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(71) Applicant: MY TINNITUS HAS GONE AG [CH/CH]; c/o

Ameseder & Jud AG Bleicherweg 45, 8002 Zürich (CH).

(72) Inventor: HAEFELI, Oliver; Küssnachtstrasse 2, 8126

Zumikon (CH).

(74) Agent: E. BLUM & CO. AG; Vorderberg 11, 8044 Zürich

(CH).

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(54) Title: PROVIDING AN AUDIO SIGNAL FOR TINNITUS SUPPRESSION

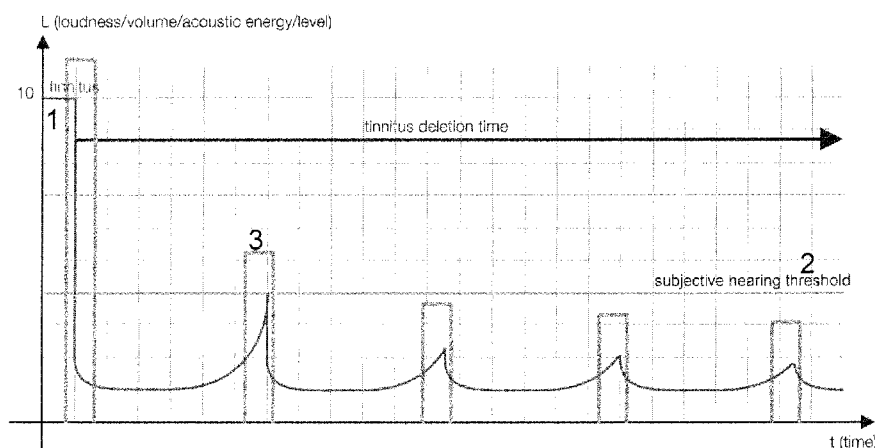


FIG 27

(57) Abstract: The present idea refers to a device for providing an audio signal for suppressing or decreasing a user's tinnitus. The device comprises an identification unit for supporting a determination of at least one parameter regarding the user's tinnitus, an adaptation unit configured to modify a received audio signal based on the at least one parameter, thereby obtaining the audio signal, or to generate the audio signal based on the at least one parameter, wherein a defined frequency spectrum of the audio signal is based on a tinnitus suppression frequency, and an audio output unit configured to play the audio signal to the user.



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2019/086814

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04R25/00

ADD. A61B5/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04R A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/288685 A1 (HAEFELI OLIVER [CH]) 25 September 2014 (2014-09-25) paragraphs [0007], [0022], [0046] - [0049], [0056]; claims 1,14,19; figures 2-6,9 -----	1-7,9, 21,22, 29, 35-38, 50-53



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 March 2020

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Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Fobel, Oliver

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2019/086814

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

2, 4, 6, 7, 9, 21, 22, 29, 35-38(completely); 1, 3, 5, 50-53(partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 2, 4, 6, 7, 9, 21, 22, 29, 35-38(completely); 1, 3, 5, 50-53(partially)

Obtaining the audio signal based on an existing audio signal

2. claims: 20(completely); 1, 3, 5, 50-53(partially)

Obtaining the audio signal by generating it

3. claim: 8

Achieving good success of complete tinnitus suppression

4. claims: 10-12

Not disturbing the user by the audio signal more than necessary

5. claim: 13

The user not perceiving the audio signal

6. claims: 14, 23-26

Achieving an effective tinnitus suppression

7. claim: 15

Characterizing the user's tinnitus

8. claims: 16-18, 39

Compensating for a user's hearing loss

9. claim: 19

Achieving an optimal suppression of tinnitus

10. claim: 27

Obtaining an audio signal from the environment as the received audio signal

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

11. claim: 28

Obtaining a pre-recorded audio signal as the received audio signal

12. claim: 30

Increasing the user's acceptance

13. claims: 31-34

Making the use of the device more agreeable

14. claim: 40

Implementing the audio output unit

15. claim: 41

Implementing the audio output unit for deaf users

16. claims: 42, 43

Addressing that the at least one parameter may vary over time for the user

17. claim: 44

Achieving the listener hearing the audio signal becoming quieter over time

18. claims: 45, 49

Not hurting the user's ear

19. claims: 46-48

Generating a more agreeable user experience

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2019/086814

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014288685 A1	25-09-2014	CN 103781446 A	07-05-2014
		DK 2566424 T3	20-02-2017
		EP 2566424 A1	13-03-2013
		EP 3136755 A1	01-03-2017
		ES 2606319 T3	23-03-2017
		US 2014288685 A1	25-09-2014
		WO 2013013326 A1	31-01-2013
