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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/582,305	12/24/2014	John Walter McDonough JR.	P20227-US	1078
136714 7590 04/26/2016 Amazon/Seyfarth Shaw LLP Two Seaport Lane Suite 300 Boston, MA 02210-2028			EXAMINER SNIEZEK, ANDREW L	
			ART UNIT 2688	PAPER NUMBER
			MAIL DATE 04/26/2016	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/582,305	Applicant(s) MCDONOUGH ET AL.	
	Examiner Andrew L. Sniezek	Art Unit 2688	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 7/17/15.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-20 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☒ Claim(s) 1-4 is/are allowed.

7) ☒ Claim(s) 5,6 and 11-14 is/are rejected.

8) ☒ Claim(s) 7-10,15 and 16 is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 12/24/14 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some** c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____.

3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.

4) ☐ Other: ____.

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

2. The information disclosure statement filed 7/17/15 has been considered.

Drawings

3. The drawings filed 12/24/14 are acceptable to the examiner.

Claim Rejections - 35 USC § 103

4. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

5. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

6. Claims 5, 11-13 are rejected under 35 U.S.C. 103 as being unpatentable over Florencio et al. (US 8,098,842 B2) in view of Maziar et al. (US 2007/0263881 A1)

Re claims 5 and 13: Florencio et al. teaches a system and computer-implemented method of a system comprising a sensor array (204) including a plurality of sensors to detect sound; at least one processor (102); a memory (104 or additional storage) that includes instructions (column 3, lines 46 – column 4, line 4) used to perform a set of actions comprising: determining with the arrangement in figure 3 an audio signal (3) including speech and noise components; determine a noise covariance matrix (312) that inherently describe covariance between sensor pairs of the sensor array and estimate direction of arrival of speech using beamforming relative to the array by using the noise covariance matrix. Florencio et al. however does not teach that the beamforming process includes the use of a Kalman filter as set forth. Maziar et al. teaches in a related speech locating arrangement that beamformers can be based on a Kalman filter (paragraph [0037] providing an alternative structure for speech location. It would have been obvious to one of ordinary skill in the art before the filing of the claimed invention to incorporate a Kalman filter as taught by Mazair et al. into the arrangement of Florencio et al. to predictably provide an alternative structure for a speech locating arrangement. Therefor the claimed subject matter would have been obvious before the filing of the claimed invention.

Re claim 11: clearly the matrix (312) is updated from a first time to a second time after the first time by considering a plurality of frames of speech for the updating o the matrix (312)

Re claim 12: since no distinction is made between a Kalman filter and an extended Kalman filter as set forth the Kalman filter taught by Maziar et al. satisfies this feature.

7. Claims 6 and 14 are rejected under 35 U.S.C. 103 as being unpatentable over Florencio et al. (US 8,098,842 B2) in view of Maziar et al. (US 2007/0263881 A1) as applied to claim 5 above, and further in view of Elko et al. (US 2008/0247565 A1). The teaching of Florencio et al. (US 8,098,842 B2) in view of Maziar et al. (US 2007/0263881 A1) is discussed above and incorporated herein. These teachings do not teach the use of a spherical sensor array. Elko et al. teaches (paragraph [0043]) that spherical sensor arrays are known and can be used in place of other types of arrays (paragraph [0007] providing beam pattern steering and full 3 D control of the beam pattern. It would have been obvious to one of ordinary skill in the art before the filing of the claimed invention to incorporate such spherical sensor pattern arrangement as taught by Elko et al. into the device of Florencio et al. and Mazair et al. as applied to predictably allow for beam pattern steering and full 3 D control of the beam pattern. Therefor the claimed subject matter would have been obvious before the filing of the invention.

Allowable Subject Matter

8. Claims 1-4 are allowed.
9. Claims 7-10, 15 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter: The claimed method for estimating an arrival direction of speech in a spherical microphone array that initially at a first time determines a first noise covariance matrix

comprising first values of covariance of diffuse noise detected between microphone pairs, detects at a later time (second time) audio for determining a signal including speech and noise components from the microphone array from the signal intensity calculated from detected pressure, estimate a noise intensity which is then multiplied by the plurality of first values to obtain a second noise covariance matrix and then estimate the direction of speech component arrival using an extended Kalman filter and the second noise covariance matrix as set forth is neither taught by nor an obvious variation of the art of record. The limitations of claims 2-4 depend upon those features of claim 1. The claimed system as provided by the combination of limitations of claim 7/6/5 and corresponding method provided by claim 15/14/13 that determines the noise covariance matrix using a radius of the array a wave number of diffuse noise and angular offset between sensors of the array as set forth is neither taught by nor an obvious variation of the art of record. The claimed system as provided by the combination of limitations of claim 8/5 and corresponding method of claim 16/13 in which the set of actions additionally include estimating an noise intensity of the noise component, multiplying the estimate noise intensity by the plurality of first values to obtain second values to be included in a second noise covariance matrix which is then used to estimate the direction of arrival as set forth is neither taught by nor an obvious variation of the art of record. The limitations of claims 9-10 depend upon those features of claim 8/5.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Korden et al. teaches an arrangement that processes signals of a

spherical microphone array. Nakadai et al. teaches an array of microphones used for estimating the position of a sound source.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew L. Sniezek whose telephone number is (571)272-7563. The examiner can normally be reached on M-TH 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571)-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew L Sniezek/
Primary Examiner
Art Unit 2688

ALS
4/21/6

Notice of References Cited	Application/Control No. 14/582,305	Applicant(s)/Patent Under Reexamination MCDONOUGH ET AL.	
	Examiner Andrew L. Snieszek	Art Unit 2688	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-8,098,842 B2	01-2012	Florencio; Dinei	H04R3/005	367/119
*	B	US-2007/0263881 A1	11-2007	Maziar; Amiri	G01S3/801	381/92
*	C	US-2008/0247565 A1	10-2008	Elko; Gary W.	H04R3/005	381/92
*	D	US-2014/0286493 A1	09-2014	Kordon; Sven	H04R3/005	381/26
*	E	US-2012/0195436 A1	08-2012	NAKADAI; Kazuhiro	H04R3/005	381/56
	F	US-				
	G	US-				
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FOREIGN PATENT DOCUMENTS

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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.