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D E C I S I O N
of 29 April 2005

Case Number: T 0915/02 - 3.5.3

Application Number: 95302429.6

Publication Number: 0679044

IPC: H04R 3/00

Language of the proceedings: EN

Title of invention:

Noise-canceling differential microphone assembly

Applicant:

AT&T Corp.

Opponent:

-

Headword:

Noise-cancelling differential microphone assembly/AT&T

Relevant legal provisions:

EPC Art. 113(1), 123(2)

EPC R. 71(2)

Keyword:

"Oral proceedings held in absence of appellant"

"Opportunity to present comments - yes"

"Amendments - added subject-matter (yes)"

Decisions cited:

-

Headnote:

The requirement of Article 113(1) EPC that a decision may only be based on grounds or evidence on which the parties concerned (in this case, the applicant/appellant) have had an opportunity to present their comments is met where oral proceedings, requested by the party, are duly held in the party's absence and the objection (in this case, added subject-matter) is one which given the history of the appeal the board could reasonably have been expected to consider.



Case Number: T 0915/02 - 3.5.3

D E C I S I O N
of the Technical Board of Appeal 3.5.3
of 29 April 2005

Appellant: AT&T Corp.
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New York, NY 10013-2412 (US)

Representative: Williams, David John
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Decision under appeal: Decision of the examining division of the
European Patent Office posted 29 April 2002
refusing European application No. 95302429.6
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. S. Clelland
Members: F. van der Voort
M.-B. Tardo-Dino

Summary of Facts and Submissions

- I. This appeal is against the decision of the examining division to refuse European patent application 95302429.6 (publication number EP 0 679 044 A). The reason given for the refusal was that the subject-matter of claim 1 was not new (Article 54 EPC) having regard to the disclosure of publication US 5 029 215 A (D1).
- II. With the statement of grounds of appeal the appellant filed two claims by way of a main and an auxiliary request, respectively, and submitted arguments in support. Oral proceedings were conditionally requested.
- III. The appellant was summoned by the board to oral proceedings. In a communication accompanying the summons, the board gave the preliminary opinion that claim 1 of each request contravened Articles 84 and 123(2) EPC. Further, it was considered that the subject-matter of claim 1 of each request appeared to lack novelty having regard to the disclosure of D1.
- IV. In response to the board's communication, the appellant filed a new set of claims, replacing both requests on file, and submitted arguments in support. He added that, in the event the board considered claim 1 not allowable, the board was invited to telephone the appellant with a view to discussing the case further.
- V. With fax letter dated 4 April 2005 the board confirmed that the oral proceedings would be held as scheduled.

VI. With fax letter dated 28 April 2005 the appellant informed the board that the applicant would not be represented at the oral proceedings. The appellant requested the board to reach a decision in accordance with the file as it stood.

VII. Oral proceedings were held on 29 April 2005 in the absence of the appellant.

VIII. Present claim 1 reads as follows:

"Apparatus comprising a transducer for converting acoustic signals, emitted by a source (96), to electrical output signals in the presence of acoustic noise, and further comprising a platform (145, 150, 185) for maintaining the transducer at a substantially constant distance from the source; wherein the transducer is adapted to respond to a second spatial derivative of the pressure field associated with at least some acoustic fields,

the transducer comprising:

- a) a microphone assembly (10) comprising two first order differential microphones (30, 32) separated by a distance d and each including a membrane having a substantially perpendicular orientation relative to a straight line drawn between the two microphones, wherein in use:

the microphone assembly is situated within the platform such that the microphones are approximately equidistant from the source, the microphone assembly thereby responding to the source like a first order differential microphone and responding to

acoustic noise like a second-order differential microphone;
the transducer further comprising:
b) differencing means (50) for receiving an electrical output signal from each of the two microphones, and for producing, in response thereto, an electrical difference signal proportional to the difference between the respective microphone output signals."

Reasons for the Decision

1. *Technical background*

Improved noise cancellation can be achieved by making use of a second-order differential (SOD) microphone, i.e. one which senses the second order spatial derivative of the sound pressure field of an acoustic source. This response is achieved by subtracting the output signals of two adjacent first-order differential (FOD) microphones, each including a membrane and measuring the difference in sound pressure at both sides of the membrane. A platform is provided for maintaining the transducer at a constant distance from the source. As illustrated in Fig. 4 of the application, by mounting the FOD-microphones within the platform such that in use they are on the same side of and equidistant from a near-field source, i.e. a speaker's mouth, the FOD-microphones will have the same output signals but of opposite sign. The subsequent subtraction thus results in an addition of the two output signals. The apparatus thereby in effect

responds as a FOD-microphone to the near-field source, i.e. speech, but as a SOD-microphone to far-field sources, such as ambient noise. The apparatus is thereby less sensitive to variations in the distance between the microphone and the speaker's mouth, whereas ambient noise is still effectively suppressed (see the application as published, col. 2, lines 27 to 32 and col. 7, line 46 to col. 8, line 3). Fig. 13 illustrates an embodiment of the apparatus including a platform in the shape of a boom which is part of a helmet or operator's headset.

2. *Amendments*

- 2.1 Claim 1 is based on claim 1 as filed, to which amendments have been made, including the deletion of the feature according to which the two first-order differential microphones are situated within the platform such that, in use, they will be **on the same side of the source** (see col. 10, lines 14 to 17; reference is made to the application as published).
- 2.2 Although the above feature relates to the use of the apparatus, in the board's view it implies constructional features of the platform and the microphones to the extent that these components of the apparatus, including their relative locations, must at least be suitable for the specified use. Without the above feature, the claim covers an embodiment which permits the microphones in use to be **at opposite sides** of the source, e.g. a geometrical arrangement in which the source is situated exactly in between the two microphones. Such an alternative arrangement, which would correspond to the arrangement shown in Fig. 4 if

distance a were equal to zero and which would imply corresponding constructional features of at least the platform, is however not disclosed in the application as filed.

2.3 More specifically, it is noted that in the description at col. 3, lines 24 to 29 it is explicitly stated that in one embodiment the microphones are situated within the platform in such a way that in use they will be on the same side of the source. Further, with respect to the figures, it is noted that Fig. 4 shows a geometrical arrangement of the microphone assembly relative to a point source 96. The distance a is defined as the distance along an axis 98 (referred to as "*major axis*") from source 96 to the midpoint 94 of a line segment 92 (referred to as "*minor axis*") connecting the microphones 30, 32 (see the corresponding passage in the description at col. 6, line 50 to col. 7, line 10). In Fig. 4, a is larger than zero, which also follows from the passage at col. 7, lines 2 to 4: "*Significantly, the angle θ is less than 90° ; i.e., both microphones lie on the same side of the source.*". Further, Figs 11 to 13 each show a platform in which in use the source, i.e. the speaker's mouth, is at a distance from the microphone assembly including the two microphones, which, with reference to Fig. 4, corresponds a microphone arrangement with a being larger than zero.

2.4 The board further notes that claim 12 as filed requires that a point, which is intermediate the two locations where the acoustic pressure field is sensed, is separated from the source along a major axis which is perpendicular to a minor axis along which the two

locations are separated (cf. col. 12, lines 37 and 38, 46 to 51 and 53 to 55). An alternative arrangement in which the two microphones are at opposite sides of the source is thereby excluded, since the intermediate point would then either coincide with the source or be on the minor axis. Likewise, this alternative arrangement is not covered by claim 11 as filed, since the transducer, including the sensing means, is defined to be at a substantially constant distance from the source along an axis (i.e. the "major axis") which is perpendicular to the minor axis along which the sensing means are arranged (cf. col. 12, lines 3 to 6 and 11 to 14). The remaining claims as filed are dependent claims.

- 2.5 The applicant argued that the deleted feature was redundant in the claim given the further definition of the microphones relative to the source. However, in the board's view, none of the remaining features of claim 1 implies that the claimed apparatus includes this feature.

In particular, it is noted that the feature of present claim 1 according to which the apparatus comprises "a platform for maintaining the transducer at a substantially constant distance from the source" relates to the transducer as a whole and not the specific locations of the two microphones with respect to the source; the feature does not exclude an arrangement in which the two microphones are situated within the platform such that, in use, they are exactly at opposite sides of the source. Such an arrangement would have microphones approximately equidistant from the source, as required by the claim. Moreover, with

this arrangement, the microphone assembly would respond to the source like a first-order differential microphone and would respond to far-field acoustic noise like a second-order differential microphone, in accordance with claim 1. Hence, in the board's view, none of these features imply that in use the microphones are on the same side of the source.

- 2.6 The board therefore concludes that claim 1 has been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed, thereby contravening Article 123(2) EPC.

Consequently, claim 1 is not allowable.

3. *Procedural matters*

- 3.1 Pursuant to Article 113(1) EPC, decisions of the EPO may only be based on grounds on which the parties concerned have had an opportunity to present their comments.
- 3.2 In the present case, with the communication accompanying the summons to oral proceedings the appellant was informed of the board's preliminary opinion that claim 1 of the requests then on file contravened Article 123(2) EPC. The appellant thereupon filed a new set of claims and stated that the amendments were made in view of the comments made by the board. Since the appellant, who was duly summoned to the oral proceedings, did not appear as summoned and the board subsequently decided to continue the oral proceedings in the appellant's absence pursuant to Rule 71(2) EPC, he was not informed about the specific

objection under Article 123(2) EPC as set out at point 2 above in respect of claim 1 of the current set of claims before the decision was taken.

3.3 However, given the objections under Article 123(2) EPC raised in the communication, the appellant could reasonably have expected the board to consider at the oral proceedings whether the amendments made complied with the requirements of Article 123(2) EPC. In deciding not to attend the oral proceedings the appellant chose not to make use of the opportunity to comment at the oral proceedings on any objection the board might have in this respect. In fact, the appellant did not seem to wish to present any further comments at all, since with the appellant's last submission, i.e. the fax letter dated 28 April 2005 in which the appellant informed the board that he would not be represented at the oral proceedings, it was submitted that *"The applicant invites the Board of Appeal to reach a decision on 29 April 2005 in accordance with the file as it currently stands"*. This request for a decision according to the state of file also rendered the appellant's earlier request for a telephone call no longer relevant. In any case, the board is not obliged to deviate from the normal procedural steps as set out in the EPC and the Rules of Procedure of the Boards of Appeal.

3.4 Under these circumstances the board is satisfied that Article 113(1) EPC has been complied with.

4. There being no other requests, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Magliano

A. S. Clelland