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**Datasheet for the decision
of 4 November 2024**

Case Number: T 2364/22 - 3.5.05

Application Number: 14193328.3

Publication Number: 3021545

IPC: H04L29/06, H04W12/10, H04R25/00

Language of the proceedings: EN

Title of invention:
Hearing instrument with an authentication protocol

Patent Proprietor:
GN Hearing A/S

Opponent:
Oticon A/S

Headword:
Authentication of hearing-aid messages/GN HEARING

Relevant legal provisions:
EPC Art. 111(1), 123(2), 123(3)
RPBA 2020 Art. 11, 12(4)

Keywords:

Added subject-matter - main request and auxiliary requests i to iii and 1 to 2i (yes)

Amendment to proprietor's case - auxiliary request 3 (no): claim request "admissibly raised and maintained" in the first-instance proceedings

Extension of scope of protection and added subject-matter - auxiliary request 3 (no)

Remittal to the opposition division - (yes): inventive step of auxiliary request 3 not examined yet

Decisions cited:

T 0246/22



Beschwerdekammern

Boards of Appeal

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Case Number: T 2364/22 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 4 November 2024

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 17 August 2022
rejecting the opposition filed against European
patent No. 3021545 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chair K. Bengi-Akyürek
Members: P. Tabery
F. Bostedt

Summary of Facts and Submissions

- I. The appeal is directed against the opposition division's decision to reject the opposition against the present European patent. The opposition division decided that the invoked grounds for opposition under Articles 100(a) to (c) EPC did not prejudice the maintenance of the patent as granted.
- II. Oral proceedings before the board were held on 4 November 2024. The final requests of the parties were as follows:
- The appellant-opponent (henceforth "the opponent") requested that the decision under appeal be set aside and that the European patent be revoked.
 - The respondent-proprietor (henceforth "the proprietor") requested that the appeal be dismissed, i.e. that the patent be maintained as granted (**main request**), or, in the alternative, that the patent be maintained in amended form in accordance with one of **auxiliary requests i, ii, iii, 1, 1i, 2, 2i and 3**.

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

- III. **Claim 1** of the **main request** reads as follows (labelling introduced by the board):

F1 "A hearing aid comprising
F2 a radio (44) configured for reception of a
wirelessly broadcasted signal including

- F2.1 a message wherein at least a part (62) of the message,
- F2.2 which part has been encoded (64) using an error checking code,
- F2.2.1 has been encrypted (68) with a first key (72), and
- F2.3 the first key, wherein the first key (76), as included in the wirelessly broadcasted signal, has been encrypted (74) with a second key (78),
- F3 an authenticator (48) configured for authentication of the message by
- F3.1 decrypting the first key with a third key (82), and
- F3.2 decrypting (86) the at least a part of the message,
- F3.2.1 which part has been encoded (64) using the error checking code,
- F3.2.2 with the first key (72), and
- F4 a processing unit that is configured for converting the message into an acoustic signal for transmission towards an eardrum of a user of the hearing aid
- F4.1 upon successful authentication of the message, wherein the successful authentication includes correct verification (88) of the received at least a part of the message using the error checking code."

Claim 11 of the main request reads as follows:

"A hearing aid according to any of the preceding claims, wherein the third key (82) comprises a public key."

The amendments of claim 1 of **auxiliary request i** vis-à-vis claim 1 of the main request concern the following features:

- F2.1-i "a message wherein ~~at least a~~ each part (62) of the message,"
- F2.2-i "each of which parts has been encoded (64) using an error checking code,"
- F3.2-i "decrypting (86) each of the ~~at least a~~ parts of the message,"
- F3.2.1-i "each of which parts has been encoded (64) using the error checking code,"
- F4.1-i "upon successful authentication of the message, wherein the successful authentication includes correct verification (88) of the received ~~at least a~~ parts of the message using the error checking code."

Claim 1 of **auxiliary request ii** differs from claim 1 of the main request in that the feature of claim 11 as granted has been appended:

- F5 "wherein the third key (82) comprises a public key."

Claim 1 of **auxiliary request iii** comprises the amendments according to auxiliary requests i and ii.

The amendments of claim 1 of **auxiliary request 1** vis-à-vis claim 1 of the main request concern the following features:

- F2.1' "a message comprising a plurality of parts wherein at least a part of the message,"

- F3.2' "decrypting the plurality of parts of the message with the first key (72) including decrypting (86) the at least a part of the message,"
- F4.1' "upon successful authentication of the message, wherein the successful authentication includes correct verification (88) of the received parts of the message including the received at least a part of the message using the error checking code."

The amendments of claim 1 of **auxiliary request 1i** vis-à-vis claim 1 of auxiliary request i concern the following feature:

- F2.1-1i "a message comprising a plurality of parts, wherein each of the parts (62) of the message."

Claim 1 of **auxiliary request 2** comprises, vis-à-vis claim 1 of the main request, amended feature F4.1' (see auxiliary request 1). Furthermore, between features F4 and F4.1', the following feature has been inserted:

- F6 "wherein the wirelessly broadcasted signal includes a sequence of encrypted parts of the message, each of which having been encrypted with the first key (72), the parts of the message including the at least a part (62) of the message, and wherein the hearing aid being configured for receiving and storing the wirelessly broadcasted encrypted parts of the message and decrypting the parts of the message with the

first key (72) upon reception of the encrypted first key (76)."

The amendments of claim 1 of **auxiliary request 2i** vis-à-vis claim 1 of auxiliary request 1i concern the following features:

F2.1-2i "a message including a sequence of encrypted parts of the message wherein each of the parts (62) of the message,"

F2.2.1-2i "has been encrypted (68) with a the same first key (72), and"

as well as the addition of the following feature:

F7 "wherein the hearing aid is configured for storing the received encrypted parts of the message, and wherein the step of decrypting (86) the parts of the message with the first key (72) is upon reception of the encrypted first key (76)."

Claim 1 of **auxiliary request 3** reads as follows:

"A hearing aid comprising
a radio (44) configured for reception of a wirelessly
broadcasted signal including

a message comprising message parts (62), wherein
CRC check bits have been calculated for each
message part (62) and added to the message
part (62) to form message payload (66), which has
been encrypted (68) with a symmetric key to form
encrypted message payload (70), and

the symmetric key, wherein the symmetric key (76),

as included in the wirelessly broadcasted signal,
has been encrypted (74) with a private key (78),

an authenticator (48) configured for authentication of
the message by

decrypting the symmetric key with a public
key (82), and

decrypting (86) the encrypted message payload (70)
with the symmetric key (72), and

a processing unit comprising a mixer (32) for mixing
the message with at least one other signal received by
the hearing aid, the processing unit comprising a
receiver (40) that is configured for converting the
message into an acoustic signal for transmission
towards an eardrum of a user of the hearing aid, the
processing unit being configured for converting the
message into the acoustic signal upon successful
authentication of the message by setting a
corresponding weight to a non-zero value in the
mixer (32), wherein the successful authentication
includes a successful CRC-check (88) of the decrypted
encrypted message payload (70)."

Reasons for the Decision

1. The opposed patent concerns encrypted wireless broadcast transmissions from an external audio source to a hearing aid. The aim is to enable a user wearing a hearing instrument to listen to public announcements, e.g. train, ship or flight departures or delays, "with certainty that the broadcasted message is authentic" (see e.g. paragraph [0008] of the opposed patent).

2. Main request

2.1 Claim construction

2.1.1 The board considers that **feature F2** effectively relates to a generic "radio", since a radio (i.e. a physical-layer device) typically cannot be configured to receive only messages of a certain (higher-layer) format. Instead, a "radio" receives messages of any formatting, as long as the radio parameters (frequency, modulation, etc.) match. Nonetheless, **features F2.1 to F2.3** limit the claimed subject-matter to the extent that parts of these features are recited in the corresponding features of the "authenticator" (i.e. feature F3) and the "processing unit" (feature F4).

2.1.2 Throughout their submissions, the parties argued about the possible interpretation of the "encoded using an/the error checking code" mentioned in **features F2.2 and F3.2.1** of claim 1.

The board concurs with the opponent's interpretation labelled as "CON-F2.2-1" that "encoding" was to be understood as meaning that the part of the message was converted into a different code. During that process, the "error checking code" was used. Taking into account the dictionary definition of "encoding" provided by the opponent, the only technically sensible interpretation is that an "error checking code" calculation is performed for the "part of the message" and that the result is subsequently incorporated into that "part of the message". The resulting "part of the message" is then subject to encryption with the "first key". On the other hand, the board considers that the opponent's interpretation labelled as "CON-F2.2-2" - according to which the result of this process was the "error

checking code" only - does not make much sense from a technical point of view. It is the purpose of the "error checking code" to eventually check data. If the data part of the message was indeed replaced, there was nothing to check, rendering the "error checking code" effectively useless.

2.2 Added subject-matter (Articles 100(c) and 123(2) EPC)

2.2.1 The board is not convinced by the proprietor's argument that the formulation "at least a part" did not specify whether the *other* parts, if there are any, were also encoded and therefore **claim 1** did not contain added subject-matter. Rather, by not specifying whether or not other parts are likewise encoded, claim 1 comprises (technically meaningful) embodiments where these other parts of the message are also encoded (with the *same* or a *different* error checking code) or where they are not encoded at all. However, the application as originally filed discloses that "the message is encoded using an error checking code" (see page 4, line 12; emphasis added).

2.2.2 In this context, the board is not persuaded by the proprietor's argument that the application as originally filed provided almost *verbatim* support by disclosing "encoding the part of the message with an error checking code" (see page 2, lines 28 and 29) and that "successful authentication includes correct verification of the received parts of the message using the error checking code" (see page 4, lines 13 and 14). Following the proprietor's above interpretation of "at least a part" within claim 1, the passage at page 2, lines 28 and 29 - mentioning "the part" - cannot disclose whether *other* message parts are encoded or not. Therefore, this disclosure cannot raise doubts as

to the patent's general teaching that "the message" is encoded, as cited in point 2.2.1 above.

2.2.3 Therefore, the fact that not all parts of the "message" need to be subjected to the "error checking code" calculation specified in **feature F4.1** of claim 1 indeed constitutes new technical information that is not originally disclosed. Consequently, the board is also not convinced by the proprietor's arguments with respect to the basis for **feature F2.2** of claim 1. Hence, present claim 1 extends beyond the content of the application as filed (Articles 100(c) and 123(2) EPC).

2.2.4 However, as to dependent **claim 11**, the board is satisfied that page 4, lines 18 and 19 of the application as originally filed indeed provides a *verbatim* basis for the feature recited therein. Hence, the added feature of claim 11 does not give rise to any further objection under Article 123(2) EPC.

2.3 In view of point 2.2.3 above, the ground for opposition under Article 100(c) EPC prejudices the maintenance of the patent as granted.

3. Auxiliary request i

3.1 Added subject-matter (Article 123(2) EPC)

3.1.1 As to the interpretation of claim 1 of **auxiliary request i**, the reference to "each part of the message" in **feature F2.1-i** is unambiguous as to the fact that now the *entire* message has been encoded, no matter how many parts there may be. Moreover, the board concurs with the proprietor that the formulation "using the error checking code" in **feature F4.1-i** may only be

understood as "using the respective error checking code", since otherwise the claimed verification cannot be achieved.

3.1.2 The proprietor referred to page 12, lines 9-14 as the relevant basis for the amended **features F2.1-i to F4.1-i** (cf. point III above). However, this disclosure in fact teaches that "CRC check bits" (as the result of using a CRC code as "error checking code" here) are calculated and added with respect to each message part to form a "message payload" before being encrypted by the "first key". The broad wording of present claim 1, however, also encompasses an error-check coding (e.g. CRC coding) of respective packet headers and/or trailers (see e.g. page 5, lines 10 and 11: "... in packet headers and trailers, with payload data in between") and not necessarily only the "message payload". This interpretation is also technically sensible for the skilled reader in the field of secure data communications. Such technical information is however not supported by the original disclosure. Hence, present claim 1 contains added subject-matter, too.

3.2 Consequently, auxiliary request i is not allowable under Article 123(2) EPC.

4. Auxiliary requests ii, 1 and 2

4.1 The objections raised in point 2.2 above with respect to claim 1 of the main request apply likewise to claim 1 of each of **auxiliary requests ii, 1 and 2**.

4.2 Therefore, none of auxiliary requests ii, 1 and 2 is allowable under Article 123(2) EPC either.

5. Auxiliary requests iii, 1i and 2i
- 5.1 The objection raised in point 3.1.2 above with respect to claim 1 of auxiliary request i applies likewise to claim 1 of each of **auxiliary requests iii, 1i and 2i**.
- 5.2 Therefore, none of auxiliary requests iii, 1i and 2i is allowable under Article 123(2) EPC.
6. Auxiliary request 3
- 6.1 **Auxiliary request 3** constitutes a "carry-over request" since it was filed during the opposition proceedings but the appealed decision is not based on this request within the meaning of Article 12(2) RPBA. Such requests do not automatically form part of the appeal proceedings. The reason is that they are considered to be an "amendment", unless the patent proprietor demonstrates on appeal that these requests were "admissibly filed and maintained" in the proceedings leading to the decision under appeal (Article 12(4), first sentence, RPBA). Only if the filing of auxiliary request 3 was an "amendment", the board would have discretion to disregard it (Article 12(4), second sentence, RPBA).
- 6.2 In the present case, the proprietor stated in its written reply to the opponent's statement of grounds of appeal that auxiliary request 3 was submitted on 1 March 2021, i.e. in response to the notice of opposition (Rule 79(1) EPC). The proprietor also indicated the purpose for this amendment within the meaning of **T 246/22**, Reasons 4.14 (see sections 8.3.1 and 8.3.2 of the proprietor's written reply to the notice of opposition and section 6.1.5 of its written reply to the statement of grounds of appeal). Moreover,

there is no doubt that this claim request was maintained until the opposition division reached its final decision. Therefore, auxiliary request 3 was "admissibly filed and maintained" and it does not constitute an "amendment" within the meaning of Article 12(4), first sentence, RPBA. Auxiliary request 3 consequently forms part of these appeal proceedings.

6.3 Extent of protection (Article 123(3) EPC)

6.3.1 The board is not convinced by the opponent's objection that claim 1 did not comply with Article 123(3) EPC, since the previously claimed "encoding using an error checking code" was different from the calculating step replacing it. Rather, the board holds that the feature "wherein CRC check bits have been calculated for each message part and added to the message part to form message payload" of claim 1 is more limited than the corresponding feature F2.2 of claim 1 as granted, since "using an error checking code" necessarily implies calculating the "CRC check bits". This amendment thus cannot shift the claim's scope of protection. In particular, although reformulated, the amended feature relates to the same technical steps being applied to each message part rather than just "at least a [single] part of the message".

6.3.2 In view of the above, claim 1 of auxiliary request 3 complies with Article 123(3) EPC.

6.4 Added subject-matter (Article 123(2) EPC)

6.4.1 The board does not concur with the opponent's objection as to added subject-matter regarding claim 1. The claimed step of "converting the message [...] by

setting a corresponding weight" does not diverge - in its technical meaning - from the original disclosure according to which "the corresponding weight is set to a non-zero value in the mixer 32 so that the message 62 is converted" (page 13, lines 3-8 of the description as originally filed).

6.4.2 The word "which" used in the phrase "... calculated for each message part (62) and added to the message part (62) to form message payload (66), which has been encrypted ..." is linguistically ambiguous as to whether it refers to "the [each] message part (62)" or the "message payload (66)". However, the application as originally filed, specifically page 12, lines 12-14, supports either interpretation. Forming an "encrypted message payload", as recited subsequently in present claim 1, mandates encrypting the entire "message payload" and thus implies the encryption of each part of the message payload. Therefore, this feature does not extend beyond the original disclosure.

6.4.3 In consequence, claim 1 of auxiliary request 3 also complies with Article 123(2) EPC.

6.5 In view of the above, the board is satisfied that auxiliary request 3 meets the requirements of Article 123(2) and (3) EPC.

7. Remittal (Article 11 RPBA)

7.1 Pursuant to Article 11 RPBA, the board may remit the case to the department whose decision was appealed if there are "special reasons" for doing so.

7.2 The opposition division decided on novelty and inventive step only in relation to the patent as

granted (main request). However, novelty and inventive step of auxiliary request 3, which contains significant amendments vis-à-vis the main request, have not been assessed yet by the opposition division.

7.3 In these circumstances, the board does not consider it appropriate to decide on the issues of novelty and inventive step of auxiliary request 3 for the very first time in these appeal proceedings. Thus, "special reasons" are indeed apparent for remitting the case to the opposition division on the basis of the claims of this claim request (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 opposition division for further prosecution.

The Registrar:

The Chair:



B. Brückner

K. Bengi-Akyürek

Decision electronically authenticated