

Internal distribution code:

- (A) [-] Publication in OJ
- (B) [-] To Chairmen and Members
- (C) [-] To Chairmen
- (D) [X] No distribution

**Datasheet for the decision
of 10 December 2021**

Case Number: T 0797/18 - 3.5.03

Application Number: 09164523.4

Publication Number: 2280560

IPC: H04R25/00

Language of the proceedings: EN

Title of invention:

A hearing aid system comprising a receiver in the ear and a system for identification of the type of receiver

Patent Proprietor:

Bernafon AG

Opponent:

Sivantos Pte. Ltd.

Headword:

Audible signal in a hearing aid/BERNAFON

Relevant legal provisions:

EPC Art. 54, 56, 100(a), 123(2)

Keyword:

Novelty - main and 1st auxiliary requests (no): erroneous claim construction by the opposition division

Added subject-matter - auxiliary requests 1A and 1B (yes)

Inventive step - 2nd and 3rd auxiliary requests (no): no credible technical effect

Decisions cited:

G 0001/19



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0797/18 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 10 December 2021

Appellant: Sivantos Pte. Ltd.
(Opponent) 18 Tai Seng Street
No. 08-08
18 Tai Seng
Singapore 539775 (SG)

Representative: FDST Patentanwälte
Nordostpark 16
90411 Nürnberg (DE)

Respondent: Bernafon AG
(Patent Proprietor) Morgenstrasse 131
3018 Bern (CH)

Representative: Cohausz & Florack
Patent- & Rechtsanwälte
Partnerschaftsgesellschaft mbB
Bleichstraße 14
40211 Düsseldorf (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 30 January 2018 rejecting the opposition filed against European patent No. 2280560 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chair K. Bengi-Akyürek
Members: K. Schenkel
F. Bostedt

Summary of Facts and Submissions

I. The appeal lies from the decision of the opposition division rejecting the opposition.

II. The following prior-art document was *inter alia* considered in the appealed decision:

D1: EP 2 053 876 A1.

III. Oral proceedings were held before the board by videoconference on 10 December 2021.

- The appellant requested that the decision under appeal be set aside and that the patent be revoked.
- The respondent requested that the appeal be dismissed (**main request**) or, in the alternative, that the patent be maintained as amended on the basis of one of **auxiliary requests 1A and 1B**, filed in reply to the board's communication pursuant to Article 15(1) RPBA 2020, or **auxiliary requests 1 to 3** filed in reply to the appellant's statement setting out the grounds of appeal.

At the end of the oral proceedings, the board's decision was announced.

IV. Claim 1 of the **main request** reads as follows:

"A hearing aid system comprising a BTE-part adapted for being located at an ear of a user and an ITE-part adapted to be located in an ear canal of a user, the ITE-part comprising a receiver for converting an electric output signal comprising frequencies in the

human audible frequency range to an output sound, the ITE-part further comprising a resistive ID-element, wherein

the hearing aid system comprising a measurement circuit for measuring an ID-parameter indicative of the resistance of said resistive ID-element, wherein said measurement circuit is adapted to use said electric output signal to determine said ID-parameter."

- V. Claim 1 of **auxiliary request 1A** differs from claim 1 of the main request in that its last part reads as follows (amendments indicated by the board):

"wherein said measurement circuit is ~~adapted to use~~ using said electric output signal comprising frequencies in the human audible frequency range to determine said ID-parameter."

- VI. Claim 1 of **auxiliary request 1B** differs from claim 1 of auxiliary request 1A in that the following wording was added at the end:

"wherein the measurement circuit comprises a diode in series with said resistive ID-element."

- VII. Claim 1 of the **auxiliary request 1** differs from claim 1 of the main request in that its beginning reads as follows (amendments indicated by the board):

"A hearing aid system comprising a BTE-part adapted for being located at an ear of a user and an ITE-part adapted to be located in an ear canal of a user, the hearing aid system comprising a microphone and a receiver, an electrical forward path being defined there between, the receiver being comprised in the ITE-part comprising a

receiver for converting an electric output signal fed via said electrical forward path for driving the receiver and comprising frequencies in the human audible frequency range to an output sound, the ITE-part further comprising a resistive ID-element".

VIII. Claim 1 of **auxiliary requests 2 and 3** differs from claim 1 of the main request and auxiliary request 1, respectively, in that the following wording was added at the end:

"wherein the measurement circuit comprises a diode."

Reasons for the Decision

1. Background of the opposed patent

The present invention concerns a hearing aid system comprising a microphone and a receiver. The claimed invention is illustrated in Figure 1c of the opposed patent:

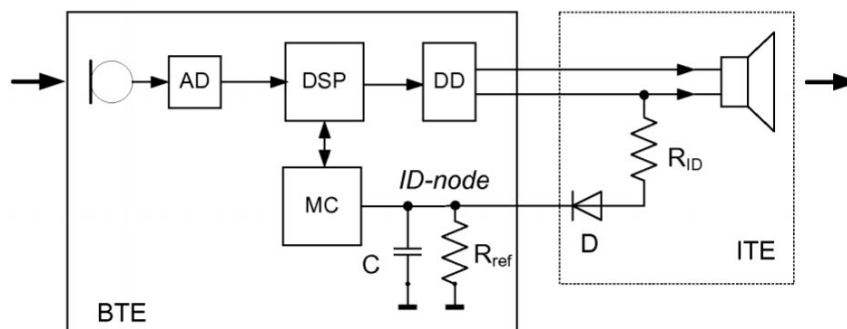


FIG. 1c

According to the relevant embodiment set out in the description, the hearing aid is made up of a BTE

(behind-the-ear) part and an ITE (in-the-ear) part. The respective signal forward path comprises an analogue-to-digital converter (AD), a signal processor (DSP) and a digital-to-digital converter (DD) generating a specific digital "electric output signal" (i.e. a pulse-width modulated difference signal) for driving the receiver. This "electric output signal" involves both signals comprising frequencies *in* the human audible frequency range (henceforth "audible signals") and signals comprising frequencies *above* the human audible frequency range (henceforth "non-audible signals").

An additional resistor R_{ID} for characterising the type of receiver is electrically connected to one of the two signal conductors fed to the receiver (see Fig. 1c above). The hearing aid further comprises a measurement circuit (MC) for identifying the type of receiver by measuring an ID-parameter (e.g. a voltage) indicative of the value of the resistance of the resistor R_{ID} . The diode D located between the resistor R_{ID} and the measurement circuit is supposed to act as a rectifier of the high-frequency component from the DD converter resulting in a DC voltage at the input to the measurement unit. According to the patent, this measurement can automatically be performed during operation of the hearing aid or during power-up/boot of the system.

2. *Main request - novelty (Article 100(a) in conjunction with Article 54 EPC)*

2.1 Claim 1 of the main request includes the following limiting features (labelling by the board):

(a) A hearing aid system comprising

- (b) a BTE-part and
- (c) an ITE-part,
- (d) the ITE-part comprising a receiver for converting an electric output signal comprising frequencies in the human audible frequency range to an output sound,
- (e) the ITE-part further comprising a resistive ID-element,
- (f) wherein the hearing aid system comprises a measurement circuit for measuring an ID-parameter indicative of the resistance of the ID-element,
- (g) wherein said measurement circuit is adapted to use said electric output signal to determine said ID-parameter.

2.2 Board's construction of features (d) and (g)

2.2.1 **Feature (d)** characterises the receiver in that it is "for converting an electric output signal comprising frequencies in the human audible frequency range to an output sound". The term "comprising" is not limiting, which is also confirmed by paragraph [0034] of the opposed patent itself. Hence, the receiver is characterised in that it is able to convert at least *audible signals* to output sound signals. The electric output signal, i.e. the signal used for driving the receiver, is not further limited with respect to its components and may therefore include components in other frequency ranges (i.e. *non-audible signals*) or DC components which can be considered to have a frequency of zero.

2.2.2 In **feature (g)**, the measurement circuit is characterised in that it is adapted to use "said electric output signal" for the underlying measurements. Since the electric output signal may also

comprise *non-audible* signal components, the measurement circuit is not limited to solely "use" *audible* signal components but may also "use" other signal components, such as a DC signal component. The board further notes in this respect that the measurement circuit according to feature (g) does not include any means for controlling the electric output signal and its components. It is merely adapted to perform the resistance measurement based on the electric output signal or at least one component of it. Once the measurement circuit is adapted to use a specific signal component for the resistance measurement, its physical structure is independent of what other components may or may not be included in the electric output signal.

As a consequence, the board does not agree with the erroneous claim interpretation adopted by the opposition division, according to which "said electric output signal is the electric output signal converted by the ITE-part of the hearing aid system to an output sound" (see appealed decision, Reasons 2.2). It is not even defined in claim 1 from where that "electric output signal" originates, i.e. it is not defined that the "electric output signal" corresponds to the signal derived from one of the two conductors indicated e.g. in Fig. 1c of the patent and fed to the receiver during the operation phase of the hearing aid (see point 1 above). The board therefore concludes that feature (g) equally refers to a "measurement circuit" adapted to use a DC component of the generated electric output signal.

2.3 Prior-art document D1

Document **D1** also discloses a device ("BTE-RIC-Gerät") with a BTE part ("Hörgerätegehäuse 10") and an ITE part

("Hörereinrichtung 13"), the latter comprising a receiver ("Hörer 12", paragraph [0019]). The BTE part comprises a resistive ID-element ("Widerstand R2", paragraph [0021]). One end of the ID-element is connected to pin 142 which also carries the signal to be fed to the speaker (paragraphs [0020] and [0021], Fig. 2). As to feature (d) of claim 1 of the opposed patent, the board considers that the receiver of the hearing aid system of D1 is implicitly adapted to convert an electric output signal provided via pin 142 into an audible signal.

The BTE part further comprises a measurement circuit ("Eingangsschaltung 16") for identifying the ITE part (paragraph [0021]: "Zur Identifikation der Hörereinrichtung 13 ist ... eine entsprechende Eingangsschaltung 16 vorgesehen"). The measurement circuit is further adapted to determine an ID-parameter, namely the resistance of the ID-element, by connecting the ID-element in series with a further resistor between the ground and a known voltage and measuring the voltage between those two resistors (paragraphs [0021] to [0023]).

In a further embodiment, the ID-element is a capacitor (C1) and is identified by means of an AC measurement instead of a DC measurement (paragraph [0026], Fig. 3). In this case, the ID-element may stay connected to the output driver during the determination of the ID-parameter.

- 2.4 The respondent did not contest the fact that the electric output signal may comprise *other* signal components not representing human audible frequencies. It was however argued that feature (g) required that the signal ("said electric output signal") used by the

measurement circuit to determine the ID-parameter had to have signals in the *audible* frequency range. This was in fact the signal used in claim 1. Contrary to that, the system of D1 explicitly disclosed a DC measurement (paragraph [0013] and Fig. 2). As to the fact that the patent itself discloses the use of a DC signal to determine the ID-parameter (see paragraph [0042]), the respondent argued that claim 1 clearly taught the use of a signal comprising *audible* frequencies, although the description was broader.

The board is not convinced by these arguments. Feature (g) merely stipulates that the measurement circuit is adapted to use the electric output signal without further specifying which particular component of the signal is used. Hence, the use of a DC component and thus a DC signal (zero-frequency signal) is not excluded. Furthermore, feature (g) does not limit the measurement circuit in such a way that audible frequencies are to be present for the measurement of the ID-parameter.

2.5 The board therefore concludes that Article 100(a) EPC in conjunction with Article 54 EPC prejudices the maintenance of the patent as granted.

3. *Auxiliary requests 1A and 1B - added subject-matter (Article 123(2) EPC)*

3.1 Claim 1 of auxiliary requests 1A and 1B further specifies that

(h) the measurement circuit is using said electric output signal comprising frequencies in the human audible frequency range to determine said ID-parameter.

3.2 However, the underlying application as filed does not disclose that the measurement circuit is using the electric output signal comprising audible frequencies, but only that the measurement circuit is adapted to use said electric output signal. Furthermore, the original disclosure does not specify which part of the signal is actually used for the measurement. Such a limitation would, moreover, not make technical sense since the "measurement circuit" of claim 1 has self-evidently no control over the particular type of incoming signals to be processed. It has to "accept" and process any signal it receives from the other sub-units of the circuit.

3.3 The respondent argued that added feature (h) was disclosed in the paragraphs at page 3, line 27 to page 4, line 6 of the description as filed, which are reproduced below:

"An object of the invention is achieved by a hearing aid system comprising a BTE-part adapted for being located at an ear of a user and an ITE-part adapted to be located in an ear canal of a user, the ITE-part comprising a receiver for converting an electric output signal comprising frequencies in the human audible frequency range to an output sound, the ITE-part further comprising a resistive ID-element, the hearing aid system comprising a measurement circuit for measuring an ID-parameter indicative of the resistance of said resistive ID-element, wherein said measurement circuit is adapted to use said electric output signal to determine said ID-parameter.

An advantage of the invention is that it utilizes the electric output signal used for driving the receiver (speaker). It does NOT require an

additional signal, for example a DC voltage, in order to determine the ID-parameter. This reduces the complexity of the circuitry and/or the firmware running in the hearing instrument. Furthermore, the detection can be done anytime where an output signal is present in the hearing aid system."

3.4 However, the board considers that the first paragraph repeats literally the wording of claim 1 as granted but does not disclose disputed feature (h). The second paragraph discloses in its first sentence the advantage that the signal for driving the speaker is used without any statements as to *which* signal component is used. The following sentences of this paragraph do also not disclose *which* signal components are used for the measurement.

3.5 The board concludes that auxiliary requests 1A and 1B are not allowable under Article 123(2) EPC.

4. *Auxiliary request 1 - novelty (Article 54 EPC)*

4.1 Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that

(i) the hearing aid system comprises a microphone and an electrical forward path between the microphone and the receiver;

(j) the receiver is comprised in the ITE part for converting the electric output signal fed via the forward path for driving the receiver.

4.2 The board notes that the added features relate to the transmission path of the electric output signal in the context of characterising the *receiver* but do not

further limit the *signal* for determining the ID-parameter and its associated transmission path.

4.3 Document **D1** teaches that a hearing aid generally includes a microphone and a signal forward path for transmitting signals from the microphone to a speaker (column 1, lines 35 to 45). D1 further states that in a BTE-RIC (behind-the-ear, receiver-in-the-canal) hearing aid the speaker/receiver is moved into the device which is to be placed in the ear channel (i.e. the ITE part), implying that the other components, in particular a microphone and a forward path, remain unchanged and are thus also present in the hearing aid according to D1 (column 1, lines 52 to 55).

4.4 The board therefore concludes that D1 also discloses added features (i) and (j), and that the hearing aid system of claim 1 of auxiliary request 1 is not new with regard to D1 either.

4.5 Hence, auxiliary request 1 is not allowable under Article 54 EPC.

5. *Auxiliary requests 2 and 3 - inventive step (Article 56 EPC)*

5.1 Claim 1 of auxiliary request 2 adds to claim 1 of the main request the feature that

(k) the measurement circuit comprises a diode.

Likewise, claim 1 of auxiliary request 3 adds this feature to claim 1 of auxiliary request 1.

5.2 The actual function or purpose of the diode added to the measurement circuit is not derivable from claim 1

of neither auxiliary request 2 nor auxiliary request 3. The respondent did also not put forward a specific function of the diode within this circuit. It is not even defined in the claim that the diode is connected to the claimed resistor in order to be able to process the respective "electric output signal". Consequently, no specific, credible technical effect can be attributed to the mere use of the diode within the measurement circuit. Therefore, the claimed hearing aid system cannot be said to solve any specific objective technical problem (see e.g. G 1/19, Reasons 49).

- 5.3 In view of the above, the board concludes that feature (k) added to auxiliary requests 2 and 3 does not contribute to an inventive step. It follows that the hearing aid system according to claim 1 of auxiliary requests 2 and 3 does not involve an inventive step having regard to **D1** and that therefore these requests are not allowable under Article 56 EPC.
6. As the ground for opposition of Article 100(a) EPC prejudices the maintenance of the patent as granted and as the amendments made by the patent proprietor do not meet the requirements of the EPC, the opposed patent has to be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chair:



B. Brückner

K. Bengi-Akyürek

Decision electronically authenticated