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D E C I S I O N
of 13 December 2001

Case Number: T 0880/99 - 3.5.1

Application Number: 97310160.3

Publication Number: 0851599

IPC: H04B 1/59

Language of the proceedings: EN

Title of invention:

Inexpensive modulated backscatter reflector

Applicant:

LUCENT TECHNOLOGIES INC.

Opponent:

-

Headword:

Backscatter modulator/LUCENT TECHNOLOGIES

Relevant legal provisions:

EPC Art. 52(1), 56

Keyword:

"Inventive step (yes) - amended claims"

Decisions cited:

-

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0880/99 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 13 December 2001

Appellant: LUCENT TECHNOLOGIES INC.
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New Jersey 07974-0636 (US)

Representative: Buckley, Christopher Simon Thirsk
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 28 May 1999
refusing European patent application
No. 97 310 160.3 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: S. V. Steinbrener
Members: R. Randes
S. C. Perryman

Summary of Facts and Submissions

I. This as an appeal against the decision by the Examining Division to refuse European patent application 97 310 160.3 because the independent claims lacked inventive step in view of the following document:

D1: GB-A-2 202 415.

II. As a result of correspondence with the Board the Appellant (Applicant) requested grant of a patent on the basis of the following documents:

Claims: 1 to 7, received 20 July 2001

Description: pages 1 and 5, received 20 July 2001
pages 2 and 8, as originally filed
pages 3, 4, 6 and 7, received 24
December 1998
page 3a, received 14 February 2001

Figures: sheets 1/6 to 6/6, as originally filed.

III. Claim 1, the only independent claim, reads as follows:

"1. A tag for a radio frequency identification communication system using modulated backscatter, where the tag has an antenna (201) of a certain reflectivity, the tag comprising

a data storage device (203) containing information;

a CMOS gate (202) electrically connected to the data storage device allowing the CMOS gate to receive the information; and

a power module (204) for generating a supply voltage for the tag from the illuminating RF signal received by the antenna; and wherein

the antenna (201) is electrically connected to the CMOS gate such that the CMOS gate modulates the reflectivity of the antenna in accordance with the received information."

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*

Claim 1 has been restricted with respect to claim 1 as originally filed by restricting the "variable impedance device" to a CMOS gate and by adding the feature of the "power module (204) for generating a supply voltage for the tag from the illuminating RF signal received by the antenna", this latter feature having been added during appeal proceedings before the Board. Figure 2, original claim 2 and column 4, lines 27 to 30 of the published application provide a basis for these amendments.

Dependent claims 2 to 6 derive from originally filed claims 3 to 7. The features of dependent claim 7 are derivable from Figure 2 and column 3, lines 32 to 35.

The Board is consequently satisfied that the amendments to the claims comply with Article 123(2) EPC and that the claims are clear, concise and supported by the description, as required by Article 84 EPC.

3. *Novelty*

D1 forms the closest prior art, the subject matter of claim 1 differing from the disclosure of D1 (see Figure 2) in:

- i. the reflectivity of the antenna being modulated by a CMOS gate (in D1 variable capacitance diodes 21 are used), and
- ii. a power module for generating a supply voltage for the tag from the illuminating RF signal received by the antenna (in D1 the tag is battery operated; see page 4, lines 9 to 16).

The subject matter of claim 1 is consequently novel.

4. *Inventive step*

The technical problem solved by the above differences with respect to the closest prior art may be seen in providing an inexpensive tag design having reduced power requirements. Even if this problem were considered to be conventional, in the Board's view the claimed solution is not obvious from the available prior art.

Regarding the first technical difference, none of the documents on file mentions the use of a CMOS gate as a variable impedance device. Hence it appears that the use of an inexpensive CMOS gate, which usually forms part of logic circuitry, in the different technical field of RF (radio frequency) circuit design is, as argued by the appellant, unexpected and conflicts with standard practice. Although CMOS devices were known to offer low power consumption there is no evidence that they could be used as variable impedance devices.

The second technical difference is linked to the first in that the use of a CMOS gate as a variable impedance device reduces the power consumption of the tag sufficiently to allow the tag to be RF-powered for short-range applications; see column 4, lines 33 to 39 and column 5, line 56 to column 6, line 6 of the published application. Furthermore, as has been asserted by the appellant and accepted by the Board, a CMOS gate exhibits stable operation over a fairly wide range of power supply voltages and thus is specifically suited for use with fluctuating RF signals as a power source.

It was of course known to power a tag from the illuminating RF signal; see D2 (WO-A-89/05549), page 8, lines 13 to 15, which was cited in the European Search Report. There would however be no incentive to combine D1 and D2, since the comparatively high power consumption of the variable capacitance diodes used in D1 requires that the tag be battery powered. Only once the power consumption of the tag has been reduced by using a CMOS gate as a variable impedance device in accordance with the claimed invention does the RF-powered approach become feasible.

Hence the skilled person would not arrive at the invention in an obvious manner.

5. The Board concludes that - having regard to the prior art identified - the subject-matter of claim 1 involves an inventive step, Articles 52(1) and 56 EPC.

6. *Remittal*

The adaption of the description to the amended claims

needs further consideration (see, for example, page 5, line 24). Furthermore, the Board wishes to draw attention to two apparently desirable amendments in the description on page 7. At line 23 the amended clock frequency of 27.84 kHz appears to contradict the value of 27.84 MHz indicated in Figure 8. At line 25 the amended clock frequency of 870 kHz appears to contradict the value of 870 Hz given in Figure 8.

For completion of examination and correction of these deficiencies the Board remits the case to the first instance, Article 111(1) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examination Division for further prosecution on the basis of the claims received on 20 July 2001.

The Registrar:

The Chairman:

M. Kiehl

S. V. Steinbrener