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Datasheet for the decision of 6 July 2006

Case Number: T 0904/03 - 3.4.01

Application Number: 01309271.3

Publication Number: 1251587

IPC: H01Q 9/04

Language of the proceedings: EN

Title of invention:
Broadband antenna structure

Applicant:
LUCENT TECHNOLOGIES INC.

Opponent:
-

Headword:
Broadband antenna structure

Relevant legal provisions:
EPC Art. 54(1)(2)
RPBA Art. 11(3)

Keyword:
"No cancellation of oral proceedings in order to continue the procedure in writing"
"Novelty (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0904/03 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 6 July 2006

Appellant: LUCENT TECHNOLOGIES INC.
600 Mountain Avenue
Murray Hill, New Jersey 07974-0636 (US)

Representative: Sarup, David Alexander
Lucent Technologies EUR-IP UK Ltd
Unit 18, Core 3
Workzone
Innova Business Park
Electric Avenue
Enfield, EN3 7XU (GB)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 2 April 2003 refusing European application No. 01309271.3 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: B. Schachenmann
Members: H. Wolfrum
G. Assi

Summary of Facts and Submissions

I. European patent application 01 309 271.3 (publication No. 1 251 587) was refused by a decision of the examining division dispatched on 2 April 2003, *inter alia* on the ground of lack of novelty within the meaning of Articles 52(1) and 54(1) and (2) EPC of an antenna structure as defined by claim 1 then on file.

II. The applicant lodged an appeal against the decision and paid the prescribed fee on 29 May 2003. On 1 August 2003 a statement of grounds of appeal was filed together with a set of new claims 1 to 12.

III. On 24 January 2006 the appellant was summoned to oral proceedings to take place on 6 July 2006.

In a communication dated 15 May 2006 the Board gave a preliminary view on the issues to be addressed during the oral proceedings, in particular novelty (Articles 52(1) and 54(1) and (2) EPC) and original disclosure of the amendments made to the claims (Article 123(2) EPC). Reference was made *inter alia* to document

D1 : US-A-5 428 364.

IV. In response the appellant informed the Board by letter of 30 May 2006 that it would not be attending the oral proceedings and requested that the oral proceedings be cancelled and the procedure be continued in writing. No comments were made as to the issues raised by the Board in its communication.

V. Oral proceedings were held on 6 July 2006 in the absence of the appellant.

VI. The appellant had requested in writing that the decision under appeal be set aside and a patent be granted on the basis of claims 1 to 12 filed together with a new page 2A of the description on 1 August 2003.

VII. Claim 1 of the appellant's request reads as follows :

"*1. An antenna structure (100) comprising :*

at least one planar antenna element (110, 130) having a balanced impedance,

an unbalanced impedance (150), and

a transmission network for coupling the at least one element with the unbalanced impedance, characterized in that

the transmission network has a balanced impedance and includes at least one balanced impedance slotline (170, 175, 180, 190) for coupling the at least one planar antenna element with the unbalanced impedance, and

the at least one slotline supports the propagation of a TE_{mn} *mode.*"

Claims 2 to 12 are dependent claims.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. *Procedural matters*

Since the Board was not convinced by the arguments presented by the appellant in its statement of grounds of appeal, the Board had considered it procedurally expedient to summon the appellant to oral proceedings according to Article 116 EPC albeit no respective request had been made.

Notwithstanding the appellant's request for cancellation of the oral proceedings and continuation of the procedure in writing, the Board, in spite of the appellant's absence, deemed it appropriate, in the interest of procedural efficiency, to conduct the oral proceedings and, in exercising its discretion pursuant to Article 11(3) RPBA, to decide the case at the conclusion of the oral proceedings, given the circumstances that the appellant had chosen not to comment on the Board's preliminary view and the case was ready for decision.

3. In view of the outcome of the present appeal, it is not necessary to consider the issue of original disclosure, pursuant Article 123(2) EPC, of the amendments made to the claims on file, which was raised in the Board's communication.

4. *Novelty (Articles 52(1) and 54(1) and (2) EPC*

4.1 Document D1 (see in particular Figures 1 and 3 and the corresponding description) shows a broadband antenna structure which comprises planar antenna elements (*ie* tapered dipole wings 118 and 120 for wideband radiation) symmetrically printed on both the top and bottom planar surfaces, respectively, of a dielectric substrate 112. The antenna elements on each surface are coupled to a coaxial cable 106 via an impedance transition section constituted by a pair of flattened conductors 114 and 116, which form on each surface a narrow conductor slotline 122 designed to match the transmission line impedance from the impedance of the coaxial cable to that of the antenna elements. The coaxial cable is mounted on the substrate by means of an input mounting block 102. The inner lead of the coaxial cable is connected to one of the flattened conductors (*eg* 114) of the slotline and the outer lead of the cable is connected to the second flattened conductor (*eg* 116) forming the slotline (column 4, lines 11 to 15). The specific input circuit design formed by the coaxial cable and the mounting block, with the coaxial conductors being positioned away from the flattened conductors of the slotline and the dipole wings of the antenna element, results in a more balanced input feed line for electromagnetic waves fed to the antenna elements (column 4, lines 23 to 37). As regards the mode of wave propagation, D1 states that "the transition section and the radiating section are essentially Transverse Electromagnetic (TEM) structures" (column 5, lines 59 to 64).

4.2 From the symmetry of the dipole wings 118 and 120 as well as of the flattened conductors 114 and 116 with

respect to axis of the slotline 122 it is immediately apparent to the skilled reader of D1 that the antenna element and associated slotline on each surface both have a balanced impedance. Thus, the Board has no reason to doubt the examining division's finding (cf point 1 of the reasons of the contested decision) that the antenna structure known from D1 comprises at least one antenna element and that the transition section formed by slotline 122 constitutes a transmission network within the meaning of claim 1 under consideration having a balanced impedance and including at least one balanced slotline.

4.3 The appellant's assertion (see page 3 of the statement of grounds of appeal, "Balanced Impedance Transmission Network") that it was reasonable to conclude that mounting block 102 was a conventional coupler or balun so that D1's transmission network did not have a balanced impedance, is at odds with the fact that D1 explicitly refers to a **balanced** feed line and the circumstance that the known antenna structure expressly shows an impedance match over a wide range of frequencies (from 0.5 to 18 GHz as shown in Figure 3) and thus possesses a property which, according to the published application specification (see column 1, line 37 to column 2, line 4), could not be obtained with a transmission network including a conventional balun.

The further submission that D1 clearly described dual slotlines whereas the invention as specified in claim 12 required a "single-slot slotline" (cf the heading "Slotline Transmission Network on page 3 of the statement of grounds of appeal) is immaterial for the

subject-matter of present claim 1, which is not limited to any number of slotlines.

Moreover, the appellant's argument that D1 presented its dual slotline construction as distinguishable from that of a conventional slotline including a ground plane on both sides of the substrate with a single slit cut into the middle of the ground plane on one side of the substrate, whereas Figure 4 of the application showed exactly this conventional form, is not convincing because of the fact that no ground plane on either side of the substrate is shown in Figures 4A and 4B of the present application. Apart from that, claim 1 under consideration does not mention the presence of any ground plane.

4.4 Finally, as regards an alleged difference in the mode of wave propagation, the Board notes that the structure of slotline 122 of an antenna element as shown in D1 comprises a parallel portion which is similar to the slotline structure shown in Figure 4A of the present application. In the Board's understanding, the claimed feature according to which "the at least one slotline supports the propagation of a TE_{mn} mode" is an inherent physical property of the geometrical structure of slotlines as shown in Figure 4 of the present application and Figure 1 of document D1. Hence, contrary to the appellant's assertion the reference in D1 (column 5, lines 62 to 64) to "TEM" structures relates to the tapered portion of the slotline and therefore is irrelevant for novelty of the subject-matter of claim 1.

In its communication of 15 May 2006 the Board confronted the appellant with such a technical understanding of this feature and indicated its doubts as to the appellant's submissions in this respect. However, the appellant abstained from commenting on the Board's view.

4.5 In summary the Board finds that the antenna structure as known from document D1 shows all features specified in claim 1 on file. Consequently, the subject-matter of claim 1 on file lacks novelty with respect to the teaching of document D1.

The appellant's request is therefore not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

S. Sánchez Chiquero B. Schachenmann