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D E C I S I O N
of 14 May 2003

Case Number: T 0572/00 - 3.5.1

Application Number: 97310201.5

Publication Number: 0853245

IPC: G01S 13/82, G06K 7/10

Language of the proceedings: EN

Title of invention:
Modulated backscatter sensor system

Applicant:
LUCENT TECHNOLOGIES INC.

Opponent:
-

Headword:
Backscatter system/LUCENT

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0572/00 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 14 May 2003

Appellant: LUCENT TECHNOLOGIES INC.
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Representative: Buckley, Christopher Simon Thirsk
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 25 January 2000 refusing European patent application No. 97 310 201.5 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: S. V. Steinbrener
Members: A. S. Clelland
H. Preglau

Summary of Facts and Submissions

I. This is an appeal against the decision of the examining division to refuse European application No. 97 310 201.5 (EP-A-0 853 245) on the ground that the claims lacked an inventive step. The decision was based on the following documents:

D1: EP-A-0 750 200

D3: Record of the 1993 IEEE National Radar Conference, Lynnfield, MA, USA, 20-22 April 1993, ISBN 0-7803-0934-0, Pages 186 to 191, Williamson et al: "A coded radar reflector for remote identification of personnel and vehicles".

II. The examining division argued that D1 represented the closest prior art. It was argued that the claimed transponder system only differed from that disclosed in D1 in that the subcarrier demodulator analysed the received subcarrier signal to measure the motion of the transponder; the skilled person would however be aware from D3 that the movement of a modulated reflector badge could be detected by measuring the frequency offset of modulation sidebands. Since in the context "sidebands" were synonymous with "subcarrier", it would be obvious for the skilled person starting out from the modulated backscatter system known from D1 to use the Doppler measurement technique of D3 to arrive at the claimed subject-matter.

III. The applicant (appellant) filed an appeal and argued that neither D1 nor D3 suggested analysing a subcarrier signal to measure the motion of a transponder. In particular, in D3 the frequency offset of the carrier,

not that of the sidebands, was measured in order to set the offset of narrow-band filters for demodulating the sidebands. The information in the sidebands was used only to determine the transponder ID and not to analyse its motion.

IV. In a communication from the Board a document was cited as representing the common general knowledge in the radar art:

D7: RADAR HANDBOOK, ed M. Skolnik, New York, 1990, ISBN 0-07-057913-X, pages 14.16 and 14.17

It was argued that these pages showed that the problem of measuring Doppler motion in signals close to clutter could be solved by measuring the Doppler frequency as far away as possible from baseband.

V. Claim 1 as received on 30 November 1999 reads as follows:

"A modulated backscatter system, comprising:
at least one transponder (105) that receives a first transmitted signal and modulates a reflected first transmitted signal using a subcarrier signal;
at least one interrogator (410) having a transmitter (503) that transmits said first transmitted signal and a receiver that receives said reflected first transmitted signal, said interrogator having a demodulator (507) that obtains a received subcarriersignal from said reflected first transmitted signal, and
CHARACTERIZED BY:
the interrogator having a subcarrier demodulator (509-510) that analyzes said received subcarrier signal to

measure a motion of said transponder."

The Appellant's requests

The appellant has requested that the decision be cancelled in its entirely and a patent granted.

Reasons for the Decision

1. The appeal complies with the requirements mentioned in Rule 65(1) EPC and is admissible.

2. The primary issue to be decided is that of inventive step. It is accepted by the appellant that the single most relevant document is D1, which discloses a transponder system using modulated backscatter. The disclosed system is identical to that of the present application in all respects except that the transponder interrogator does not analyse the received subcarrier signal to measure a motion of the transponder; indeed D1 is from the present applicant and was published a matter of days before the claimed priority date of the application. The appellant acknowledges that the features of the preamble of claim 1 are known from D1. The feature of the characterising part, that the interrogator has a subcarrier demodulator that analyzes said received subcarrier signal to measure a motion of the transponder, is as noted above not known from D1, so that the subject-matter of claim 1 is novel.

3. In the Board's view the objective problem to be solved is the implementation of motion detection in the modulated backscatter system known from D1. Since D1 acknowledges that "Radio Frequency Identification

(RFID) systems are used for identification and/or tracking of equipment inventory, or living things" (see D1 at column 1, lines 11 to 13) no contribution to inventive step can be seen in posing the problem. Hence, the assessment of inventive step comes down to the question of whether the skilled person, starting out from D1 and desiring to measure motion, would find it obvious to analyse the received subcarrier signal.

4. The Board has considered this question in the light of the teaching of D7, rather than D3 as cited by the examining division. D7 is one of the best-known textbooks in the radar field. At pages 14.16 and 14.17 it deals with the problem of detecting Doppler signals in clutter and explains the problems which arise when detecting at baseband. Two solutions are offered, the first being "a subcarrier band for the doppler intelligence which does not extend to dc but is centred at a frequency where either quartz or electromechanical filters have sufficient Q's to permit sharp filtering". The skilled person is accordingly invited to use a subcarrier for aiding Doppler detection; given the widespread distribution of this textbook the Board takes the view that its teaching was common general knowledge in the radar art at the claimed priority date.

5. Thus, given the disclosure of D7 and the presence of a subcarrier in the D1 system, it appears to the Board that the skilled person would have found it obvious to solve the problem of measuring a motion of the transponder in the system of D1 by analysing the received subcarrier signal rather than the baseband signal. The subject-matter of claim 1 accordingly lacks an inventive step.

6. The appellant argued that the subcarrier band mentioned in D7 related to a frequency band at which to perform filtering and not a subcarrier signal. However, the reference to a subcarrier implies the existence of a subcarrier signal. The sidebands produced by an amplitude modulated backscatter transponder constitute subcarriers providing exactly the characteristic suggested as desirable by D7. The skilled person, invited to implement the kind of filtering seen as advantageous in D7 in the context of the D1 system, would without the exercise of invention make use of the existing sidebands.

7. The impugned decision cites D3 and notes that D3 discloses modulation sidebands which are Doppler shifted. The appellant in the statement of grounds of appeal argued that D3 was not relevant because speed measurement was undertaken at baseband. The Board agrees and observes that D3 is concerned with the specific problem of distinguishing between transponder tag carriers and non-carriers, whether personnel or vehicles. Although vehicle speed is also to be measured there is no clear teaching that this is done by measuring the subcarrier Doppler shift; indeed, the primary reason for measuring Doppler shift is to enable narrow-band filters to be adjusted to maximise ID code recovery. Although it can be argued that since D3 draws attention to the existence of a Doppler shift in the sidebands, no invention is involved in measuring Doppler shift by using them rather than the carrier, in view of the Board's conclusion at paragraph 5 above it has not been necessary to consider this matter further.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl S. V. Steinbrener