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NOTICE OF ALLOWANCE AND FEE(S) DUE

136714 7590 11/01/2018
Pierce Atwood LLP (Attn: Amazon Docketing)
Attn: Patent Docketing (Amazon)
100 Summer Street
Suite 2250
Boston, MA 02110

EXAMINER
SHARMA, NEERAJ

ART UNIT	PAPER NUMBER
2659	

DATE MAILED: 11/01/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/629,155	06/21/2017	Amit Singh Chhetri	P39455-US	3993

TITLE OF INVENTION: PLAYBACK REFERENCE SIGNAL-ASSISTED MULTI-MICROPHONE INTERFERENCE CANCELER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$0	$1000	02/01/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date indicated below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/629,155	06/21/2017	Amit Singh Chhetri	P39455-US	3993

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nonprovisional	UNDISCOUNTED	$1000	$0	$0	$1000	02/01/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
SHARMA, NEERAJ	2659	704-226000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1_____
2_____
3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*
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❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 15/629,155	Applicant(s) CHHETRI, AMIT SINGH	
	Examiner NEERAJ SHARMA	Art Unit 2659	AIA (First Inventor to File) Status Yes

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Applicant's submission filed on 06/21/2017*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ 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.
3. ☒ The allowed claim(s) is/are *1-20*. As a result of the allowed claim(s), 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.
4. ☐ 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)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/NEERAJ SHARMA/ Primary Examiner, Art Unit 2659	10/29/2018

DETAILED ACTION

Introduction

1. This office action is in response to Applicant's submission filed on 06/21/2017. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Drawings

2. The drawings filed on 06/21/2017 have been accepted and considered by the Examiner.

Allowable subject matter

3. Claims 1-20 are allowable over the prior art of record and the following is the examiner's statement of the reasons for allowance:

The closest relevant prior art (which is discussed in further detail below), either taken individually or in combination, fails to explicitly teach or reasonably suggest the invention as represented by the independent claims. The applicants have presented a novel way of effectively and conveniently cancelling noise and echo signals by making

use of at least two adaptive filters and also taking into account the different directions of the audio data including noise data. The system envisioned by the Applicants includes a loudspeaker and a microphone (or microphone array) that captures the audio output of the loudspeaker. The Applicants combine an Adaptive Reference Signal Selection Algorithm with a traditional audio echo cancellation techniques to generate an audio interference canceller, which has an enhanced performance in non-linear systems in high frequency range and thus constitutes an improvement to the current noise reduction technology.

Most pertinent prior art:

Yamabe (U.S. Patent Application Publication # 2013/0073283 A1) discloses a speech segment determiner configured to determine whether or not a sound picked up by at least either a first microphone or a second microphone is a speech segment and to output speech segment information when it is determined that the sound picked up by the first or the second microphone is the speech segment; a voice direction detector configured, when receiving the speech segment information, to detect a voice incoming direction indicating from which direction a voice sound travels, based on a first sound pick-up signal obtained based on a sound picked up by the first microphone and a second sound pick-up signal obtained based on a sound picked up by the second microphone and to output voice incoming-direction information when the voice incoming direction is detected; and an adaptive filter configured to perform a noise reduction

process using the first and second sound pick-up signals based on the speech segment information and the voice incoming-direction information (**Para 7**). However, Yamabe does not teach sending first playback audio data to a first loudspeaker; receiving combined input audio data, the combined input audio data including a representation of audible sound output by the first loudspeaker and a representation of speech input; determining target data that includes a first directional portion of the combined input audio data that corresponds to a first direction; determining first reference data that includes a second directional portion of the combined input audio data that does not correspond to the first direction; determining, using a first adaptive filter and the first reference data, interference data that models a first interference portion of the combined input audio data, the interference data corresponding to at least one of the representation of the audible sound or a representation of ambient acoustic noise; determining, using a second adaptive filter and the first playback audio data, echo data that models a second interference portion of the combined input audio data, the echo data corresponding to the representation of the audible sound; combining the interference data and the echo data to generate combined interference data and subtracting the combined interference data from the target data to generate first output audio data that includes data corresponding to the representation of speech input.

Chen (U.S. Patent Application Publication # 2006/0147063 A1) teaches a telephone including a receiver, a loudspeaker, a first and second microphone, a voice activity detector (VAD), an echo canceller, and a transmitter. The first and second microphones

are used to improve voice activity detection, which in turn, can improve echo cancellation. For example, the receiver receives a far-end audio signal including a voice component of a far-end user. The loudspeaker converts the far-end audio signal into sound waves. The first microphone picks up the sound waves and outputs a first audio signal. The first audio signal includes a first voice component associated with the voice of a near-end user and a second voice component associated with the voice of the far-end user. The second microphone outputs a second audio signal. The VAD processes the first audio signal, the second audio signal and the far-end audio signal to generate output relating to at least one of (i) time intervals in which the first voice component is present in the first audio signal and (ii) time intervals in which the second voice component is present in the first audio signal. The echo canceller cancels the second voice component included in the first audio signal based on the output from the VAD, thereby producing a third audio signal. The transmitter transmits the third audio signal (**Para 10**). However, Chen also is silent with respect to sending first playback audio data to a first loudspeaker; receiving combined input audio data, the combined input audio data including a representation of audible sound output by the first loudspeaker and a representation of speech input; determining target data that includes a first directional portion of the combined input audio data that corresponds to a first direction; determining first reference data that includes a second directional portion of the combined input audio data that does not correspond to the first direction; determining, using a first adaptive filter and the first reference data, interference data that models a first interference portion of the combined input audio data, the interference data

corresponding to at least one of the representation of the audible sound or a representation of ambient acoustic noise; determining, using a second adaptive filter and the first playback audio data, echo data that models a second interference portion of the combined input audio data, the echo data corresponding to the representation of the audible sound; combining the interference data and the echo data to generate combined interference data and subtracting the combined interference data from the target data to generate first output audio data that includes data corresponding to the representation of speech input.

Orescanin (U.S. Patent Application Publication # 2016/0295322 A1) teaches receiving a first microphone array processing signal associated with a frequency band that includes a plurality of sub-bands. The method includes receiving a second microphone array processing signal associated with the frequency band that includes the plurality of sub-bands. The method includes generating a first output based on the first microphone array processing signal. The first output corresponds to a first sub-band of the plurality of sub-bands. The method includes generating a second output based on the second microphone array processing signal. The second output corresponds to the first sub-band. The method includes generating a third output based on the first microphone array processing signal. The third output corresponds to a second sub-band. The method includes generating a fourth output based on the second microphone array processing signal. The fourth output corresponds to the second sub-band. The method further includes performing a first set of microphone mixing

operations to generate a first adaptive mixer output associated with the first sub-band and performing a second set of microphone mixing operations to generate a second adaptive mixer output associated with the second sub-band. The second set of microphone mixing operations is different from the first set of microphone mixing operations (**Para 3**). However, Orescanin also does not teach sending first playback audio data to a first loudspeaker; receiving combined input audio data, the combined input audio data including a representation of audible sound output by the first loudspeaker and a representation of speech input; determining target data that includes a first directional portion of the combined input audio data that corresponds to a first direction; determining first reference data that includes a second directional portion of the combined input audio data that does not correspond to the first direction; determining, using a first adaptive filter and the first reference data, interference data that models a first interference portion of the combined input audio data, the interference data corresponding to at least one of the representation of the audible sound or a representation of ambient acoustic noise; determining, using a second adaptive filter and the first playback audio data, echo data that models a second interference portion of the combined input audio data, the echo data corresponding to the representation of the audible sound; combining the interference data and the echo data to generate combined interference data and subtracting the combined interference data from the target data to generate first output audio data that includes data corresponding to the representation of speech input.

Fan (U.S. Patent Application Publication # 2016/0112817 A1) teaches a head wearable device. A first microphone is coupled to the head wearable device, and is positioned on the head wearable device to receive a voice signal from the user when the head wearable device is on the user's head. A first signal from the first microphone is to be input as a main channel to a noise cancellation unit. A second microphone is coupled to the head wearable device. A first acoustic distance between the first microphone and the user's mouth is less than a second acoustic distance between the second microphone and the user's mouth when the head wearable device is on the user's head. A second signal from the second microphone is to be input as a reference channel to the noise cancellation unit. A first signal-to-noise ratio of the first signal from the first microphone is larger than a second signal-to-noise ratio of the second signal from the second microphone (**Abstract**). However, once again there is no suggestion in Fan of sending first playback audio data to a first loudspeaker; receiving combined input audio data, the combined input audio data including a representation of audible sound output by the first loudspeaker and a representation of speech input; determining target data that includes a first directional portion of the combined input audio data that corresponds to a first direction; determining first reference data that includes a second directional portion of the combined input audio data that does not correspond to the first direction; determining, using a first adaptive filter and the first reference data, interference data that models a first interference portion of the combined input audio data, the interference data corresponding to at least one of the representation of the audible sound or a representation of ambient acoustic noise; determining, using a

second adaptive filter and the first playback audio data, echo data that models a second interference portion of the combined input audio data, the echo data corresponding to the representation of the audible sound; combining the interference data and the echo data to generate combined interference data and subtracting the combined interference data from the target data to generate first output audio data that includes data corresponding to the representation of speech input.

Hence as evidenced above, the closest prior art of record although teaching bit and parts, fails to describe the coding invention set forth in the independent claims. Furthermore, it would not have been obvious to one of ordinary skill in the art to modify the teachings of the prior art of record to obtain the recited claim limitations of the independent claims as noted above. The dependent claims represent a narrower and more specific version of the invention set forth in the independent claims, thus as such, are also allowable for at least the preceding reasons. Furthermore, it would not have been obvious to one of ordinary skill in the art to modify the teachings of the prior art of record to obtain the recited claim limitations of the independent claims as noted above.

CONCLUSION

4. The following prior art, made of record but not relied upon, is considered pertinent to applicant's disclosure: **Lee (U.S. Patent Application Publication # 2011/0232989 A1), Kanazawa (U.S. Patent # 6339758 B1), Matouk (U.S. Patent #**

5625684 A), Petit (U.S. Patent Application Publication # 2010/0280824 A1), Boemer (U.S. Patent Application Publication # 2012/0183154 A1), Niemisto (U.S. Patent Application Publication # 2009/0271190 A1), Pan (U.S. Patent Application Publication # 2011/0103603 A1). These references are also included in the PTO-892 form.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEERAJ SHARMA whose telephone number is (571)270-5487. The examiner can normally be reached on M-F 8:30AM to 5 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pierre-Louis Desir can be reached on (571)272-7799. 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. For 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.

/NEERAJ SHARMA/
Primary Examiner, Art Unit 2659

Notice of References Cited	Application/Control No. 15/629,155	Applicant(s)/Patent Under Reexamination CHHETRI, AMIT SINGH	
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