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**Datasheet for the decision
of 22 March 2012**

Case Number: T 0712/08 - 3.4.01

Application Number: 04778100.0

Publication Number: 1682918

IPC: G01S 1/00, G01S 5/00, G01S 5/14

Language of the proceedings: EN

Title of invention:
Aided location communication system

Applicant:
SiRF Technology, Inc.

Opponent:
-

Headword:
-

Relevant legal provisions (EPC 1973):
EPC Art. 54, 56

Keyword:
"Novelty (no - fourth auxiliary request)"
"Inventive step (no - main request, auxiliary requests 1-3)"

Decisions cited:
-

Catchword:
-



Case Number: T 0712/08 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 22 March 2012

Appellant:
(Applicant)

SiRF Technology, Inc.
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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 26 November 2007
refusing European patent application
No. 04778100.0 pursuant to Article 97(1) EPC
1973.

Composition of the Board:

Chairman: G. Assi
Members: P. Fontenay
M. J. Vogel

Summary of Facts and Submissions

- I. European patent application No. 04 778 100.0 was refused by a decision of the examining division dispatched on 26 November 2007.
- II. In its decision, the examining division held that the subject-matter of independent claims 1, 2 and 56 of the main request and first auxiliary request lacked inventive step. The examining division relied on a combination of document US-B-6389291 (D1), considered to illustrate the closest prior art, with either document GB-A-2271486 (D3) or common general knowledge in the field of the invention to justify its objection. The examining division further held that independent claims 1, 2 and 56 of the second auxiliary request, in which the feature of a reverse aiding mode had been replaced by features relating to a selective switching between an augmented autonomous mode and another position determining mode, lacked novelty in view of document D1.
- III. By letter dated 25 January 2008 the appellant (applicant) lodged an appeal against this decision and paid the prescribed appeal fee on the same day. The statement setting out the grounds of appeal was filed on 4 April 2008.

The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of various sets of claims according to a main or first to fourth auxiliary requests, i.e. on the basis of following sets of claims:

Main request:

Claims 1-81 filed as main request with a letter dated
15 October 2007;

First auxiliary request:

Claims 1-78 filed as first auxiliary request with the
letter of 15 October 2007;

Second auxiliary request:

Claims 1-3 filed with the grounds of appeal, as second
auxiliary request;

Third auxiliary request:

Claims 1-3 filed with the grounds of appeal, as third
auxiliary request;

Fourth auxiliary request:

Claims 1-78 filed as second auxiliary request with the
letter of 15 October 2007.

- IV. In case the Board did not intend to grant the main request, the appellant requested oral proceedings.

On 28 December 2011, summons to attend oral proceedings were issued. In a communication pursuant to Article 15(1) Rules of Procedure of the Boards of Appeal (RPBA) annexed to the summons, the Board expressed its provisional opinion with regard to the requests then on file. Concerning the main, first and fourth auxiliary requests, the Board appeared to share the analysis developed by the examining division in their decision with regard to, respectively, the main, first and second auxiliary requests then pending. Referring to the main request and first auxiliary

request, the Board was, in particular, not convinced by the arguments put forward by the appellant according to which the skilled person would not have considered document D3 since it did not address the problem of the invention of improving the communication between a basestation and moving Aided Location Communication Devices "ALCDs" within one cell. In the appellant's view, document D3 specifically addressed the problem of "hand-off" errors of mobile units between different cells. Concerning the fourth auxiliary request, the Board appeared to concur with the examining division in its finding that the subject-matter of independent claims 1, 2 and 56 lacked novelty since the claims' wording did not permit to distinguish between the "augmented-autonomous mode" of the claimed invention and the homonymous mode described in document D1.

With regard to the first, second and third auxiliary requests, the Board observed that the additional limitations concerning various functionalities of the basestation in the definition of the ALCD in claim 2 of these requests had actually no bearing on the ALCD as such. Consequently, these amendments did not affect the conclusion of lack of inventive step to be reached with regard to claim 2 of the main request. Moreover, in the Board's view, the objection of lack of inventive step would have also applied to independent claims 1 and 3 of these requests. Concerning, more specifically, claim 1 of the first auxiliary request, the Board noted that the additional limitation recited therein appeared to be known from document D3.

V. Oral proceedings before the Board took place on 22 March 2012. As previously announced in a letter of

17 February 2012, the appellant did not attend the oral proceedings and was also not represented.

VI. Claim 1 of the main request reads:

*"1. An Aided Location Communication System ("ALCS") (100, 300, 400), comprising:
a geolocation server (418); and
an Aided Location Communication Device ("ALCD") (102, 302) including
a communication section (200) in signal communication with the geolocation server (418) via a wireless communications network (104), the wireless network (104) comprising a basestation (106), and
a position-determination section (202) adapted for determining the position of the ALCD (102, 302), wherein the position-determination section (202) is capable of selectively switching between
a first position-determination mode for determining a geolocation of the ALCD (102, 302) and
a second position-determination mode for determining the geolocation of the ALCD (102, 302), wherein the second position-determination mode is a reverse aiding mode and the position-determination section (202) is adapted to transmit location information, heading information, and velocity information to the basestation (106), and
wherein the basestation (106) is adapted to direct an antenna beam towards the ALCD (102, 302) in response to the location information, heading information, and velocity information."*

Independent claim 2 of the main request defines an Aided Location Communication Device ("ALCD").

Independent claim 56 of the main request is directed to the corresponding method for determining the geolocation of an ALCD within an ALCS. The claims 3 to 55 and 57 to 81 are dependent claims.

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the following feature has been added at the end of the claim: *"wherein the basestation (106) is adapted to direct multiple antenna beams in response to the location information, heading information, and velocity information utilizing space-domain multiplexing ("SDM")"*. Similar amendments have been made in independent claims 2 and 56 with regard to the corresponding claims of the first auxiliary request. Concretely, claim 2 of the first auxiliary request differs from claim 2 of the main request in that it is further specified at the end of the claim that the *"basestation (106) is capable of directing multiple antenna beams in response to the location information, heading information, and velocity information utilizing space-domain multiplexing ("SDM")"*. Claims 3 to 55 and 57-78 of the first auxiliary request are dependent claims.

Claim 1 of the second auxiliary request refers to a basestation in an Aided Location Communication System ("ALCS").

Claim 2 of the second auxiliary request refers to an Aided Location Communication Device ("ALCD") and reads:

"2. An Aided Location Communication Device ("ALCD") (102, 302), the ALCD comprising:

a communication section (200) for communication with a wireless communications network (104), the wireless network (104) comprising a basestation (106), and

a position-determination section (202) adapted for determining the position of the ALCD (102, 302), wherein the position-determination section is capable of selectively switching between

a first position-determination mode and a second position-determination mode for determining a geolocation of the ALCD (102, 302),

the second position-determination mode being a reverse aiding mode wherein the position-determination section (202) is adapted to transmit location information, heading information, and velocity information to the basestation (106) such that the basestation (106) is capable of directing an antenna beam of narrower bandwidth relative to an undirected antenna beam towards the ALCD (102, 302) in response to the location information, heading information, and velocity information, and wherein the basestation (106) is capable of directing multiple antenna beams in response to the location information, heading information, and velocity information utilizing space-domain multiplexing ("SDM")."

Independent method claim 3 of the second auxiliary request refers to the corresponding method for determining the geolocation of an ALCD within an ALCS.

Claim 1 of the third auxiliary request refers to a basestation in an Aided Location Communication System ("ALCS") wherein, in particular, the basestation is adapted to direct multiple antenna beams towards

multiple ALCDs in response to the location information, heading information, and velocity information, obtained from an ALCD, utilizing space-domain multiplexing ("SDM") to isolate the multiple transmissions to the ALCDs thereby increasing the transmission frequency capacity of the basestation, and to vary the transmission power of the basestation (106) based on the motion of the ALCDs for reducing the same.

Independent claim 2 of the third auxiliary request refers to an ALCD. It reads:

"2. An Aided Location Communication Device ("ALCD") (102, 302), the ALCD comprising:

a communication section (200) for communication with a wireless communications network (104), the wireless network (104) comprising a basestation (106), and

a position-determination section (202) adapted for determining the position of the ALCD (102, 302), wherein the position-determination section is capable of selectively switching between

a first position-determination mode and a second position-determination mode for determining a geolocation of the ALCD (102, 302),

the second position-determination mode being a reverse aiding mode wherein the position-determination section (202) is adapted to transmit location information, heading information, and velocity information to the basestation (106) such that the basestation (106) is capable of directing multiple antenna beams towards multiple ALCDs (102, 302) in response to the location information, heading information, and velocity information utilizing space-

domain multiplexing ("SDM") to isolate the multiple transmissions to the ALCDs (102, 302), thereby increasing the transmission frequency capacity of the basestation (106), and to vary the transmission power of the basestation (106) based on the motion of the ALCDs for reducing the same."

Independent claim 3 of the third auxiliary request defines a method for determining the geolocation of an ALCD within an ALCS and reproduces similar amendments with regard to the corresponding claim of the second auxiliary request.

Claim 1 of the fourth auxiliary request differs from claim 1 of the main request in that the two last "wherein" clauses in the claim have been replaced by following wording: *"wherein the second position-determination mode is an augmented-autonomous mode and wherein the position-determination section (202) is capable of selectively switching between the first position-determination mode and second position-determination mode in response to occurrence of a predetermined event"*. Independent claims 2 and 56 of the fourth auxiliary request have been similarly amended with regard to the corresponding claims of the main request. Claims 3 to 55 and 57 to 78 of the fourth auxiliary request are dependent claims.

VII. This decision is issued after the entry into force of the EPC 2000 on 13 December 2007. Reference is thus made to the relevant transitional provisions for the amended and new provisions of the EPC, from which it may be derived which Articles of the EPC 1973 are still applicable to the present application and which

Articles of the EPC 2000 are to apply. When Articles or Rules of the former version of the EPC are cited, their citations are followed by the indication "1973".

Reasons for the Decision

1. The appeal and the corresponding statement of grounds comply with the requirements of Articles 106 to 108 EPC and Rule 99 EPC. The appeal is, thus, admissible.

2. *Main request*

2.1 In the appellant's view, the ALCS of claim 1 of the main request differed from the system according to D1 in that the position determination section of the ALCD was adapted to transmit heading information and velocity information in addition to location information to the basestation of the wireless network, the basestation being adapted to direct an antenna beam towards the ALCD in response to this information.

In the following the terminology of the present application as published is used when referring to the disclosure of a prior art document, for ease of comparison.

However, contrary to the view expressed by the appellant, the Board notes that D1 (column 11, lines 40-47, this citation corresponding to page 39, paragraph [0109] of the present application) discloses that the position determination section of the ALCD is also adapted to transmit "*velocity information*" to the basestation of the wireless network. If the expression

"velocity information" is understood in a restrictive way as concerning the scalar value of the velocity only (i.e. without any information as to its actual direction), the claimed ALCS and the system of D1 would simply differ in that the position-determination section of the ALCD is adapted to transmit heading information (in addition to location information and velocity information) to the basestation, the basestation being adapted to direct an antenna beam towards the ALCD in response to the heading information in addition to location information and velocity information.

The appellant submitted that the basestation in the claimed ALCS knew the effective location of the ALCD at a given time in view of the location information transmitted by the ALCD and, moreover, could estimate the location at a future time in view of the heading information and the velocity information also transmitted by the ALCD. The result would then be that the basestation directing a beam towards the ALCD could effectively and reliably communicate with a moving ALCD even if the width of the transmitted beam was narrow. Moreover, the ALCD needed to transmit the information less frequently.

Starting from the system according to D1 and considering the effects mentioned above, the Board holds that the problem to be solved may be seen in improving the system according to document D1 with regard to effectiveness and reliability of the basestation beam steering.

2.2 In the appellant's view, D3 concerned a cellular communications system employing GPS positioning. However, it did not deal with the problem of improving the communication between basestations and moving ALCDs within a cell, but rather with the problem of incorrect hand-off of ALCDs between different cells of the cellular communications system. For this reason, in the appellant's submissions, the skilled person would not consult D3 in order to improve the system of D1.

The Board is, however, not convinced by this analysis. It is observed, in this respect, that D3 (claim 1; Figures 1 and 2) discloses a cellular communication system using GPS information. More specifically, the system comprises basestations coupled to a controller and a plurality of ALCDs, each including a communication section in signal communication with a basestation and a GPS position determination section. Location information periodically derived from GPS satellites transmissions is used by the ALCDs to infer vector velocity information, i.e. velocity (amplitude) and heading (page 11, lines 11-15). Moreover, contrary to the view expressed by the appellant, document D3 does not only address problems relating to "hand-off" errors but also, more generally, issues related to frequency reuse in a cell and basestation antenna beam steering (page 14, lines 26-36; page 15, lines 14-22), these issues being discussed in the present application too (paragraphs [083]-[089] and [099]). With particular regard to basestation antenna beam steering, D3 (page 15, lines 20-22) discloses that precise knowledge of ALCD location, velocity and heading allows for mitigation of beam steering decision errors.

It thus appears that the technical field of the present application of multi-mode GPS receivers for use with wireless networks (paragraph [005]) does not fundamentally differ from the field of cellular communication systems employing GPS positioning to which document D3 pertains. As a matter of fact, the two technical fields merely differ by the kind of service for which the systems are primarily conceived (GPS positioning versus wireless communication) but, *de facto* incorporate the same functionalities and share accordingly similar problems such as those associated with the reuse of frequencies in a cell or with beam steering at the basestation. For these reasons, the Board holds that document D3 represents prior art pertaining to a field that would indeed be considered by the skilled person when looking for a solution to the problems of effectiveness and reliability associated with beam steering.

- 2.3 As already stated, it can be inferred from D3 (page 15, lines 20-22) that problems associated with beam steering may be reduced if the ALCD location, velocity and heading are transmitted by the ALCD to the basestation.

Hence, the Board concurs with the conclusion of the examining division in the decision under appeal (cf. point II.1 of the impugned decision) that the subject-matter of claim 1 of the main request lacks inventive step (Article 56 EPC 1973) with regard to the disclosure of D1 and D3.

- 2.4 Therefore, the main request is not allowable.

3. *Auxiliary requests*

3.1 *First auxiliary request - "ALCS"*

3.1.1 Claim 1 of the first auxiliary request refers to an ALCS. It differs from claim 1 of the main request in that the basestation in the ALCS is adapted to direct multiple antenna beams in response to location information, heading information and velocity information utilizing space domain multiplexing (SDM).

This additional limitation does not, however, affect the analysis developed above in relation with claim 1 of the main request. As shown above under point 2, the transmission of heading information in order to improve the communication between basestation and moving ALCDs within a cell cannot as such justify an inventive step. Concerning the additional limitation recited in claim 1, the Board notes that it actually refers to a functionality of the basestation commonly associated with phased array technology and, for example, known from the systems of both documents D1 and D3. Particular reference is made, in this respect to column 10, lines 45-65, in D1, according to which phased array technology is used *"to beam steer or beam form a shaped transmission beam that is centered upon each mobile user"* which thus helps to *"increase the capacity of wireless communications system basestations"*. Similarly, document D3 (Figure 2) discloses that the basestation in a given cell comprises a transceiver for transmitting and receiving signals to and from ALCDs. In addition, the basestation in D3 may also administer control, when required, of a subset of ALCDs located in an adjacent cell (cf. D3,

claim 6). It may also comprise tracking means for beam steering the antenna (page 7, line 30 - page 8, line 10; page 15, lines 14-22), thus utilizing space domain multiplexing.

Therefore, D1 as well as D3 disclose the additional limitation recited in claim 1 of the first auxiliary request so that the adaptation of the system of D1 in the light of the teaching of document D3 will indeed lead to a system reproducing this feature. For this reason, the subject-matter of claim 1 of the first auxiliary request is not inventive for the reasons set forth above under point 2.

3.1.2 It follows that the subject-matter of claim 1 of the first auxiliary request is not inventive in the sense of Article 56 EPC 1973. Therefore, the first auxiliary request is not allowable.

3.2 *Second and third auxiliary requests - "ALCD"*

3.2.1 The ALCD defined in claim 2 of the second and third auxiliary request differs from the ALCD disclosed in document D1 in that the position-determination section of the ALCD is adapted to transmit heading information (in addition to location information and velocity information) to the basestation (cf. point 2.1 above).

It is observed, in this respect, that the indication in claim 2 of the second auxiliary request according to which the position-determination section is adapted to transmit this information to the basestation such that *"the basestation is capable of directing an antenna beam of narrower bandwidth relative to an undirected*

antenna beam towards the ALCD in response to the location information, heading information and velocity information, and wherein the basestation is capable of directing multiple antenna beams in response to the location information, heading information, and velocity information utilizing space-domain multiplexing ("SDM") does not define any additional structural or functional limitation of the ALCD, as such. Similarly, the indication in claim 2 of the third auxiliary request according to which the position-determination section is adapted to transmit location information, heading information and velocity information to the basestation such that *"the basestation is capable of directing multiple antenna beams towards multiple ALCDs in response to the location information, heading information, and velocity information utilizing space-domain multiplexing ("SDM") to isolate the multiple transmissions to the ALCDs, thereby increasing the transmission frequency capacity of the basestation, and to vary the transmission power of the basestation based on the motion of the ALCDs for reducing the same"* does not concern the ALCD, as such, but another component of the ALCS which is external thereto, namely the basestation. As a matter of fact, these indications reflect functionalities of the sole basestation without any bearing on the claimed ALCD.

For these reasons, the conclusion reached above with regard to claim 1 of the main request according to which the skilled person would arrive in a straightforward manner at a system in which heading information would also be transmitted, in addition to location and velocity information, from the ALCD to the basestation implies that the ALCD, which constitutes a

part of said system, would be adapted accordingly. The position-determination section of the ALCD would therefore be modified so as to transmit heading information (in addition to location information and velocity information) to the basestation.

Consequently, the ALCD of claim 2 of the second and third auxiliary requests is not inventive in the sense of Article 56 EPC 1973.

3.2.2 The second and third auxiliary requests are thus not allowable.

3.3 *Fourth auxiliary request*

Claim 1 of the fourth auxiliary request differs from claim 1 of the main request in that the last feature of the former, concerning the augmented autonomous mode and selective switching, replaces the last two features of the latter, concerning the reverse aiding mode and the information transmitted by the ALCD.

The appellant acknowledges that D1 discloses an ALCS comprising a geolocation server and an ALCD, the ALCD including a communication section for communication with the geolocation server via a wireless network comprising a basestation and a position determination section capable of switching between a first position determination mode and a second position determination mode (cf. grounds of appeal, point II.1, first paragraph).

The Board concurs with the examining division in their finding that the so-called augmented autonomous mode is

also known from document D1 (column 8, lines 47-60). Moreover, according to D1 (column 9, lines 13-15) the position determination section allows selection of a particular position determination mode depending on the circumstances, in other words "*in response to occurrence of a predetermined event*" as recited in claim 1 of the fourth auxiliary request.

The appellant contested this analysis of the examining division and stressed that the claim's wording had to be interpreted in the light of the description. In this respect, the appellant submitted that the augmented autonomous mode according to the present application relied on the use of GPS re-radiators. Consequently, the augmented autonomous mode known from D1, which did not disclose any such GPS re-radiators could not be equated with the augmented autonomous mode according to claim 1 of the fourth auxiliary request.

This argument does not, however, convince the Board. As a general principle, claims in a patent application must be clear per se. In the present case, the feature concerning GPS re-radiators is not specified in claim 1, as the examining division already stated in the decision under appeal (cf. point II.3 of the impugned decision). The claim is, therefore, not limited by this feature. It is, in particular, observed that the passage of the description referring to the augmented autonomous mode does not specify that the presence of GPS re-radiators is indeed inherent to the definition of said mode but merely suggest that examples of implementations of ALCS incorporating said mode may include GPS re-radiators.

Hence, the Board shares the view of the examining division in the decision under appeal that the subject-matter of claim 1 of the fourth auxiliary request lacks novelty (Article 54 EPC 1973) with regard to document D1. The same findings would apply *mutatis mutandis* to independent claims 2 and 56 of the fourth auxiliary request.

Therefore, the fourth auxiliary request is not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

R. Schumacher

G. Assi