

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

**Datasheet for the decision
of 26 May 2011**

Case Number: T 1828/07 - 3.4.01

Application Number: 99946749.1

Publication Number: 1112511

IPC: G01S 5/14

Language of the proceedings: EN

Title of invention:

Call maintenance during position location

Applicant:

QUALCOMM INCORPORATED

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 56

Relevant legal provisions (EPC 1973):

-

Keyword:

"Inventive step - ex post facto analysis"

Decisions cited:

-

Catchword:

-



Case Number: T 1828/07 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 26 May 2011

Appellant: QUALCOMM INCORPORATED
5775 Morehouse Drive
San Diego, CA 92121-1714 (US)

Representative: Dunlop, Hugh Christopher
R.G.C. Jenkins & Co.
26 Caxton Street
London SW1H 0RJ (GB)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 16 March 2007
refusing European patent application
No. 99946749.1 pursuant to Article 97(1) EPC
1973.

Composition of the Board:

Chairman: B. Schachenmann
Members: F. Neumann
G. Assi

Summary of Facts and Submissions

- I. The appeal lies from the decision of the examining division to refuse the European patent application number 99 946 749.1. The contested decision was based on a lack of inventive step of claim 1 of all requests then on file having regard to document WO-A-07/14056 (D1). A failure to comply with Article 123(2) EPC 1973 was also cited against the main and first auxiliary requests.

- II. With the statement setting out the grounds of appeal the appellant requested that a patent be granted on the basis of the claims of the main request on which the contested decision was based. Arguments were presented in favour of novelty, inventive step and Article 123(2). Reimbursement of the appeal fee was requested for the reason that the examining division had decided on the basis of a text which had not actually been submitted. Oral proceedings were requested as an auxiliary measure.

- III. The Board summoned to oral proceedings and in a communication set out its preliminary opinion concerning clarity, added subject-matter, novelty, inventive step and the request for reimbursement of the appeal fee.

- IV. In response to this communication, the appellant filed two additional sets of claims forming the basis of a first and second auxiliary request respectively. The request for reimbursement of the appeal fee was withdrawn.

V. During the oral proceedings the appellant requested, as a sole request, that the decision under appeal be set aside and a patent be granted on the basis of claims 1 to 9 filed during the oral proceedings before the Board of Appeal.

VI. Claim 1 reads as follows:

"A method in a subscriber unit (10) for performing GPS position location in a CDMA wireless communications system having a base station (12), the method comprising:
receiving a position location request during a CDMA communication mode;
tuning a receiver (52, 54, 102, 104) of the subscriber unit (10) away from the CDMA communication mode to a GPS frequency in a GPS position location mode in order to receive GPS signals;
receiving information over the GPS frequency and using the received information to perform a position location procedure; and
retuning the receiver (52, 54, 102, 104) to the CDMA communication mode when said position location procedure has been completed by determining a pseudo-range for each satellite in the [sic] set of satellites;
wherein:
the subscriber unit (10) transmits frames to the base station (12) during the position location procedure, after signal samples from a [sic] set of satellites are collected, but before the position location procedure is completed."

Claims 2 to 8 are all dependent method claims and claim 9 reads as follows:

*"A subscriber unit (10) for a CDMA wireless communications system having a base station (12), the subscriber unit (10), comprising:
means for implementing the method of any of claims 1 to 8."*

VII. The arguments of the appellant, insofar as they are pertinent to the present decision, are set out below in the reasons for the decision.

Reasons for the Decision

1. Amendments

The amendments to claim 1 address the clarity issues raised in the communication of the Board. The basis of these amendments may be derived from page 5, lines 3 to 14 of the originally filed application.

Although the originally filed claims did not contain any apparatus claims, the original application does refer to "a novel and improved method and apparatus" at several locations. The description of the invention on pages 4 to 5 makes reference to the concrete apparatus features involved in performing the method and the originally filed method claim itself also makes reference to the various means involved in implementing the method. The subject-matter of claim 9 is therefore considered to be derivable from the original application.

The basis for dependent claim 2 may be found on page 4, lines 30 to 36 and the basis for dependent claim 8 may be found on page 12, lines 5-6. The remaining dependent claims are based on the originally filed dependent claims.

2. Inventive step

2.1 In general terms, claim 1 is directed to a method for performing GPS position location in a subscriber unit of a CDMA wireless communications system. Whilst in a CDMA communication mode, the subscriber unit receives a position location request. In response to this request, the receiver of the subscriber unit is tuned away from the communication mode to a GPS frequency. In this GPS position location mode, GPS signals can be received from a set of satellites and the information received via the GPS frequency is used to determine a pseudo-range to each satellite in the set of satellites. Once the pseudorange calculations are complete, the receiver is retuned to the CDMA communication mode.

2.2 D1 discloses a similar combined GPS and communication system having shared circuitry. The system of D1 has two antennas, one of which is used for receiving GPS data and the other of which is used for transmitting and receiving communication data. D1 describes a number of embodiments in which the circuitry may be shared in a variety of manners. In particular, either the receiver unit is shared so that data may be received either via the GPS antenna or via the communications antenna (Fig. 1A, Fig. 7B), or the processing unit is shared so that either the GPS data or the communication

data may be processed (Fig. 7A). The embodiment of Fig. 7B represents the arrangement most closely resembling the arrangement defined in claim 1 of the application. Here, an antenna switch is provided for tuning the receiver either to a frequency for receiving communication signals or to a frequency for receiving GPS signals. The switching arrangement does not influence the transmission channel. Transmission of data via the communication antenna may be performed at any time, even if the system is switched to receive data via the GPS antenna, thus blocking reception of data via the communication antenna. However, even despite this functionality, D1 consistently stipulates that when the receiver is tuned to the GPS frequency, the GPS positioning procedure (the calculation of the pseudoranges) is completed before any further communication transmission is performed.

2.3 It was common ground that the invention set out in claim 1 is distinguished from the disclosure of D1 in that:

- i) the GPS position location is performed in a CDMA system
- ii) the subscriber unit transmits frames to the base station during the position location procedure, after signal samples have been collected from the satellites but before the pseudo-ranges have been calculated.

2.4 Having regard to the first of these differences, the Board considers that the reference to CDMA merely defines the operational context in which the method is performed and as such, does not serve to impart any

inventive subject matter to the method defined in claim 1. CDMA is a channel access scheme used in digital communications which enables multiple users to simultaneously transmit over a single communication channel. Even at the priority date of the application, CDMA was well established. No inventive step can therefore be seen in running the system of D1 in a CDMA-operated communication system.

- 2.5 Turning now to the second of these differences, the Board firstly notes that one of the constraints of CDMA is that synchronisation between the transmitter and receiver is not instantaneous and requires a certain amount of time to initiate. When a broken connection is reinstated, this takes longer than in an analog communication system since resynchronisation involves a considerable delay.

The technical effect of the second distinguishing feature is that the synchronisation on the uplink is maintained during the time period in which the pseudoranges are being calculated. This has the consequence that when the communication channel is reconnected after the receipt and processing of the GPS signals, the time required for resynchronisation is shorter since only the downlink has to be resynchronised.

The objective technical problem may therefore be seen as the modification of the method of D1 such that, when operated under CDMA conditions, the time necessary to re-establish the communication link once the receiver is retuned to the communication mode is minimised.

2.6 As noted above, the communications system involved in the method of claim 1 includes a receiver channel which operates such that signals are received either via the communication antenna or via the GPS antenna. This is apparent from the operational features of claim 1 in which after receiving a position location request during a communication mode, the receiver is tuned away from the communication mode to the GPS position location mode. The receiver is tuned back to the communication mode when the pseudo ranges have been determined.

The sharing of receiver circuitry has the consequence that the communication downlink has to be severed when the GPS signal is being received and that this communication downlink therefore has to be re-established once the GPS signals have been received.

The present invention as set out in claim 1 is based on the recognition that in such a system, severing the communication downlink does not necessarily entail severing the communication uplink. This is of particular significance in a CDMA system where reconnection can be somewhat time-consuming due to the necessary re-synchronisation. The invention involves taking active measures to ensure that the uplink is maintained despite the fact that the communication downlink is severed. This is achieved by transmitting frames - if necessary, null frames - to the base station during the interval in which the pseudo-ranges are being calculated and in which the downlink is severed. When the communication receiver is reconnected, the time required for complete

reconnection is therefore minimised since at least the uplink connection has been preserved.

- 2.7 The examining division held that the maintenance of synchronisation is a high priority in CDMA operation. Thus, when performing the method of D1 in a CDMA environment, the skilled person would strive to preserve synchronisation where possible and would thus attempt to keep the uplink open by regular data transmission, if necessary of null frames.

In the flow chart of Figure 3 and the corresponding portions of the description, it is clear that the method of D1 involves waiting until all pseudo-ranges are calculated before these are sent to the base station. D1 does not suggest transmission of any sort either whilst the GPS signals are being received or whilst the pseudoranges are being calculated.

The Board is of the opinion that even when operating the system of D1 in a CDMA environment, the skilled person would follow the method steps set out in D1. The Board notes that it would be contrary to the teaching of D1 to transmit the results of the pseudorange calculations as and when they become available, as proposed by the examining division. As pointed out by the appellant, the skilled person would recognise that when performing the method of D1 in a CDMA environment, any attempt to maintain synchronisation would be meaningless since the communication link is intentionally severed. The use of the shared receiver channel means that the communication link must be broken when GPS signals are being received and that resynchronisation will always be necessary on

reconnection. The Board is therefore of the view that the skilled person would accept that the loss of synchronisation and the resulting reconnection delay is a necessary consequence of running the shared channel arrangement of D1 under CDMA operating conditions.

Thus it would appear that the view of the examining division was based on a hindsight appreciation of the problem. Starting from D1 and accepting that resynchronisation will be necessary in the shared receiver arrangement disclosed therein, it cannot be considered as obvious to attempt to maintain any synchronisation on this channel.

- 2.8 In the decision of the examining division, the objective technical problem was formulated as selecting the time point at which to transfer the pseudoranges. It was argued that the time at which information was transmitted to the base station of D1 was simply a matter of choice for the skilled person and that, if the skilled person considered it more convenient, the pseudo-ranges would be transmitted in a piece-meal fashion as soon as each one was calculated.

As noted above, the clear teaching of D1 is that the pseudoranges are determined for all satellites and only then are the results transmitted back to the base station. There is no apparent reason, without the benefit of hindsight, why the skilled person would depart from this teaching.

- 2.9 In summary, what the inventor of the present application has recognised is that since the uplink channel is not severed, then at least this much can be

kept synchronised. The time required for re-synchronisation of the entire communications channel is therefore reduced since only re-synchronisation of the downlink is necessary. Starting from the teaching of D1 this would not have been obvious for the reasons given above. The subject matter of claim 1 involves an inventive step (Article 56 EPC).

3. Since announcing the decision, the Board has become aware of two clerical errors in claim 1 of the appellant's request. Specifically, "*the set of satellites*" (with a definite article) is referred to in claim 1 before "*a set of satellites*" (with an indefinite article). The Board is not entitled, in the absence of any request for correction, to modify *ex officio* the wording of claim 1. Should the appellant request correction of these two errors under Rule 139 EPC and only insofar as any such request is restricted to the correction of these errors, it will be up to the examining division to decide on the allowability of the request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent on the basis of claims 1 to 9 filed in the oral proceedings as main request, with the description and drawings to be adapted.

The Registrar:

The Chairman:

R. Schumacher

B. Schachenmann