O7 was submitted by the opponent with a letter dated 17 January 2003, *i.e.* after expiration of the nine-month opposition period.
In the appeal proceedings, the patent proprietor requested with a letter dated 15 January 2004, that this document be disregarded as late-filed and *prima facie* not relevant.

2.2 In the contested decision document O7 was analysed in detail and its disclosure compared with the subject-matter of claim 1 of the patent in suit (cf. page 19, last paragraph to page 20, third paragraph). In fact, it appears from the opposition file that this document was admitted into the proceedings by the opposition division without any objection being raised by the patent proprietor.

2.3 Under these circumstances, the Board considers that it has no power to put into question the admissibility of

O7 and disregard a document which constituted part of the prior art assessed in the contested decision.

3. *Added subject-matter*

3.1 It is not in dispute that the application as originally filed does not explicitly disclose a "*system for determining road traffic conditions*" comprising "*a wireless traffic monitor*" as recited in claims 11, 16 and 18 of the patent as granted.

3.2 According to the application documents (cf. published application: column 4, lines 41 to 43): "*At the heart of wireless network 20 is wireless switch 50 that monitors and coordinates the operations of the base stations 1 - 12*". The wireless switch comprises, *inter alia*, a processor 55 which includes a CPU 101 and a storage area 100 containing "*registration and cell counters 104 and 105 and registration and cell timer complexes 102 and 103*" (*ibid.* column 4, line 53 to column 5, line 1). The processor 55 is arranged to increment a cell counter by "one" whenever one of the mobile end-user devices initiates a call from a location within the coverage area of that cell (*ibid.* column 5, lines 45 to 52). In addition to the registration and cell counters, the processor 55 also stores a table (see Figure 2) which correlates particular cells to sections of a thoroughfare. One of the road traffic estimation processes of the invention is initiated when the CPU 101 of the processor 55 compares the value indicated by the counter of a particular cell to the expected average number of active - busy devices in that cell under equivalent

conditions, such as time-of-day, day-of-week and day-of-year (*ibid*. column 8, lines 3 to 9).

As pointed out in the description (*ibid.* column 6, lines 15 to 22), the cell timer complex may be implemented as a stand-alone device or may be alternatively included in the processor of each of the base stations. However, even in this particular embodiment, the cell timer forwards a signal to the CPU 101 of the processor 55 when a predetermined time threshold has been exceeded.

Hence, in all embodiments of the invention as specified in the application documents, it is the wireless switch 50, in particular its processor 55, which collects and stores the data required for tracking a current flow of active mobile end-user devices entering and exiting the cells of the wireless communications system.

3.3 The application as originally filed relates, therefore, to a system comprising "*a wireless switch*" which includes all the hardware required for tracking the flow of active mobile end-user devices entering and exiting the cells in a radio coverage area. In claim 11 of the patent as granted, however, this functionality is attributed to *"a wireless traffic monitor"* coupled to, and thus separate from, the wireless switch. The system according to claim 11 of the patent as granted comprises, therefore, a combination of technical features (a *"wireless traffic monitor"* coupled to *"a wireless switch"*) which is not disclosed in the originally filed documents.

3.4 According to the decision of the Enlarged Board of Appeal G 1/93 (OJ 1994, 541), a feature which has not been disclosed in the application as filed but which has been added to the application during examination and which, without providing a technical contribution to the subject-matter of the claimed invention, merely limits the protection conferred by the patent as granted by excluding protection for part of the subject-matter of the claimed invention as covered by the application as filed, is not to be considered subject-matter which extends beyond the content of the application as filed within the meaning of Article 123(2) EPC.

In the present case, however, the added feature (*"a wireless traffic monitor"*) in claim 11 cannot be regarded as a feature which does not provide any technical contribution to the subject-matter of the claimed invention, since it performs the essential function of tracking "*a current flow of active mobile end-user devices (90, 91) entering and exiting at least one of a plurality of radio coverage areas*".

3.5 In summary, independent claim 11 and dependent claims 16 and 18 of the patent as granted, and according to the patent proprietor's main request, recite subject-matter (*"a wireless traffic monitor"*) which extends beyond the content of the application as originally filed and thus infringes Article 123(2) EPC, so that the ground of opposition under Article 100(c) EPC prejudices the maintenance of the patent in its granted form. The patent proprietor's main request must therefore be refused.

4.1 Claims 11 according to the auxiliary requests A, B and A1 of the patent proprietor relate to a system in which the functions of the *"wireless traffic monitor*" are performed by the wireless switch or one of its components (*i.e.* the "*processor*" 55).

As pointed out above, claim 11 as granted attributes the function of tracking the flow of active mobile end-user entering and exiting a cell of the wireless communications system to *"a wireless traffic monitor".* This excludes the possibility that, in the same system, the same function is performed by "*wireless switch*" 50 (see Figure 1).

4.2 In so far as they involve the deletion of a technical feature (*"wireless traffic monitor")* and attribute its essential function to the *"wireless switch*" 50, the amendments to the granted patent specified in the patent proprietor's auxiliary requests A, B and A1 extend the protection conferred by the patent as granted and thus violate Article 123(3) EPC. The patent proprietor's auxiliary requests A, B and A1 must therefore be refused.

Auxiliary request C - novelty and inventive step

5.1 The opposition division maintained the patent on the basis of the method claims 1 to 10 of the patent as granted. According to the opponent, however, document O7 disclosed "*a method of determining road traffic conditions in thoroughfares in radio coverage areas served by a wireless communications network*" which comprised, or necessarily implied, all the features recited in claim 1 of the contested patent. Hence, in

the opponent's opinion, the claimed method was not new within the meaning of Article 54 EPC.

5.2 Document O7 is concerned with a method for locating mobile stations in a digital telephone network and relies on standard reference data which are routinely transmitted by a mobile station to the base stations and fed to an adaptive neural network trained by means of reference data (O7: column 2, line 55 to column 3, line 7). One of the applications of the known method highlighted in O7 is the possibility *"to estimate road or street traffic for the larger traffic routes by making reference models for these. It is consequently possible to estimate how many calls are occurring on the stretch of road and what the mean speed of the mobile stations, that is to say the cars, is"* (*ibid.* column 2, lines 44 to 49).

5.3 As the data processed by the method of O7 to obtain the location of a mobile station is the *"information which is regularly measured in existing systems without needing to add internal functions"* (see O7: column 2, lines 50 to 52), they correspond essentially to the *"real-time registration and cell activity data from the active mobile end-user devices"* referred in claim 1 of the contested patent.

5.4 Document O7 thus relates to a method of determining road traffic conditions in thoroughfares located in radio coverage areas served by a standard wireless communication network, which, as such, necessarily includes a plurality of base stations, each serving a cell in the radio coverage areas, and a wireless switch coupled to the plurality of base stations. This method

thus comprises the following step recited in claim 1 of the patent in suit:

- receiving from each of a plurality of cells, via said wireless switch coupled to a base station associated with a cell, real-time registration and cell activity data from active mobile end-user devices currently located in each of said plurality of cells served by the wireless communications network.

5.5 Though O7 refers to *"reference models"* for traffic routes, and thus implicitly to a comparison with previously collected data which would be required to define such models, it does not suggest that road traffic conditions could be estimated on the basis of a comparison between the reference data sent to the base stations by the mobile devices and past equivalent data. In fact, the estimation of traffic conditions taught in O7 is essentially based on the evaluation of the position of a mobile device over time, its mean speed and some reference model for the road on which the device travels. The cell activity data is not used for estimating traffic conditions.

5.6 In the result, O7 does not disclose a method comprising the step of estimating road traffic conditions "*based on a comparison (401, 501) of said real-time registration and cell activity data to past analogous equivalent information previously collected by said wireless communications network (50) for said at least one of said radio coverage areas*", as recited in claim 1 of the contested patent.

The subject-matter of claim 1 is thus new within the meaning of Article 54 EPC.

6.1 The opponent has further argued that both O1 and O3 suggest determining road traffic conditions on the basis of a comparison of the actual registration and cell activity data from mobile phones with corresponding reference data. According to the opponent, the method of claim 1 would result from an obvious application of the teaching of O1 or O3 to the method known from O7.

6.2 Starting from O7, the problem addressed in the contested patent could be defined as simplifying the known method and directing it primarily to the determination of road traffic conditions.

6.3 The method according to claim 1 of the patent in suit solves the above problem by comparing real-time registration and cell activity data, indicative of the number of active-idle and active-busy mobile devices in a location area and in a cell, with previously collected equivalent information, representative of known traffic conditions.

6.4 Like O7, document O1 is also primarily concerned with locating a mobile device operating within a wireless communications network on the basis of data exchanged between the cell base stations and the mobile devices (cf. page 11, lines 9 to 30). Though it refers to *"highway management"* as a possible application (page 33, lines 23 to 25), O1 does not disclose how location information should be processed and, in particular,

whether such *"highway management"* would imply a comparison with previously collected data.

6.5 Document O3 (see page 8) refers to a project relating to an operational test for evaluating "*the use of the Bell Atlantic cellular telephone infrastructure with passive statistical cellular and cellular geolocation technologies to estimate traffic congestion information and identify incidents*". One of the objectives of the study is to "*determine if information from cellular telephone traffic can be effectively integrated into a real-time area-wide traffic control system*". This document, however, does not disclose any detail of the planned operational test and, in particular, does not indicate how road traffic conditions could be derived from data exchanged between the cell stations and the mobile devices.

6.6 In summary, neither O3 nor O1 suggests to the skilled person how a method for determining the location of mobile devices operating within a wireless communication network, as known from O7, could be simplified and primarily adapted to the determination of road traffic conditions. In particular, these documents do not teach that an estimate of traffic conditions in an area covered by at least one cell of a wireless communications system could be based on a comparison of cell activity data with previously collected data corresponding to predetermined traffic conditions.

6.7 As it would not have been obvious to a person skilled in the art to arrive at the claimed method by combining the teaching of document O7 with the teaching of O1 or

O3, the subject-matter of claim 1 of the patent in suit involves an inventive step within the meaning of Article 56 EPC.

Request for referral of question to Enlarged Board

7.1 As to the question whether a patent proprietor may return to the claims as originally filed, in case he finds himself in the trap of Article 132(2), (3) EPC, the Board notes that EPC does not foresee any exception to the provision that the claims of the European patent may not be amended during opposition in such a way as to extend the protection conferred. Thus, in principle, a reintroduction of the claims of the application as originally filed into the proceedings would be allowable under Article 123(3) EPC only if such claims were not broader that the granted claims.

7.2 As to the question of the conflicting requirements of Article 123(2) and (3) addressed by the patent proprietor, the Board wishes to draw the parties' attention to G 1/93, where the Enlarged Board of Appeal came, *inter alia,* to the following conclusions (point 13.):

- *"if a limiting feature is considered to fall under Article 123(2) EPC, it cannot be maintained in the patent in view of Article 100(c) EPC, nor can it be removed from the claims without violating Article 123(3) EPC. Only if the added feature can be replaced by another feature disclosed in the application as filed without violating Article 123(3) EPC, can the patent be maintained (in amended form)".*

- *"it must be admitted that Article 123(2) in combination with Article 123(3) can operate rather harshly against an applicant, who runs the risk of being caught in an inescapable trap and losing everything by amending his application, even if the amendment is limiting the scope of protection."*

- *"this hardship is not per se a sufficient justification for not applying Article 123(2) EPC as it stands in order to duly protect the interests of the public. Nor does it, in principle, matter that such amendment has been approved by the Examining Division. The ultimate responsibility for any amendment of a patent application (or patent) always remains that of the applicant (or the patentee)."*

8. In the result, the Board agrees with the opposition division that the subject-matter of claims 1 to 10 of the patent as granted is new within the meaning of Article 54 EPC and involves an inventive step within the meaning of Article 56 EPC. Hence, the patent can be maintained on the basis of such claims, as decided in the contested decision.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar: The Chairman:

U. Bultmann W. J. L. Wheeler