

(19)



(11)

EP 2 813 175 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
01.04.2015 Bulletin 2015/14

(51) Int Cl.:
A61B 5/00 (2006.01) **A61B 5/0484** (2006.01)
G06F 3/01 (2006.01) **A61B 5/0478** (2006.01)
H04R 25/00 (2006.01) **A61B 5/048** (2006.01)
A61B 5/0482 (2006.01) **A61B 5/12** (2006.01)

(43) Date of publication A2:
17.12.2014 Bulletin 2014/51

(21) Application number: **14170930.3**

(22) Date of filing: **03.06.2014**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
 GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
 PL PT RO RS SE SI SK SM TR**
 Designated Extension States:
BA ME

- **Pedersen, Michael Syskind**
DK-2765 Smørum (DK)
- **Hauschultz, Lars Ivar**
DK-2500 Valby (DK)
- **Koch, Povl**
DK-2765 Smørum (DK)
- **Naylor, Graham**
DK-2765 Smørum (DK)
- **Petersen, Eline Borch**
DK-2765 Smørum (DK)

(30) Priority: **14.06.2013 EP 13172066**

(71) Applicant: **Oticon A/S**
2765 Smørum (DK)

(72) Inventors:

- **Pontoppidan, Niels Henrik**
DK-2765 Smørum (DK)
- **Lunner, Thomas**
DK-2765 Smørum (DK)

(74) Representative: **Mikkelsen, Jacob**
Oticon A/S
Kongebakken 9
2765 Smørum (DK)

(54) A hearing assistance device with brain-computer interface

(57) The present disclosure relates to a communication device. The device comprises input for receiving sound signal to be processed and presented to a user, and output for outputting the processed signal to a user perceivable as sound. The processing is performed by use of a processor for processing the sound signal in dependence of a setting or a set of setting to compensate a hearing loss profile. Further, the communication device comprises a bio-signal acquisition and amplifier component in communication with a user interface for providing the biosignals as input to the user interface, the user interface controlling the setting or set of setting for operation of the communication device.

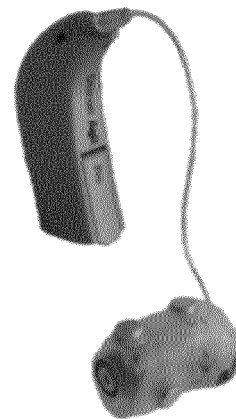


FIG 4

EP 2 813 175 A3



EUROPEAN SEARCH REPORT

Application Number
EP 14 17 0930

5

10

15

20

25

30

35

40

45

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 200 342 A1 (SIEMENS MEDICAL INSTR PTE LTD [SG]) 23 June 2010 (2010-06-23) * the whole document *	1,3,5,8	INV. A61B5/00 A61B5/0484 G06F3/01 A61B5/0478
X	WO 2013/017169 A1 (WIDEX AS [DK]; UNGSTRUP MICHAEL [DK]; KIDMOSE PREBEN [DK]; RANK MIKE L) 7 February 2013 (2013-02-07) * the whole document *	1-3,5,8	ADD. H04R25/00 A61B5/048 A61B5/0482 A61B5/12
X,D	EP 2 560 412 A1 (OTICON AS [DK]) 20 February 2013 (2013-02-20) * the whole document *	1-3,5,8	
X	WO 2011/006681 A1 (WIDEX AS [DK]; KIDMOSE PREBEN [DK]; MANDIC DANILLO P [GB]; UNGSTRUP MI) 20 January 2011 (2011-01-20) * the whole document *	1-5,8-12	
X	US 2010/074460 A1 (MARZETTA THOMAS L [US]) 25 March 2010 (2010-03-25)	1,5,6	
A	* paragraphs [0018], [0026], [0028], [0031] *	9,11,13,14	TECHNICAL FIELDS SEARCHED (IPC)
X	US 2005/175218 A1 (VERTEGAAL ROEL [CA] ET AL) 11 August 2005 (2005-08-11)	1,5-7	H04R A61B G06F
A	* abstract; figure 15 * * paragraphs [0099], [0115], [0116] *	9,11,13-15	
X	EP 2 508 945 A1 (SONY ERICSSON MOBILE COMM AB [SE]) 10 October 2012 (2012-10-10)	1,5,6	
A	* paragraphs [0014] - [0017], [0019] *	9,11,13,14	
X	CA 2 297 344 A1 (MANN W STEVE G [CA]) 1 August 2000 (2000-08-01)	1,5,6	
A	* page 4, line 23 - page 5, line 2 *	9,11,13,14	
	----- -/--		
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 February 2015	Examiner Bücker, Martin
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

2

50

55



EUROPEAN SEARCH REPORT

Application Number
EP 14 17 0930

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2011/000375 A1 (WIDEX AS [DK]; KIDMOSE PREBEN [DK]; UNGSTRUP MICHAEL [DK]) 6 January 2011 (2011-01-06) * the whole document * -----	1-3,5,7	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 February 2015	Examiner Bücker, Martin
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03/02 (P04/C01)



Application Number

EP 14 17 0930

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 14 17 0930

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3, 5, 8

Communication device according to EP 2 200 342 A1 wherein the bio-signal amplifier and acquisition component comprises alternatively an ear EEG electrode comprised in a mould configured specifically for the wearers ear canal or an implantable EEG electrode.

2. claims: 4, 9-15

Communication device or method of controlling communication device according to EP 2 200 342 A1 wherein the bio-signal amplifier and acquisition component picks up intended space gestures.

3. claim: 6

Communication device according to EP 2 200 342 A1 wherein the bio-signal amplifier and acquisition component includes a wearable camera for eye-tracking.

4. claim: 7

Communication device according to EP 2 200 342 A1 wherein the communication system further comprises an alarm device.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 14 17 0930

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10

19-02-2015

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2200342 A1	23-06-2010	DK 2200342 T3 EP 2200342 A1 US 2010160714 A1	09-12-2013 23-06-2010 24-06-2010
WO 2013017169 A1	07-02-2013	EP 2740279 A1 US 2014148724 A1 WO 2013017169 A1	11-06-2014 29-05-2014 07-02-2013
EP 2560412 A1	20-02-2013	CN 103716744 A EP 2560412 A1 EP 2717597 A1 US 2014098981 A1	09-04-2014 20-02-2013 09-04-2014 10-04-2014
WO 2011006681 A1	20-01-2011	AU 2010272769 A1 CA 2768424 A1 CN 102474696 A EP 2454892 A1 JP 5577449 B2 JP 2012533248 A JP 2014112856 A KR 20120031506 A SG 177606 A1 US 2012177233 A1 WO 2011006681 A1	16-02-2012 20-01-2011 23-05-2012 23-05-2012 20-08-2014 20-12-2012 19-06-2014 03-04-2012 29-03-2012 12-07-2012 20-01-2011
US 2010074460 A1	25-03-2010	CN 102165795 A EP 2335425 A2 JP 2012503935 A KR 20110058853 A US 2010074460 A1 WO 2010036321 A2	24-08-2011 22-06-2011 09-02-2012 01-06-2011 25-03-2010 01-04-2010
US 2005175218 A1	11-08-2005	CA 2545202 A1 EP 1691670 A1 US 2005175218 A1 WO 2005046465 A1	26-05-2005 23-08-2006 11-08-2005 26-05-2005
EP 2508945 A1	10-10-2012	EP 2508945 A1 US 2012257036 A1	10-10-2012 11-10-2012
CA 2297344 A1	01-08-2000	NONE	
WO 2011000375 A1	06-01-2011	AU 2010268498 A1 CA 2767036 A1 CN 102469950 A DK 2448477 T3	02-02-2012 06-01-2011 23-05-2012 24-11-2014

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 17 0930

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10

19-02-2015

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		EP 2448477 A1	09-05-2012
		JP 5655068 B2	14-01-2015
		JP 2012530563 A	06-12-2012
		KR 20120016181 A	22-02-2012
		SG 177405 A1	28-02-2012
		US 2012209101 A1	16-08-2012
		WO 2011000375 A1	06-01-2011
		WO 2011000383 A1	06-01-2011

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	具有脑机接口的助听设备		
公开(公告)号	EP2813175A3	公开(公告)日	2015-04-01
申请号	EP2014170930	申请日	2014-06-03
[标]申请(专利权)人(译)	奥迪康有限公司		
申请(专利权)人(译)	OTICON A / S		
当前申请(专利权)人(译)	OTICON A / S		
[标]发明人	PONTOPPIDAN NIELS HENRIK LUNNER THOMAS PEDERSEN MICHAEL SYSKIND HAUSCHULTZ LARS IVAR KOCH POVL NAYLOR GRAHAM PETERSEN ELINE BORCH		
发明人	PONTOPPIDAN, NIELS HENRIK LUNNER, THOMAS PEDERSEN, MICHAEL SYSKIND HAUSCHULTZ, LARS IVAR KOCH, POVL NAYLOR, GRAHAM PETERSEN, ELINE BORCH		
IPC分类号	A61B5/00 A61B5/0484 G06F3/01 A61B5/0478 H04R25/00 A61B5/048 A61B5/0482 A61B5/12		
CPC分类号	A61B5/0478 A61B5/048 A61B5/0482 A61B5/04845 A61B5/121 A61B5/6817 A61B5/6868 G06F3/013 G06F3/015 H04R25/40 H04R25/453 H04R25/505 H04R25/552 H04R25/70 H04R2225/41 H04R2225 /61 A61B5/165 A61B5/746 G06K9/00604 H04R25/00 H04R25/305 H04R25/606 H04R2225/43 H04R2225/67		
代理机构(译)	MIKKELSEN , JACOB		
审查员(译)	BÜCKER , MARTIN		
优先权	2013172066 2013-06-14 EP		
其他公开文献	EP2813175A2		
外部链接	Espacenet		

摘要(译)

本公开涉及通信设备。该设备包括用于接收要处理并呈现给用户的语音信号的输入，以及用于将处理后的信号输出给可感知为声音的用户的输出。通过使用处理器来执行处理，该处理器根据设置或一组设置来处理语音信号，以补偿听力损失曲线。此外，通信设备包括与用户界面通信的生物信号获取和放大器组件，用于将生物信号作为输入提供给用户界面，用户界面控制用于操作通信设备的设置或设置。

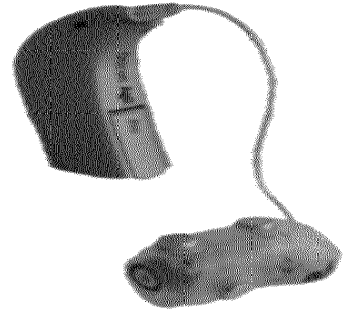


FIG 4