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**Datasheet for the decision
of 16 March 2023**

Case Number: T 1924/20 - 3.5.03

Application Number: 12761978.1

Publication Number: 2898704

IPC: H04R25/00

Language of the proceedings: EN

Title of invention:
Encapsulated hearing device

Patent Proprietor:
Sonova AG

Opponents:
Oticon A/S / Widex A/S / GN Hearing A/S

Headword:
Hearing-device hull/SONOVA

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 13(2), 17(2)

Keyword:

Inventive step - main request (no): juxtaposition of obvious features

Admittance of claim requests filed after summons - auxiliary requests 1 to 4 (no): increased complexity + no clear allowability

Decisions cited:

T 1127/16, T 0894/19, T 2764/19

Catchword:

As to claim construction, see point 2.7 of the Reasons.



Beschwerdekammern

Boards of Appeal

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Case Number: T 1924/20 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 16 March 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
17 August 2020 concerning maintenance of the
European Patent No. 2898704 in amended form.**

Composition of the Board:

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

Summary of Facts and Submissions

I. The appeal from the joint opponents (appellant) lies from the interlocutory decision of the opposition division to maintain the opposed patent of the proprietor (respondent) in amended form on the basis of the claims of the proprietor's then "first auxiliary request". In the appealed decision, the proprietor's then "main request" was deemed to be unallowable for lack of inventive step (Article 100(a) in conjunction with Article 56 EPC).

II. A communication was issued under Article 15(1) RPBA 2020 including the board's preliminary opinion concerning, amongst others, inventive step (Article 56 EPC) having regard to the following prior-art document:

E1: WO 02/03757 A1.

This preliminary opinion also comprised a positive assessment of inventive step regarding claim 1 of the main request.

III. Both parties replied in writing to the board's preliminary opinion.

IV. Oral proceedings before the board were held on 16 March 2023. The parties' final requests were as follows:

- The appellant requests that the appealed decision be set aside and that the patent be revoked.
- The respondent requests, as **main request**, that the appeal be dismissed, i.e. that the patent be

maintained in amended form based on the claims of the then "first auxiliary request" held allowable in the appealed decision or, alternatively, that the patent be maintained in amended form based on the claims of one of four auxiliary requests, all filed after the notification of the summons to the oral proceedings before the board, namely

- "Auxiliary Request AUX5" and "Auxiliary Request AUX6", submitted with the written reply to the board's preliminary opinion and henceforth labelled **auxiliary requests 1 and 2** respectively;

- "Auxiliary Request AUX7" and "Auxiliary Request AUX8", filed during the oral proceedings before the board and henceforth labelled **auxiliary requests 3 and 4** respectively.

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

V. Claim 1 of the **main request**, i.e. claim 1 as maintained by the opposition division, reads as follows (board's feature labelling):

- (a) "Hearing device (50) comprising:
- (b) - a single-piece thermoformed hull (30) with an open first end and a second end provided with at least one opening (31);
- (c) - an electronics module (10) comprising a microphone in communication with a sound inlet (11), a battery, and a loudspeaker in communication with a sound outlet (12);
- (d) wherein the electronics module (10) is disposed in the hull (30) with the sound outlet (12) in communication with the opening (31),

- (e) wherein the entire electronics module (10) with the exception of at least part of the sound inlet (11) and at least part of the sound outlet (12) is encapsulated into the hull (30) by an adhesive (41), and
- (f) wherein the battery is hardwired to the electronics module (10),
- (g) wherein the hearing device (50) further comprises a silicone ear mold or a compressible seal disposed around the hull (30)".

VI. Claim 8 of the **main request**, i.e. claim 8 as maintained by the opposition division, reads as follows:

- "Method of manufacturing a hearing device (50) comprising the following steps:
- a. Providing a sheet (20) of thermoformable material;
 - b. Thermoforming and separating a hull blank (21) from the sheet (20) of thermoformable material, said hull blank (21) comprising an open end and a closed end;
 - c. Forming at least one opening (31) in the closed end of the hull blank (21), thereby forming a hull (30);
 - d. Providing an electronics module (10) comprising a microphone in communication with a sound inlet (11), a battery, and a loudspeaker in communication with a sound outlet (12);
 - e. Inserting the electronics module (10) into the hull such that the sound outlet (12) is in communication with the opening (31);
 - f. Encapsulating the electronics module (10) with the exception of at least part of the sound inlet (11) and at least part of the sound outlet (12) into the hull (30) with an

adhesive (41), wherein the battery is hardwired to the electronics module (10)".

VII. Claim 1 of **auxiliary request 1** is identical to claim 1 of the main request. Claim 8 of the first auxiliary request reads as follows (amendments vis-à-vis claim 8 of the main request underlined by the board):

"Method of manufacturing a hearing device (50) according to claim 1, the method comprising the following steps:

- a. Providing a sheet (20) of thermoformable material;
- b. Thermoforming and separating a hull blank (21) from the sheet (20) of thermoformable material, said hull blank (21) comprising an open end and a closed end;
- c. Forming at least one opening (31) in the closed end of the hull blank (21), thereby forming a hull (30);
- d. Providing an electronics module (10) comprising a microphone in communication with a sound inlet (11), a battery, and a loudspeaker in communication with a sound outlet (12);
- e. Inserting the electronics module (10) into the hull such that the sound outlet (12) is in communication with the opening (31);
- f. Encapsulating the electronics module (10) with the exception of at least part of the sound inlet (11) and at least part of the sound outlet (12) into the hull (30) with an adhesive (41), wherein the battery is hardwired to the electronics module (10)".

VIII. In each of **auxiliary requests 2 to 4**, the respective method claims were deleted.

IX. Claim 1 of **auxiliary request 2** is identical to claim 1 of the main request.

X. Claim 1 of **auxiliary request 3** includes all the features of claim 1 of the main request, where feature (g) is replaced with the following feature (amendments vis-à-vis feature (g) highlighted by the board):

(h) "wherein the hearing device (50) further comprises ~~a silicone ear mold~~ or a compressible seal, made of a soft, compressible foam, disposed around the hull (30)".

XI. Claim 1 of **auxiliary request 4** includes all the features of claim 1 of the main request, where feature (g) is replaced with the following feature (amendments vis-à-vis feature (g) highlighted by the board):

(i) "wherein the hearing device (50) further comprises ~~a silicone ear mold~~ or a compressible seal disposed around the hull (30)".

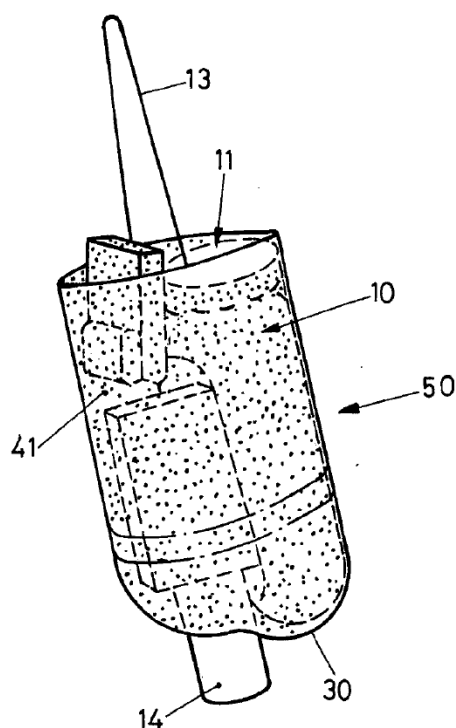
Reasons for the Decision

1. *Technical background*

1.1 The opposed patent relates to a hearing aid intended for "extended wear", i.e. a hearing aid that can be worn for several weeks up to several months without being taken out. It is typically worn in the bony part

of the user's ear canal. Such a hearing aid must be able to withstand prolonged exposure to moisture and cerumen. This prolonged exposure can be particularly hazardous for the hearing aid's electronics components.

1.2 In the opposed patent, the electronics components are arranged as electronics module 10 (see e.g. Figure 5 of the opposed patent, reproduced below). Electronics module 10 is protected by encapsulation material 41 (represented by dots in Fig. 5 below) and hull 30. According to the invention, hull 30 is manufactured as a single piece using thermoforming. This is supposed to eliminate seams in the hull through which moisture and cerumen could infiltrate.



2. *Main request: claim 8 - inventive step*

2.1 In Reasons 1.3.1 ii) of the appealed decision, the opposition division acknowledged novelty over

document **E1** in view of steps a to c, e and f of claim 8 of the main request (cf. point VI above). The board's review in this respect is as follows:

- 2.1.1 The board notes upfront that steps c, e and f of present claim 8 relate to the same "hull". The term "hull" of manufacturing method claim 8 can well refer e.g. to an intermediate shell that acts as a placeholder for the future hearing-device housing during the claimed manufacturing method.
- 2.1.2 The board holds that "shell 50" of E1 (page 16, lines 16 to 21 and page 17, lines 1 to 6) represents such an intermediate shell and that, as a result, **inserting step e** and **encapsulating step f** of claim 8 are disclosed in this document. Shell 50 of E1 may have the same shape as skin 12 of E1 but does not serve as the housing of the ready product (i.e. the hearing device), as can be seen from lines 27 to 29 of page 15 together with lines 22 and 23 of page 16 of E1. Moreover, E1 does not provide details on the manufacturing method for shell 50: the passage on page 14, line 29 to page 15, line 2 of E1 simply assumes shell 50 to be available.

As regards **providing step a, thermoforming and separating step b** and **forming step c** of claim 8, the board agrees with the appellant that the expression "thermoformed" in line 2 of page 7 of E1 may indeed imply these three steps, based on the skilled reader's common general knowledge. However, the thermoforming process according to lines 1 to 3 of page 7 of E1 is only disclosed for skin 12. This, however, does not mean that shell 50 is also manufactured by means of these three steps.

2.1.3 As a result, E1 does not disclose the following features of claim 8 (board's labelling):

A. the battery is hardwired to the electronics module

and

B. the hull of inserting step e and encapsulating step f is manufactured by steps a to c of claim 8 of the main request.

2.2 Regarding the technical effect of **feature A**, the parties were in agreement that this feature allowed for *a more compact design of the hearing device* which is manufactured by the method of claim 8. The board sees no reason to doubt the credibility of this technical effect.

The technical effect of **feature B** is that *a concrete manufacturing process for the hull is provided for use in inserting step e and encapsulating step f of claim 8.*

2.3 The board cannot discern any synergy between features A and B. These features form a mere juxtaposition. The partial problems (PPs) individually associated with each distinguishing feature and with which the respective inventive-step assessments can be conducted independently may be formulated as follows:

- **PP-A** relating to feature A:

"how to provide for a more compact design of E1's hearing device";

- **PP-B** relating to feature B:

"how to provide for a concrete manufacturing method for shell 50 of E1".

2.4 Concerning **PP-A**, the board regards hardwiring the respective battery to the electronics module as a straightforward and obvious selection for the skilled person among a number of known and equally likely possibilities, where the "could-would approach" normally does not apply (cf. **T 894/19**, Reasons 3.6). Feature A therefore cannot contribute to inventive step.

2.5 With respect to **PP-B**, the skilled person would have understood that shell 50 of E1 must have the following properties:

- it must be a *rigid* shell that can assume the shape of a user's ear canal, that can be drilled and that can withstand an elastomer-curing process (E1: page 14, line 29 to page 15, line 2; page 15, lines 23 to 29; page 16, lines 5 to 6; page 16, lines 16 to 21; page 17, lines 3 to 6);
- it must be compatible with silicone-moulding (E1: page 15, lines 14 to 22).

The board therefore considers that thermoforming would have been one of the available and straightforward options for the skilled person to solve partial problem PP-B as it allows to make a shell with the required properties. Based on their common general knowledge, the skilled person would then have readily applied steps a to c of claim 8 of the main request to provide for the hull to be used in inserting step e and

encapsulating step f of this claim 8.

2.6 When attempting to solve PP-A and PP-B, the skilled person would have arrived at a manufacturing method like in claim 8 of the main request having steps a to f without using any inventive skill.

2.7 The respondent's line of argumentation regarding E1's disclosure and inventive step concerning claim 8 hinged upon a claim construction that was based on the description of the opposed patent. The board holds such a line of argumentation to be not convincing, given its conviction that a skilled reader of a patent claim would, for many reasons, interpret the claims based essentially on their own merits (see e.g. **T 2764/19**, Reasons 3.1.1; **T 1127/16**, Reasons 2.6.1). This is because the "subject-matter of the European patent" (cf. Article 100(a) EPC) is defined by the claims and only by them. The description and drawings are, however, typically used by the deciding body to determine the above-mentioned "skilled reader" and, hence, the view point from which the claims are interpreted. This means that, when interpreting the claims, the description and drawings cannot be relied on as a sort of fall-back or supplementary-guidance tool for filling up gaps or for resolving inconsistencies in a claim to the patent proprietor's advantage. Such a reliance on the description and the drawings by the patent proprietor will normally fail to convince.

The present case is no exception to this. The reasons why the respondent's arguments failed to convince the board are as follows:

- 2.7.1 First, the board does not agree with the respondent that E1 did not disclose **encapsulating step f** in its entirety. The respondent's argument that encapsulating step f must necessarily lead to reducing the chance of moisture breaching as set out in paragraph [0005] of the opposed patent is not persuasive because claim 8 cannot be construed to include such a necessary reduction. The board is therefore also not convinced that the objective technical problem of "how to allow not only for a small electronics module but also to hinder moisture from entering the electronics module in the system of E1" could be of any relevance in the present inventive-step assessment.
- 2.7.2 Likewise, present claim 8 is silent about the fact that thermoforming the hull involved "effective barrier materials to moisture" as pointed out by the respondent based on paragraph [0025] of the opposed patent. Moreover, the respondent's mere reference to skin 12 and shell 50 of E1 being two different products with different properties could not persuade the board that shell 50 of E1 could not be manufactured by means of thermoforming. In particular, as correctly argued by the appellant, it would have been straightforward for the skilled person to manufacture by means of this thermoforming process a relatively thick shell, so that it can be drilled as shown in, for instance, Figure 15A of E1. The fact that shell 50 is broken to extract modular structure 10-1 as apparent from lines 22 and 23 of page 16 of E1 does not disqualify "thermoforming" as a manufacturing process for this shell 50 either.
- 2.7.3 Furthermore, the board could not identify, in step f, any synergy between the encapsulating and the hardwiring of the battery. Such a synergy is also not apparent from paragraph [0007] of the opposed patent to

which the respondent referred during the oral proceedings before the board.

2.8 As a result, the subject-matter of independent claim 8 of the main request does not involve an inventive step (Article 56 EPC).

3. *Auxiliary request 1: admittance*

3.1 Regardless of whether the respondent could actually provide cogent reasons justifying "exceptional circumstances" within the meaning of Article 13(2) RPBA 2020, **auxiliary request 1** is not *prima facie* allowable under Article 84 EPC. This is because the hearing device of claim 1 itself, to which claim 8 of auxiliary request 1 now refers (see point VII above), comprises a "hull". As a result, it would not be apparent for the skilled reader whether the term "the hull" of inserting step e of present claim 8 refers to the expression "a hull" of forming step c of claim 8 or to "the hull" of the hearing device of claim 1.

3.2 Moreover, the board cannot see how the amendment underlying claim 8 of auxiliary request 1 could overcome, *prima facie*, the objection raised in point 2 above regarding the main request: the expression "according to claim 1" does not preclude the interpretation set out in point 2.1.1 and the mapping in point 2.1.2 above of the "hull" according to inserting step e and encapsulating step f to "shell 50" of E1.

3.3 Hence, auxiliary request 1 was not admitted into the appeal proceedings (Article 13(2) RPBA 2020).

4. *Auxiliary request 2: admittance*

4.1 The board acknowledges that the filing of **auxiliary request 2** (with former method claims 8 to 16 being deleted) could indeed be seen as a serious attempt by the respondent to directly react to the board's positive preliminary opinion on inventive step regarding claim 1 of the main request (cf. point II above). Nonetheless, it goes without saying that the board is not in any way bound by such a favourable preliminary opinion (cf. Article 17(2) RPBA 2020). This is especially the case in the present appeal, given that the appellant upheld its inventive-step objection against claim 1 and had augmented its argumentation in its written reply to the board's preliminary opinion (cf. point III above).

4.2 The deletion of independent method claim 8 in auxiliary request 2 therefore necessitated a re-assessment, at least *prima facie*, of the question of inventive step as regards the now sole independent claim, i.e. apparatus claim 1, of auxiliary request 2. In order to address this *prima facie* re-assessment, questions were asked during the oral proceedings before the board as to the differences between the subject-matter of claim 1 and the disclosure of E1 and regarding the technical effect which these differences could credibly achieve over the whole claimed scope. In reply to these questions, the respondent referred to the technical effects of holding the hearing device comfortably in place and of reducing feedback in accordance with paragraph [0009] of the opposed patent.

The board, however, considers that those technical effects can be credibly achieved by the "silicone ear mould", corresponding to the first option of

feature (g), over the whole scope claimed only if the expression "disposed around the hull" of feature (g) is read in combination with the term "silicone ear mould". But the board cannot see how this is necessarily the case. The respondent contradicted this. It thereby not only introduced a new interpretation of feature (g) but also challenged, at this very late stage of the overall proceedings, the interpretation underlying the first sentence of point 8.3.2 of the board's preliminary opinion that the expression "disposed around the hull" is to be read solely in combination with the "compressible seal" of feature (g). Consequently, the admittance of auxiliary request 2 into the appeal proceedings would have constituted a "fresh case" in the sense that the case now necessitated the consideration of issues which had not previously been required to be addressed.

- 4.3 Moreover, the respondent could not convince the board of any technical effect that the "silicone ear mould" of feature (g) would credibly bring about over the whole claimed scope. Feature (g) may therefore *prima facie* be considered to represent only an obvious alternative, additional (protective) measure with respect to a hearing device to the skilled person, based on their common general knowledge, for the case that the skilled person may even dispense with the initial object of optimising the overall size of the resulting hearing aid (which appears to be contrary to the opposed patent's teaching set out e.g. in paragraph [0003], first dash: "... the size ... of the outer hull or housing must likewise be kept to a minimum" and paragraph [0007]: "... reducing the overall size of the hearing device ..."). The amendments underlying auxiliary request 2 therefore do not seem, *prima facie*, to overcome the inventive-step

issues raised by the appellant.

4.4 Thus, auxiliary request 2 was not admitted into the appeal proceedings either (Article 13(2) RPBA 2020).

5. *Auxiliary request 3: admittance*

5.1 Auxiliary request 3 was filed during the oral proceedings before the board. It can remain open whether the reasons provided by the respondent constitute cogent reasons justifying "exceptional circumstances" within the meaning of Article 13(2) RPBA 2020. The board just notes in that regard that it cannot be the purpose of a hearing in appeal proceedings, after having discussed multiple higher-ranking claim requests, to allow an applicant or patent proprietor to present yet another amended set of claims somehow in a trial-and-error fashion for finally defining its actual "invention".

At any rate, the amendment underlying claim 1 of **auxiliary request 3** is detrimental to procedural economy. This is because the expression "made of a soft, compressible foam" used in **feature (h)** is taken from the description of the opposed patent. The appellant correctly argued that a claim amendment based on the description might even necessitate an additional search and, hence, an adjournment of the oral proceedings before the board.

5.2 Moreover, the appellant also convincingly argued that claim 1 of auxiliary request 3 is *prima facie* not clear (Article 84 EPC) in view of the relative term "soft". Present claim 1 therefore gives rise to at least one further objection.

5.3 As a consequence, the board decided not to admit auxiliary request 3 into the appeal proceedings (Article 13(2) RPBA 2020).

6. *Auxiliary request 4: admittance*

6.1 Leaving the questions of "cogent reasons" and "exceptional circumstances" aside again, claim 1 of **auxiliary request 4** is not *prima facie* allowable under Article 56 EPC either. This is because the respondent could not convince the board that **feature (i)** achieved a credible technical effect over the whole scope claimed.

6.2 To illustrate this, a hearing device according to claim 1 of auxiliary request 4 can realistically be considered in which the "thermoformed hull" of feature (b) is "relatively elastic and flexible" (see paragraph [0028] of the opposed patent). The skilled reader would readily understand such a "thermoformed hull" to be suitable for providing contact with the user's ear canal when the hearing device is worn. The hull's flexible properties will then allow to hold the hearing device comfortably in place and to reduce or prevent acoustic feedback. They will allow to do so, depending on the extent of contact between the hull and the ear canal, to any degree which would make technical sense to the skilled reader. Given that such a hull therefore already achieves the technical effects mentioned in paragraph [0009] of the opposed patent, the board cannot see how disposing, in addition, a compressible seal, such as a ring, around this hull like in feature (i) could credibly contribute further to those technical effects.

The respondent argued that the "thermoformed hull" of

claim 1 of auxiliary request 4 will constitute a rigid body once the encapsulating adhesive according to feature (e) is hardened out. The appellant, however, correctly pointed out that this hardening is not apparent from present claim 1 of auxiliary request 4. Conversely, it is also not apparent from this claim 1 that the "thermoformed hull" of feature (b) indeed acts as a rigid body.

6.3 In the absence, *prima facie*, of any credible technical effect achieved over the whole claimed scope, feature (i) likewise cannot contribute to an inventive step (Article 56 EPC).

6.4 Hence, auxiliary request 4 was not admitted into the appeal proceedings either (Article 13(2) RPBA 2020).

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