

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2012-08-22
	First Named Inventor	Heui-Suck JUNG	
	Art Unit	NYA	
	Examiner Name	NYA	
	Attorney Docket Number	MSF0011USC	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5832430		1998-11-03	LLEIDA, et al.	
	2	6980956		2005-12-27	TAKAGI, et al.	
	3	7203652		2007-04-10	Larry P. HECK	

If you wish to add additional U.S. Patent citation information please click the Add button.

Add

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20010056349		2001-12-27	Vicky ST. JOHN	
	2	20020161581		2002-10-31	MORIN	
	3	20030023437		2003-01-30	Pascale FUNG	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date		2012-08-22	
	First Named Inventor	Heui-Suck JUNG		
	Art Unit	NYA		
	Examiner Name	NYA		
	Attorney Docket Number	MSF0011USC		

	4	20050149326		2005-07-07	HOGENGOUT, et al.	
	5	20060074651		2006-04-06	ARUN	
	6	20070179784		2007-08-02	THAMBIRATNAM, et al.	
	7	20090055185		2009-02-26	NAKADE, et al.	
	8	20110224987		2011-09-15	Karl D. GIERACH	

If you wish to add additional U.S. Published Application citation information please click the Add button. [Add](#)

FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	0679044	KR		2007-02-06	Samsung Electronics Co., Ltd.		☐
	2	1020060097895	KR		2006-09-18	Samsung Electronics Co., Ltd.		☐
	3	2006184589	JP		2006-07-13	Casio Comput Co., Ltd.		☐
	4	1020080013541	KR		2008-02-13	Samsung Electronics Co., Ltd.		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date		2012-08-22	
	First Named Inventor	Heui-Suck JUNG		
	Art Unit	NYA		
	Examiner Name	NYA		
	Attorney Docket Number	MSF0011USC		

	5	2007045723	WO		2007-04-26	Nokia Corporation		☐
--	---	------------	----	--	------------	-------------------	--	--------------------------

If you wish to add additional Foreign Patent Document citation information please click the Add button **Add**

NON-PATENT LITERATURE DOCUMENTS

Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	LEE, et al. Automatic speech and speaker recognition, 1996, Kluwer Academic Publishers, chapter 13, p.303-329.	☐
	2	International Search Report - PCT/KR2009/002118.	☐
	3	KIPO Office Action - Korean Application No. 10-2008-0049455 corresponding to U.S. Patent Application No. 12/863,437.	☐
	4	D. B. PAUL, et al., Speaker stress resistant continuous speech recognition, 1988, Proceedings of the Int. Conf. on acoustic speech and signal processing, p.283-286.	☐
	5	HOFSTETTER, et al., Techniques for task independent word spotting in continuous speech messages, 1992, Lincoln Laboratory MIT, p.II-101-II-104.	☐

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2012-08-22
	First Named Inventor	Heui-Suck JUNG	
	Art Unit	NYA	
	Examiner Name	NYA	
	Attorney Docket Number	MSF0011USC	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jaegyoo Jang/	Date (YYYY-MM-DD)	2012-08-22
Name/Print	Jaegyoo Jang	Registration Number	68540

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
First Named Inventor/Applicant Name:		Heui-Suck JUNG		
Filer:		Jaegyoo Jang		
Attorney Docket Number:		MSF0011USC		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	95	95
Utility Search Fee	2111	1	310	310
Utility Examination Fee	2311	1	125	125
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				530

Electronic Acknowledgement Receipt	
EFS ID:	13558553
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	Jaegyoo Jang
Filer Authorized By:	
Attorney Docket Number:	MSF0011USC
Receipt Date:	22-AUG-2012
Filing Date:	
Time Stamp:	13:27:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 530
RAM confirmation Number	10333
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
-----------------	----------------------	-----------	----------------------------------	------------------	------------------

1	Application Data Sheet	ADS.PDF	1023800 876b805fe3cc8e5fd351047446c454645c1e280b	no	5
Warnings:					
Information:					
2		Specification_MSF0011USC.PDF	2943973 8be2aca9de441ceee95f8f498d31c54b243fc923	yes	26
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	21	
	Claims		22	25	
	Abstract		26	26	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	Drawings_MSF0011USC.PDF	5301579 2b5e3ffa38350392674e877eea2e4a9fbx284f13	no	7
Warnings:					
Information:					
4	Oath or Declaration filed	Declaration.PDF	209458 16f6675890ec61373ce7f4a9faec3884517ac9da	no	5
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	IDS.PDF	613233 2e276b0560115d515284ae0c83efe68d6d01454f	no	5
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	32920 9fe20771bc0ca7cddc7d3f213ca44cd672e1d305	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			10124963		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	MSF0011USC
		Application Number	
Title of Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1					Remove
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Heui-Suck		JUNG		
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service					
City	Incheon	Country Of Residenceⁱ	KR		
Citizenship under 37 CFR 1.41(b)ⁱ		KR			
Mailing Address of Applicant:					
Address 1	306-402 Sambo Happyhaim Apt., Bullo Jigu 34BL-1L				
Address 2	Bullo-dong, Seo-gu				
City	Incheon	State/Province			
Postal Code	404-270	Countryⁱ	KR		
Applicant 2					Remove
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Se-Hoon		CHIN		
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service					
City	Seoul	Country Of Residenceⁱ	KR		
Citizenship under 37 CFR 1.41(b)ⁱ		KR			
Mailing Address of Applicant:					
Address 1	603, Seogwang Premera Apt., 981-1, Hwagok 6-dong				
Address 2	Gangseo-gu				
City	Seoul	State/Province			
Postal Code	157-915	Countryⁱ	KR		
Applicant 3					Remove
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Tae-Young		ROH		
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service					
City	Bucheon-si	Country Of Residenceⁱ	KR		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	MSF0011USC	
		Application Number		
Title of Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS			
Citizenship under 37 CFR 1.41(b) i		KR		
Mailing Address of Applicant:				
Address 1	139-30, Ojeong-dong, Ojeong-gu			
Address 2	Gyeonggi-do			
City	Bucheon-si	State/Province		
Postal Code	421-814	Country	KR	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).		
☐ An Address is being provided for the correspondence Information of this application.		
Customer Number	23413	
Email Address		Add Email Remove Email

Application Information:

Title of the Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
Attorney Docket Number	MSF0011USC	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<p>Request Not to Publish. I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.</p> <p>☐ C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.</p>

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.			
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	MSF0011USC	
		Application Number		
Title of Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS			
Customer Number	23413			

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	12863437	2010-07-17
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).			
			Remove
Application Number	Country ⁱ	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
10-2008-0049455	KR	2008-05-28	☒ Yes ☐ No
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.			
			Remove
Assignee 1			
If the Assignee is an Organization check here. ☒			
Organization Name	KOREAPOWEROICE CO., LTD.		
Mailing Address Information:			
Address 1	201-510, Chunui Technopark 2-cha, 202, Chunui-dong		
Address 2	Wonmi-gu		
City	Bucheon-si	State/Province	
Country ⁱ	KR	Postal Code	420-857
Phone Number		Fax Number	
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.
--

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		MSF0011USC	
		Application Number			
Title of Invention		SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS			
Signature		/Jaegyoo Jang/		Date (YYYY-MM-DD)	
				2012-08-22	
First Name	Jaegyoo	Last Name	Jang	Registration Number	68540

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

[DESCRIPTION]

[Invention Title]

**SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS**

5

[Technical Field]

The present invention relates, in general, to a continuous speech recognition system, and, more particularly, to a continuous speech recognition system, which, in order to smoothly perform continuous speech recognition in noisy environments, selects call commands and configures a minimum recognition network composed of a silence interval accompanied by noise and the call commands in the form of tokens, so that real-time speech recognition is continuously performed on input speech, the confidence of the input speech is continuously analyzed, and speech subsequently input by a speaker is recognized, thus being robust in noisy environments.

10
15

[Background Art]

The means by which a human being expresses his or her thoughts to another party can be configured in various forms, but speech is the most basic communication of these means used by human beings.

20

Speech processing by human beings can be divided into the two aspects of speech production and speech perception. Speech production refers to a series of procedures allowing a speaker to communicate his or her intention, and speech perception refers to a series of procedures enabling spoken contents to be perceived from the speech spoken by another party. Research into these two types of speech aspects has been individually conducted, and has been followed by various academic environments such as linguistics, phonetics, phonology, physiology, and anatomy.

Access methods of performing speech recognition from the standpoint of speech perception of speech processing can be classified into four types of methods, that is, an acoustic-phonetic method, a statistical pattern recognition method, an artificial intelligence method, and a neural network method.

Speech recognition systems using the above-described various access methods can be classified into isolated word speech recognition systems that recognize isolated words according to the type of vocalization, and continuous speech recognition systems that recognize speech made by continuously speaking words.

Of these speech recognition systems, an isolated word speech recognition system is a scheme for performing recognition in the sequence of Voice Activity Detection (VAD) → feature extraction → pattern comparison → recognition, and is a technology which is suitable for

small computational loads or small-scale speech recognition, but is unsuitable for commercialization because unregistered words are rejected only by confidence detection with the result that errors frequently occur in confidence detection depending on noisy environments, and because a special event such as a recording button for speech recognition is required.

Fig. 1 is a diagram briefly showing the construction of a conventional continuous speech recognition network. The continuous speech recognition network employs a scheme that performs recognition by performing post-processing on a recognized word sequence using a language model. This scheme is mainly used in large-capacity speech recognition systems of ten thousand or more words.

A continuous speech recognition system is a scheme for performing recognition in the sequence of feature extraction → pattern comparison (acoustic model comparison) → language model comparison → post-processing → recognition, is suitable for large-scale speech recognition systems in high-specification server level Personal Computers (PCs), and also enables a real-time large-scale speech recognition system to be implemented with the development of storage media and computational processing abilities. However, there are disadvantages because, in order to install such a continuous speech recognition system in terminals which have gradually become lightweight, still as of yet insufficient storage capacity

and complicated floating computation cause problems, and a large computational load and storage capacity for a large amount of data are required.

Fig. 2 is a diagram showing a speech waveform produced by speaking the same command in a vehicle which has not been started, and Fig. 3 is a diagram showing a speech waveform produced by speaking the same command in a vehicle which is traveling with the window open. With regard to the comparison between Figs. 2 and 3, the performance of Voice Activity Detection (VAD) using existing energy or Zero Crossing Rate (ZCR) remarkably decreases due to the influence of the vibrating sound of a vehicle engine, the output sound of multimedia devices, and the wind which is there when the window of the vehicle is open, in an actual vehicle environment. Therefore, in a conventional speech recognition apparatus in a vehicle, a vehicle driver presses a hot-key to generate a speech recognition event, and then speech recognition is conducted. Such a function causes a user to feel inconvenience even if the conventional speech recognition apparatus is a small-scale speech recognition system having relatively excellent performance such as the electronic control of the vehicle or the menu control of a navigation terminal basically mounted in the vehicle, thus becoming a large obstacle to commercialization.

[Disclosure]

[Technical Problem]

The present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide a system for
5 detecting a speech interval in noisy environments using speech call commands, which is based on the changes of a speech recognition network and the detection of confidence rate.

Another object of the present invention is to provide
10 a system for detecting a speech interval in noisy environments using call commands, which can solve the disadvantage of a conventional keyword detection-based continuous speech recognition technique which cannot perform real-time processing due to the large computational
15 load, a language model which must be changed according to the field of application, and the use of post-processing, and can solve the disadvantage of a conventional isolated word recognition system which requires a special event, thus enabling the system to always wait for speech
20 recognition to occur.

A further object of the present invention is to provide a system for detecting a speech interval in noisy environments using call commands, which can solve the disadvantage of an isolated word recognition system which
25 requires a special event for speech recognition while solving the disadvantage of a conventional keyword detection-based continuous speech recognition technique

which requires not only a large computational load but also the change of a language model or post-processing, thus enabling the system to always wait for speech recognition to occur.

5 **[Advantageous Effects]**

According to the construction of the present invention, in order to smoothly perform continuous speech recognition in noisy environments, a call command such as 'Naraeya' or 'Nepiya' is selected, and a minimum
10 recognition network composed of a silence interval accompanied by noise and the call command is configured in the form of tokens, so that real-time speech recognition is continuously performed on input speech, the confidence of the input speech is continuously analyzed, and the
15 subsequently input speech intervals of a speaker, as well as buffered speech intervals, are applied to a continuous speech recognition engine at the moment at which the call command from the speaker is recognized, thus enabling continuous speech recognition which is very robust in noisy
20 environments.

[Description of Drawings]

Fig. 1 is a diagram briefly showing the construction of a conventional continuous speech recognition network;

Fig. 2 is a diagram showing a speech waveform
25 produced by speaking the same command in a vehicle which

has not been started;

Fig. 3 is a diagram showing a speech waveform produced by speaking the same command while a vehicle is traveling with the window open;

5 Fig. 4 is a block diagram showing a continuous speech recognition system including a call command search routine in noisy environments according to the present invention;

Fig. 5 is a diagram briefly showing the construction of a system for detecting a speech interval and recognizing
10 continuous speech in noisy environments using the real-time recognition of call commands according to the present invention;

Fig. 6 is a diagram showing the call command recognition network of the system for detecting a speech
15 interval and recognizing continuous speech in noisy environments using the real-time recognition of call commands according to the present invention; and

Fig. 7 is a diagram showing the results of the performance of confidence detection when the probability at
20 the moment at which the transition to silence is made corresponds to the uppermost level among the probabilities of the tokens of a relevant frame in the call command recognition network according to the present invention.

[Best Mode]

25 In order to accomplish the above objects, the present invention provides a system for detecting a speech interval

and recognizing continuous speech using real-time recognition of call commands, wherein when a speaker speaks a call command, the call command is recognized, confidence rate of the call command is measured, and a speech interval
5 spoken subsequent to the call command is applied to a continuous speech recognition engine at a moment at which the call command is recognized, thus recognizing speech of the speaker.

In this case, the recognition of the call command is
10 performed by a call command recognition network which is implemented using a Left-to-Right (LTR) model, and a speech frame input to the recognition network is configured to include predetermined tokens and is compared based on probability with the recognition network in real time.

15 In this case, each of the predetermined tokens includes the speech frame and a silence interval accompanied by noise.

In this case, the call command recognition network is configured such that, when an accumulated probability of
20 the predetermined token which is computed in real time after passing through the call command recognition network falls within a range of a predetermined upper percentage, the call command is estimated to have been spoken, and the speech frame is transferred to a confidence measurement
25 stage.

In this case, the speech frame is configured such that a beam width thereof is limited to 20 or 30 tokens.

In this case, the predetermined upper percentage is 10%.

In this case, the confidence rate is determined by the following equation:

5
$$LLR_i(0, \lambda_i) = \log p(0|\lambda_i) - \log p(0|\lambda_{\bar{i}})$$

where LLR is log likelihood ratio, λ_i is a phoneme model, and $\lambda_{\bar{i}}$ is an anti-phoneme model.

Further, the present invention provides a system for detecting a speech interval and recognizing continuous
10 speech using real-time recognition of call commands, comprising a call command recognition network including a call command search routine of searching for a call command in real time, and a confidence detection routine of detecting confidence rate of the call command found by the
15 call command search routine; and a continuous speech recognition network for recognizing speech input from a speaker subsequent to the call command at a moment at which the call command is recognized by the call command recognition network.

20 In this case, the call command recognition network comprises an adaptive filter, a feature extraction unit and a keyword searching unit.

In this case, the continuous speech recognition network comprises a token passing unit, a keyword spotting
25 unit, a confidence detection unit and a rule check unit.

[Mode for Invention]

Hereinafter, techniques, structures and operating characteristics of a system for detecting a speech interval and recognizing continuous speech in noisy environments using the real-time recognition of call commands (hereinafter referred to as a 'call command/continuous speech recognition system') according to the present invention will be described in detail with reference to the attached drawings.

The call command/continuous speech recognition system according to the present invention selects a call command such as 'Naraeya' or 'Nepiya' and configures a minimum recognition network composed of a silence interval accompanied by noise and the call command in the form of tokens in order to smoothly perform continuous speech recognition in noisy environments, so that real-time speech recognition is continuously performed on input speech, the confidence of the input speech is continuously analyzed, and the subsequently input speech intervals of a speaker, as well as buffered speech intervals, are applied to a continuous speech recognition engine at the moment at which the call command from the speaker is recognized, thus performing continuous speech recognition which is very robust in noisy environments.

Fig. 4 is a block diagram showing a continuous speech recognition system including a call command search routine in noisy environments according to the present invention.

As shown in Fig. 4, the system for detecting a speech

interval and recognizing continuous speech in noisy environments using the real-time recognition of call commands according to the present invention executes a call command recognition network, which mainly includes a call command search routine for searching for call commands and a confidence detection routine 421, 422 and 423 for detecting the confidence of the found call commands, before executing a continuous speech recognition network 430.

The call command recognition network 420 includes an adaptive filter 421, a feature extraction unit 422, and a keyword searching unit 423, and the continuous speech recognition network 430 includes a token passing unit 431, a keyword spotting unit 432, a confidence detection unit 433, and a rule check unit 444.

In the call command recognition network 420, a minimum recognition network composed of a silence interval accompanied by noise and a call command from the speaker is configured in the form of tokens, thus enabling real-time speech recognition to be continuously performed on input speech. When the call command is recognized as the call command from the speaker through the call command search routine, the confidence of the call command is detected in the confidence detection routine which is a subsequent stage. Accordingly, whether the found call command is an authentic call command intended by the speaker or a false call command is determined, thus enabling the recognition of continuous speech to be performed on commands spoken

subsequent to the call command.

The construction and function of the call command recognition network 420 will be described below.

5 The adaptive filter 421 is a Finite Impulse Response (FIR) filter for automatically tracking the spectrum characteristics of surrounding noise from noise-containing input speech (all spoken voices including call commands) and eliminating the surrounding noise.

10 The feature extraction unit 422 is a component for audibly modeling the spectrum characteristics of the input speech, having passed through the adaptive filter 421, for each frame, and converting the spectrum characteristics into robust parameters.

15 The keyword searching unit 423 determines whether relevant speech is a call command using an acoustic model database (DB), a pronunciation dictionary DB and a language model DB, and then determines whether to execute the continuous speech recognition routine. The keyword searching unit 423 includes a token passing unit for
20 configuring a speech frame, which includes a silence interval accompanied by noise and call commands from the speaker, in the form of a minimum number of tokens, and then searching for call commands, and a confidence detection unit for detecting the confidence of each
25 recognized call command in relation to whether the recognized call command is an authentic or false command.

When the speech of the speaker is recognized as the

call command by the call command recognition network 420,
the process proceeds to the subsequent stage, that is, the
continuous speech recognition network 430. The construction
and function of the continuous speech recognition network
5 430 will be described below.

First, the token passing unit 431 is a component for
searching for input speech in the configured continuous
speech recognition network.

The keyword spotting unit 432 is a component for
10 spotting a keyword from a token for which beam search is
conducted using keywords and filler models.

The confidence detection unit 433 is a component for
determining whether a recognized keyword is authentic or
false by detecting the confidence of the keyword.

15 The rule check unit 444 is a post-processing
component for determining whether the results of the
recognition correspond to a recognition target sentence.

As shown in Fig. 4, the call command recognition
network 420 includes the search routine and the confidence
20 detection routine for call commands, thus remarkably
reducing the computational load compared to the
conventional continuous speech recognition in which the
recognition network must be executed on all of the
continuous speech that is input.

25 Therefore, the advantages of continuous speech
recognition can be applied even to application fields such
as portable devices or embedded systems, which have low

computational processing ability and a small storage capacity.

5 The call command recognition network 420 includes a component for extracting feature parameters from input speech, and a component for executing a modified call command recognition network and detecting confidence (call command search routine and confidence detection routine).

10 Fig. 5 is a diagram briefly showing the construction of the system for detecting a speech interval and recognizing continuous speech in noisy environments using the real-time recognition of call commands according to the present invention.

15 As shown in Fig. 5, the call command/continuous speech recognition system includes a call command recognition network for recognizing call commands and detecting the confidence thereof and a continuous speech recognition network for recognizing speech which is an actual command. The call command/continuous speech recognition system configures a recognition network for
20 call commands (for example, "Naraeya", "Nepiya", etc.), executes the recognition network for one call command with respect to the input speech, and measures the confidence of the call command, thus determining whether to start a recognition network for actual continuous speech.

25 The scheme of the present invention has the advantages of remarkably reducing the memory capacity and computational processing ability which are necessary for a

continuous speech recognition system using the conventional recognition network.

In order to solve the problems, the following technique is proposed in the present invention so that a higher rejection rate for unregistered words can be obtained and the speech recognition rate can be improved even though just a small computational load is used when the keyword-detection based continuous speech recognition system is implemented.

Fig. 6 is a configuration diagram showing the call command recognition network of the system for detecting a speech interval and recognizing continuous speech in noisy environments using the real-time recognition of call commands according to the present invention.

As shown in Fig. 6, the recognition network for call commands is implemented using a left-to-right model and is configured to enable just the transition from one silence model to another silence model. On the basis of probability, every input speech frame is compared with a recognition network for only one word in real time. In this case, the width of a beam is limited to only 20 to 30 tokens, thus minimizing the computational load.

Since the recognition network is a recognition network for only one word, a minimum number of (20 to 30) tokens are required. When the accumulated probability of a relevant token, obtained at the moment at which the transition to a silence model is made while real-time

computation is performed on the frames which are continuously input, corresponds to the top 10% of the 20 to 30 tokens in the call command recognition network, it is assumed that an actual call command has been spoken, and
5 information about a relevant frame is transferred to the confidence detection routine 421, 422 and 423.

The time-series operating sequence of the call command recognition network is described below. First, the call command recognition network is configured (Step 1).
10 The real-time recognition network for a recorded input speech frame is decoded and is then stored in tokens (Step 2). In this case, the individually stored bit values are sorted according to the log likelihood ratio given by the following Equation,

$$15 \quad LLR_k(0, \lambda_k) = \log p(0|\lambda_k) \quad (1)$$

where LLR_k is the log likelihood ratio, λ_k is a k-th model parameter, and $p(0|\lambda_k)$ is the probability of the λ_k model of the input speech frame.

After the accumulated probabilities have been sorted
20 at Step 2, token beam pruning is performed on N (20 to 30) tokens (Step 3). Then, in the final stage of the call command recognition network, when the accumulated probability of a relevant token at the moment at which the transition to the silence interval is made at Step 3
25 corresponds to the top 10% (2 to 3), it is assumed that the call command has been spoken and the process proceeds to the confidence detection routine, otherwise the process

proceeds to Step 2 (Step 4).

Generally, the number of tokens required for the configuration of a speech recognition network is about the number of words * the number of words. That is, the stable
5 number of tokens required in order to recognize continuous speech of about 1,000 words is about 1,000,000. However, in the call command recognition network according to the present invention, the accumulated probabilities and model transition states for only 20 to 30 tokens are stored.
10 Among these 20 to 30 tokens, only tokens for which the uppermost probability is stored are required. In Fig. 6, when a relevant token is a token for which the accumulated probability at the moment at which the transition to silence is made in a_{33} is stored as the uppermost
15 probability, it is recognized that the call command has been spoken, and the detection of confidence thereof is performed. Here, the range of the uppermost probability may be set to the top 10% range.

The computational load based on such a call command
20 recognition network is limited to the amount of computation required for the real-time extraction of Mel Frequency Cepstrum Coefficients (MFCC) parameters and the decoding of 20 to 30 tokens, and is only an extremely small amount compared to the computational load based on the continuous
25 speech recognition network, and thus the computational load can be reduced compared to the computational load based on the conventional VAD detection technique using energy and

ZCR. However, in noisy environments, VAD detection rate can be remarkably improved.

When it is determined by the call command recognition network that the call command has been spoken, the confidence rate of the call command is detected.

All speech input through a microphone is recognized by one call command recognition network, and tokens having excellent accumulated probability values among the 20 to 30 tokens are transferred to the confidence detection routine (430 of Fig. 4). Here, in the tokens, information, obtained when the previously input speech makes a transition in the call command recognition network (auto segmentation information), is stored.

With respect to input speech (call command) assumed to be a call command 'Naraeya' or 'Nepiya' according to the recognized auto segmentation information, a ratio of the probability $p(0|\lambda_i)$ of phoneme models for the call command recognition network to the probability $p(0|\lambda_{\bar{i}})$ of anti-phoneme models, other than the assumed phoneme models, is computed, and thus the confidence rate of the call command is computed. This is represented by the following Equation (2),

$$LLR_k(0, \lambda_i) = \log p(0|\lambda_i) - \log p(0|\lambda_{\bar{i}}) \quad (2)$$

where LLR is log likelihood ratio, λ_i is a phoneme model, and $\lambda_{\bar{i}}$ is an anti-phoneme model.

When LLR is determined by Equation (2) and ' $LLR > \text{threshold}$ ' is satisfied, the continuous speech recognition

network is executed, otherwise the initial state is maintained. Here, the continuous speech recognition denotes the recognition of actual commands spoken subsequent to the call command.

5 Fig. 7 is a diagram showing the results of the performance of confidence detection when the probability at the moment at which the transition to silence is made corresponds to the uppermost level among the probabilities of the tokens of a relevant frame in the call command
10 recognition network according to the present invention.

 As shown in Fig. 7, depicted are the results of the performance of confidence detection when the probability at the moment at which the transition to silence is made corresponds to the uppermost level among the probabilities
15 of the tokens of the relevant frame (in the case where a call command is assumed to be 'Nepiya') in the call command recognition network. That is, when the input speech frames transferred to the confidence detection routine are backtracked along the stored tokens, the call command is
20 automatically segmented into portions of "N", "E", "P", "IY" and "YA", as shown in Fig. 7. When the confidence of each of the portions is greater than 0 due to a difference between the probability $p(0|i_k)$ of its own phoneme model and the probability $p(0|\bar{i}_k)$ of an anti-phoneme model, the call
25 command "Nepiya" is recognized, and speech spoken subsequent to the call command is transferred to the continuous speech recognition engine to perform continuous

speech recognition. In contrast, when the confidence is less than 0, it is determined that the call command is not spoken, and the process returns to the initial state.

5 The speech recognition scheme using the conventional continuous speech recognition network detects a pause interval of speech using a silence model without extracting end points, whereas the call command recognition scheme proposed in the present invention executes a recognition network only in a predetermined interval after a call
10 command, thus obtaining an advantage in that large-capacity memory and high-performance computational processing ability are not required.

Although the preferred embodiments of the present invention have been disclosed for illustrative purposes,
15 those skilled in the art will appreciate that the present invention can be implemented in other detailed forms without changing the technical spirit or essential features of the present invention. Therefore, those embodiments should be understood to be exemplary rather than restrictive, and the
20 scope of the present invention will be defined by the accompanying claims rather than the detailed description, and all changes or modifications derived from the meaning and scope of the claims and equivalents thereof should be interpreted as being included in the scope of the present
25 invention.

[Industrial Applicability]

The present invention relates to a speech recognition system, which can be industrially and widely used in the fields of home networking systems, intelligent robots, vehicle navigation terminals, and speech recognition systems for car-PCs.

5

What is claimed are:

1. A method for recognizing a speech of a speaker, the method comprising:
receiving an input speech spoken by the speaker;
receiving a subsequent input speech spoken, by the speaker, subsequently to the input speech;
comparing the input speech with a preset call command;
recognizing the input speech as the preset call command according to a result of the comparison; and
recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command.
2. The method of claim 1,
wherein recognizing the input speech as the preset call command comprises:
assuming the input speech to be the preset call command according to the result of the comparison;
computing a confidence rate of the assumed input speech; and
recognizing the assumed input speech as the preset call command based on the computed confidence rate.
3. The method of claim 2,
wherein recognizing the assumed input speech comprises:
recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.
4. The method of claim 2,
wherein recognizing the assumed input speech comprises:
determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate; and
recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.
5. The method of claim 2,

wherein assuming the input speech to be the preset call command comprises:
computing a log likelihood ratio of the input speech; and
assuming the input speech to be the preset call command based on the computed log likelihood ratio.

6. The method of claim 5,
wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

7. The method of claim 6,
wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

8. The method of claim 1, further comprising:
determining whether or not the recognized subsequent input speech corresponds to a target sentence.

9. An apparatus for recognizing a speech of a speaker, the apparatus comprising:
a preset call command recognition unit; and
a continuous speech recognition unit,
wherein the preset call command recognition unit is configured to
receive an input speech spoken by the speaker;
receive a subsequent input speech spoken, by the speaker, subsequently to the input speech;
compare the input speech with a preset call command; and
recognize the input speech as the preset call command according to a result of the comparison,
wherein the continuous speech recognition unit is configured to recognize the subsequent input speech as an actual command if the input speech is recognized as the preset call command by the preset call command recognition unit.

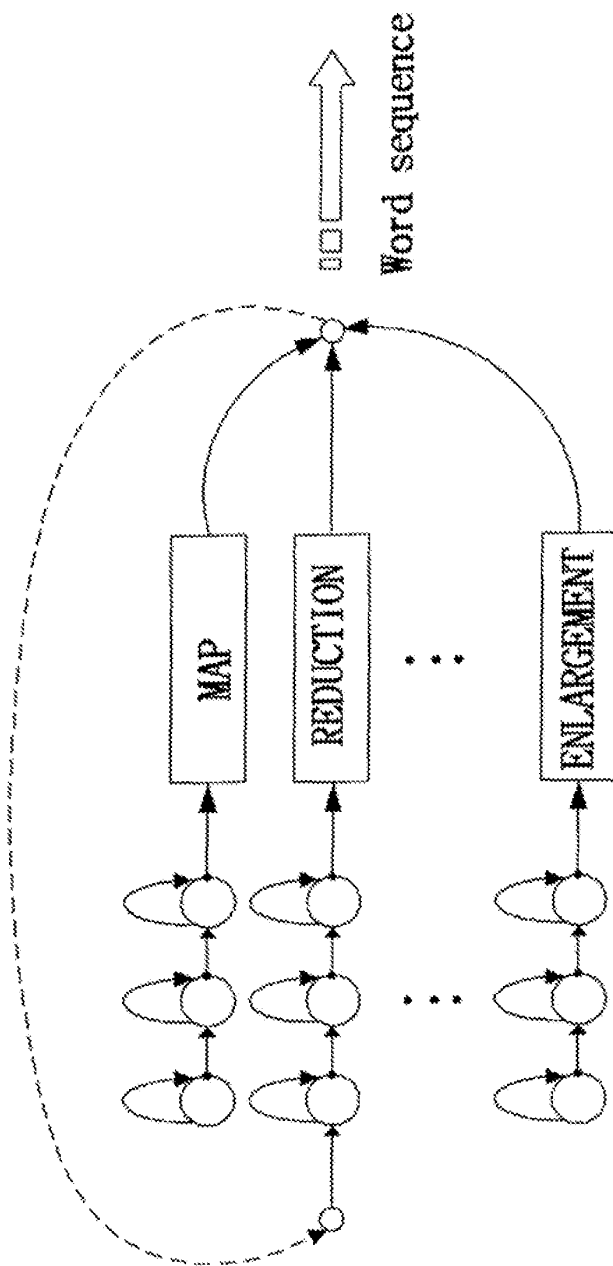
10. The apparatus of claim 9,
wherein the call command recognition unit comprises:
an adaptive filter configured to receive the input speech and the subsequent input speech;
a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison; and
a confidence detection unit configured to compute a confidence rate of the assumed input speech and recognize the assumed input speech as the preset call command based on the computed confidence rate.
11. The apparatus of claim 10,
wherein the confidence detection unit is further configured to recognize the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.
12. The apparatus of claim 10,
wherein the confidence detection unit is further configured to determine whether or not the assumed input speech is an authentic call command based on the computed confidence rate and recognize the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.
13. The apparatus of claim 10,
wherein the token passing unit is further configured to compute a log likelihood ratio of the input speech and assume the input speech to be the preset call command based on the computed log likelihood ratio.
14. The apparatus of claim 13,
wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.
15. The apparatus of claim 14,

wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

16. The apparatus of claim 9,
wherein the continuous speech recognition unit comprises:
a keyword spotting unit configured to recognize the subsequent input speech as the actual command if the input speech is recognized as the preset call command; and
a rule check unit configured to determine whether the recognized subsequent input speech corresponds to a target sentence.

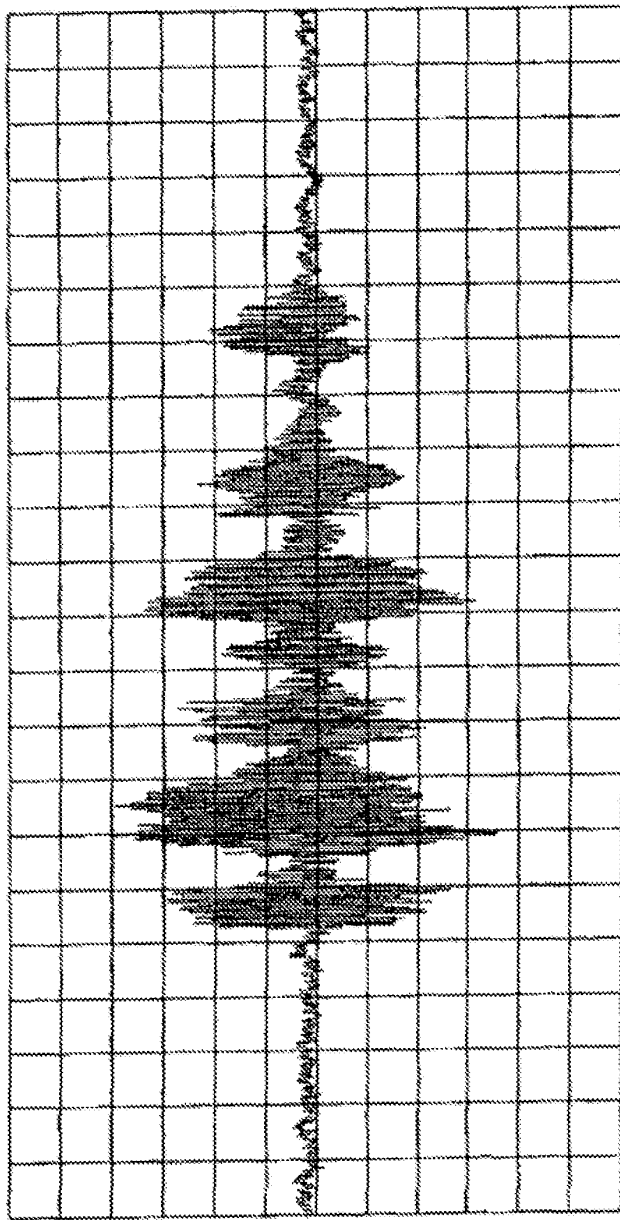
[Abstract]

A continuous speech recognition system to recognize continuous speech smoothly in a noisy environment. The system selects call commands, configures a minimum recognition network in token, which consists of the call commands and mute intervals including noises, recognizes the inputted speech continuously in real time, analyzes the reliability of speech recognition continuously and recognizes the continuous speech from a speaker. When a speaker delivers a call command, the system for detecting the speech interval and recognizing continuous speech in a noisy environment through the real-time recognition of call commands measures the reliability of the speech after recognizing the call command, and recognizes the speech from the speaker by transferring the speech interval following the call command to a continuous speech-recognition engine at the moment when the system recognizes the call command.



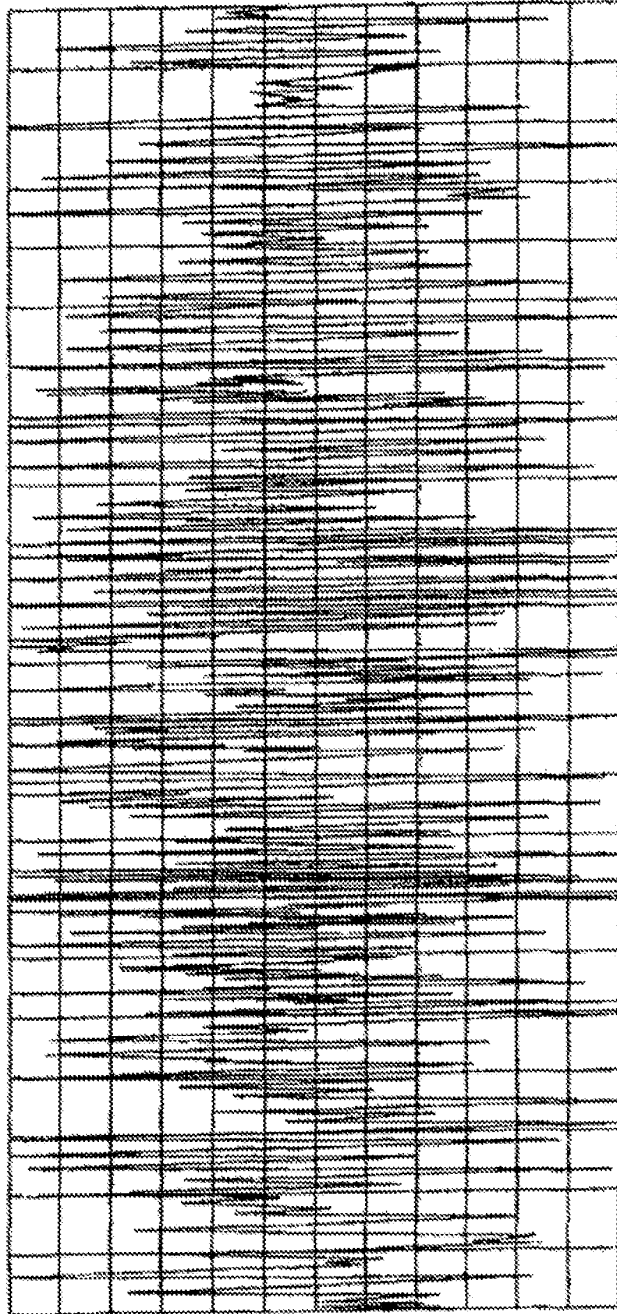
RELATED ART

FIG. 1



RELATED ART

FIG. 2



RELATED ART

FIG. 3

FIG. 4

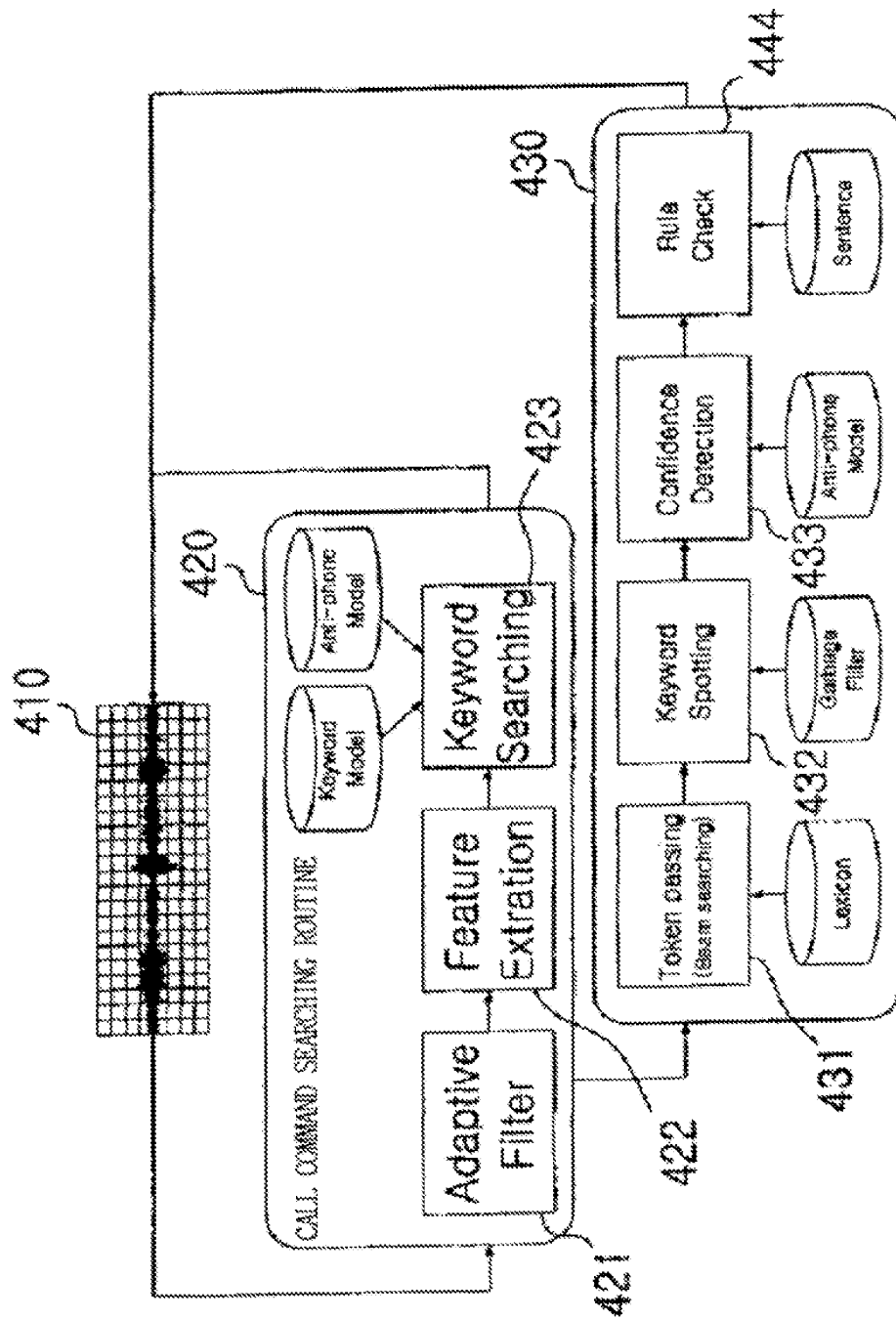


FIG. 5

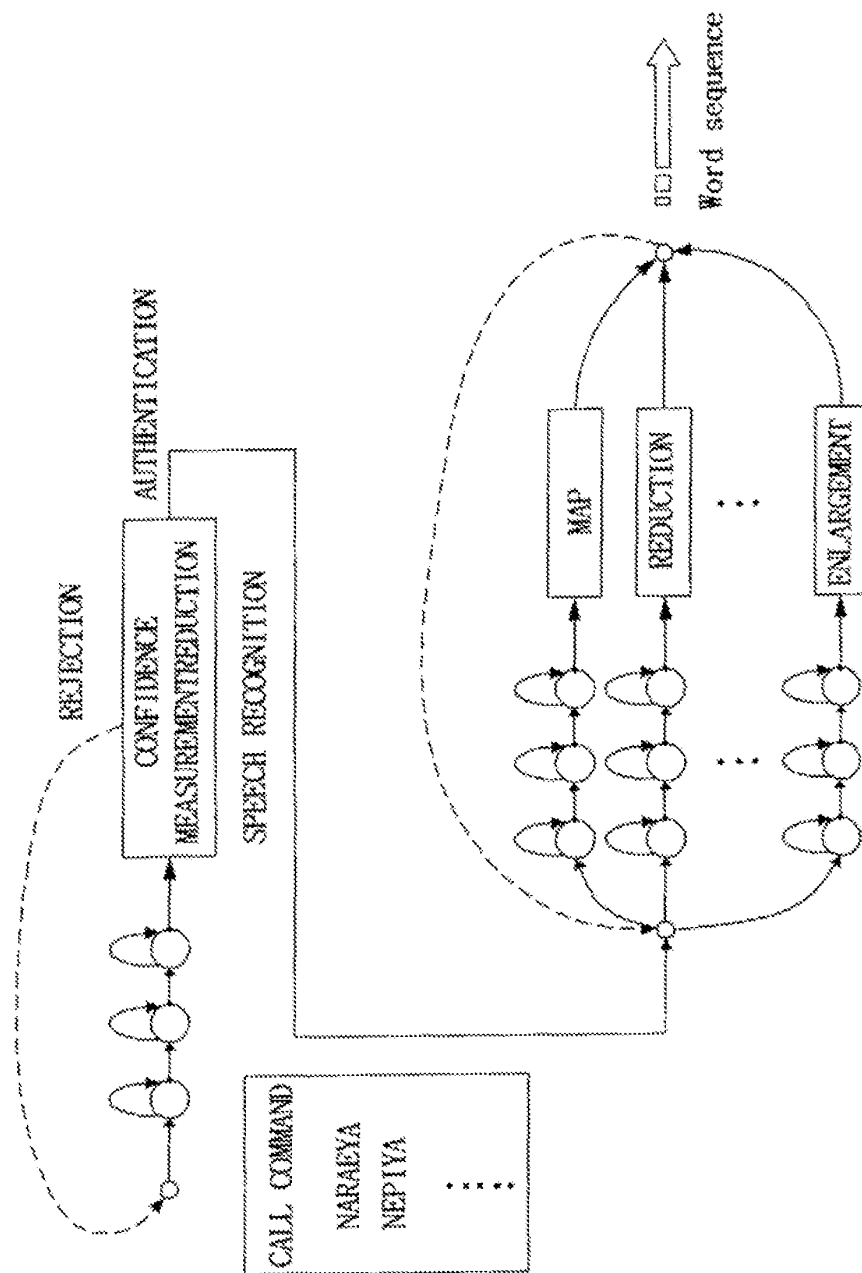


FIG. 6

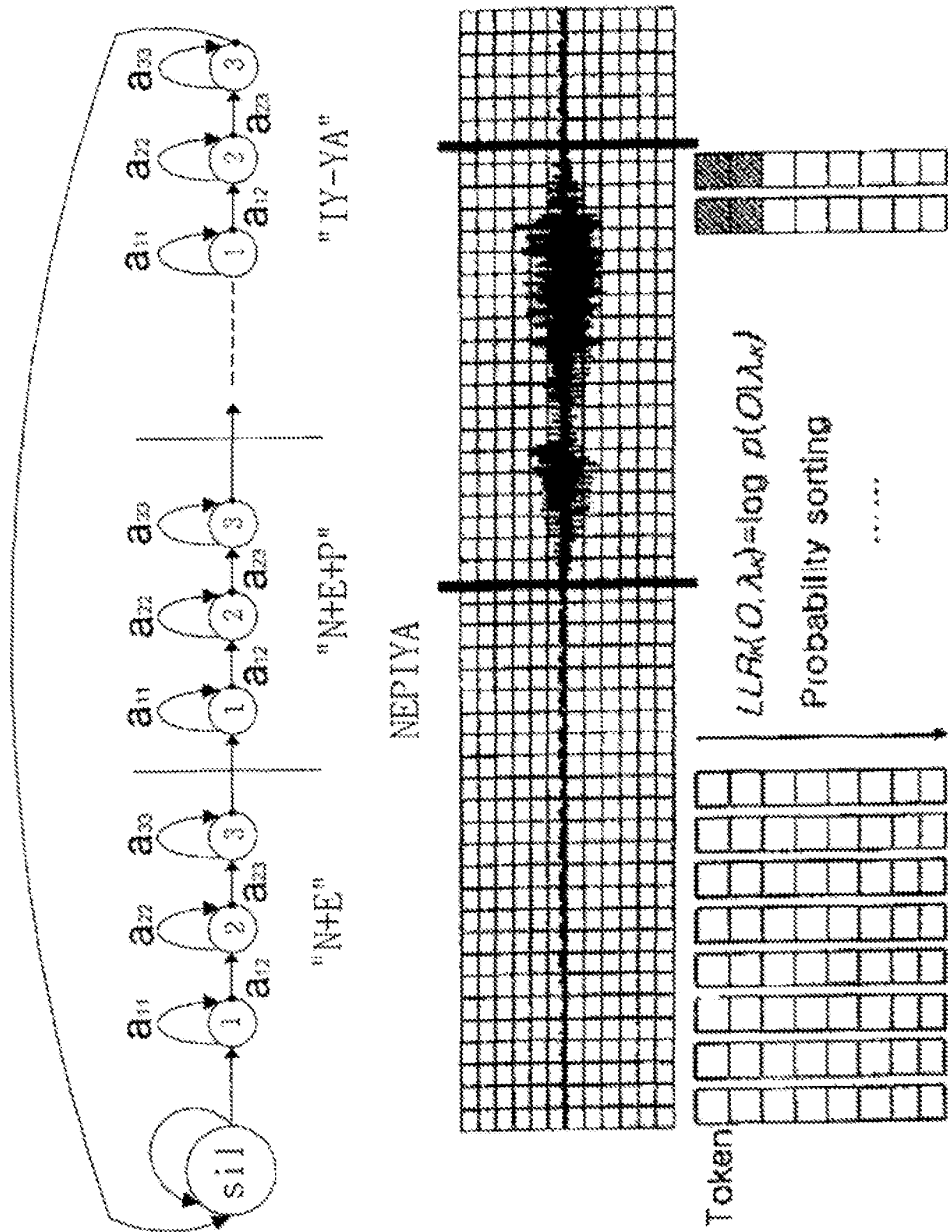
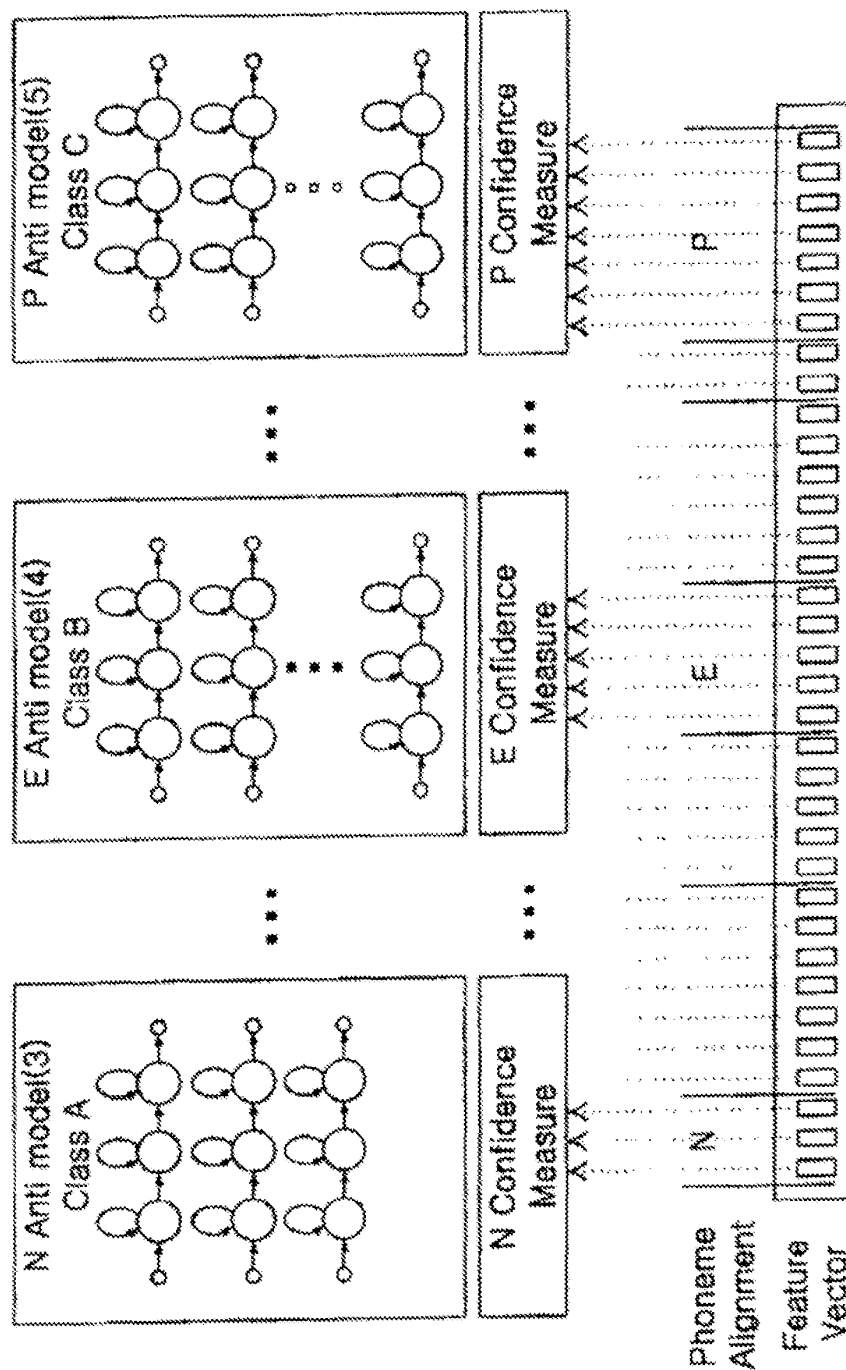


FIG. 7



Declaration and Power of Attorney for Utility or Design Patent Application (Korean Language)

특허 혹은 의장 출원에 대한 선언서 및 위임장 (한국어)

본인은, 아래에 기재된 발명자로서, 다음의 사항을 선언합니다.

본인의 거주지, 우송주소 및 국적은 본인의 이름 옆에 기재된 것과 같습니다.

본인은 다음에 기재된 특허(혹은 의장)를 받고자 청구된 발명의 내용에 대하여 본인이 최초의 독창적인 단독발명자이거나 (아래에 하나의 이름만 기재된 경우), 또는 최초의 독창적인 공동발명자임을 (아래에 둘 이상의 이름이 기재된 경우) 말합니다.

상기 발명의 명세서에는 다음 난이 체크되어 있지 않은한, 본 문서에 첨부되어 있습니다.

☐ 년 월 일에 미국 출원번호 _____로 출원되었고, _____년 월 일에 보정되었거나 (해당되는 경우), 혹은 _____년 월 일에 PCT 국제출원번호 _____로 출원되었고, _____년 월 일에 보정되었을 (해당되는 경우).

본인은 상기 보정서에 의해 보정된, 청구범위를 포함한 상기 명세서의 내용을 검토하고 이해하였음을 진술합니다.

본인은 미연방시행규칙 제 37 편 제 1.56 조에 의거하여 특허성판단에 중요한 정보를 공개할 의무가 있음을 인지합니다.

본인은 미 연방시행규칙 제 35 편 제 119 조 (a)-(d)항 또는 제 365 조 (b)항에 의거하여 다음에 기재된 외국의 특허나 발명자증명서 출원, 또는 제 365 조 (a)항에 의거하여 다음에 기재된 바와 같이 미국 이외의 적어도 하나의 국가를 지정한 PCT 국제출원의 국제우선권을 주장합니다. 또한 본인은, 우선권주장의 근거가 되는 출원서의 출원일 이전에 출원된 외국특허나 발명자증명서 출원 또는 PCT 국제출원일 없음을 아래의 "아니오" 난에 체크함으로써 이를 확인하였습니다.

Prior foreign applications

선 외국출원

10-2008-0049455	Republic of Korea	28/MAY/2008
(Number)	(Country)	(Day/Month/Year Filed)
(번호)	(국가)	(출원 년월일)

(Number)	(Country)	(Day/Month/Year Filed)
----------	-----------	------------------------

(FORM DEC)Page 1

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

"SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS"

the specification of which is attached hereto unless the following box is checked:

☒ is filed as a national phase entry of PCT International Application Number **PCT/KR2009/002118** designating the United States of America, filed **April 22, 2009**.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority under Title 35, United States Code §119(a-d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States, listed below. I have also identified below, by checking the "No" box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

Priority claimed

우선권 주장

☒ ☐
Yes No
예 아니오

☐ ☐
Yes No

Docket #: P10308US

(번호)

(국가)

(출원 년월일)

에 아니오

☐ 그 외의 추가되는 외국출원번호는 첨부된 우선권
보충자료에 기재되어 있습니다.

☐ Additional foreign application numbers are listed a
supplemental priority sheet attached hereto.

본인은 미연방법 제 35 편 제 119 조 (e) 항에 근거하여, 하기의
미국 가출원의 특권을 주장합니다.

I hereby claim the benefit under Title 35, United States Code
§119 (e) of any United States provisional application(s) listed
below.

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

☐ 그 외의 추가되는 미국 가출원 번호는 첨부된 우선권
보충자료에 기재되어 있습니다.

☐ Additional provisional application numbers are listed on a
supplemental priority sheet attached hereto.

본인은 미연방법 제 35 편 제 120 조에 의거하여 다음에 기재된
미국 출원, 또는 제 365 조 (c) 항에 의거하여 다음에 기재된
PCT 국제출원의 특권을 주장합니다. 또한 본 출원의 각
청구항의 내용이 미연방법 제 35 편 제 112 조의 첫번째 절에
명시된 방법에 의하여 선 미국출원서 또는 PCT 국제출원에
기재되어 있지 않는 한, 본인은 미연방시행규칙 제 37 편
제 1.56 조에 명시된 바와 같이 선 출원일자와 본 출원의 국내
또는 PCT 국제출원일자 사이에 가능하게 된 특허성 판단에
중요한 자료를 공개할 의무가 있음을 인지합니다.

I hereby claim the benefit under Title 35, United States Code
§120 of any United States application(s), or §365(c) of any
PCT international application designating the United States,
listed below and, insofar as the subject matter of each of the
claims of this application is not disclosed in the prior United
States or PCT international application in the manner provided
by the first paragraph of Title 35, United States Code §112, I
acknowledge the duty to disclose information which is material
to patentability as defined in Title 37, Code of Federal
Regulations §1.56 which became available between the filing
date of the prior application and the national or PCT
international filing date of this application.

PCT/KR2009/002118

(Application No.)

(출원번호)

22/APR/2009

(Day/Month/Year Filed)

(출원 년월일)

Pending

(현황)

(Status)

(특허획득, 출원중, 포기) (patented, pending, abandoned)

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

(현황)

(Status)

(특허획득, 출원중, 포기) (patented, pending, abandoned)

☐ 그 외의 추가되는 미국 혹은 국제출원번호는 첨부된 우선권
보충자료에 기재되어 있습니다.

등록된 특허의 유효성을 위태롭게 할 수 있음을 인지하면서
여기에 선언합니다.

본인이 아는 한 본 문서에 제공된 모든 내용이 사실이고,
제공된 정보나 믿는 바에 대한 진술이 모두 사실이며, 더우기
미 연방법 제 18 편 제 1001 조에 명시된 바와 같이 고의로
허위진술을 하거나 이와 유사한 행위를 한 경우에는 벌금이나
감옥으로 처벌받거나 벌금과 감옥형을 모두 받을 수 있고
이러한 고의의 허위 진술은 특허출원서 또는 그에 대하여

아래에 서명한 본인은 본 문서에 지명된 미국변리사나
대리인에게 본 출원과 관련하여 미국특허청에서 취해야 할 모든
일에 대하여 미국변리사 혹은 대리인이 본인과 직접적인 의견
교환 없이 본인의 외국 특허대리인이나 회사의 대표자
(해당되는 경우)의 지시를 받고 따를 권한을 위임합니다.
상기의 미국변리사나 대리인은 그 지시를 하는 자가 변경된
경우에 본인으로부터 그 사실을 통보받을 것입니다.

(FORM-DEC)Page 2

Docket #: P10308US

☐ Additional U.S. or international application numbers are listed on a supplemental priority sheet attached hereto.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

The undersigned hereby authorizes the U.S. attorney or agent appointed herein to accept and follow instructions from either his foreign patent agent or corporate representative, if any, as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent appointed herein will be so notified by the undersigned.

{FORM DEC}Page 3

Docket #: P10308US

위임권 : 본인은 아래에 기재된 발명자로서 아래에 명기된
고객번호를 갖는 다음의 변리사나 대리인에게 본 출원서를
출원하고 이 출원과 관련하여 특허청에서 필요한 모든 일을
처리하는 것을 위임하고, 모든 통신문은 다음의 고객번호로
송부할 것을 지시합니다.

POWER OF ATTORNEY: As a named inventor, I hereby
appoint the attorney(s) and/or agent(s) associated with the
Customer Number provided below to prosecute this application
and transact all business in the Patent and Trademark Office
connected therewith, and direct that all correspondence be
addressed to that Customer Number:

CUSTOMER NUMBER 86144

고객번호 86144

{FORM DEC}Page 4

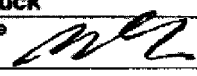
Docket #: P10308US

Address: **LRK PATENT LAW FIRM**
1952 Gallows Rd. Suite 200
Vienna, VA 22182

직통전화연락처 :

Direct Telephone Calls to:

LRK PATENT LAW FIRM
(703) 854-1331

단독 발명자 혹은 첫번째 발명자의 성명	Full name of sole or first inventor JUNG, Heui-Suck
발명자의 서명	Inventor's signature  Date Jul. 16, 2010
주소	Residence 306-402, Sambo Happyhaim Apt., Bullo Jigu 34BL-1L, Bullo-dong, Seo-gu, Incheon 404-270 Republic of Korea
국적	Citizenship Republic of Korea
우송주소	c/o 1952 Gallows Rd. Suite 200, Vienna, VA 22182

두번째 발명자의 성명	Full name of second inventor CHIN, Se-Hoon
발명자의 서명	Inventor's signature  Date Jul. 16, 2010
주소	Residence 603, Seogwang Premera Apt., 981-1, Hwagok 6-dong, Gangseo-gu, Seoul 157-915 Republic of Korea
국적	Citizenship Republic of Korea
우송주소	c/o 1952 Gallows Rd. Suite 200, Vienna, VA 22182

세번째 발명자의 성명	Full name of third inventor ROH, Tae-Young
발명자의 서명	Inventor's signature  Date Jul. 16, 2010
주소	Residence 139-30, Ojeong-dong, Ojeong-gu, Bucheon-si, Gyeonggi-do 421-814 Republic of Korea
국적	Citizenship Republic of Korea
우송주소	c/o 1952 Gallows Rd. Suite 200, Vienna, VA 22182

{FORM DEC}

SCORE Placeholder Sheet for IFW Content

Application Number: 13591479

Document Date: 8/22/2012

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: February 8, 2006



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
13/591,479	08/22/2012	2626	530	MSF0011USC	16	2

CONFIRMATION NO. 7024

23413
CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

FILING RECEIPT



OC000000056289886

Date Mailed: 09/06/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Heui-Suck JUNG, Incheon, KOREA, REPUBLIC OF;
Se-Hoon CHIN, Seoul, KOREA, REPUBLIC OF;
Tae-Young ROH, Bucheon-si, KOREA, REPUBLIC OF;

Assignment For Published Patent Application

KOREAPOWEROICE CO., LTD., Bucheon-si, KOREA, REPUBLIC OF

Power of Attorney: The patent practitioners associated with Customer Number 86144

Domestic Priority data as claimed by applicant

This application is a CON of 12/863,437 07/17/2010 PAT 8275616
which is a 371 of PCT/KR2009/002118 04/22/2009

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)

REPUBLIC OF KOREA 10-2008-0049455 05/28/2008

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

If Required, Foreign Filing License Granted: 08/30/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/591,479**

Projected Publication Date: 12/13/2012

page 1 of 3

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS

Preliminary Class

704

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage, facilitate, and accelerate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 13/591,479				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	95		N/A				
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	310		N/A				
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	125		N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	16	minus 20 = *	x 30 =	0.00	OR					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *	x 125 =	0.00						
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00						
				TOTAL		TOTAL				
* If the difference in column 1 is less than zero, enter "0" in column 2.				530						
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
<p style="font-size: x-small;">* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p style="font-size: x-small;">** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p style="font-size: x-small;">*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p style="font-size: x-small;">The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.</p>										



별첨 사본은 아래 출원의 원본과 동일함을 증명함.

This is to certify that the following application annexed hereto
is a true copy from the records of the Korean Intellectual
Property Office

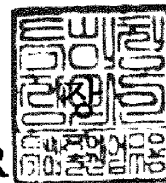
출 원 번 호 : 10-2008-0049455
Application Number

출 원 년 월 일 : 2008년 05월 28일
Filing Date MAY 28, 2008

출 원 인 : (주)파워보이스
Applicant(s) Powervoice Co., Ltd.

2012년 09월 07일

특 허 청
COMMISSIONER



제출 일자 : 2008-05-28

【서지사항】

【서류명】	특허출원서
【출원구분】	특허출원
【출원인】	
【명칭】	(주)한국파워보이스
【출원인코드】	1-2003-003126-3
【대리인】	
【성명】	박기원
【대리인코드】	9-2004-000565-3
【포괄위임등록번호】	2008-006680-3
【대리인】	
【성명】	박양호
【대리인코드】	9-2005-000021-2
【포괄위임등록번호】	2008-006681-1
【발명의 국문명칭】	실시간 호출명령어 인식을 이용한 잡음환경에서의 음성구간 검출과 연속음성인식 시스템
【발명의 영문명칭】	System for Robust Voice Activity Detection andContinuous speech recognition in noisy environmentusing real-time calling key-word recognition
【발명자】	
【성명】	정희석
【출원인코드】	4-2002-010493-7
【발명자】	
【성명】	진세훈
【출원인코드】	4-2008-003636-9
【발명자】	

제출 일자 : 2008-05-28

【성명】 노태영

【출원인코드】 4-2008-003638-1

【심사청구】 청구

【취지】 위와 같이 특허청장에게 제출합니다.

박기원

박양호

(인)

【수수료】

【출원료】	0 면	38,000 원
【가산출원료】	27 면	0 원
【우선권주장료】	0 건	0 원
【심사청구료】	10 항	429,000 원
【합계】	467,000 원	
【감면사유】	소기업 (70%감면)	
【감면후 수수료】	140,100 원	

【첨부서류】 1. 중소기업기본법 제2조의 규정에 따른 소기업에 해당함을
증명하는 서류_1통

【요약서】

【요약】

본 발명은 잡음환경에서 원활한 연속음성인식을 수행하기 위하여 호출명령어를 선정하고 잡음을 포함한 묵음구간과 호출명령어로 구성된 최소의 인식네트워크를 토큰으로 구성하여 입력된 음성에 대해 실시간 음성인식을 계속적으로 수행하고 이에 대한 신뢰도를 연속적으로 분석하여 연이어 들어오는 발화자의 음성을 인식하는 잡음환경에 매우 강인한 연속음성인식 시스템에 관한 것이다.

본 발명에 따른 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템은, 발화자가 호출명령어를 발화하면, 호출명령어를 인식한 후 신뢰도를 측정하여 상기 호출명령어를 인식하는 순간 상기 호출명령어에 연이어 발화되는 음성구간을 연속음성인식엔진에 인가함으로써 발화자의 음성을 인식하는 것을 특징으로 하여 이루어진다.

【대표도】

도 5

【색인어】

호출명령어, 토큰, 연속 음성 인식, 호출명령어 검색 루틴, 신뢰도 검사 루틴

【명세서】

【발명의 명칭】

실시간 호출명령어 인식을 이용한 잡음환경에서의 음성구간검출과 연속음성 인식 시스템{System for Robust Voice Activity Detection and Continuous speech recognition in noisy environment using real-time calling key-word recognition}

【발명의 상세한 설명】

【기술분야】

<1> 본 발명은 연속음성인식 시스템에 관한 것으로서, 보다 상세하게는 잡음환경에서 원활한 연속음성인식을 수행하기 위하여 호출명령어를 선정하고 잡음을 포함한 묵음구간과 호출명령어로 구성된 최소의 인식네트워크를 토큰으로 구성하여 입력된 음성에 대해 실시간 음성인식을 계속적으로 수행하고 이에 대한 신뢰도를 연속적으로 분석하여 연이어 들어오는 발화자의 음성을 인식하는 잡음환경에 매우 강한 연속음성인식 시스템에 관한 것이다.

【배경기술】

<2> 인간이 자신의 생각을 다른 사람에게 표현할 수 있는 수단은 여러가지의 형태가 있지만 그 중에서도 음성은 인간이 사용하는 가장 기본적인 의사소통을 위한 수단이다.

- <3> 인간에 의한 음성 처리는 크게 음성 생성(Speech Production)과, 음성 인지(Speech Perception)의 두 가지 측면으로 나누어 볼 수 있다. 해당 음성 생성은 발화자(Speaker)가 의도한 바를 전달하기 위한 일련의 과정이고, 해당 음성 인지는 상대 발화자에 의해서 발성된 음성으로부터 발화 내용을 인식하는 과정을 말한다. 이러한 음성의 두 가지 측면과 관련된 연구들이 각기 개별적으로 이루어져 왔으며, 언어학, 음성학, 음운학, 생리학, 해부학 등의 다양한 학문적인 배경 하에 진행되어 왔다.
- <4> 음성 처리의 음성 인지의 측면에서 음성 인식을 수행하기 위한 접근 방법은, 크게 가청 음성학(Acoustic-Phonetic) 방법과, 통계적인 패턴 인식(Statistical Pattern Recognition) 방법과, 인공 지능(Artificial Intelligence) 방법과, 신경망(Neural Network) 방법의 4가지로 분류할 수 있다.
- <5> 상술한 바와 같은 다양한 접근 방법을 통한 음성 인식 시스템은, 발성 형태에 따라 고립 단어를 인식하는 고립 단어 음성 인식(Isolated Word Speech Recognition)과, 단어를 연속하여 발성한 음성을 인식하는 연속 음성 인식(Continuous Speech Recognition)으로 분류할 수 있다.
- <6> 이러한 음성 인식 시스템 중 고립 단어 인식은 VAD(Voice Activity Detection) → 특징추출 → 패턴비교 → 인식의 순으로 인식하는 방식이며, 적은 계산량 또는 소규모 음성인식에 적합한 방식이나, 신뢰도 검사만으로 미등록어 거절을 수행하여 잡음환경에 따라 신뢰도 검사 오류 발생이 자주 발생되고, 음성인식을 위한 녹음 버튼 등의 특별한 이벤트가 필요하게 되어 상용화하기엔 부적합한 기

술이다.

<7> 도 1은 종래의 연속 음성 인식 네트워크의 구성을 간략히 도시한 것이다.

도 1에 도시된 연속 음성 인식 네트워크는 인식된 단어열을 언어모델을 통한 후처리 과정을 수행하여 인식하는 방식이다. 이 방식은 1만 단어이상 대용량 음성인식 시스템 등에서 주로 사용되어진다.

<8> 연속 음성 인식은 특징추출 → 패턴비교(음향모델비교) → 언어모델비교 → 후처리과정 → 인식의 순으로 인식하는 방식이며, 고사양의 서버급 PC등에서 대규모 음성인식 시스템에 적합하며, 저장매체와 연산처리 능력이 날로 발전함에 따라 실시간 대규모 음성인식 시스템의 구현이 가능하게 되고 있다. 하지만, 그와 더불어 날로 경량화 되어 가는 단말기에 탑재되기 위해서는 여전히 부족한 저장용량과 복잡한 floating 연산이 문제가 되며, 많은 계산량과 대규모 데이터 저장용량 필요하다는 단점을 안고 있다.

<9> 도 2는 동일한 명령어를 시동을 켜지않은 차량내에서 발성한 음성파형이며, 도 3은 동일한 명령어를 창문을 열고 주행시 발성한 음성파형이다. 도 2 및 도 3를 비교하면 실제 차량 환경에서는 차량 엔진 진동음, 멀티미디어 기기의 출력음 및 자동차 창문 개방시 발생하는 바람의 영향으로 인하여 기존의 에너지나 ZCR(Zero Crossing Rate)을 이용한 VAD(Voice Activity Detection)은 그 성능이 현저히 떨어지게 된다. 따라서, 기존의 차량내 음성인식 장치에서는 차량의 운전자가 핫키(Hot-Key)를 누름으로써 음성인식 이벤트를 발생하고 음성인식을 수행하였다. 이러한 기능은 차량의 전장제어나 기본 탑재되는 네비게이션의 메뉴 제어 등

제출 일자 : 2008-05-28

비교적 우수한 성능을 가지는 소규모 음성인식 시스템임에도 불구하고 사용자로 하여금 불편함을 야기하여 상용화되는데 큰 걸림돌이 되고 있다.

【발명의 내용】

【해결하고자 하는 과제】

- <10> 상술한 종래의 문제점을 해결하기 위한 본 발명의 목적은, 음성 인식 네트워크의 변경과 신뢰도 검사를 통한 음성 호출 명령어를 이용한 잡음환경에서의 음성 구간 검출 시스템을 제안하고자 한다.
- <11> 또한, 기존의 핵심어 검출 방식의 연속 음성 인식 기법이 방대한 계산량과 적용분야에 따라 변결되어야 하는 언어모델이나 후처리 과정을 이용해 실시간 처리가 불가능한 단점을 해결하여 특별한 이벤트를 필요로 하는 고립단어 인식 시스템의 단점을 해결하여 음성인식 상시 대기 상태를 가능한 호출 명령어를 이용한 잡음 환경에서의 음성 구간 검출 시스템을 제안하고자 한다.
- <12> 또한, 방대한 계산량뿐만 아니라 언어모델이나 후처리 과정이 변경되어야 하는 기존 핵심어 검출 방식의 연속 음성 인식 기법의 단점을 해결하는 동시에, 반드시 음성인식을 위한 특별한 이벤트를 필요로 하는 고립단어 인식 시스템의 단점을 해결하여 음성인식 상시 대기 상태가 가능한 호출명령어를 이용한 잡음환경에서의 음성 구간 검출 시스템을 제안하고자 한다.

【과제 해결 수단】

- <13> 상술한 과제를 해결하기 위한 본 발명에 따른 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템은, 발화자가 호출명령어를 발화하면, 호출명령어를 인식한 후 신뢰도를 측정하여 상기 호출명령어를 인식하는 순간 상기 호출명령어에 연이어 발화되는 음성구간을 연속음성인식엔진에 인가함으로써 발화자의 음성을 인식하는 것을 특징으로 하여 이루어진다.
- <14> 여기서, 상기 호출명령어 인식은, 호출명령어 인식 네트워크를 통해 수행되며, 상기 인식 네트워크는 LTR(Left-to-Right) 모델로 구성되어지고, 상기 인식 네트워크에 입력되는 음성 프레임은 소정의 토큰으로 구성되어 상기 인식 네트워크와 실시간 확률 비교가 이루어지는 것을 특징으로 한다.
- <15> 여기서, 상기 소정의 토큰은 상기 음성 프레임과 잡음을 포함한 묵음구간을 더 포함하여 구성되는 것을 특징으로 한다.
- <16> 여기서, 상기 인식 네트워크는, 상기 인식 네트워크를 통과해 실시간 계산되는 상기 소정의 토큰의 누적확률이 기설정된 상위 백분율 이내이던 상기 호출명령어를 발화한 것으로 추정하여 상기 음성 프레임을 신뢰도 측정단계로 전달하는 것을 특징으로 한다.
- <17> 여기서, 상기 음성 프레임의 범폭은 20 내지 30개의 토큰으로 제한하여 구성되는 것을 특징으로 한다.
- <18> 여기서, 상기 상위 백분율은 10%인 것이 바람직하다.

<19> 여기서, 상기 신뢰도는 다음 수학식에 의하여 결정되는,

$$\text{LLR}_k(O, \lambda_k) = \log p(O | \lambda_k) - \log p(O | \lambda_{\bar{k}})$$

<20>

<21> 여기서, LLR(Log likelihood ratio), λ_k 음소모델, $\lambda_{\bar{k}}$ 반음소모델(Anti-phoneme model)인 것을 특징으로 하여 이루어진다.

<22> 또한, 호출명령어를 실시간으로 검색하는 호출명령어 검색 루틴과 상기 호출명령어 검색 루틴에서 검색된 호출명령어의 신뢰도를 검사하는 신뢰도 검사 루틴을 포함하는 호출명령어 인식 네트워크와; 상기 호출명령어 인식 네트워크에서 상기 호출명령어가 인식되는 순간 상기 호출명령어에 연이어 들어오는 발화자의 음성을 인식하는 연속 음성 인식 네트워크;을 포함하여 이루어진다.

<23> 여기서, 상기 호출명령어 인식 네트워크는 적응형 필터(Adaptive Filter), 특징추출부(Feature Extration) 및 탐색부(Keyword Searching)를 포함하여 이루어지는 것이 바람직하다.

<24> 여기서, 상기 연속 음성 인식 네트워크는 토큰 패싱부(Token passing), 키워드 탐지부(Keyword spotting), 신뢰도 검사부(Confidence Detection) 및 룰 체크부(Rule check)를 포함하여 이루어지는 것이 바람직하다.

【효과】

<25> 상술한 본 발명의 구성에 따르면, 잡음환경에서 원활한 연속음성인식을 수행하기 위하여 '나래야', '네비야' 등과 같은 호출명령어를 선정하고 잡음을 포함한

<28> 도 4는 본 발명에 따른 호출명령어 검색 루틴이 포함된 감음환경에서의 연

연진에 인가하므로써 감음환경에 매우 강인한 연속 음성인식을 수행하게 된다.

여 있는 음성구간을 포함하여 연이어 들어오는 발화자의 음성구간을 연속음성인식
대한 신뢰도를 연속적으로 분석하여 발화자의 호출명령어가 인식된 순간 비퍼링되
으로 구성하여 입력된 음성에 대해 실시간 음성인식을 계속적으로 수행하고 이에
하고 감음을 포함한 복음구간과 호출명령어로 구성된 최초의 인식네트워드를 토
연속음성인식을 수행하기 위하여, '나래야', '네비야', 등과 같은 호출명령어를 선정
본 발명에 따른 호출명령어/연속 음성 인식 시스템은 감음환경에서 원활한

음성 인식 시스템'이라 함)의 기법, 구조 및 동작 특성을 살펴보기로 한다.
용한 감음환경에서의 음성구간검출과 연속음성인식 시스템(이하, '호출명령어/연속
<26> 이하, 첨부된 도면을 참조하여 본 발명에 따른 실시간 호출명령어 인식을 이

【발명의 실시를 위한 구체적인 내용】

를 시스템을 제공할 수 있다.

환경에 매우 강인한 연속 음성인식을 가능하게 하는 감음환경에서의 음성 구간 검
하여 연이어 들어오는 발화자의 음성구간을 연속음성인식엔진에 인가하므로써 감
로 분석하여 발화자의 호출명령어가 인식된 순간 비퍼링되어 있는 음성구간을 포함
음성에 대해 실시간 음성인식을 계속적으로 수행하고 이에 대한 신뢰도를 연속적으
복음구간과 호출명령어로 구성된 최초의 인식네트워드를 토대로 구성하여 입력된

제출 일자 : 2008-05-28

속 음성 인식 시스템의 블록도이다.

<29> 도 4에 도시된 바와 같이 본 발명의 실시간 호출명령어 인식을 이용한 잡음 환경에서의 음성구간검출과 연속음성인식 시스템은 연속 인식 네트워크(430)를 진행하기 전에 크게 호출명령어를 검색하는 호출명령어 검색 루틴과 검색된 호출명령어의 신뢰도를 검사하는 신뢰도 검사 루틴(421, 422, 423)을 포함하는 호출명령어 인식 네트워크를 수행한다.

<30> 호출명령어 인식 네트워크(420)는 적응형 필터(Adaptive Filter, 421), 특징 추출부(Feature Extration, 422) 및 탐색부(Keyword Searching, 423)를 포함하며, 연속 음성 인식 네트워크(430)는 토큰 패싱부(Token passing, 431), 키워드 탐지부(Keyword spotting, 432), 신뢰도 검사부(Confidence Detection, 433) 및 룰 체크부(Rule check, 444)를 포함한다.

<31> 호출명령어 인식 네트워크(420)에서는 잡음을 포함한 묵음구간과 발화자의 호출명령어로 구성된 최소의 인식네트워크를 토큰으로 구성하여 입력된 음성에 대해 실시간 음성인식을 계속적으로 수행한다. 호출명령어 검색 루틴을 통해 발화자의 호출명령어로 인식되면 다음 단계인 신뢰도 검사 루틴에서 신뢰도를 검사하여 검색된 호출명령어가 발화자가 의도하는 진의 호출명령어인지 거짓 호출명령어인지를 판단하여 호출명령어 다음에 연이어 발화되는 명령어의 연속 음성 인식을 수행하도록 한다.

<32> 호출명령어 인식 네트워크(420)의 구성과 그 역할은 다음과 같다.

- <33> 적응형 필터(Adaptive Filter, 421)는 입력된 잡음이 포함된 음성(호출명령어를 포함하여 발화되는 모든 음성)에 대하여 주변 잡음의 스펙트럼(Spectrum) 특성을 자동으로 추적하여 주변 잡음을 제거하는 FIR(Finite Impulse Response) 필터이다.
- <34> 특징추출부(Feature Extration, 422)는 적응형 필터(421)를 통과한 입력 음성에 대하여 프레임별로 음성의 스펙트럼 특성을 청각 모델링하여 강인한 파라미터로 변환하는 부분이다.
- <35> 탐색부(Keyword Searching, 423)는 음향모델 DB, 발음사전 DB 및 언어모델 DB를 사용하여 호출명령어 인지 아닌지를 판단하여 연속 음성 인식 루틴을 수행할지 수행하지 않을지를 판단한다. 탐색부(423)에는 잡음을 포함한 묵음구간과 발화자의 호출명령어를 포함한 음성 프레임을 최소한의 토큰으로 구성하여 호출명령어를 검색하는 토큰 패싱부와 인식된 호출명령어가 진짜인지 아닌지의 신뢰도를 검사하는 신뢰도 검사부를 포함한다.
- <36> 호출명령어 인식 네트워크(420)에 의해 발화자의 음성이 호출명령어로 인식되면 다음 단계인 연속 음성 인식 네트워크(430)로 이행되며, 연속 음성 인식 네트워크(430)의 구성 및 그 역할은 다음과 같다.
- <37> 먼저, 토큰 패싱부(Token passing, 431)는 구성된 연속 음성 인식 네트워크에서 입력된 음성을 검색하는 부분이다.
- <38> 키워드 탐지부(Keyword spotting, 432)는, 핵심어와 필터모델을 이용하여 범

- <45> 도 5에 도시된 바와 같이, 호출명령어/연속 음성 인식 시스템은 호출명령어 인식 및 신뢰도를 측정하는 호출명령어 인식 네트워크와 실제 명령어인 음성을 인식하는 연속 음성 인식 네트워크로 구성된다. 호출명령어/연속 음성 인식 시스템
- <44> 도 5는 본 발명의 실시가 호출명령어 인식을 이용한 적응환경에서의 음성구간검출과 연속음성인식 시스템의 구성을 간략하게 도시한 것이다.
- <43> 호출명령어 인식 네트워크(420)는 입력음성에 대한 특정 파라미터 추출 부분과 변형된 호출 명령어 인식 네트워크 및 신뢰도 검사 부분이 포함된다(호출명령어 검색 부분 및 신뢰도 검사 부분).
- <42> 따라서, 포터를 기거나 임베디드 시스템과 같이 계산적리능력과 저장용량이 적은 응용분야에서도 연속 음성인식의 장점을 적용할 수 있게 된다.
- <41> 도 4와 같이, 호출명령어 인식 네트워크(420)는 호출명령어에 대한 검색 부분 및 신뢰도 검사 부분을 포함함으로써 입력되는 모든 연속 음성에 대하여 인식 네트워크를 진행해야만 하는 기존 연속 음성인식에 비하여 계산량이 급격히 감소하게 된다.
- <40> 룰 체크부(Rule check, 444)는, 인식된 결과가 인식 대상 문장인지 아닌지 판단하는 후처리 부분이다.
- <39> 신뢰도 검사부(Confidence Detection, 433)는, 인식된 해설어가 진짜인지 아닌지 신뢰도를 검사하여 판단하는 부분이다.
- 사지된 토큰에서 해설어를 검출하는 부분이다.

제출 일자 : 2008-05-28

은 호출명령어('나래야', '네비야' 등)에 대한 인식 네트워크를 구성하고 입력되어지는 음성에 대해 호출 명령어 1개에 대한 인식 네트워크에 대해 진행하고 신뢰도를 측정함으로써 실제 연속 음성 인식 네트워크를 시작할 지 안할 지를 결정해준다.

<46> 이러한 본 발명에 따른 방식은 기존의 인식 네트워크를 사용하는 연속 음성 인식 시스템에서 필요한 메모리와 연산 처리 능력을 현격히 감소시켜 주는 효과를 가진다.

<47> 문제해결을 위해, 핵심어 검출 방식의 연속 음성인식 시스템을 수행함에 있어서 소량의 연산만으로 보다 높은 미등록어 거절을 및 음성 인식을 향상을 위하여 본 발명에서는 다음과 같은 기법을 제안한다.

<48> 도 6은 본 발명에 따른 실시간 호출명령어 인식을 이용한 잡음환경에서의 음성구간검출과 연속음성인식 시스템에서의 호출명령어 인식 네트워크를 설명하기 위해 도시한 구성도이다.

<49> 도 6에 도시된 바와 같이, 호출 명령어에 대한 인식 네트워크는 Left-to-Right 모델로 구성되어지며 묵음모델에서 묵음모델로의 전이만 가능하며, 매 입력 음성 프레임은 단지 1 단어의 인식 네트워크와 실시간 확률 비교가 이루어지게 된다. 여기서, 빔폭은 20 내지 30개의 토큰만으로 제한하여 계산량을 최소화 시킬 수 있다.

<50> 단지 1 단어에 대한 인식 네트워크이므로 극소량(20개 내지 30개)의 토큰만

이 필요하며, 연속적으로 입력되는 프레임에 대해 실시간 계산이 이루어지면서, 호출명령어 인식 네트워크에서 묵음 모델로 천이하는 순간의 토큰 누적 확률이 20 내지 30개의 토큰 중에 상위 10%에 해당하던 실제 호출명령어를 발생하였다고 가정하고 프레임 정보를 신뢰도 검사 루틴(신뢰도 검사 루틴, 430)으로 전달한다.

<51> 즉, 호출명령어 인식 네트워크의 시계열적 작동순서를 살펴보면, 먼저 호출명령어 인식 네트워크를 구성한다(Step 1). 녹음된 음성 입력 프레임의 실시간 인식 네트워크를 디코딩 후 토큰에 저장한다(Step 2). 이때 저장되는 각각의 비트값은 다음식의 로그 가능성 비율값에 따라 소팅(Sorting) 된다.

【수학식 1】

<52>
$$LLR_k(O, \lambda_k) = \log p(O | \lambda_k)$$

<53> 여기서, LLR_k 는 Log Likelihood Ratio(로그 확률 비율), λ_k 는 k번째 모델 파라미터, $p(O | \lambda_k)$ 는 입력 음성 프레임의 λ_k 모델에 대한 확률을 나타낸다.

<54> Step 2에 따라 누적확률이 정렬된 후 N(20 내지 30)개로 토큰 빔 프루닝(Token Beam pruning)을 행한다(Step 3). 이어서, 호출 명령어 인식 네트워크의 마지막 상태로서 Step 3 상태에서 묵음구간으로 천이하는 순간의 토큰 누적확률값이 상위 10%(2 내지 3)에 해당하면 호출명령어로 가정하고 신뢰도 검사 루틴으로 이동, 그렇지 않으면 Step 2로 이동한다(Step 4).

<55> 일반적으로 음성인식 네트워크 구성시 필요한 토큰의 수는 단어수 * 단어수 정도가 필요하며, 즉, 1,000단어 정도의 연속 음성 인식을 위해 필요한 안정적인

제출 일자 : 2008-05-28

토큰의 수는 1,000,000개 정도가 필요합니다. 하지만, 본 발명의 호출명령어 인식 네트워크에서는 단지 20 내지 30개의 토큰에 대한 누적확률 및 모델 천이 상태가 저장된다. 이 20개 내지 30개 중에서 최상위 확률값을 저장하는 토큰만이 필요하며, 도 5에서 a33에서 silence(묵음구간)로 천이하는 순간의 누적확률이 최상위 확률값을 저장하는 토큰이면 호출명령어가 발화된 것으로 간주하고 신뢰도 검사를 실시한다. 이때, 최상위 확률값의 범위는 상위 10%의 범위로 정할 수 있다.

<56> 이러한 호출 명령어 인식 네트워크의 계산량은 실시간 MFCC(Mel Frequency Cepstrum Coefficient) 파라미터 추출 및 20 내지 30개의 토큰 디코딩에 필요한 계산으로 한정되어 연속 음성 인식 네트워크에 따른 계산량에 비해 극소량에 불과하여, 기존의 에너지와 ZCR을 이용한 VAD 검출 기법의 계산량보다도 오히려 감소하게 된다. 하지만, 잡음환경하에서의 VAD 검출율은 현격히 향상될 수 있다.

<57> 호출명령어 인식 네트워크에 의해 호출명령어가 발화된 것으로 결정되면, 호출명령어에 대한 신뢰도 검사를 행한다.

<58> 마이크로로부터 입력되는 모든 음성은 1번의 호출명령어 인식 네트워크에 따라 음성 인식이 수행되어 지며, 20 내지 30개의 토큰 중 누적확률 값이 우수한 토큰은 신뢰도 검사 루틴(신뢰도 검사 루틴, 도4에서는 430)으로 전달되어 진다. 이때, 토큰에는 이미 입력된 음성이 호출명령어 인식 네트워크에서 천이된 정보(자동 분할(auto segmentation) 정보)가 보유된다.

<59> 이와 같이 인식된 자동 분할된 분할 정보에 따라 호출명령어인 '나래야' 또는 '네비야' 라고 가정된 입력 음성(호출명령어)은 호출명령어 인식 네트워크의 음

소모델에 대한 확률 $p(O|\lambda_s)$ 과 가정된 음소가 아닌 반음소 모델(anti-phone mode l)에 대한 확률 $p(O|\lambda_a)$ 과의 비율을 계산하여 신뢰도(Confidence rate)를 계산하게 된다. 그 수학식은 다음과 같다.

【수학식 2】

$$LLR_s(O, \lambda_s) = \log p(O|\lambda_s) - \log p(O|\lambda_a)$$

<60>

<61> 여기서, LLR는 Log likelihood ratio, λ_s 는 음소모델, λ_a 는 반음소모델을 의미한다.

<62> 위 수학식 2에 따라 LLR값이 결정되어 'LLR > 임계값'이면 연속 음성 인식 네트워크를 수행하고, 그렇지 않으면 초기상태를 유지한다. 여기서, 연속 음성 인식은 호출명령어에 연이어 발화되는 실제명령어를 의미한다.

<63> 도 7은 본 발명에 따른 호출명령어 인식 네트워크에서 묵음으로 천이하는 순간의 확률값이 그 프레임의 토큰들 중 최상위에 해당할 때 신뢰도 검사를 수행한 결과를 나타낸 것이다.

<64> 도 7에 도시된 바와 같이, 호출명령어 인식 네트워크에서 묵음으로 천이하는 순간의 확률값이 그 프레임의 토큰들 중 최상위에 해당할 때(호출명령어를 '네비야'라고 가정할 때) 신뢰도 검사를 수행한 결과이다. 즉, 신뢰도 검사루틴으로 전달된 음성 입력 프레임들은 저장된 토큰을 따라 백트래킹(backtracking)하더라도 7과 같이 “ㄴ”, “ㄱ”, “ㄴ”, “ㅣ”, “야” 부분으로 자동 분할되며, 각

부분은 자신모델과의 확률값 $P(O|I_k)$ 와 반응소모델과의 확률값 $P(O|I_k)$ 의 차에 의해 0보다 크면 호출명령어 “네비야”를 인식하고 호출명령어에 연이어 발화되는 음성을 연속 음성 인식 엔진으로 전달하여 연속 음성 인식을 수행하고, 0보다 작으면 호출명령어가 발화되지 않은 것으로 판단하여 초기상태로 복귀한다.

<65> 기존의 연속 음성인식 네트워크를 통한 음성인식 방식이 끝점 추출 없이 묵음 모델(silence model)을 통해 음성의 휴지(pause) 구간을 찾는 반면, 제안한 본 발명에 따른 호출명령어 인식 방식에서는 호출명령어 이후에 일정 구간에 대해서만 인식 네트워크를 진행함으로써 대량의 메모리나 고성능의 연산 처리 능력이 요구되어 지지 않는 장점을 가지게 된다.

<66> 이상 첨부된 도면을 참조하여 본 발명의 바람직한 실시예를 설명하였지만, 상술한 본 발명의 기술적 구성은 본 발명이 속하는 기술 분야의 당업자가 본 발명의 그 기술적 사상이나 필수적 특징을 변경하지 않고서 다른 구체적인 형태로 실시될 수 있다는 것을 이해할 수 있을 것이다. 그러므로 이상에서 기술한 실시예들은 모든 면에서 예시적인 것이며 한정적인 것이 아닌 것으로서 이해되어야 하고, 본 발명의 범위는 상기 상세한 설명보다는 후술하는 특허청구범위에 의하여 나타내어지며, 특허청구범위의 의미 및 범위 그리고 그 등가 개념으로부터 도출되는 모든 변경 또는 변형된 형태가 본 발명의 범위에 포함되는 것으로 해석되어야 한다.

제출 일자 : 2008-05-28

【산업상이용가능성】

<67> 본 발명은 음성 인식 시스템에 관한 것으로서, 홈네트워크시스템이나 지능형 로봇, 차량용 내비게이션 및 Car-PC용 음성 인식 시스템 분야에 널리 산업적으로 이용될 수 있는 발명이다.

【특허청구범위】

【청구항 1】

발화자가 호출명령어를 발화하면, 호출명령어를 인식한 후 신뢰도를 측정하여 상기 호출명령어를 인식하는 순간 상기 호출명령어에 연이어 발화되는 음성구간을 연속음성인식엔진에 인가함으로써 발화자의 음성을 인식하는, 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

【청구항 2】

제1항에 있어서,

상기 호출명령어 인식은,

호출명령어 인식 네트워크를 통해 수행되며, 상기 인식 네트워크는 LTR(Left-to-Right) 모델로 구성되어지고,

상기 인식 네트워크에 입력되는 음성 프레임은 소정의 토큰으로 구성되어 상기 인식 네트워크와 실시간 확률 비교가 이루어지는, 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

【청구항 3】

제2항에 있어서,

상기 소정의 토큰은 상기 음성 프레임과 잡음을 포함한 묵음구간을 더 포함하여 구성되는, 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

제출 일자 : 2008-05-28

【첨구항 4】

제3항에 있어서,

상기 호를명령어 인식 네트워크는,

상기 호를명령어 인식 네트워크를 통과해 실시간 계산되는 상기 조정의 토론

의 능력확률이 기설정된 상위 백분율 이내이면 상기 호를명령어를 발화한 것으로

추정하여 상기 음성 프레임들 신뢰도 측정단계로 전달하는, 실시간 호를명령어인식

를 이용한 음성구간검출 및 연속음성인식 시스템.

【첨구항 5】

제4항에 있어서,

상기 음성 프레임의 빈폭은 20 내지 30개의 토론으로 제한하여 구성하는, 실

시간 호를명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

【첨구항 6】

제4항에 있어서,

상기 상위 백분율은 10%인, 실시간 호를명령어인식을 이용한 음성구간검출

및 연속음성인식 시스템.

【첨구항 7】

제1항에 있어서,

상기 신뢰도는 다음 수학적식에 의하여 결정되는,

$$LLR_x(O, \lambda_x) = \log p(O | \lambda_x) - \log p(O | \lambda_{\bar{x}})$$

여기서, 여기서, LLR(Log likelihood ratio), λ_x 음소모델, $\lambda_{\bar{x}}$ 반음소모델 (Anti-phoneme model)인, 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

【청구항 8】

호출명령어를 실시간으로 검색하는 호출명령어 검색 루틴과 상기 호출명령어 검색 루틴에서 검색된 호출명령어의 신뢰도를 검사하는 신뢰도 검사 루틴을 포함하는 호출명령어 인식 네트워크와;

상기 호출명령어 인식 네트워크에서 상기 호출명령어가 인식되는 순간 상기 호출명령어에 연이어 들어오는 발화자의 음성을 인식하는 연속 음성 인식 네트워크;를 포함하는, 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

【청구항 9】

제3항에 있어서,

상기 호출명령어 인식 네트워크는 적응형 필터(Adaptive Filter), 특징추출부(Feature Extration) 및 탐색부(Keyword Searching)를 포함하여 이루어지는, 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

【청구항 10】

제9항에 있어서,

상기 연속 음성 인식 네트워크는 토큰 패싱부(Token passing), 키워드 탐지부(Keyword spotting), 신뢰도 검사부(Certainty Detection) 및 룰 체크부(Rule check)를 포함하여 이루어지는, 실시간 호출명령어인식을 이용한 음성구간검출 및 연속음성인식 시스템.

【도면의 간단한 설명】

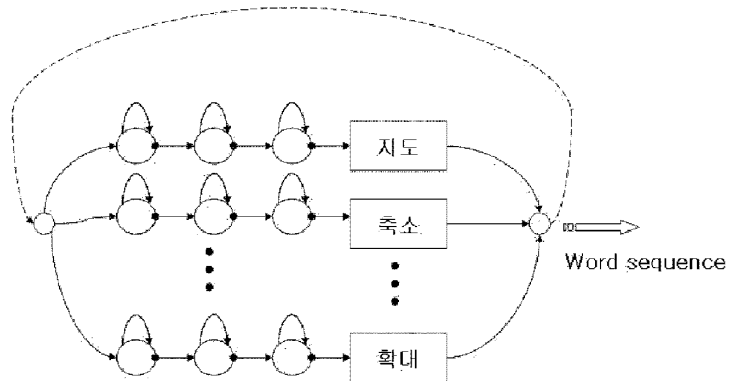
- <68> 도 1은 종래의 연속 음성 인식 네트워크의 구성을 간략히 도시한 것이다.
- <69> 도 2는 동일한 명령어를 시동을 켜지않은 차량내에서 발성한 음성파형이다.
- <70> 도 3은 동일한 명령어를 창문을 열고 주행시 발성한 음성파형이다.
- <71> 도 4는 본 발명에 따른 호출명령어 검색 루틴이 포함된 잡음환경하에서의 연속 음성 인식 시스템의 블록도이다.
- <72> 도 5는 본 발명의 실시간 호출명령어 인식을 이용한 잡음환경에서의 음성구간검출과 연속음성인식 시스템의 구성을 간략하게 도시한 것이다.
- <73> 도 6은 본 발명에 따른 실시간 호출명령어 인식을 이용한 잡음환경에서의 음성구간검출과 연속음성인식 시스템에서의 호출명령어 인식 네트워크를 설명하기 위해 도시한 구성도이다.
- <74> 도 7은 본 발명에 따른 호출명령어 인식 네트워크에서 묶음으로 천이하는 순

제출 일자 : 2008-05-28

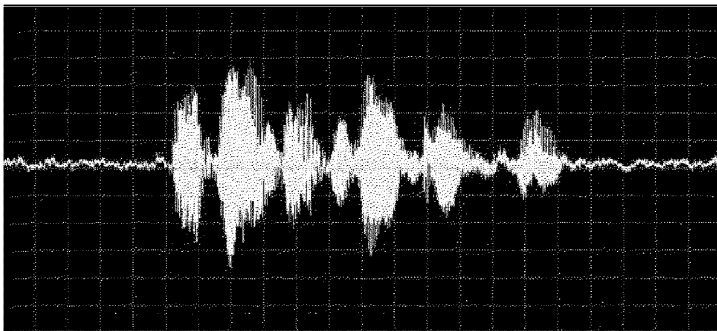
간의 확률값이 그 프레임의 토큰들 중 최상위에 해당할 때 신뢰도 검사를 수행한
결과를 나타낸 것이다.

【도면】

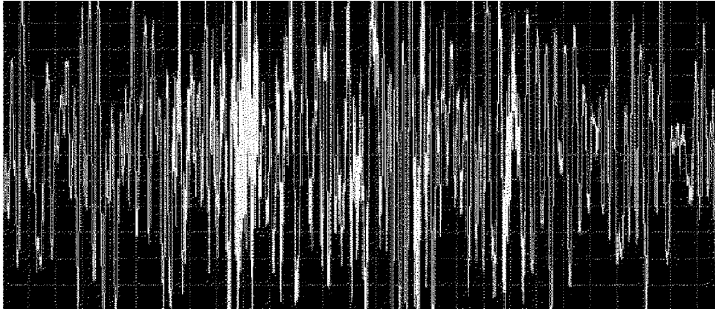
【도 1】



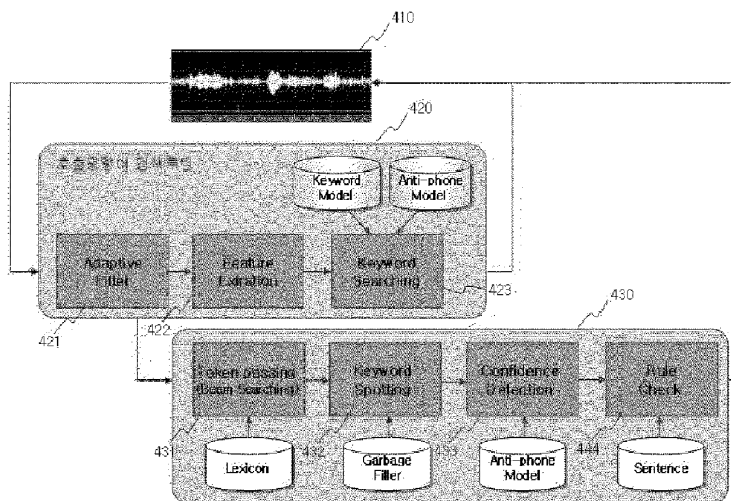
【도 2】



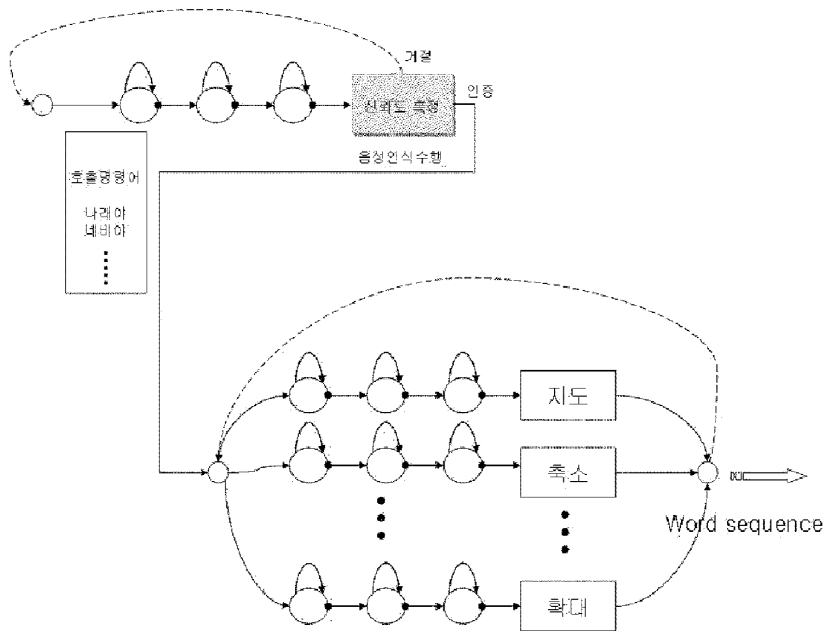
【도 3】



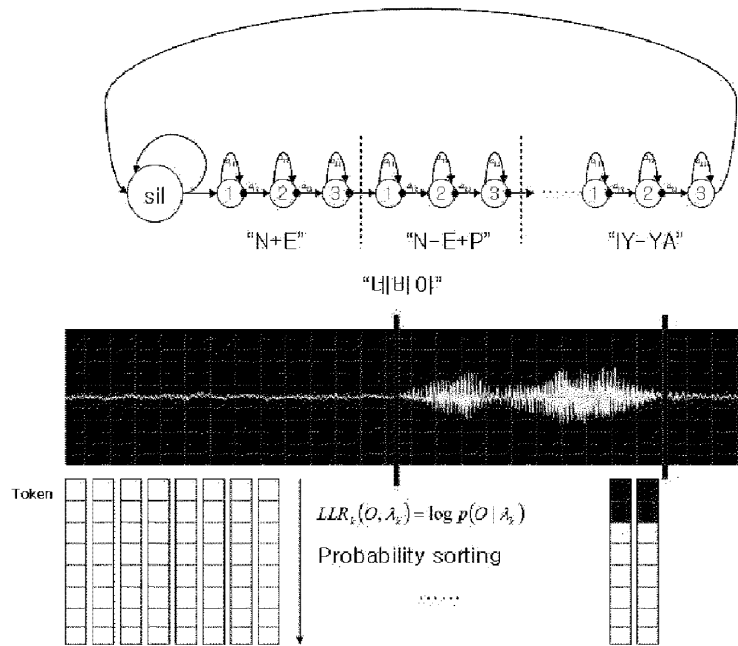
【도 4】



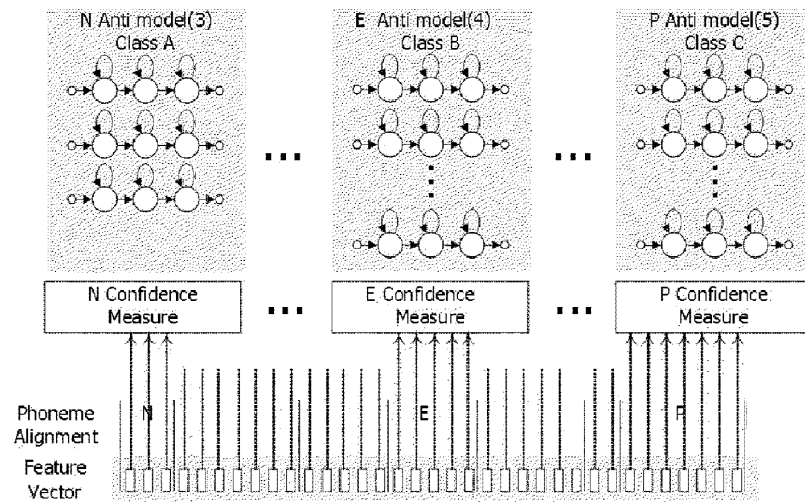
【도 5】



【도 6】



【도 7】





UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024

23413	7590	11/29/2012
CANTOR COLBURN LLP		
20 Church Street		
22nd Floor		
Hartford, CT 06103		

EXAMINER	
JACKSON, JAKIEDA R	

ART UNIT	PAPER NUMBER
2657	

NOTIFICATION DATE	DELIVERY MODE
11/29/2012	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary	Application No. 13/591,479		Applicant(s) JUNG ET AL.	
	Examiner JAKIEDA JACKSON		Art Unit 2657	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 ____.

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) 1-16 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-16 is/are rejected.

8) ☐ Claim(s) ____ 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 22 August 2012 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).

a) ☒ All b) ☐ Some * c) ☐ None of:

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/08)
Paper No(s)/Mail Date ____.

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

4) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-8 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In regards to claims 1-8, while the claim(s) recite a series of steps or acts to be performed, a statutory "process" under 35 USC 101 must (1) be tied to another statutory category (such as a manufacture or a machine), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. To qualify as a § 101 statutory process, the claim should positively recite the other statutory class (the thing or product) to which it is tied, for example by identifying the apparatus that accomplishes the method steps, or positively recite the subject matter that is being transformed, for example by identifying the material that is being changed to a different state. The instant claim(s) neither transform underlying subject matter nor positively recite structure associated with another statutory category, and therefore do not define a statutory process. In particular, there is no physical transformation of an article in the claim language and the claim language does not cite any physical hardware to perform the steps, rather, the method is a manipulation of abstract data, which does not perform any useful, concrete tangible results.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Yao et al. (USPN 7,966,183), hereinafter referenced as Yao.

Regarding **claims 1 and 9**, Yao discloses a method and apparatus, hereinafter referenced as a method for recognizing a speech of a speaker, the method comprising:

receiving an input speech spoken by the speaker (receive a command “call”; column 1, lines 17-50);

receiving a subsequent input speech spoken, by the speaker, subsequently to the input speech (subsequent speech “a name”; column 1, lines 17-50);

comparing the input speech with a preset call command (match; column 1, lines 17-50);

recognizing the input speech as the preset call command according to a result of the comparison (match; column 1, lines 17-50); and

recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command (recognition; column 1, lines 17-50).

Regarding **claims 2 and 10**, Yao discloses a method wherein recognizing the input speech as the preset call command comprises:

assuming the input speech to be the preset call command according to the result of the comparison (match; column 1, lines 17-50);

computing a confidence rate of the assumed input speech (confidence; column 1, lines 17-50); and

recognizing the assumed input speech as the preset call command based on the computed confidence rate (confidence; column 1, lines 17-50).

Regarding **claims 3 and 11**, Yao discloses a method wherein recognizing the assumed input speech comprises:
recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value (threshold; column 1, lines 17-50).

Regarding **claims 4 and 12**, Yao discloses a method wherein recognizing the assumed input speech comprises:
determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate (column 1, lines 17-50); and
recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command (column 1, lines 17-50).

Regarding **claims 5 and 13**, Yao discloses a method wherein assuming the input speech to be the preset call command comprises:

computing a log likelihood ratio of the input speech (log-likelihood; column 3, line 5 – column 7, line 49); and

assuming the input speech to be the preset call command based on the computed log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 6 and 14**, Yao discloses a method

wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command (phone), and the computed confidence rate is another log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 7 and 159**, Yao discloses a method wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command (column 3, line 5 – column 7, line 49).

Regarding **claim 8**, Yao discloses a method further comprising:

determining whether or not the recognized subsequent input speech corresponds to a target sentence (column 1, lines 17-50 with column 3, line 5 – column 7, line 49).

Regarding **claim 16**, it is interpreted and rejected for similar reasons as set forth in the combination of claims 1 and 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAKIEDA JACKSON whose telephone number is (571)272-7619. The examiner can normally be reached on Monday-Friday from 5:30am-2:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. 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.

/Jakieda R Jackson/
Primary Examiner, Art Unit 2657

Notice of References Cited	Application/Control No. 13/591,479	Applicant(s)/Patent Under Reexamination JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,966,183	06-2011	Yao et al.	704/251
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

<i>Search Notes</i> 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History	11/19/12	JJ
Reviewed for 101, deemed	11/19/12	JJ
Inventor Search	11/19/12	JJ
Reviewed for DP, not deemed	11/19/12	JJ

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

--	--



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 7024

SERIAL NUMBER 13/591,479	FILING or 371(c) DATE 08/22/2012 RULE	CLASS 704	GROUP ART UNIT 2657	ATTORNEY DOCKET NO. MSF0011USC		
APPLICANTS Heui-Suck JUNG, Incheon, KOREA, REPUBLIC OF; Se-Hoon CHIN, Seoul, KOREA, REPUBLIC OF; Tae-Young ROH, Bucheon-si, KOREA, REPUBLIC OF; ** CONTINUING DATA ***** This application is a CON of 12/863,437 07/17/2010 PAT 8,275,616 which is a 371 of PCT/KR2009/002118 04/22/2009 ** FOREIGN APPLICATIONS ***** REPUBLIC OF KOREA 10-2008-0049455 05/28/2008 ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY ** 08/30/2012						
Foreign Priority claimed ☒ Yes ☐ No 35 USC 119(a-d) conditions met ☒ Yes ☐ No Verified and /JAKIEDA R JACKSON/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY KOREA, REPUBLIC OF	SHEETS DRAWINGS 7	TOTAL CLAIMS 16	INDEPENDENT CLAIMS 2
ADDRESS CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103 UNITED STATES						
TITLE SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS						
FILING FEE RECEIVED 530	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		13/591,479
	Filing Date		2012-08-22
	First Named Inventor	Heui-Suck JUNG	
	Art Unit	2657	
	Examiner Name	NTA Jakieda Jackson	
	Attorney Docket Number	MSF0011USC	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5832430		1998-11-03	LLEIDA, et al.	
	2	6980956		2005-12-27	TAKAGI, et al.	
	3	7203652		2007-04-10	Larry P. HECK	

If you wish to add additional U.S. Patent citation information please click the Add button.

Add

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20010056349		2001-12-27	Vicky ST. JOHN	
	2	20020161581		2002-10-31	MORIN	
	3	20030023437		2003-01-30	Pascale FUNG	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		13/591,479	
	Filing Date		2012-08-22	
	First Named Inventor		Heui-Suck JUNG	
	Art Unit		2654 2657	
	Examiner Name		NYA Jakieda Jackson	
	Attorney Docket Number		MSF0011USC	

	4	20050149326		2005-07-07	HOGENGOUT, et al.	
	5	20060074651		2006-04-06	ARUN	
	6	20070179784		2007-08-02	THAMBIRATNAM, et al.	
	7	20090055185		2009-02-26	NAKADE, et al.	
	8	20110224987		2011-09-15	Karl D. GIERACH	

If you wish to add additional U.S. Published Application citation information please click the Add button. **Add**

FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	0679044	KR		2007-02-06	Samsung Electronics Co., Ltd.		☐
	2	1020060097895	KR		2006-09-18	Samsung Electronics Co., Ltd.		☐
	3	2006184589	JP		2006-07-13	Casio Comput Co., Ltd.		☐
	4	1020080013541	KR		2008-02-13	Samsung Electronics Co., Ltd.		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		13/591,479	
	Filing Date		2012-08-22	
	First Named Inventor	Heui-Suck JUNG		
	Art Unit	2657 2657		
	Examiner Name	AKA Jakieda Jackson		
	Attorney Docket Number	MSF0011USC		

	5	2007045723	WO		2007-04-26	Nokia Corporation		☐
--	---	------------	----	--	------------	-------------------	--	--------------------------

If you wish to add additional Foreign Patent Document citation information please click the Add button **Add**

NON-PATENT LITERATURE DOCUMENTS

Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	LEE, et al. Automatic speech and speaker recognition, 1996, Kluwer Academic Publishers, chapter 13, p.303-329.	☐
	2	International Search Report - PCT/KR2009/002118.	☐
	3	KIPO Office Action - Korean Application No. 10-2008-0049455 corresponding to U.S. Patent Application No. 12/863,437.	☐
	4	D. B. PAUL, et al., Speaker stress resistant continuous speech recognition, 1988, Proceedings of the Int. Conf. on acoustic speech and signal processing, p.283-286.	☐
	5	HOFSTETTER, et al., Techniques for task independent word spotting in continuous speech messages, 1992, Lincoln Laboratory MIT, p.II-101-II-104.	☐

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE

Examiner Signature	/Jakieda Jackson/	Date Considered	11/19/2012
--------------------	-------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

<i>Index of Claims</i> 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM		DATE								
Final	Original	11/19/2012								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S2	2954	call\$4 near2 command\$4 and (speech\$4 voic\$4) near2 recogni\$9	US-PGPUB; USPAT	OR	OFF	2012/11/19 08:59
S3	0	call\$4 near2 command\$4 and (speech\$4 voic\$4) near2 recogni\$9 and (confiden\$5 threshold\$4) and log\$5 near2 likelihood\$4	US-PGPUB; USPAT	OR	OFF	2012/11/19 09:00
S4	5	call\$4 near2 command\$4 and (speech\$4 voic\$4) near2 recogni\$9 and (confiden\$5 threshold\$4) and log\$5 near2 likelihood\$4	US-PGPUB; USPAT	OR	OFF	2012/11/19 09:00
S5	2	call\$4 near2 command\$4 and (speech\$4 voic\$4) near2 recogni\$9 and (confiden\$5 threshold\$4) and log\$5 near2 likelihood\$4 and (phonem\$4 phonetic\$5)	US-PGPUB; USPAT	OR	OFF	2012/11/19 09:02

11/ 19/ 2012 12:21:12 PM



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC

CONFIRMATION NO. 7024

23413
CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

PUBLICATION NOTICE



Title:SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS

Publication No.US-2012-0316879-A1

Publication Date:12/13/2012

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heui-Suck JUNG, et al.) Group Art Unit: 2657
Serial No. 13/591,479)
Filed: August 22, 2012) Examiner: JACKSON, JAKIEDA R
For: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**RESPONSE TO NON-FINAL OFFICE ACTION
UNDER 37 CFR § 1.111, WITH AMENDMENT**

Dear Sir:

In response to the Non-Final Office Action mailed on November 29, 2012, Applicants request reconsideration in view of the following amendments and remarks for entry in the above-identified application. This reply is being submitted with a Petition of three-month extension of time.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper; and

Remarks begin on page 6 of this paper.

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (Currently amended) A method for recognizing a speech of a speaker, the method comprising:

receiving, by a preset call command recognition unit, an input speech spoken by the speaker;

receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;

comparing, by the preset call command recognition unit, the input speech with a preset call command;

recognizing, by the preset call command recognition unit, the input speech as the preset call command according to a result of the comparison; and

recognizing, by a continuous speech recognition unit, the subsequent input speech as an actual command if the input speech is recognized as the preset call command.

2. (Currently amended) The method of claim 1,

wherein recognizing the input speech as the preset call command comprises:

assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison;

computing, by a confidence detection unit, a confidence rate of the assumed input speech; and

recognizing, by the confidence detection unit, the assumed input speech as the preset call command based on the computed confidence rate.

3. (Original) The method of claim 2,

wherein recognizing the assumed input speech comprises:

recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.

4. (Original) The method of claim 2,
wherein recognizing the assumed input speech comprises:
determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate; and
recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.

5. (Original) The method of claim 2,
wherein assuming the input speech to be the preset call command comprises:
computing a log likelihood ratio of the input speech; and
assuming the input speech to be the preset call command based on the computed log likelihood ratio.

6. (Original) The method of claim 5,
wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

7. (Original) The method of claim 6,
wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

8. (Original) The method of claim 1, further comprising:
determining whether or not the recognized subsequent input speech corresponds to a target sentence.

9. (Original) An apparatus for recognizing a speech of a speaker, the apparatus comprising:

- a preset call command recognition unit; and
- a continuous speech recognition unit,

wherein the preset call command recognition unit is configured to receive an input speech spoken by the speaker;

- receive a subsequent input speech spoken, by the speaker, subsequently to the input speech;
- compare the input speech with a preset call command; and
- recognize the input speech as the preset call command according to a result of the comparison,

wherein the continuous speech recognition unit is configured to recognize the subsequent input speech as an actual command if the input speech is recognized as the preset call command by the preset call command recognition unit.

10. (Original) The apparatus of claim 9,

- wherein the call command recognition unit comprises:
 - an adaptive filter configured to receive the input speech and the subsequent input speech;
 - a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison; and
 - a confidence detection unit configured to compute a confidence rate of the assumed input speech and recognize the assumed input speech as the preset call command based on the computed confidence rate.

11. (Original) The apparatus of claim 10,

- wherein the confidence detection unit is further configured to recognize the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.

12. (Original) The apparatus of claim 10,

wherein the confidence detection unit is further configured to determine whether or not the assumed input speech is an authentic call command based on the computed confidence rate and recognize the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.

13. (Original) The apparatus of claim 10,

wherein the token passing unit is further configured to compute a log likelihood ratio of the input speech and assume the input speech to be the preset call command based on the computed log likelihood ratio.

14. (Original) The apparatus of claim 13,

wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

15. (Original) The apparatus of claim 14,

wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

16. (Original) The apparatus of claim 9,

wherein the continuous speech recognition unit comprises:

a keyword spotting unit configured to recognize the subsequent input speech as the actual command if the input speech is recognized as the preset call command; and

a rule check unit configured to determine whether the recognized subsequent input speech corresponds to a target sentence.

REMARKS

The above amendments are made in response to the outstanding Non-final Office Action dated November 29, 2012. The Examiner's reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claims 1 and 2 have been amended to more clearly define the claimed invention. No new matter has been introduced by these amendments.

Claims 1-16 are pending in the present application.

Claim Rejections Under 35 U.S.C. §101

Claims 1-8 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter.

In response, Claims 1 and 2 have been amended to be directed to statutory subject matter.

Applicants therefore respectfully request the Examiner to reconsider the amended claims and withdraw the rejection of Claim 1-8.

Claim Rejections Under 35 U.S.C. § 102

To anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). “[a] claim is anticipated only if **each and every element as set forth in the claim** is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, “[t]he identical invention must be shown in **as complete detail as is contained** in the ...claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). (Emphasis added)

“An anticipatory reference must show all of the limitations of the claims **arranged or combined in the same way as recited in the claims**, not merely in a particular order.” “Thus, it is not enough that the prior art reference discloses part of the claimed invention, which an

ordinary artisan might supplement to make the whole, or ...” *Net NoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 88 USPQ2d 1751 (Fed. Cir. 2008). (Emphasis added)

Rejection of Claims 1-16

Claims 1-16 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Yao, et al. (U.S. Patent No. 7,966,183; hereinafter, “Yao”).

Claims 1 and 2 have been amended to more clearly define the claimed subject matter.

Claims 1 and 9 are independent claims. Claims 1-8 and 10-16 are directly or indirectly dependent from Claims 1 and 9, respectively.

Amended Claim 1 reads as below:

A method for recognizing a speech of a speaker, the method comprising:
receiving, by a preset call command recognition unit, an input speech spoken by the speaker;
receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;
comparing, by the preset call command recognition unit, the input speech with a preset call command;
recognizing, by the preset call command recognition unit, the input speech as the preset call command according to a result of the comparison; and
recognizing, by a continuous speech recognition unit, the subsequent input speech as an actual command if the input speech is recognized as the preset call command. (Emphasis added)

According to the claimed invention, in the call command recognition network, a minimum recognition network composed of a silence interval accompanied by noise and a call command from the speaker is configured in the form of tokens, thus enabling real-time speech recognition to be continuously performed on input speech. When the call command (i.e., an input speech spoken by the speaker) such as “Naraeya” or Nepiya”, for example, is recognized as the call command from the speaker through the call command search routine, the confidence of the call command is detected in the confidence detection routine which is a subsequent stage. Accordingly, whether the found call command is an authentic call command intended by the

speaker or a false call command is determined, thus enabling the recognition of continuous speech to be performed on commands spoken subsequent to the call command (i.e., subsequent input speech spoken by the speaker). (See page 6 lines 6-20 and page 11 line 15 to page 12 line 1 of the specification)

The Examiner states on page 3 of the Office action that Yao teaches the above described inventive feature of the claimed invention in column1 lines 17-50. Specifically, the Examiner states that “call” and “a name” correspond to “an input speech spoken by the speaker” and “a subsequent input speech spoken, by the speaker” of the claimed invention. However, Yao merely teaches in lines 21-26 that a user orally tells the cellphone to call a “name”, and then the cellphone’s ASR recognizes the utterance as a call command plus a name in its telephone directory. That is, “calling” is not a call command but calling a “name” is an input speech spoken by the speaker for a call command plus a name in its telephone directory. Accordingly, even assuming, *arguendo*, that calling a “name” of Yao may correspond to “an input speech spoken by the speaker (i.e., call command)” of the claimed invention, Yao does not disclose “a subsequent input speech spoken, by the speaker” subsequent to the call command “name.”

Therefore, the Applicants respectfully submit that Yao does not anticipate the applicant’s claimed invention by failing to disclose *all the elements* in the claim 1 and thus the claim 1 currently amended is allowable. Applicants also respectfully submit that independent Claim 9 recites the allowable inventive feature of Claim 1, and thus Claims 1 and 9 are now allowable.

Claims 2-8 and 10-16 are also believed to be allowable by virtue of its dependency from the allowable Claims 1 and 9, respectively.

Accordingly, Applicants respectfully request the Examiner to review these submissions and withdraw the rejection of Claims 1-16 under 35 U.S.C. §102(e).

Conclusion

Application No. 13/591,479
Response dated: May 29, 2013
Reply to Non-Final Office Action of: November 29, 2012

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Reconsideration and subsequent allowance of this application are courteously requested.

If there are any charges due with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

The Examiner is invited to contact Applicants' Attorneys at the below-listed telephone number with any questions or comments regarding this Response or otherwise concerning the present application.

Respectfully submitted,

CANTOR COLBURN, LLP

/Jaegyo Jang/

Jaegyo Jang

Registration No.: 68540

Eugene Kwon

Registration No.: 62422

Date: May 29, 2013
Cantor Colburn LLP
1800 Diagonal Road
Suite 400
Alexandria, VA 22314
Telephone: (703) 236-4500
Facsimile: (703) 236-4501

Electronic Patent Application Fee Transmittal				
Application Number:		13591479		
Filing Date:		22-Aug-2012		
Title of Invention:		SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
First Named Inventor/Applicant Name:		Heui-Suck JUNG		
Filer:		Jaegyoo Jang		
Attorney Docket Number:		MSF0011USC		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with \$0 paid	2253	1	700	700

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				700

Electronic Acknowledgement Receipt	
EFS ID:	15880218
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	Jaegyoo Jang
Filer Authorized By:	
Attorney Docket Number:	MSF0011USC
Receipt Date:	29-MAY-2013
Filing Date:	22-AUG-2012
Time Stamp:	11:56:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$700
RAM confirmation Number	13462
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
-----------------	----------------------	-----------	-------------------------------------	------------------	------------------

1	Amendment/Req. Reconsideration-After Non-Final Reject	ResponsetoNFOAddtd11292012. PDF	163001 3253ee0cd8d11ac6821c15b871aa3d65a5735092	no	9
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30359 b61f883449c4e66679928c3c78447592d12f18ad	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			193360		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

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.

PATENT APPLICATION FEE DETERMINATION RECORD				Application or Docket Number		Filing Date		☐ To be Mailed	
Substitute for Form PTO-875				13/591,479		08/22/2012			
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO									
APPLICATION AS FILED – PART I									
(Column 1)		(Column 2)							
FOR	NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		X \$ =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL					
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	05/29/2013	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X \$40 =		0	
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$210 =		0	
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
TOTAL ADD'L FEE						0			
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =			
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =			
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
TOTAL ADD'L FEE									
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

This collection of information is required by 37 CFR 1.16. 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 12 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024
23413 7590 08/08/2013 CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103			EXAMINER JACKSON, JAKIEDA R	
			ART UNIT 2657	PAPER NUMBER
			NOTIFICATION DATE 08/08/2013	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary	Application No. 13/591,479	Applicant(s) JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	AIA (First Inventor to File) Status No

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 5/29/13.
☐ 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) 1-16 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-16 is/are rejected.
- 8) ☐ Claim(s) ____ 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 ____ 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/08)
Paper No(s)/Mail Date ____.
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 4) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

In response to the Office Action mailed November 29, 2012, applicant submitted an amendment filed on May 29, 2013, in which the applicant amended and requested reconsideration.

Response to Arguments

Applicants argue that the prior art cited fails to teach recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command. Applicants' arguments are persuasive, but are moot in view of new grounds of rejection.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 8-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Although claims 8-16 appear to fall in a statutory category since the claims recite a system, the system can encompass a program embodiment, which is merely functional descriptive material, therefore the claims are rejected under 35 U.S.C. 101. According to current guidance, when each limitation of a claim appears to be directed to a machine such as a "system", "apparatus", or "arrangement", if the claim is reasonably

read on the corresponding software portion of the disclosure, the claim as a whole is directed to entirely a software embodiment, not a hardware embodiment. The units contained within the system are disclosed as including software embodiments. Therefore, it is necessary to ensure the software-only embodiments are positively excluded.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Yao et al. (USPN 7,966,183), hereinafter referenced as Yao in view of Miyazawa et al. (USPN 6,070,139), hereinafter referenced as Miyazawa.

Regarding **claims 1 and 9**, Yao discloses a method and apparatus, hereinafter referenced as a method for recognizing a speech of a speaker, the method comprising:

receiving, by a preset call command recognition unit, an input speech spoken by the speaker (receive a command "call"; column 1, lines 17-50);

receiving, by a preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech (subsequent speech "a name"; column 1, lines 17-50);

comparing, by a preset call command recognition unit, the input speech with a preset call command (match; column 1, lines 17-50);

recognizing, by a preset call command recognition unit, the input speech as the preset call command according to a result of the comparison (match; column 1, lines 17-50), but does not specifically teach recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command.

Miyazawa discloses a method that when a call command is recognized as the call command from the speaker, the confidence of the call command is detected in the confidence detection routine which is a subsequent stage. This enables the recognition of continuous speech to be performed on commands spoken subsequent to the call command (abstract with column 3, lines 46-65 and column 7, line 46 - column 10, line 65). In other words, Miyazawa discloses a method of recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command, to assist with achieving high recognition rates.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yao's method as described above, to allow for recognizing continuous speech at high recognition rates (abstract), as taught by Miyazawa.

Regarding **claims 2 and 10**, Yao discloses a method wherein recognizing the input speech as the preset call command comprises:

assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison (match; column 1, lines 17-50);

computing, by a confidence detection unit, a confidence rate of the assumed input speech (confidence; column 1, lines 17-50); and

recognizing, by a continuous speech recognition unit, the assumed input speech as the preset call command based on the computed confidence rate (confidence; column 1, lines 17-50).

Regarding **claims 3 and 11**, Yao discloses a method wherein recognizing the assumed input speech comprises: recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value (threshold; column 1, lines 17-50).

Regarding **claims 4 and 12**, Yao discloses a method wherein recognizing the assumed input speech comprises: determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate (column 1, lines 17-50); and recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command (column 1, lines 17-50).

Regarding **claims 5 and 13**, Yao discloses a method wherein assuming the input speech to be the preset call command comprises: computing a log likelihood ratio of the input speech (log-likelihood; column 3, line 5 – column 7, line 49); and

assuming the input speech to be the preset call command based on the computed log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 6 and 14**, Yao discloses a method

wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command (phone), and the computed confidence rate is another log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 7 and 159**, Yao discloses a method wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command (column 3, line 5 – column 7, line 49).

Regarding **claim 8**, Yao discloses a method further comprising:

determining whether or not the recognized subsequent input speech corresponds to a target sentence (column 1, lines 17-50 with column 3, line 5 – column 7, line 49).

Regarding **claim 16**, it is interpreted and rejected for similar reasons as set forth in the combination of claims 1 and 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAKIEDA JACKSON whose telephone number is (571)272-7619. The examiner can normally be reached on Monday-Friday from 5:30am-2:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. 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.

/Jakieda R Jackson/
Primary Examiner, Art Unit 2657

Notice of References Cited	Application/Control No. 13/591,479	Applicant(s)/Patent Under Reexamination JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,070,139	05-2000	Miyazawa et al.	704/275
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

<p><i>Index of Claims</i></p> 	<p>Application/Control No.</p> <p>13591479</p>	<p>Applicant(s)/Patent Under Reexamination</p> <p>JUNG ET AL.</p>
	<p>Examiner</p> <p>JAKIEDA JACKSON</p>	<p>Art Unit</p> <p>2657</p>

✓	Rejected
=	Allowed

-	Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47									
CLAIM		DATE							
Final	Original	11/19/2012	07/31/2013						
	1	✓	✓						
	2	✓	✓						
	3	✓	✓						
	4	✓	✓						
	5	✓	✓						
	6	✓	✓						
	7	✓	✓						
	8	✓	✓						
	9	✓	✓						
	10	✓	✓						
	11	✓	✓						
	12	✓	✓						
	13	✓	✓						
	14	✓	✓						
	15	✓	✓						
	16	✓	✓						

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"20120316879".did.	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
L2	0	"20120316879".did. and software\$4	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
S1	305	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5))	US-PGPUB; USPAT	OR	OFF	2013/07/30 19:24
S2	186	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18
S3	23	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4 and subsequen\$4 near3 speech\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18

7/ 31/ 2013 12:12:43 PM**C:\ Users\ jjackson3\ Documents\ EAST\ Workspaces\ Jung 13591479.wsp**

Search Notes 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History	11/19/12	JJ
Reviewed for 101, deemed	11/19/12	JJ
Inventor Search	11/19/12	JJ
Reviewed for DP, not deemed	11/19/12	JJ
EAST Search History Update	8/1/13	JJ

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

--	--

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heui-Suck JUNG, et al.) Group Art Unit: 2657
Serial No. 13/591,479) Examiner: JACKSON, JAKIEDA R
Filed: August 22, 2012) Confirmation No.: 7024
For: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**RESPONSE TO NON-FINAL OFFICE ACTION
UNDER 37 CFR § 1.111, WITH AMENDMENT**

Dear Sir:

In response to the Non-Final Office Action mailed on August 8, 2013, Applicants request reconsideration in view of the following amendments and remarks for entry in the above-identified application. This reply is being submitted with a Petition of one-month extension of time.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper; and

Remarks begin on page 7 of this paper.

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (Currently amended) A method for recognizing a speech of a speaker, the method comprising:

 receiving, by a preset call command recognition unit, an input speech spoken by the speaker;

 receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;

 comparing, by the preset call command recognition unit, the input speech with a preset call command;

 recognizing, by the preset call command recognition unit, the input speech as the preset call command according to a result of the comparison; and

 recognizing, by a continuous speech recognition unit, the subsequent input speech as an actual command if the input speech is recognized as the preset call command,

wherein recognizing the input speech as the preset call command comprises:

 assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.

2. (Currently amended) The method of claim 1,

 wherein recognizing the input speech as the preset call command further comprises:

~~assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison;~~

~~computing, by a confidence detection unit, a confidence rate of the assumed input speech; and~~

recognizing, by the confidence detection unit, the assumed input speech as the preset call command based on the computed confidence rate.

3. (Original) The method of claim 2,
wherein recognizing the assumed input speech comprises:
recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.

4. (Original) The method of claim 2,
wherein recognizing the assumed input speech comprises:
determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate; and
recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.

5. (Original) The method of claim 2,
wherein assuming the input speech to be the preset call command comprises:
computing a log likelihood ratio of the input speech; and
assuming the input speech to be the preset call command based on the computed log likelihood ratio.

6. (Original) The method of claim 5,
wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

7. (Original) The method of claim 6,
wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

8. (Currently amended) The method of claim 1, further comprising:
determining, using a rule check unit, whether or not the recognized subsequent
input speech corresponds to a target sentence.

9. (Currently amended) An apparatus for recognizing a speech of a speaker, the
apparatus comprising:
_____ a processor,
a preset call command recognition unit using the processor; and
a continuous speech recognition unit using the processor,
wherein the preset call command recognition unit is configured to receive an input
speech spoken by the speaker;
receive a subsequent input speech spoken, by the speaker, subsequently to the
input speech;
compare the input speech with a preset call command; and
recognize the input speech as the preset call command according to a result of the
comparison,
wherein the continuous speech recognition unit is configured to recognize the
subsequent input speech as an actual command if the input speech is recognized as the preset call
command by the preset call command recognition unit, and
_____ wherein the call command recognition unit comprises a token passing unit
configured to assume the input speech to be the preset call command according to the result of
the comparison using a minimum recognition network composed of a silence interval
accompanied by noise and the call command.

10. (Currently amended) The apparatus of claim 9,
wherein the call command recognition unit further comprises:
an adaptive filter configured to receive the input speech and the subsequent input
speech;
_____ ~~a token passing unit configured to assume the input speech to be the preset call~~
~~command according to the result of the comparison; and~~

a confidence detection unit configured to compute a confidence rate of the assumed input speech and recognize the assumed input speech as the preset call command based on the computed confidence rate.

11. (Original) The apparatus of claim 10,

wherein the confidence detection unit is further configured to recognize the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.

12. (Original) The apparatus of claim 10,

wherein the confidence detection unit is further configured to determine whether or not the assumed input speech is an authentic call command based on the computed confidence rate and recognize the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.

13. (Original) The apparatus of claim 10,

wherein the token passing unit is further configured to compute a log likelihood ratio of the input speech and assume the input speech to be the preset call command based on the computed log likelihood ratio.

14. (Original) The apparatus of claim 13,

wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

15. (Original) The apparatus of claim 14,

wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

16. (Original) The apparatus of claim 9,

wherein the continuous speech recognition unit comprises:
a keyword spotting unit configured to recognize the subsequent input speech as the actual command if the input speech is recognized as the preset call command; and
a rule check unit configured to determine whether the recognized subsequent input speech corresponds to a target sentence.

REMARKS

The above amendments are made in response to the outstanding Non-final Office Action dated August 8, 2013. The Examiner's reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claims 1, 2, 8, 9 and 10 have been amended to more clearly define the claimed invention. No new matter has been introduced by these amendments.

Claims 1-16 are pending in the present application.

Claim Rejections Under 35 U.S.C. §101

Claims 8-16 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter.

In response, Claims 8 and 9 have been amended to be directed to statutory subject matter.

Applicants therefore respectfully request the Examiner to reconsider the amended claims and withdraw the rejection of Claim 8-16 under 35 U.S.C. §101.

Claim Rejections Under 35 U.S.C. §103

For an obviousness rejection to be proper, the Examiner is expected to meet the burden of establishing why the differences between the prior art and that claimed would have been obvious. (MPEP 2141(III)) "A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." To find obviousness, the Examiner must "identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does." *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007) (Emphasis added)

A hallmark of a proper obviousness rejection based on combining known prior art elements is that one of ordinary skill in the art would reasonably have expected the elements to

maintain their respective properties or functions after they have been combined. *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356 (Fed. Cir. 2008). (Emphasis added)

Predictability as discussed in KSR encompasses the expectation that prior art elements are capable of being combined, as well as the expectation that the combination would have worked for its intended purpose. The “predictable result” discussed in KSR refers not only to the expectation that prior art elements are capable of being physically combined, but also that the combination would have worked for its intended purpose. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314 (Fed. Cir. 2009). (Emphasis added)

Rejection of Claims 1-16

Claims 1-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao, et al. (U.S. Patent No. 7,966,183; hereinafter, “Yao”) in view of Miyazawa et al. (U.S. Patent No. 6,070,139; hereinafter, “Miyazawa”).

Claims 1, 2, 8, 9 and 10 have been amended to more clearly define the claimed subject matter.

Claims 1 and 9 are independent claims. Claims 2-8 and 10-16 are directly or indirectly dependent from Claims 1 and 9, respectively.

Amended Claim 1 reads as below:

A method for recognizing a speech of a speaker, the method comprising:
receiving, by a preset call command recognition unit, an input speech spoken by the speaker;
receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;
comparing, by the preset call command recognition unit, the input speech with a preset call command;
recognizing, by the preset call command recognition unit, the input speech as the preset call command according to a result of the comparison; and
recognizing, by a continuous speech recognition unit, the subsequent input speech as an actual command if the input speech is recognized as the preset call command,
wherein recognizing the input speech as the preset call command comprises:

assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.
(Emphasis added)

According to the claimed invention, in order to smoothly perform continuous speech recognition in noisy environments, a call command such as 'Naraeya' or 'Nepiya' is selected, and a minimum recognition network composed of a silence interval accompanied by noise and the call command is configured in the form of tokens, so that real-time speech recognition is continuously performed on input speech, the confidence of the input speech is continuously analyzed, and the subsequently input speech intervals of a speaker, as well as buffered speech intervals, are applied to a continuous speech recognition engine at the moment at which the call command from the speaker is recognized, thus enabling continuous speech recognition which is very robust in noisy environments. (See page 6, lines 6-20 of the specification)

The Examiner states on page 3 of the Office action that the term "match" in column 1, lines 17-50 of Yao teaches assuming the input speech to be the preset call command according to the result of the comparison by the token passing unit as recited in Claim 1. However, Yao does not disclose as to whether a minimum recognition network composed of a silence interval accompanied by noise and the call command is used for the result of the comparison.

Furthermore, Miyazawa does not cure the deficiency of the Yao with regard to the above-described inventive feature of the claimed invention. Specifically, Miyazawa is silent as to whether a minimum recognition network composed of a silence interval accompanied by noise and the call command is used for the result of the comparison.

In view of the above discussions, Applicants respectfully argues that Yao and Miyazawa, either alone or in combinations, fail to show all of the limitations recited in the claims, and thus cannot be combined into each other to reach the claimed invention in the same way that the new claimed invention does. Accordingly, *prime facie* obviousness does not exist regarding the

Application No. 13/591,479
Response dated: November 27, 2013
Reply to Non-Final Office Action of: August 8, 2013

subject matter claimed in Claim 1 with respect to the cited references. Applicants respectfully submit that Claim 1, as amended, is now allowable.

Applicants respectfully submit that independent Claim 9 recites the allowable inventive feature of Claim 1, and thus Claims 1 and 9, as amended, are now allowable.

Claims 2-8 and 10-16 are also believed to be allowable by virtue of its direct or indirect dependency from the allowable Claims 1 and 9, respectively.

Accordingly, Applicants respectfully request the Examiner to review these submissions and withdraw the rejection of Claims 1-16 under 35 U.S.C. §103(a).

Request for Interview

Regarding the above amendments to claims in order to overcome the pending 101 and 103 rejections, Applicants respectfully requests to contact Applicants' representative (Jay J. Jang, Telephone No.: 703-236-4500 ext. 4110) for further amendments and/or in-depth discussions, whenever necessary to expedite or advance prosecution of this application.

Application No. 13/591,479
Response dated: November 27, 2013
Reply to Non-Final Office Action of: August 8, 2013

Conclusion

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Reconsideration and subsequent allowance of this application are courteously requested.

If there are any charges due with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

The Examiner is invited to contact Applicants' Attorneys at the below-listed telephone number with any questions or comments regarding this Response or otherwise concerning the present application.

Respectfully submitted,

CANTOR COLBURN, LLP

By: /Jaegyoo Jang/
Jaegyoo Jang
Registration No. 68540
Eugene Kwon
Registration No. 62422

Date: November 27, 2013
Cantor Colburn LLP
1800 Diagonal Road
Suite 400
Alexandria, VA 22314
Telephone: (703) 236-4500
Facsimile: (703) 236-4501

Electronic Patent Application Fee Transmittal				
Application Number:		13591479		
Filing Date:		22-Aug-2012		
Title of Invention:		SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
First Named Inventor/Applicant Name:		Heui-Suck JUNG		
Filer:		Jaegyoo Jang		
Attorney Docket Number:		MSF0011USC		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with \$0 paid	2251	1	100	100

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				100

Electronic Acknowledgement Receipt	
EFS ID:	17518097
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	Jaegyoo Jang
Filer Authorized By:	
Attorney Docket Number:	MSF0011USC
Receipt Date:	27-NOV-2013
Filing Date:	22-AUG-2012
Time Stamp:	12:31:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$100
RAM confirmation Number	15563
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
-----------------	----------------------	-----------	-------------------------------------	------------------	------------------

1	Amendment/Req. Reconsideration-After Non-Final Reject	ResponseToNFOAof080813. PDF	176877 1b0d322bb063f1815f7b7d93247b77f4b0e4b875	no	11
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30317 786de5b500f1fa5afd928a441092437a4f07ab13	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			207194		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 13/591,479		Filing Date 08/22/2012		☐ To be Mailed					
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO													
APPLICATION AS FILED – PART I													
(Column 1)		(Column 2)											
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)					
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A							
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A							
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A							
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =							
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =							
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))													
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL							
APPLICATION AS AMENDED – PART II													
(Column 1)		(Column 2)		(Column 3)									
AMENDMENT	11/27/2013		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		* 16		Minus	** 20	= 0		X \$40 =		0		
	Independent (37 CFR 1.16(h))		* 2		Minus	***3	= 0		X \$210 =		0		
	☐ Application Size Fee (37 CFR 1.16(s))												
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
						TOTAL ADD'L FEE		0					
(Column 1)		(Column 2)		(Column 3)									
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		*		Minus	**	=		X \$ =				
	Independent (37 CFR 1.16(h))		*		Minus	***	=		X \$ =				
	☐ Application Size Fee (37 CFR 1.16(s))												
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
						TOTAL ADD'L FEE							
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										LIE /BRENDA HARRISON/			

This collection of information is required by 37 CFR 1.16. 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 12 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024
23413 7590 01/29/2014 CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103			EXAMINER JACKSON, JAKIEDA R	
			ART UNIT 2657	PAPER NUMBER
			NOTIFICATION DATE 01/29/2014	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary	Application No. 13/591,479	Applicant(s) JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	AIA (First Inventor to File) Status No

-- 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 11/27/13.
☐ 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) 1-16 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-16 is/are rejected.
- 8) ☐ Claim(s) ____ 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 ____ 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: ____.

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Response to Amendment

In response to the Office Action mailed August 8, 2013, applicant submitted an amendment filed on November 27, 2013, in which the applicant amended and requested reconsideration.

Response to Arguments

Applicants argue that the prior art cited fails to teach the claims as amended. In particular, Applicants argue that the prior art cited fails to teach assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command. Applicants arguments are persuasive, but are moot in view of new grounds of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Yao et al. (USPN 7,966,183), hereinafter referenced as Yao in view of Miyazawa et al. (USPN 6,070,139), hereinafter referenced as Miyazawa and in further view of Armbruster et al. (PGPUB 2002/0136166), hereinafter referenced as Armbruster.

Regarding **claims 1 and 9**, Yao discloses a method and apparatus, hereinafter referenced as a method for recognizing a speech of a speaker, the method comprising:

receiving, by a preset call command recognition unit, an input speech spoken by the speaker (receive a command “call”; column 1, lines 17-50);

receiving, by a preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech (subsequent speech “a name”; column 1, lines 17-50);

comparing, by a preset call command recognition unit, the input speech with a preset call command (match; column 1, lines 17-50);

recognizing, by a preset call command recognition unit, the input speech as the preset call command according to a result of the comparison (match; column 1, lines 17-50), but does not specifically teach recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command and assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.

Miyazawa discloses a method that when a call command is recognized as the call command from the speaker, the confidence of the call command is detected in the confidence detection routine which is a subsequent stage. This enables the recognition of continuous speech to be performed on commands spoken subsequent to the call command (abstract with column 3, lines 46-65 and column 7, line 46 - column 10, line 65). In other words, Miyazawa discloses a method of recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command, to assist with achieving high recognition rates.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yao's method as described above, to allow for recognizing continuous speech at high recognition rates (abstract), as taught by Miyazawa.

Yao in view of Miyazawa teaches the method as described above, but does not specifically teach assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.

Armbruster discloses a method comprising assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command (paragraphs 0039-0040), to provide continuous speech recognition.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yao in view of Miyazawa's method as described above, to avoid a monopolizing speaker or a noisy environment (paragraph 0007), as taught by Armbruster.

Regarding **claims 2 and 10**, Yao discloses a method wherein recognizing the input speech as the preset call command comprises:

computing, by a confidence detection unit, a confidence rate of the assumed input speech (confidence; column 1, lines 17-50); and

recognizing, by a continuous speech recognition unit, the assumed input speech as the preset call command based on the computed confidence rate (confidence; column 1, lines 17-50).

Regarding **claims 3 and 11**, Yao discloses a method

wherein recognizing the assumed input speech comprises:

recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value (threshold; column 1, lines 17-50).

Regarding **claims 4 and 12**, Yao discloses a method

wherein recognizing the assumed input speech comprises:

determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate (column 1, lines 17-50); and

recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command (column 1, lines 17-50).

Regarding **claims 5 and 13**, Yao discloses a method wherein assuming the input speech to be the preset call command comprises: computing a log likelihood ratio of the input speech (log-likelihood; column 3, line 5 – column 7, line 49); and

assuming the input speech to be the preset call command based on the computed log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 6 and 14**, Yao discloses a method wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command (phone), and the computed confidence rate is another log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 7 and 159**, Yao discloses a method wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command (column 3, line 5 – column 7, line 49).

Regarding **claim 8**, Yao discloses a method further comprising: determining whether or not the recognized subsequent input speech corresponds to a target sentence (column 1, lines 17-50 with column 3, line 5 – column 7, line 49).

Regarding **claim 16**, it is interpreted and rejected for similar reasons as set forth in the combination of claims 1 and 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAKIEDA JACKSON whose telephone number is (571)272-7619. The examiner can normally be reached on Monday-Friday from 5:30am-2:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. 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.

/Jakieda R Jackson/
Primary Examiner, Art Unit 2657

Notice of References Cited	Application/Control No. 13/591,479	Applicant(s)/Patent Under Reexamination JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0136166	09-2002	Armbruster et al.	370/250
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	305	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5))	US-PGPUB; USPAT	OR	OFF	2013/07/30 19:24
S2	186	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18
S3	23	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4 and subsequen\$4 near3 speech\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18
S4	1	"20120316879".did.	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
S5	0	"20120316879".did. and software\$4	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
S6	332	silen\$6 with (nois\$4 speech\$4 audio\$4) with command\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 12:28
S7	34	silen\$6 with (nois\$4 speech\$4 audio\$4) with command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 12:30
S8	9	minimum\$4 near2 recogni\$9 near2 network\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:07
S9	44	(mut\$4 silen\$6) with (nois\$4 speech\$4 audio\$4) with command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:19
S10	10	S9 not S7	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:20
S11	199	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:30
S12	28	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:31
S13	28	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:31
S14	1	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same token\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:32
S15	7	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and token\$4	US-PGPUB;	OR	OFF	2014/01/15 13:33

		and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	USPAT			
S16	15	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same (compar\$9 match\$4) and token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:34
S17	3	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same (compar\$9 match\$4) same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:34
S18	4	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:35
S19	3	(mut\$4 silen\$6) same (nois\$4) same command\$4 same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:36
S20	3	(mut\$4 silen\$6) same (nois\$4) same command\$4 same token\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:36
S21	29	(mut\$4 silen\$6) same (nois\$4) same (speech\$4 voic\$4 command\$4) same token\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:37
S22	102	(mut\$4 silen\$6) same (nois\$4) same (speech\$4 voic\$4 command\$4) and token\$4 near2 pass\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S23	92	S22 not S21	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S24	74	S22 not S21 and continu\$9 near2 speech\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S25	16	S22 not S21 and continu\$9 near2 speech\$4 not bennett\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:49
S26	1	"20110077936".did.	US-PGPUB; USPAT	OR	OFF	2014/01/16 10:58
S27	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.)	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:04
S28	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:04
S29	967258	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 updat\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S30	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S31	2	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S32	1	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5 and transcri\$6	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:06
S33	0	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and	US-PGPUB;	OR	OFF	2014/01/16 11:07

		updat\$5 and (STT or (speech\$4to\$4text\$4))	USPAT			
S34	1	shar\$4 near2 material\$4 and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:08
S35	11	shar\$4 near2 material\$4 and updat\$4 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:09
S36	4909	(conferenc\$4 meeting\$4 lectur\$4) and updat\$4 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:10
S37	83	(conferenc\$4 meeting\$4 lectur\$4) and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:10
S38	13	G10L15/183.cpc. and (conferenc\$4 meeting\$4 lectur\$4) and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:11
S39	5759	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4 apple\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:27
S40	589	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4 apple\$4) and "704"/\$.cls.	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:27
S41	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and "704"/\$.cls. and artist\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S42	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and "704"/\$.cls. and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S43	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S44	7	(speech\$4 voic\$4) near2 command\$4 and (kate) and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28

1/16/2014 3:17:25 PM

C:\Users\jjackson3\Documents\EAST\Workspaces\Jung 13591479.wsp

<p><i>Index of Claims</i></p> 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant					☐ CPA					☐ T.D.					☐ R.1.47				
CLAIM		DATE																	
Final	Original	11/19/2012	07/31/2013	01/15/2014															
	1	✓	✓	✓															
	2	✓	✓	✓															
	3	✓	✓	✓															
	4	✓	✓	✓															
	5	✓	✓	✓															
	6	✓	✓	✓															
	7	✓	✓	✓															
	8	✓	✓	✓															
	9	✓	✓	✓															
	10	✓	✓	✓															
	11	✓	✓	✓															
	12	✓	✓	✓															
	13	✓	✓	✓															
	14	✓	✓	✓															
	15	✓	✓	✓															
	16	✓	✓	✓															

<i>Search Notes</i> 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History	11/19/12	JJ
Reviewed for 101, deemed	11/19/12	JJ
Inventor Search	11/19/12	JJ
Reviewed for DP, not deemed	11/19/12	JJ
EAST Search History Update	8/1/13	JJ
EAST Search History Update	1/15/14	JJ

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

--	--

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heui-Suck JUNG, et al.) Group Art Unit: 2657
Serial No. 13/591,479) Examiner: Jakieda R. Jackson
Filed: August 22, 2012) Confirmation No.: 7024
For: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO FINAL OFFICE ACTION
UNDER 37 CFR § 1.116, WITH AMENDMENT

Dear Sir:

This Amendment is submitted in response to the Final Office Action dated January 29, 2014, with a request for participation in the After Final Consideration Pilot 2.0. Please amend the Application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper; and

Remarks begin on page 7 of this paper.

Attachment: Request for After-final Consideration Program

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (Currently Amended) A method for recognizing a speech of a speaker by a device, the method comprising:

receiving, by a preset call command recognition unit, an input speech spoken by the speaker;

receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;

comparing, by the preset call command recognition unit, the input speech with a preset call command;

~~recognizing, determining,~~ by the preset call command recognition unit, whether the input speech is recognized as the preset call command according to a result of the comparison; and

based on determining that the input speech is recognized as the preset call command, activating recognizing, by a continuous speech recognition unit[[,]] configured to determine whether the subsequent input speech is recognized as an actual command if the input speech is recognized as the preset call command, in order to reduce computational load on the device.

~~wherein recognizing the input speech as the preset call command comprises:~~

~~assuming, by a token passing unit, the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.~~

2. (Previously Presented) The method of claim 1,
wherein recognizing the input speech as the preset call command further comprises:

computing, by a confidence detection unit, a confidence rate of the assumed input speech; and

recognizing, by the confidence detection unit, the assumed input speech as the preset call command based on the computed confidence rate.

3. (Original) The method of claim 2,
wherein recognizing the assumed input speech comprises:
recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.

4. (Original) The method of claim 2,
wherein recognizing the assumed input speech comprises:
determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate; and
recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.

5. (Original) The method of claim 2,
wherein assuming the input speech to be the preset call command comprises:
computing a log likelihood ratio of the input speech; and
assuming the input speech to be the preset call command based on the computed log likelihood ratio.

6. (Original) The method of claim 5,
wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

7. (Original) The method of claim 6,

wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

8. (Previously Presented) The method of claim 1, further comprising:
determining, using a rule check unit, whether or not the recognized subsequent input speech corresponds to a target sentence.

9. (Previously Presented) An apparatus for recognizing a speech of a speaker, the apparatus comprising:

a processor,
a preset call command recognition unit using the processor; and
a continuous speech recognition unit using the processor,
wherein the preset call command recognition unit is configured to receive an input speech spoken by the speaker;
receive a subsequent input speech spoken, by the speaker, subsequently to the input speech;
compare the input speech with a preset call command; and
recognize the input speech as the preset call command according to a result of the comparison,

wherein the continuous speech recognition unit is configured to recognize the subsequent input speech as an actual command if the input speech is recognized as the preset call command by the preset call command recognition unit, and

wherein the call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.

10. (Previously Presented) The apparatus of claim 9,
wherein the call command recognition unit further comprises:

an adaptive filter configured to receive the input speech and the subsequent input speech; and

a confidence detection unit configured to compute a confidence rate of the assumed input speech and recognize the assumed input speech as the preset call command based on the computed confidence rate.

11. (Original) The apparatus of claim 10,
wherein the confidence detection unit is further configured to recognize the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.

12. (Original) The apparatus of claim 10,
wherein the confidence detection unit is further configured to determine whether or not the assumed input speech is an authentic call command based on the computed confidence rate and recognize the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.

13. (Original) The apparatus of claim 10,
wherein the token passing unit is further configured to compute a log likelihood ratio of the input speech and assume the input speech to be the preset call command based on the computed log likelihood ratio.

14. (Original) The apparatus of claim 13,
wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

15. (Original) The apparatus of claim 14,
wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

16. (Original) The apparatus of claim 9,
wherein the continuous speech recognition unit comprises:
a keyword spotting unit configured to recognize the subsequent input speech as
the actual command if the input speech is recognized as the preset call command; and
a rule check unit configured to determine whether the recognized subsequent
input speech corresponds to a target sentence.

REMARKS

The above amendments are made in response to the outstanding Final Office Action dated January 29, 2014. The Examiner's reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claim 1 has been amended to more clearly define the claimed invention. No new matter has been introduced by these amendments.

Claims 1-16 are pending in the present application.

Claim Rejections Under 35 U.S.C. §103

Claims 1-16 stand rejected under pre-AIA 35 U.S.C. §103(a) as being unpatentable over Yao, et al. (U.S. Patent No. 7,966,183; hereinafter, "Yao"), in view of Miyazawa, et al. (U.S. Patent No. 6,070,139; hereinafter, "Miyazawa") and in further view of Armbruster, et al. (U.S. Publication No. 2002/0136166; hereinafter, "Armbruster"), and the applicants' discussion of the prior art (ADPA), in combinations thereof.

Applicants respectfully submit that the cited references, alone or in combination, do not disclose suggest all elements of claim 1. For instance, the cited references fail to disclose or suggest "determining, by the preset call command recognition unit, whether the input speech is recognized as the preset call command according to a result of the comparison; and based on determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit configured to determine whether the subsequent input speech is recognized as an actual command, in order to reduce computational load on the device."

Yao merely teaches in lines 21-26 that a user orally tells the cellphone to call a "name, and then the cellphone's ASR recognizes the utterance as a call command plus a name in its telephone directory. The call command plus a name, therefore, does not disclose an input speech recognized as a preset call command and a subsequent input speech recognized as an actual command. Accordingly, Yao cannot disclose or suggest determining by a unit whether the input speech is recognized as the preset call command and activating another unit configured to determine whether the subsequent input speech is recognized as the actual command.

Miyazawa does not cure the above deficiency of Yao. Miyazawa merely discloses that a user terminal takes as input the user's speech, processes the user's speech in a speaker-specific fashion, and sends the processed result to a vending machine, which further processes the user's speech in a non-speaker-specific fashion. *See*, e.g., Abstract; col 3, ll. 46-65; and col. 7, l. 46 – col. 10, l. 65 of Miyazawa. Therefore, Miyazawa has nothing to do with determining by a unit whether the input speech is recognized as the preset call command and, based on determining that the input speech is recognized as the preset call command, activating another unit configured to determine whether the subsequent input speech is recognized as the actual command, in order to reduce computational load on a device. Moreover, Applicants respectfully submit that Armbruster does not cure the deficiencies of Yao and Miyazawa.

For at least the foregoing reasons, claim 1 should be allowable over Yao, Miyazawa and Armbruster. Claims 2-8 are also believed to be allowable over Yao, Miyazawa and Armbruster by virtue of their direct or indirect dependency from claim 1. Accordingly, withdrawal of rejection on claims 1-8 is respectfully requested.

Regarding claim 9, Applicants submit that the cited references, alone or in combination, do not disclose or suggest all elements of the claim. For instance, the cited references fail to disclose “wherein the call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.”

The Office Action correctly states that Yao in view of Miyazawa does not teach the above element of claim 9. The Office Action relies on paragraphs [0030] and [0031] of Armbruster for disclosing the element. While these paragraphs of Armbruster appear to disclose a “token passing arrangement” that has a few common words with the claimed “token passing unit,” the description of the token passaging arrangement in Armbruster has nothing to do with “assum[ing] the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.”

For at least the foregoing reasons, claim 9 should be allowable over Yao, Miyazawa and Armbruster. Claims 10-16 are also believed to be allowable over Yao, Miyazawa and Armbruster by virtue of their direct or indirect dependency from claim 9. Accordingly, withdrawal of rejection on claims 9-16 is respectfully requested.

In view of the prosecution history and the Examiner's statements in the pending Final Office action, Applicants believe that the Examiner has fully understood the disclosed and claimed invention, and no significant further search is required. Thus, a Request for After-final Consideration Program is being submitted, along with this paper.

Further, Applicants respectfully request the Examiner to contact Applicants' representative (Michael Park, Telephone No.: 248-524-2300 ext. 3111) for further amendments and/or discussions, whenever necessary to expedite or advance prosecution of this application.

Application No. 13/591,479
Response dated: April 24, 2014
Reply to Final Office Action of: January 29, 2014

Conclusion

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Reconsideration and subsequent allowance of this application are courteously requested.

If there are any charges due with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

The Examiner is invited to contact Applicants' Attorneys at the below-listed telephone number with any questions or comments regarding this Response or otherwise concerning the present application.

Respectfully submitted,

CANTOR COLBURN, LLP

By: /Jaegyoo Jang/
Jaegyoo Jang
Registration No. 68540
Michael Park
Registration No. 62435

Date: April 24, 2014
Cantor Colburn LLP
1800 Diagonal Road
Suite 400
Alexandria, VA 22314
Telephone: (703) 236-4500
Facsimile: (703) 236-4501

Doc Code: A.NE.AFCP

Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0		
Practitioner Docket No.: MSF0011USC	Application No.: 13/591,479	Filing Date: 2012-08-22
First Named Inventor: Heui-Suck JUNG	Title: <small>SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL</small>	
<p>APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.</p> <ol style="list-style-type: none">The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (<i>e.g.</i>, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).The above-identified application contains an outstanding final rejection.Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]By filing this certification and request, applicant acknowledges the following:<ul style="list-style-type: none">Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.The examiner will verify that the AFCP 2.0 submission is compliant, <i>i.e.</i>, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:<ul style="list-style-type: none">The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, by mailing an advisory action.If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.<ul style="list-style-type: none">The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.		
Signature /Jaegyoo Jang/		Date 2014-04-24
Name (Print/Typed) Jaegyoo Jang		Practitioner Registration No. 68540
Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.		
☒ * Total of <u>1</u> forms are submitted.		

Privacy Act Statement

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.

Electronic Acknowledgement Receipt	
EFS ID:	18851552
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	Jaegyoo Jang
Filer Authorized By:	
Attorney Docket Number:	MSF0011USC
Receipt Date:	24-APR-2014
Filing Date:	22-AUG-2012
Time Stamp:	15:47:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response After Final Action	Amendment_FOA01292014.PDF	136864 f2d143a27942d33fe543bc94136ba73e30abd082	no	10

Warnings:

Information:

2	After Final Consideration Program Request	AFCP.PDF	226781	no	2
			905e748d2b12a2ef87e419ff8c225131bd11b79d		
Warnings:					
Information:					
Total Files Size (in bytes):				363645	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

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.

PATENT APPLICATION FEE DETERMINATION RECORD				Application or Docket Number		Filing Date		☒ To be Mailed	
Substitute for Form PTO-875				13/591,479		08/22/2012			
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO									
APPLICATION AS FILED – PART I									
(Column 1)		(Column 2)							
FOR	NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		X \$ =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL					
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	04/24/2014	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X \$40 =		0	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$210 =		0	
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE		0	
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =			
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =			
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

This collection of information is required by 37 CFR 1.16. 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 12 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024
23413 7590 04/29/2014 CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103			EXAMINER JACKSON, JAKIEDA R	
			ART UNIT 2657	PAPER NUMBER
			NOTIFICATION DATE 04/29/2014	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Advisory Action Before the Filing of an Appeal Brief	Application No. 13/591,479	Applicant(s) JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	AIA (First Inventor to File) Status No

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

THE REPLY FILED 4/24/14 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires _____ months from the mailing date of the prior Advisory Action or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because

a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);

b) ☐ They raise the issue of new matter (see NOTE below);

c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: See Continuation Sheet. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____.

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.

13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____

14. ☐ Other: _____.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: _____.

Claim(s) rejected: 1-16.

Claim(s) withdrawn from consideration: _____.

	/JAKIEDA JACKSON/ Primary Examiner, Art Unit 2657
--	--

Continuation of 3. NOTE: New issues have been added requiring further consideration of the art under 102/103. In particular, Applicants amend the claims to include that based on determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit configured to determine whether the subsequent input speech is recognized as an actual command in order to reduce computational load on the device. Therefore the proposed amendments will not be entered.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heui-Suck JUNG, et al.) Group Art Unit: 2657
Serial No. 13/591,479) Examiner: Jakieda R. Jackson
Filed: August 22, 2012) Confirmation No.: 7024
For: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO FINAL OFFICE ACTION
UNDER 37 CFR § 1.116, WITH AMENDMENT

Dear Sir:

This Amendment is submitted in response to the Final Office Action dated January 29, 2014, with a request for participation in the After Final Consideration Pilot 2.0. Please amend the Application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper; and

Remarks begin on page 7 of this paper.

Attachment: Request for After-final Consideration Program

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL **(Submitted Only via EFS-Web)**

Application Number	13/591,479	Filing Date	2012-08-22	Docket Number (if applicable)	MSF0011USC	Art Unit	2657
First Named Inventor	Heui-Suck JUNG			Examiner Name	JACKSON, JAKIEDA R		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☒ Other A response to Final Office action filed on April 24, 2014.

☐ Enclosed

☐ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
 (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 061130

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Jaegyoo Jang/	Date (YYYY-MM-DD)	2014-04-29
Name	Jaegyoo Jang	Registration Number	68540

This collection of information is required by 37 CFR 1.114. 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 1.11 and 1.14. This collection is estimated to take 12 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, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

Electronic Patent Application Fee Transmittal				
Application Number:		13591479		
Filing Date:		22-Aug-2012		
Title of Invention:		SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
First Named Inventor/Applicant Name:		Heui-Suck JUNG		
Filer:		Jaegyoo Jang		
Attorney Docket Number:		MSF0011USC		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Request for Continued Examination	2801	1	600	600
Total in USD (\$)				600

Electronic Acknowledgement Receipt	
EFS ID:	18887392
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	Jaegyoo Jang
Filer Authorized By:	
Attorney Docket Number:	MSF0011USC
Receipt Date:	29-APR-2014
Filing Date:	22-AUG-2012
Time Stamp:	14:19:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 600
RAM confirmation Number	601
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
-----------------	----------------------	-----------	-------------------------------------	------------------	------------------

1	Request for Continued Examination (RCE)	RCE_MSF0011USC.PDF	697663 6de1bcf45ab446da472b0fb1cd420f7f8ede c47e	no	3
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30525 22902bddd1e911c9b877d6a889f945dcbf82 02a76	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			728188		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024
23413 7590 06/10/2014 CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103			EXAMINER JACKSON, JAKIEDA R	
			ART UNIT 2657	PAPER NUMBER
			NOTIFICATION DATE 06/10/2014	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary	Application No. 13/591,479	Applicant(s) JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	AIA (First Inventor to File) Status No

-- 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 4/29/14.
☐ 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) 1-16 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-16 is/are rejected.
- 8) ☐ Claim(s) ____ 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 ____ 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) | 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____. | 4) ☐ Other: ____. |

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 29, 2014 has been entered.

Response to Arguments

Applicants argue that the prior art cited fails to teach the claims as amended. In particular, Applicants argue that the prior art cited fails to teach based on determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit configured to determine whether the subsequent input speech is recognized as an actual command in order to reduce computational load on the device. Applicants' arguments are persuasive, but are moot in view of new grounds of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to

be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Yao et al. (USPN 7,966,183), hereinafter referenced as Yao in view of Miyazawa et al. (USPN 6,070,139), hereinafter referenced as Miyazawa and in further view of Evermann et al. (PGPUB 2008/0154870), hereinafter referenced as Evermann.

Regarding **claims 1 and 9**, Yao discloses a method and apparatus, hereinafter referenced as a method for recognizing a speech of a speaker by a device, the method comprising:

receiving, by a preset call command recognition unit, an input speech spoken by the speaker (receive a command “call”; column 1, lines 17-50);

receiving, by a preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech (subsequent speech “a name”; column 1, lines 17-50);

comparing, by a preset call command recognition unit, the input speech with a preset call command (match; column 1, lines 17-50);

determining, by a preset call command recognition unit, the input speech as the preset call command according to a result of the comparison (match; column 1, lines 17-50), but does not specifically teach recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command and determining that the input speech is recognized as the preset call command, activating

a continuous speech recognition unit configured to determine whether the subsequent input speech is recognized as an actual command in order to reduce computational load on the device

Miyazawa discloses a method that when a call command is recognized as the call command from the speaker, the confidence of the call command is detected in the confidence detection routine which is a subsequent stage. This enables the recognition of continuous speech to be performed on commands spoken subsequent to the call command (abstract with column 3, lines 46-65 and column 7, line 46 - column 10, line 65). In other words, Miyazawa discloses a method of recognizing the subsequent input speech as an actual command if the input speech is recognized as the preset call command, to assist with achieving high recognition rates.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yao's method as described above, to allow for recognizing continuous speech at high recognition rates (abstract), as taught by Miyazawa.

Yao in view of Miyazawa teaches the method as described above, but does not specifically teach determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit configured to determine whether the subsequent input speech is recognized as an actual command in order to reduce computational load on the device.

Evermann discloses a method comprising determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit

configured to determine whether the subsequent input speech is recognized as an actual command (paragraphs 0034-0045), in order to reduce computational load on the device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yao in view of Miyazawa's method as described above, to enhance the capability in speech processing device (abstract) and to improve quality of the information (paragraphs 0028, 0040), as taught by Evermann.

Regarding **claims 2 and 10**, Yao discloses a method wherein recognizing the input speech as the preset call command comprises:

computing, by a confidence detection unit, a confidence rate of the assumed input speech (confidence; column 1, lines 17-50); and

recognizing, by a continuous speech recognition unit, the assumed input speech as the preset call command based on the computed confidence rate (confidence; column 1, lines 17-50).

Regarding **claims 3 and 11**, Yao discloses a method wherein recognizing the assumed input speech comprises:

recognizing the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value (threshold; column 1, lines 17-50).

Regarding **claims 4 and 12**, Yao discloses a method wherein recognizing the assumed input speech comprises:

determining whether or not the assumed input speech is an authentic call command based on the computed confidence rate (column 1, lines 17-50); and
recognizing the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command (column 1, lines 17-50).

Regarding **claims 5 and 13**, Yao discloses a method
wherein assuming the input speech to be the preset call command comprises:
computing a log likelihood ratio of the input speech (log-likelihood; column 3, line 5 – column 7, line 49); and
assuming the input speech to be the preset call command based on the computed log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 6 and 14**, Yao discloses a method
wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command (phone), and the computed confidence rate is another log likelihood ratio (column 3, line 5 – column 7, line 49).

Regarding **claims 7 and 15**, Yao discloses a method wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command (column 3, line 5 – column 7, line 49).

Regarding **claim 8**, Yao discloses a method further comprising:

determining whether or not the recognized subsequent input speech corresponds to a target sentence (column 1, lines 17-50 with column 3, line 5 – column 7, line 49).

Regarding **claim 16**, it is interpreted and rejected for similar reasons as set forth in the combination of claims 1 and 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAKIEDA JACKSON whose telephone number is (571)272-7619. The examiner can normally be reached on Monday-Friday from 5:30am-2:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. 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.

/Jakieda R Jackson/
Primary Examiner, Art Unit 2657

Notice of References Cited	Application/Control No. 13/591,479	Applicant(s)/Patent Under Reexamination JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0154870	06-2008	Evermann et al.	707/4
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

<i>Index of Claims</i> 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant						☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE									
Final	Original	11/19/2012	07/31/2013	01/15/2014	06/03/2014						
	1	✓	✓	✓	✓						
	2	✓	✓	✓	✓						
	3	✓	✓	✓	✓						
	4	✓	✓	✓	✓						
	5	✓	✓	✓	✓						
	6	✓	✓	✓	✓						
	7	✓	✓	✓	✓						
	8	✓	✓	✓	✓						
	9	✓	✓	✓	✓						
	10	✓	✓	✓	✓						
	11	✓	✓	✓	✓						
	12	✓	✓	✓	✓						
	13	✓	✓	✓	✓						
	14	✓	✓	✓	✓						
	15	✓	✓	✓	✓						
	16	✓	✓	✓	✓						

Search Notes 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

CPC- SEARCHED		
Symbol	Date	Examiner
G10L15/00	5/3/14	JJ

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History	11/19/12	JJ
Reviewed for 101, deemed	11/19/12	JJ
Inventor Search	11/19/12	JJ
Reviewed for DP, not deemed	11/19/12	JJ
EAST Search History Update	8/1/13	JJ
EAST Search History Update	1/15/14	JJ
EAST Search History Update	5/3/14	JJ
G10L (text limited search)		

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
G10L	15/00	5/3/14	JJ

--	--

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	305	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5))	US-PGPUB; USPAT	OR	OFF	2013/07/30 19:24
S2	186	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18
S3	23	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4 and subsequen\$4 near3 speech\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18
S4	1	"20120316879".did.	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
S5	0	"20120316879".did. and software\$4	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
S6	332	silens\$6 with (nois\$4 speech\$4 audio\$4) with command\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 12:28
S7	34	silens\$6 with (nois\$4 speech\$4 audio\$4) with command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 12:30
S8	9	minimum\$4 near2 recogni\$9 near2 network\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:07
S9	44	(mut\$4 silen\$6) with (nois\$4 speech\$4 audio\$4) with command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:19
S10	10	S9 not S7	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:20
S11	199	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:30
S12	28	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:31
S13	28	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:31
S14	1	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same token\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:32
S15	7	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and token\$4	US-PGPUB;	OR	OFF	2014/01/15 13:33

		and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	USPAT			
S16	15	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same (compar\$9 match\$4) and token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:34
S17	3	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same (compar\$9 match\$4) same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:34
S18	4	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:35
S19	3	(mut\$4 silen\$6) same (nois\$4) same command\$4 same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:36
S20	3	(mut\$4 silen\$6) same (nois\$4) same command\$4 same token\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:36
S21	29	(mut\$4 silen\$6) same (nois\$4) same (speech\$4 voic\$4 command\$4) same token\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:37
S22	102	(mut\$4 silen\$6) same (nois\$4) same (speech\$4 voic\$4 command\$4) and token\$4 near2 pass\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S23	92	S22 not S21	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S24	74	S22 not S21 and continu\$9 near2 speech\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S25	16	S22 not S21 and continu\$9 near2 speech\$4 not bennett\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:49
S26	1	"20110077936".did.	US-PGPUB; USPAT	OR	OFF	2014/01/16 10:58
S27	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.)	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:04
S28	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:04
S29	967258	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 updat\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S30	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S31	2	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S32	1	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5 and transcri\$6	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:06
S33	0	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and	US-PGPUB;	OR	OFF	2014/01/16 11:07

		updat\$5 and (STT or (speech\$4to\$4text\$4))	USPAT			
S34	1	shar\$4 near2 material\$4 and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:08
S35	11	shar\$4 near2 material\$4 and updat\$4 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:09
S36	4909	(conferenc\$4 meeting\$4 lectur\$4) and updat\$4 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:10
S37	83	(conferenc\$4 meeting\$4 lectur\$4) and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:10
S38	13	G10L15/183.cpc. and (conferenc\$4 meeting\$4 lectur\$4) and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:11
S39	5759	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4 apple\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:27
S40	589	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4 apple\$4) and "704"/\$.ccls.	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:27
S41	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and "704"/\$.ccls. and artist\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S42	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and "704"/\$.ccls. and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S43	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S44	7	(speech\$4 voic\$4) near2 command\$4 and (kate) and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S45	1	"20120123782".did.	US-PGPUB; USPAT	OR	OFF	2014/01/16 15:29
S46	12094	long\$4term\$4 and short\$4term\$4 and cod\$4 and frequenc\$6	US-PGPUB; USPAT	OR	OFF	2014/01/21 08:02
S47	11	long\$4term\$4 and short\$4term\$4 and cod\$4 and frequenc\$6 and son.in.	US-PGPUB; USPAT	OR	OFF	2014/01/21 08:02
S48	11	long\$4term\$4 and short\$4term\$4 and cod\$4 and frequenc\$6 and son.in. and (compress\$4 expans\$9)	US-PGPUB; USPAT	OR	OFF	2014/01/21 08:04
S49	40705	subsequent\$4 near2 (speech\$4 voic\$4 input\$4)	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:31
S50	1572	subsequent\$4 near2 (speech\$4 voic\$4 input\$4) with command\$4	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:32
S51	77	subsequent\$4 near2 (speech\$4 voic\$4 input\$4) with command\$4 and reduc\$4 near2 (computational\$4 load\$4)	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:33
S52	17	subsequent\$4 near2 (speech\$4 voic\$4	US-	OR	OFF	2014/06/03

		input\$4) with command\$4 and reduc\$4 near2 (computational\$4 load\$4) and "704"/\$.ccls.	PGPUB; USPAT			17:35
S53	13	preset\$4 near2 command\$4 same actual\$4 near2 command	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:42
S54	15	preset\$4 near2 command\$4 same actual\$4 near2 command\$4	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:42
S55	2605	continuous\$4 near2 speech\$4 near2 recogni\$6	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:04
S56	1321	continuous\$4 near2 speech\$4 near2 recogni\$6 and command\$4	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:04
S57	7	(US-20040128137-\$ or US-20050256711-\$ or US-20020136166-\$ or US-20080154870-\$).did. or (US-6070139-\$ or US-6249757-\$ or US-5890111-\$).did.	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:05
S58	716	continuous\$4 near2 speech\$4 near2 recogni\$6 and command\$4 and (likelihood\$4)	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:07
S59	10	continuous\$4 near2 speech\$4 near2 recogni\$6 and command\$4 and (likelihood\$4) and G10L15/00.cpc.	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:13

6/ 3/ 2014 9:10:37 PM

C:\Users\jjackson3\Documents\EAST\Workspaces\Jung 13591479.wsp



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024
23413 7590 08/12/2014 CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103			EXAMINER JACKSON, JAKIEDA R	
			ART UNIT 2657	PAPER NUMBER
			NOTIFICATION DATE 08/12/2014	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/591,479	JUNG ET AL.	
	Examiner	Art Unit	
	JAKIEDA JACKSON	2657	

All participants (applicant, applicant's representative, PTO personnel):

(1) JAKIEDA JACKSON. (3) ____.

(2) Michael Park. (4) ____.

Date of Interview: 07 August 2014.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: ____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1,9 and 17.

Identification of prior art discussed: Yao et al., Miyazawa et al. and Evermann et al.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Mr. Park explained the present invention and how it is believed that the prior art cited does not specifically teach the claims. In particular, Mr. Park explained that claim 1 teaches that the preset call command recognition unit only searches for preset call commands and once a command is recognized, then the continuous speech recognizer can be activated to determine the subsequent speech. The benefit is to reduce the computational load on the local device so that it does not have to store an extensive database. The Examiner agreed to reconsider. Mr. Park also pointed out that the present invention does not teach wherein the call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command. Mr. Park explained that it is a one word sequence of a one word command followed by silence and then a command. The Examiner explained that further clarification is needed for this claim. .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/JAKIEDA JACKSON/ Primary Examiner, Art Unit 2657	
--	--

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heui-Suck JUNG, et al.) Group Art Unit: 2657
Serial No. 13/591,479) Examiner: Jakieda R. Jackson
Filed: August 22, 2012) Confirmation No.: 7024
For: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**RESPONSE TO NON-FINAL OFFICE ACTION
UNDER 37 CFR § 1.111, WITH AMENDMENT**

Dear Sir:

In response to the Non-Final Office Action mailed on June 10, 2014, Applicants request reconsideration in view of the following amendments and remarks for entry in the above-identified application.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper; and

Remarks begin on page 8 of this paper.

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (Previously Presented) A method for recognizing a speech of a speaker by a device, the method comprising:

receiving, by a preset call command recognition unit, an input speech spoken by the speaker;

receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;

comparing, by the preset call command recognition unit, the input speech with a preset call command;

determining, by the preset call command recognition unit, whether the input speech is recognized as the preset call command according to a result of the comparison; and

based on determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit configured to determine whether the subsequent input speech is recognized as an actual command, in order to reduce computational load on the device.

2. (Currently Amended) The method of claim 1,

wherein ~~recognizing~~ determining whether the input speech is recognized as the preset call command further comprises:

computing, by a confidence detection unit, a confidence rate of the ~~assumed~~ input speech; and

recognizing, by the confidence detection unit, the ~~assumed~~ input speech as the preset call command based on the computed confidence rate.

3. (Currently Amended) The method of claim 2,

wherein recognizing the ~~assumed~~ input speech comprises:

recognizing the ~~assumed~~ input speech as the preset call command if the computed confidence rate is higher than a threshold value.

4. (Currently Amended) The method of claim 2,

wherein recognizing the ~~assumed~~ input speech comprises:

determining whether or not the ~~assumed~~ input speech is an authentic call command based on the computed confidence rate; and

recognizing the ~~assumed~~ input speech as the preset call command if it is determined that the ~~assumed~~ input speech is the authentic call command.

5. (Currently Amended) The method of claim ~~2~~ 1,

wherein ~~assuming determining whether~~ the input speech ~~to be is recognized as~~ the preset call command further comprises:

computing a log likelihood ratio of the input speech; and

assuming the input speech to be the preset call command based on the computed log likelihood ratio.

6. (Original) The method of claim 5,

wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

7. (Original) The method of claim 6,

wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

8. (Previously Presented) The method of claim 1, further comprising:

determining, using a rule check unit, whether or not the recognized subsequent input speech corresponds to a target sentence.

9. (Currently Amended) An apparatus for recognizing a speech of a speaker, the apparatus comprising:

a processor,

a preset call command recognition unit using the processor; and

a continuous speech recognition unit using the processor,

wherein the preset call command recognition unit is configured to receive an input speech spoken by the speaker;

receive a subsequent input speech spoken, by the speaker, subsequently to the input speech;

compare the input speech with a preset call command; and

recognize the input speech as the preset call command according to a result of the comparison,

wherein the continuous speech recognition unit is configured to recognize the subsequent input speech as an actual command if the input speech is recognized as the preset call command by the preset call command recognition unit, and

wherein the preset call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the preset call command.

10. (Currently Amended) The apparatus of claim 9,

wherein the preset call command recognition unit further comprises:

an adaptive filter configured to receive the input speech and the subsequent input speech; and

a confidence detection unit configured to compute a confidence rate of the assumed input speech and recognize the assumed input speech as the preset call command based on the computed confidence rate.

11. (Original) The apparatus of claim 10,

wherein the confidence detection unit is further configured to recognize the assumed input speech as the preset call command if the computed confidence rate is higher than a threshold value.

12. (Original) The apparatus of claim 10,

wherein the confidence detection unit is further configured to determine whether or not the assumed input speech is an authentic call command based on the computed confidence rate and recognize the assumed input speech as the preset call command if it is determined that the assumed input speech is the authentic call command.

13. (Original) The apparatus of claim 10,

wherein the token passing unit is further configured to compute a log likelihood ratio of the input speech and assume the input speech to be the preset call command based on the computed log likelihood ratio.

14. (Original) The apparatus of claim 13,

wherein the computed log likelihood ratio is a natural logarithm of a probability on the input speech for a phoneme model of the preset call command, and the computed confidence rate is another log likelihood ratio.

15. (Original) The apparatus of claim 14,

wherein said another log likelihood ratio is computed by subtracting, from the log likelihood ratio, a natural logarithm of a probability on the input speech for an anti-phoneme model of the preset call command.

16. (Original) The apparatus of claim 9,

wherein the continuous speech recognition unit comprises:

a keyword spotting unit configured to recognize the subsequent input speech as the actual command if the input speech is recognized as the preset call command; and

a rule check unit configured to determine whether the recognized subsequent input speech corresponds to a target sentence.

17. (New) A method for recognizing a speech of a speaker by a single device, the method comprising:

receiving, by a preset call command recognition unit of the single device, an input speech spoken by the speaker;

receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;

comparing, by the preset call command recognition unit, the input speech with a preset call command;

determining, by the preset call command recognition unit of the single device, whether the input speech is recognized as the preset call command according to a result of the comparison; and

only if the input speech is recognized as the preset call command, activating a continuous speech recognition unit of the single device that is configured to perform continuous speech recognition to determine whether the subsequent input speech is recognized as an actual command, in order to reduce overall computational load on the single device.

18. (New) The method of claim 17, wherein the single device is a portable device or an embedded system.

19. (New) The method of claim 17, wherein the single device.

wherein determining whether the input speech is recognized as the preset call command further comprises:

computing, by a confidence detection unit, a confidence rate of the input speech;
and

recognizing, by the confidence detection unit, the input speech as the preset call command based on the computed confidence rate.

20. (New) The method of claim 17,

wherein determining whether the input speech is recognized as the preset call command further comprises:

computing a log likelihood ratio of the input speech; and

assuming the input speech to be the preset call command based on the computed log likelihood ratio.

REMARKS

The above amendments are made in response to the outstanding Non-Final Office Action dated June 10, 2014. The Examiner's reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claims 2-5, 9 and 10 have been amended to more clearly define the claimed invention. New claims 17-20 have been added. No new matter has been introduced by these amendments.

Claims 1-20 are pending in the present application.

Claim Rejections Under 35 U.S.C. §103

Claims 1-16 stand rejected under pre-AIA 35 U.S.C. §103(a) as being unpatentable over Yao, et al. (U.S. Patent No. 7,966,183; hereinafter, "Yao"), in view of Miyazawa, et al. (U.S. Patent No. 6,070,139; hereinafter, "Miyazawa") and in further view of Evermann, et al. (U.S. Publication No. 2008/0154870; hereinafter, "Evermann"), in combinations thereof.

Applicants respectfully submit that the cited references, alone or in combination, do not disclose or suggest all elements of claim 1. For instance, the cited references fail to disclose or suggest "determining, by the preset call command recognition unit, whether the input speech is recognized as the preset call command according to a result of the comparison; and **based on determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit** configured to determine whether the subsequent input speech is recognized as an actual command, in order to reduce computational load on the device."

The Office Action correctly states that Yao in view of Miyazawa does not teach the above-recited element of claim 1. The Office Action relies on Evermann for disclosing the element. Evermann discloses reducing computational load placed on **remote recognition servers** by taking advantage of local processing power on **a mobile device** that uses the remote servers. See, e.g., par. [0034] of Evermann. That is, Evermann merely distributes computational load over multiple devices (i.e., the remote recognition servers and the mobile device), and the overall computational load over the multiple devices does not get reduced. In contrast, the

embodiments of the claimed invention reduces computational load on “a” device by **activating a continuous speech recognition unit** configured to determine whether the subsequent input speech is recognized as an actual command, **when the preset call command recognition unit determines that the input speech is recognized as the preset call command**. That is, by not being activated until the input speech is recognized as the preset call command, the continuous speech recognition unit does not have to perform continuous speech recognition all the time for all of the input speeches. *See*, p. 13, ll. 18-24 of the Specification.

For at least the foregoing reasons, claim 1 should be allowable over Yao, Miyazawa and Evermann. Claims 2-8 are also believed to be allowable over Yao, Miyazawa and Evermann by virtue of their direct or indirect dependency from claim 1. Accordingly, withdrawal of rejection on claims 1-8 is respectfully requested.

Regarding claim 9, Applicants respectfully submit that the Office Action did not address all elements of the claim by rejecting claims 1 and 9 with different elements in a single rejection. For instance, the Office Action failed to address “wherein the call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.” Applicants respectfully request that the Examiner respond to Applicants’ arguments for the above-recited element of claim 9 made in the response submitted on April 24, 2014. The arguments are reproduced below for the Examiner’s convenience:

The previous Office Action dated January 29, 2014, stated that Yao in view of Miyazawa does not teach the above element of claim 9 and relied on paragraphs [0030] and [0031] of Armbruster, et al. (U.S. Publication No. 2002/0136166; hereinafter, “Armbruster”) for disclosing the element. While these paragraphs of Armbruster appear to disclose a “token passing arrangement” that has a few common words with the claimed “token passing unit,” the description of the token passing arrangement in Armbruster has nothing to do with “assum[ing] the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the call command.” In particular, the “token” in Armbruster indicates which one of

the multiple speakers has the control of a conference and is used for cutting off the speaker who is monopolizing the conference call. Therefore, “token passing” as in “token passing arrangement” of Armbruster has nothing to do with the claimed “token passing unit,” which performs the above-recited element of claim 9. Applicants also respectfully submit that Evermann does not cure the deficiencies of Yao, Miyazawa and Armbruster.

For at least the foregoing reasons, claim 9 should be allowable over Yao, Miyazawa and Evermann. Claims 10-16 are also believed to be allowable over Yao, Miyazawa, Armbruster and Evermann by virtue of their direct or indirect dependency from claim 9. Accordingly, withdrawal of rejection on claims 9-16 is respectfully requested.

New Claims

Applicants have added new claims 17-20. The cited references do not disclose or suggest all elements of the new independent claim 17, which recites “determining, by the preset call command recognition unit of the single device, whether the input speech is recognized as the preset call command according to a result of the comparison; and **only if the input speech is recognized as the preset call command, activating a continuous speech recognition unit of the single device that is configured to perform continuous speech recognition** to determine whether the subsequent input speech is recognized as an actual command, in order to reduce overall computational load on the single device” (emphasis added). For the reasons discussed above for claim 1, the cited references fail to disclose or suggest this element of claim 17. Therefore, claim 17 should be allowable over Yao, Miyazawa and Evermann. Claims 18-20 are also believed to be allowable over Yao, Miyazawa and Evermann by virtue of their direct or indirect dependency from claim 17. No new matter has been introduced by the new claims.

Conclusion

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Reconsideration and subsequent allowance of this application are courteously requested.

If there are any charges due with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

The Examiner is invited to contact Applicants' Attorneys at the below-listed telephone number with any questions or comments regarding this Response or otherwise concerning the present application.

Respectfully submitted,

CANTOR COLBURN, LLP

By: /Jaegyoo Jang/
Jaegyoo Jang
Registration No. 68540
Michael Park
Registration No. 62435

Date: September 5, 2014
Cantor Colburn LLP
1800 Diagonal Road
Suite 400
Alexandria, VA 22314
Telephone: (703) 236-4500
Facsimile: (703) 236-4501

Electronic Acknowledgement Receipt	
EFS ID:	20056301
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	Jaegyoo Jang
Filer Authorized By:	
Attorney Docket Number:	MSF0011USC
Receipt Date:	05-SEP-2014
Filing Date:	22-AUG-2012
Time Stamp:	13:36:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	ResponseNFOADated06102014 .PDF	151691 07994e580c90c1b5a58540b03287211e07d20d9f	no	11

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 13/591,479		Filing Date 08/22/2012		☐ To be Mailed		
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO										
APPLICATION AS FILED – PART I										
		(Column 1)		(Column 2)						
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)		
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A		190		
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A				
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =				
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL		190		
APPLICATION AS AMENDED – PART II										
		(Column 1)		(Column 2)		(Column 3)				
AMENDMENT	09/05/2014		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		* 20		Minus	** 20	= 0	X \$40 =	0	
	Independent (37 CFR 1.16(h))		* 3		Minus	***3	= 0	X \$210 =	0	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
								TOTAL ADD'L FEE		0
		(Column 1)		(Column 2)		(Column 3)				
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		*		Minus	**	=	X \$ =		
	Independent (37 CFR 1.16(h))		*		Minus	***	=	X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
								TOTAL ADD'L FEE		
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>										

This collection of information is required by 37 CFR 1.16. 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 12 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

23413 7590 09/30/2014
CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

EXAMINER

JACKSON, JAKIEDA R

ART UNIT

PAPER NUMBER

2657

DATE MAILED: 09/30/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024

TITLE OF INVENTION: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	12/30/2014

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.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23413 7590 09/30/2014
CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024

TITLE OF INVENTION: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	12/30/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
JACKSON, JAKIEDA R	2657	704-275000

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 03-02 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, 1 _____
- (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. 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 has been filed for recordation as set forth in 37 CFR 3.11. 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. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

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.

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.

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. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024

23413	7590	09/30/2014
CANTOR COLBURN LLP		
20 Church Street		
22nd Floor		
Hartford, CT 06103		

EXAMINER	
JACKSON, JAKIEDA R	

ART UNIT	PAPER NUMBER
2657	

DATE MAILED: 09/30/2014

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.

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 12 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.

Privacy Act Statement

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. 13/591,479	Applicant(s) JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	AIA (First Inventor to File) Status No

-- 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 arguments filed 9/5/2014.
☐ 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)

- | | |
|--|--|
| <ol style="list-style-type: none"> 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 _____ | <ol style="list-style-type: none"> 5. ☒ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____ |
|--|--|

--	--

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Soomin Kim on September 24, 2014.

The application has been amended as follows:

Amendment to claim 1:

A method for recognizing a speech of a speaker by a device, the method comprising:

receiving, by a preset call command recognition unit, an input speech spoken by the speaker;

receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;

comparing, by the preset call command recognition unit, the input speech with a preset call command;

determining, by the preset call command recognition unit, whether the input speech is recognized as the preset call command according to a result of the comparison; and

based on determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit configured to determine whether the subsequent input speech is recognized as an actual command, in order to reduce computational load on the device; and

wherein the preset call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the preset call command.

Amendment to claim 17:

A method for recognizing a speech of a speaker by a single device, the method comprising:

receiving, by a preset call command recognition unit of the single device, an input speech spoken by the speaker;

receiving, by the preset call command recognition unit, a subsequent input speech spoken, by the speaker, subsequently to the input speech;

comparing, by the preset call command recognition unit, the input speech with a preset call command;

determining, by the preset call command recognition unit of the single device, whether the input speech is recognized as the preset call command according to a result of the comparison; and

only if the input speech is recognized as the preset call command, activating a continuous speech recognition unit of the single device that is configured to perform continuous speech recognition to determine whether the subsequent input speech is recognized as an actual command, in order to reduce overall computational load on the single device; and

wherein the preset call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the preset call command.

Allowable Subject Matter

Claims 1-20 are allowed.

The following is a statement of reasons for allowance:

As for independent claims 1, 9 and 17, they recite a method and apparatus for recognizing a speech of a speaker by a device in a noisy environment through real-time recognition of call commands. Prior art such as Yao, Miyazawa and Evermann disclose a similar method and apparatus, but fails to teach the claims in combination with based on determining that the input speech is recognized as the preset call command, activating a continuous speech recognition unit configured to determine whether the

subsequent input speech is recognized as an actual command, in order to reduce computational load on the device and wherein the preset call command recognition unit comprises a token passing unit configured to assume the input speech to be the preset call command according to the result of the comparison using a minimum recognition network composed of a silence interval accompanied by noise and the preset call command.

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."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAKIEDA JACKSON whose telephone number is (571)272-7619. The examiner can normally be reached on Monday-Friday from 5:30am-2:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. 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.

/JAKIEDA JACKSON/
Primary Examiner, Art Unit 2657

Issue Classification 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.	
	Examiner JAKIEDA JACKSON	Art Unit 2657	

CPC						
Symbol					Type	Version
G10L		15	I	20	F	2013-01-01
G10L		15	I	08	I	2013-01-01
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			
			I			

CPC Combination Sets					
Symbol		Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)		
/JAKIEDA JACKSON/ Primary Examiner.Art Unit 2657	9/24/14	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	4	9

Issue Classification 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION														
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED									
704			275			G	1	0	L	21 / 00 (2013.01.01)										
CROSS REFERENCE(S)																				
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																			
									</											

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)		
/JAKIEDA JACKSON/ Primary Examiner.Art Unit 2657	9/24/14	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	4	9

Issue Classification 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17												
	2		18												
	3		19												
	4		20												
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)		
/JAKIEDA JACKSON/ Primary Examiner.Art Unit 2657	9/24/14	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	4	9

Search Notes 	Application/Control No. 13591479	Applicant(s)/Patent Under Reexamination JUNG ET AL.
	Examiner JAKIEDA JACKSON	Art Unit 2657

CPC- SEARCHED		
Symbol	Date	Examiner
G10L15/00	5/3/14	JJ

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
704	275	9/24/14	JJ

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History	11/19/12	JJ
Reviewed for 101, deemed	11/19/12	JJ
Inventor Search	11/19/12	JJ
Reviewed for DP, not deemed	11/19/12	JJ
EAST Search History Update	8/1/13	JJ
EAST Search History Update	1/15/14	JJ
EAST Search History Update	5/3/14	JJ
G10L (text limited search)	5/3/14	JJ
EAST Search History Update	9/25/14	JJ

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
G10L	15/00	5/3/14	JJ
704	275	9/24/14	JJ

--	--

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	305	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5))	US-PGPUB; USPAT	OR	OFF	2013/07/30 19:24
S2	186	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18
S3	23	continuous\$4 near2 (speech\$4 voic\$4) near2 recogni\$9 and ((keyword\$2 or word\$4) near2 (spot\$5)) and command\$4 and subsequen\$4 near3 speech\$4	US-PGPUB; USPAT	OR	OFF	2013/07/30 20:18
S4	1	"20120316879".did.	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
S5	0	"20120316879".did. and software\$4	US-PGPUB; USPAT	OR	OFF	2013/07/31 11:38
S6	332	silen\$6 with (nois\$4 speech\$4 audio\$4) with command\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 12:28
S7	34	silen\$6 with (nois\$4 speech\$4 audio\$4) with command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 12:30
S8	9	minimum\$4 near2 recogni\$9 near2 network\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:07
S9	44	(mut\$4 silen\$6) with (nois\$4 speech\$4 audio\$4) with command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:19
S10	10	S9 not S7	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:20
S11	199	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:30
S12	28	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:31
S13	28	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:31
S14	1	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same token\$4 and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:32
S15	7	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 and token\$4	US-PGPUB;	OR	OFF	2014/01/15 13:33

		and continuous\$4 same (compar\$9 match\$4) near2 (speech\$4 voic\$4)	USPAT			
S16	15	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same (compar\$9 match\$4) and token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:34
S17	3	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same (compar\$9 match\$4) same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:34
S18	4	(mut\$4 silen\$6) same (nois\$4 speech\$4 audio\$4) same command\$4 same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:35
S19	3	(mut\$4 silen\$6) same (nois\$4) same command\$4 same token\$4 and continuous\$4 near2 (speech\$4 voic\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:36
S20	3	(mut\$4 silen\$6) same (nois\$4) same command\$4 same token\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:36
S21	29	(mut\$4 silen\$6) same (nois\$4) same (speech\$4 voic\$4 command\$4) same token\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 13:37
S22	102	(mut\$4 silen\$6) same (nois\$4) same (speech\$4 voic\$4 command\$4) and token\$4 near2 pass\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S23	92	S22 not S21	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S24	74	S22 not S21 and continu\$9 near2 speech\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:47
S25	16	S22 not S21 and continu\$9 near2 speech\$4 not bennett\$4	US-PGPUB; USPAT	OR	OFF	2014/01/15 14:49
S26	1	"20110077936".did.	US-PGPUB; USPAT	OR	OFF	2014/01/16 10:58
S27	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.)	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:04
S28	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:04
S29	967258	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 updat\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S30	4	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S31	2	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:05
S32	1	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and updat\$5 and transcri\$6	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:06
S33	0	((("20100250547" "20090049053").did. or ("7818215" "8255386").pn.) and shar\$5 and	US-PGPUB;	OR	OFF	2014/01/16 11:07

		updat\$5 and (STT or (speech\$4to\$4text\$4))	USPAT			
S34	1	shar\$4 near2 material\$4 and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:08
S35	11	shar\$4 near2 material\$4 and updat\$4 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:09
S36	4909	(conferenc\$4 meeting\$4 lectur\$4) and updat\$4 and languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:10
S37	83	(conferenc\$4 meeting\$4 lectur\$4) and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:10
S38	13	G10L15/183.cpc. and (conferenc\$4 meeting\$4 lectur\$4) and updat\$4 near2 languag\$4 near2 model\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:11
S39	5759	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4 apple\$4)	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:27
S40	589	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4 apple\$4) and "704"/\$.ccls.	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:27
S41	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and "704"/\$.ccls. and artist\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S42	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and "704"/\$.ccls. and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S43	0	(speech\$4 voic\$4) near2 command\$4 and (pomme\$4) and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S44	7	(speech\$4 voic\$4) near2 command\$4 and (kate) and song\$4	US-PGPUB; USPAT	OR	OFF	2014/01/16 11:28
S45	1	"20120123782".did.	US-PGPUB; USPAT	OR	OFF	2014/01/16 15:29
S46	12094	long\$4term\$4 and short\$4term\$4 and cod\$4 and frequenc\$6	US-PGPUB; USPAT	OR	OFF	2014/01/21 08:02
S47	11	long\$4term\$4 and short\$4term\$4 and cod\$4 and frequenc\$6 and son.in.	US-PGPUB; USPAT	OR	OFF	2014/01/21 08:02
S48	11	long\$4term\$4 and short\$4term\$4 and cod\$4 and frequenc\$6 and son.in. and (compress\$4 expans\$9)	US-PGPUB; USPAT	OR	OFF	2014/01/21 08:04
S49	40705	subsequent\$4 near2 (speech\$4 voic\$4 input\$4)	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:31
S50	1572	subsequent\$4 near2 (speech\$4 voic\$4 input\$4) with command\$4	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:32
S51	77	subsequent\$4 near2 (speech\$4 voic\$4 input\$4) with command\$4 and reduc\$4 near2 (computational\$4 load\$4)	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:33
S52	17	subsequent\$4 near2 (speech\$4 voic\$4	US-	OR	OFF	2014/06/03

		input\$4) with command\$4 and reduc\$4 near2 (computational\$4 load\$4) and "704"/\$.ccls.	PGPUB; USPAT			17:35
S53	13	preset\$4 near2 command\$4 same actual\$4 near2 command	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:42
S54	15	preset\$4 near2 command\$4 same actual\$4 near2 command\$4	US-PGPUB; USPAT	OR	OFF	2014/06/03 17:42
S55	2605	continuous\$4 near2 speech\$4 near2 recogni\$6	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:04
S56	1321	continuous\$4 near2 speech\$4 near2 recogni\$6 and command\$4	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:04
S57	7	(US-20040128137-\$ or US-20050256711-\$ or US-20020136166-\$ or US-20080154870-\$).did. or (US-6070139-\$ or US-6249757-\$ or US-5890111-\$).did.	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:05
S58	716	continuous\$4 near2 speech\$4 near2 recogni\$6 and command\$4 and (likelihood\$4)	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:07
S59	10	continuous\$4 near2 speech\$4 near2 recogni\$6 and command\$4 and (likelihood\$4) and G10L15/00.cpc.	US-PGPUB; USPAT	OR	OFF	2014/06/03 19:13
S60	350	activat\$6 near3 speech\$4 near2 recogn\$8 same command\$4	US-PGPUB; USPAT	OR	OFF	2014/09/18 11:40
S61	197	activat\$6 near3 speech\$4 near2 recogn\$8 same command\$4 and "704"/\$.ccls.	US-PGPUB; USPAT	OR	OFF	2014/09/18 11:43
S62	0	activat\$6 near3 continuous\$4 near2 speech\$4 near2 recogn\$8 same command\$4 and "704"/\$.ccls.	US-PGPUB; USPAT	OR	OFF	2014/09/18 11:54
S63	0	activat\$6 near3 continuous\$4 near2 speech\$4 near2 recogn\$8	US-PGPUB; USPAT	OR	OFF	2014/09/18 11:54
S64	2681	continuous\$4 near2 speech\$4 near2 recogn\$8	US-PGPUB; USPAT	OR	OFF	2014/09/18 11:54
S65	1	"20120316879".did.	US-PGPUB; USPAT	OR	OFF	2014/09/19 09:05
S66	2300	token\$4 near2 passing\$4 and minimum\$4	US-PGPUB; USPAT	OR	OFF	2014/09/19 23:24
S67	44	token\$4 near2 passing\$4 and minimum\$4 near2 recogni\$6	US-PGPUB; USPAT	OR	OFF	2014/09/19 23:24
S68	3	token\$4 near2 passing\$4 and minimum\$4 near2 recogni\$6 and silenc\$4 near2 interval\$4	US-PGPUB; USPAT	OR	OFF	2014/09/19 23:24
S69	3	token\$4 near2 passing\$4 and minimum\$4 near2 recogni\$6 and silenc\$4 near2 interval\$4 same nois\$4	US-PGPUB; USPAT	OR	OFF	2014/09/19 23:24
S70	12	(US-20040128137-\$ or US-20050256711-\$ or US-20020136166-\$ or US-20080154870-	US-PGPUB;	OR	OFF	2014/09/24 13:38

		\$ or US-20090024391-\$ or US-20080270136-\$ or US-20080071546-\$ or US-20080059171-\$ or US-20080021705-\$).did. or (US-6070139-\$ or US-6249757-\$ or US-5890111-\$).did.	USPAT			
S71	2680	continuous\$4 near2 speech\$4 near2 recogni\$9	US-PGPUB; USPAT	OR	OFF	2014/09/24 13:41
S72	1362	continuous\$4 near2 speech\$4 near2 recogni\$9 and command\$4	US-PGPUB; USPAT	OR	OFF	2014/09/24 13:41
S73	1104	continuous\$4 near2 speech\$4 near2 recogni\$9 and command\$4 and "704"/\$.ccls.	US-PGPUB; USPAT	OR	OFF	2014/09/24 13:44
S74	392	continuous\$4 near2 speech\$4 near2 recogni\$9 and command\$4 and "704"/\$.ccls. and confidenc\$4	US-PGPUB; USPAT	OR	OFF	2014/09/24 13:50
S75	35	continuous\$4 near2 speech\$4 near2 recogni\$9 and call\$4 near2 command\$4 and "704"/\$.ccls. and confidenc\$4	US-PGPUB; USPAT	OR	OFF	2014/09/24 13:57

9/ 24/ 2014 2:53:50 PM

C:\Users\jjackson3\Documents\EAST\Workspaces\Jung 13591479.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heui-Suck JUNG, et al. Group Art No.: 2657
Serial No: 13/591,479 Examiner: JACKSON, JAKIEDA R
Filed: August 22, 2012 Confirmation No.: 7024
For: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 C.F.R. §1.312

Dear Sir:

This amendment is submitted in response to the Notice of Allowance and Issue Fee Due mailed on September 30, 2014. Please amend the present Application as follows:

Amendments to the Title of the Invention begin on page 2; and

Remarks begin on page 3 of this paper.

Attachment: 1) Declaration filed on August 22, 2012;
2) Corrected Application Data Sheet; and
3) Request for Corrected Filing Receipt.

Amendments to the Title of the Invention:

- Please delete the Title of the Invention on page 1 of this application and insert the following new Title of the Invention

SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS
SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF
CALL COMMANDS

REMARKS

This amendment is submitted after allowance under 37 C.F.R. §1.312. This amendment is to correct the typographical error in the title of the invention in the Application Data Sheet filed on August 22, 2012. Please note that the title was correctly spelled in the original Declaration and the Specification filed on the same day.

Entrance of this amendment is respectfully requested.

The Examiner is courteously invited to contact Applicants' Attorney at the below-listed telephone number with any questions or comments regarding this matter.

If there are any additional charges with respect to this Amendment, or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By: /Jaegyoo Jang/
Jaegyoo Jang
Registration No. 68540

Date: October 3, 2014
CANTOR COLBURN LLP
1800 Diagonal Rd
Suite 400
Alexandria, VA 22314
Telephone (703) 236-4500
Facsimile (703) 236-4501

Declaration and Power of Attorney for Utility or Design Patent Application (Korean Language)

특허 혹은 의장 출원에 대한 선언서 및 위임장 (한국어)

본인은, 아래에 기재된 발명자로서, 다음의 사항을 선언합니다.

본인의 거주지, 우송주소 및 국적은 본인의 이름 옆에 기재된 것과 같습니다.

본인은 다음에 기재된 특허(혹은 의장)를 받고자 청구된 발명의 내용에 대하여 본인이 최초의 독창적인 단독발명자이거나 (아래에 하나의 이름만 기재된 경우), 또는 최초의 독창적인 공동발명자임을 (아래에 둘 이상의 이름이 기재된 경우) 알습니다.

상기 발명의 명세서에는 다음 난이 체크되어 있지 않은한, 본 문서에 첨부되어 있습니다.

☐ 년 월 일에 미국 출원번호 _____로 출원되었고, _____년 월 일에 보정되었거나 (해당되는 경우), 혹은 _____년 월 일에 PCT 국제출원번호 _____로 출원되었고, _____년 월 일에 보정되었음 (해당되는 경우).

본인은 상기 보정서에 의해 보정된, 청구범위를 포함한 상기 명세서의 내용을 검토하고 이해하였음을 진술합니다.

본인은 미연방시행규칙 제 37 편 제 1.56 조에 의거하여 특허성판단에 중요한 정보를 공개할 의무가 있음을 인지합니다.

본인은 미 연방시행규칙 제 35 편 제 119 조 (a)-(d)항 또는 제 365 조 (b)항에 의거하여 다음에 기재된 외국의 특허나 발명자증명서 출원, 또는 제 365 조 (a)항에 의거하여 다음에 기재된 바와 같이 미국 이외의 적어도 하나의 국가를 지칭한 PCT 국제출원의 국제우선권을 주장합니다. 또한 본인은, 우선권주장의 근거가 되는 출원서의 출원일 이전에 출원된 외국특허나 발명자증명서 출원 또는 PCT 국제출원일 없음을 아래의 "아니오" 난에 체크함으로써 이를 확인하였습니다.

Prior foreign applications

선 외국출원

10-2008-0049455	Republic of Korea	28/MAY/2008
(Number)	(Country)	(Day/Month/Year Filed)
(번호)	(국가)	(출원 년월일)

(Number)	(Country)	(Day/Month/Year Filed)
----------	-----------	------------------------

(FORM DEC)Page 1

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

"SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS"

the specification of which is attached hereto unless the following box is checked:

☒ is filed as a national phase entry of PCT International Application Number **PCT/KR2009/002118** designating the United States of America, filed **April 22, 2009**.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority under Title 35, United States Code §119(a-d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States, listed below. I have also identified below, by checking the "No" box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

Priority claimed

우선권 주장

☒ ☐
Yes No
예 아니오

☐ ☐
Yes No

Docket #: P10308US

(번호)

(국가)

(출원 년월일)

에 아니오

☐ 그 외의 추가되는 외국출원번호는 첨부된 우선권
보충자료에 기재되어 있습니다.

☐ Additional foreign application numbers are listed a
supplemental priority sheet attached hereto.

본인은 미연방법 제 35 편 제 119 조 (e) 항에 근거하여, 하기의
미국 가출원의 특권을 주장합니다.

I hereby claim the benefit under Title 35, United States Code
§119 (e) of any United States provisional application(s) listed
below.

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

☐ 그 외의 추가되는 미국 가출원 번호는 첨부된 우선권
보충자료에 기재되어 있습니다.

☐ Additional provisional application numbers are listed on a
supplemental priority sheet attached hereto.

본인은 미연방법 제 35 편 제 120 조에 의거하여 다음에 기재된
미국 출원, 또는 제 365 조 (c) 항에 의거하여 다음에 기재된
PCT 국제출원의 특권을 주장합니다. 또한 본 출원의 각
청구항의 내용이 미연방법 제 35 편 제 112 조의 첫번째 절에
명시된 방법에 의하여 선 미국출원서 또는 PCT 국제출원에
기재되어 있지 않는 한, 본인은 미연방시행규칙 제 37 편
제 1.56 조에 명시된 바와 같이 선 출원일자와 본 출원의 국내
또는 PCT 국제출원일자 사이에 가능하게 된 특허성 판단에
중요한 자료를 공개할 의무가 있음을 인지합니다.

I hereby claim the benefit under Title 35, United States Code
§120 of any United States application(s), or §365(c) of any
PCT international application designating the United States,
listed below and, insofar as the subject matter of each of the
claims of this application is not disclosed in the prior United
States or PCT international application in the manner provided
by the first paragraph of Title 35, United States Code §112, I
acknowledge the duty to disclose information which is material
to patentability as defined in Title 37, Code of Federal
Regulations §1.56 which became available between the filing
date of the prior application and the national or PCT
international filing date of this application.

PCT/KR2009/002118

(Application No.)

(출원번호)

22/APR/2009

(Day/Month/Year Filed)

(출원 년월일)

Pending

(현황)

(Status)

(특허획득, 출원중, 포기) (patented, pending, abandoned)

(Application No.)

(출원번호)

(Day/Month/Year Filed)

(출원 년월일)

(현황)

(Status)

(특허획득, 출원중, 포기) (patented, pending, abandoned)

☐ 그 외의 추가되는 미국 혹은 국제출원번호는 첨부된 우선권
보충자료에 기재되어 있습니다.

등록된 특허의 유효성을 위태롭게 할 수 있음을 인지하면서
여기에 선언합니다.

본인이 아는 한 본 문서에 제공된 모든 내용이 사실이고,
제공된 정보나 믿는 바에 대한 진술이 모두 사실이며, 더우기
미 연방법 제 18 편 제 1001 조에 명시된 바와 같이 고의로
허위진술을 하거나 이와 유사한 행위를 한 경우에는 벌금이나
감옥으로 처벌받거나 벌금과 감옥형을 모두 받을 수 있고
이러한 고의의 허위 진술은 특허출원서 또는 그에 대하여

아래에 서명한 본인은 본 문서에 지명된 미국변리사나
대리인에게 본 출원과 관련하여 미국특허청에서 취해야 할 모든
일에 대하여 미국변리사 혹은 대리인이 본인과 직접적인 의견
교환 없이 본인의 외국 특허대리인이나 회사의 대표자
(해당되는 경우)의 지시를 받고 따를 권한을 위임합니다.
상기의 미국변리사나 대리인은 그 지시를 하는 자가 변경된
경우에 본인으로부터 그 사실을 통보받을 것입니다.

(FORM-DEC)Page 2

Docket #: P10308US

☐ Additional U.S. or international application numbers are listed on a supplemental priority sheet attached hereto.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

The undersigned hereby authorizes the U.S. attorney or agent appointed herein to accept and follow instructions from either his foreign patent agent or corporate representative, if any, as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent appointed herein will be so notified by the undersigned.

{FORM DEC}Page 3

Docket #: P10308US

위임권 : 본인은 아래에 기재된 발명자로서 아래에 명기된
고객번호를 갖는 다음의 변리사나 대리인에게 본 출원서를
출원하고 이 출원과 관련하여 특허청에서 필요한 모든 일을
처리하는 것을 위임하고, 모든 통신문은 다음의 고객번호로
송부할 것을 지시합니다.

POWER OF ATTORNEY: As a named inventor, I hereby
appoint the attorney(s) and/or agent(s) associated with the
Customer Number provided below to prosecute this application
and transact all business in the Patent and Trademark Office
connected therewith, and direct that all correspondence be
addressed to that Customer Number:

CUSTOMER NUMBER 86144

고객번호 86144

Docket #: P10308US

Address: **LRK PATENT LAW FIRM**
1952 Gallows Rd. Suite 200
Vienna, VA 22182

직통전화연락처 :

Direct Telephone Calls to:

LRK PATENT LAW FIRM
(703) 854-1331

단독 발명자 혹은 첫번째 발명자의 성명	Full name of sole or first inventor JUNG, Heui-Suck
발명자의 서명	Inventor's signature  Date Jul. 16, 2010
주소	Residence 306-402, Sambo Happyhaim Apt., Bullo Jigu 34BL-1L, Bullo-dong, Seo-gu, Incheon 404-270 Republic of Korea
국적	Citizenship Republic of Korea
우송주소	c/o 1952 Gallows Rd. Suite 200, Vienna, VA 22182

두번째 발명자의 성명	Full name of second inventor CHIN, Se-Hoon
발명자의 서명	Inventor's signature  Date Jul. 16, 2010
주소	Residence 603, Seogwang Premera Apt., 981-1, Hwagok 6-dong, Gangseo-gu, Seoul 157-915 Republic of Korea
국적	Citizenship Republic of Korea
우송주소	c/o 1952 Gallows Rd. Suite 200, Vienna, VA 22182

세번째 발명자의 성명	Full name of third inventor ROH, Tae-Young
발명자의 서명	Inventor's signature  Date Jul. 16, 2010
주소	Residence 139-30, Ojeong-dong, Ojeong-gu, Bucheon-si, Gyeonggi-do 421-814 Republic of Korea
국적	Citizenship Republic of Korea
우송주소	c/o 1952 Gallows Rd. Suite 200, Vienna, VA 22182

{FORM DEC}

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	MSF0011USC
		Application Number	
Title of Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS <u>CONTINUOUS</u> SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1				
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117
				☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix
	Heui-Suck		JUNG	
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service				
City	Incheon	Country Of Residence	KR	
Citizenship under 37 CFR 1.41(b)		KR		
Mailing Address of Applicant:				
Address 1	306-402 Sambo Happyhaim Apt., Bullo Jigu 34BL-1L			
Address 2	Bullo-dong, Seo-gu			
City	Incheon	State/Province		
Postal Code	404-270	Country	KR	
Applicant 2				
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117
				☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix
	Se-Hoon		CHIN	
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service				
City	Seoul	Country Of Residence	KR	
Citizenship under 37 CFR 1.41(b)		KR		
Mailing Address of Applicant:				
Address 1	603, Seogwang Premera Apt., 981-1, Hwagok 6-dong			
Address 2	Gangseo-gu			
City	Seoul	State/Province		
Postal Code	157-915	Country	KR	
Applicant 3				
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117
				☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix
	Tae-Young		ROH	
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service				
City	Bucheon-si	Country Of Residence	KR	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	MSF0011USC	
		Application Number		
Title of Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS			
Citizenship under 37 CFR 1.41(b)		KR		
Mailing Address of Applicant:				
Address 1		139-30, Ojeong-dong, Ojeong-gu		
Address 2		Gyeonggi-do		
City	Bucheon-si	State/Province		
Postal Code	421-814	Country	KR	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	23413		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
Attorney Docket Number	MSF0011USC	Small Entity Status Claimed ☒	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

<p>Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.</p>
--

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	MSF0011USC
		Application Number	
Title of Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	23413		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	12863437	2010-07-17
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).			
Remove			
Application Number	Country ¹	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
10-2008-0049455	KR	2008-05-28	☒ Yes ☐ No
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.			
Assignee 1			
If the Assignee is an Organization check here. ☒			
Organization Name	KOREAPOWEROICE CO., LTD.		
Mailing Address Information:			
Address 1	201-510, Chunui Technopark 2-cha, 202, Chunui-dong		
Address 2	Wonmi-gu		
City	Bucheon-si	State/Province	
Country ¹	KR	Postal Code	420-857
Phone Number		Fax Number	
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	MSF0011USC
		Application Number	
Title of Invention	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.					
Signature	/Jaegyoo Jang/			Date (YYYY-MM-DD)	2014-10-03
First Name	Jaegyoo	Last Name	Jang	Registration Number	68540

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heui-Suck JUNG, et al. Group Art No.: 2657
Serial No: 13/591,479 Examiner: JACKSON, JAKIEDA R
Filed: August 22, 2012 Confirmation No.: 7024
For: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING
CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME
RECOGNITION OF CALL COMMANDS

REQUEST FOR CORRECTED FILING RECEIPT

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicants hereby request a Corrected Filing Receipt for the above-referenced patent application. Applicants submit herewith a new Application Data Sheet to correct the typographical error in the title of the application, as follows; SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING ~~CONTINUOUS~~ CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS. Applicants submit herewith a Corrected Application Data Sheet indicating said correction.

If there are any additional charges with respect to this Amendment, or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP
Applicants' Attorney

By: /Jaegyoo Jang/
Jaegyoo Jang
Registration No.: 68540
Customer No.:23413

Date: October 3, 2014
Cantor Colburn LLP
1800 Diagonal Road
Suite 400
Alexandria, VA 22314
Telephone: (703) 236-4500
Facsimile: (703) 236-4501

Electronic Acknowledgement Receipt	
EFS ID:	20319357
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	Jaegyoo Jang
Filer Authorized By:	
Attorney Docket Number:	MSF0011USC
Receipt Date:	03-OCT-2014
Filing Date:	22-AUG-2012
Time Stamp:	13:51:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment after Notice of Allowance (Rule 312)	Amendment_afterNOAunder312.PDF	4209933 9f4bd28e7d4633d4c98007fe8d7a76e20c616b8e	no	14

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
13/591,479	08/22/2012	2657	530	MSF0011USC	16	2

CONFIRMATION NO. 7024

CORRECTED FILING RECEIPT



OC000000071369555

23413
CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

Date Mailed: 10/16/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Heui-Suck JUNG, Incheon, KOREA, REPUBLIC OF;
Se-Hoon CHIN, Seoul, KOREA, REPUBLIC OF;
Tae-Young ROH, Bucheon-si, KOREA, REPUBLIC OF;

Applicant(s)

Heui-Suck JUNG, Incheon, KOREA, REPUBLIC OF;
Se-Hoon CHIN, Seoul, KOREA, REPUBLIC OF;
Tae-Young ROH, Bucheon-si, KOREA, REPUBLIC OF;

Assignment For Published Patent Application

KOREAPOWEROICE CO., LTD., Bucheon-si, KOREA, REPUBLIC OF

Power of Attorney: The patent practitioners associated with Customer Number 86144

Domestic Priority data as claimed by applicant

This application is a CON of 12/863,437 07/17/2010 PAT 8275616
which is a 371 of PCT/KR2009/002118 04/22/2009

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)
REPUBLIC OF KOREA 10-2008-0049455 05/28/2008

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

If Required, Foreign Filing License Granted: 08/30/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/591,479**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS

Preliminary Class

704

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024
23413 7590 CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103			EXAMINER JACKSON, JAKIEDA R	
			ART UNIT 2657	PAPER NUMBER
			NOTIFICATION DATE 10/17/2014	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Response to Rule 312 Communication	Application No. 13/591,479	Applicant(s) HEUI-SUCK J.
	Examiner	Art Unit

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

1. ☒ The amendment filed on 10/03/2014 under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

Title has been corrected.

B.Crittenden

Publishing Division

--	--

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23413 7590 09/30/2014
CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	08/22/2012	Heui-Suck JUNG	MSF0011USC	7024

TITLE OF INVENTION: SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING ~~CONTINUOUS~~ **CONTINUOUS** SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	12/30/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
JACKSON, JAKIEDA R	2657	704-275000

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 03-02 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 CANTOR COLBURN LLP

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 has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

~~XXX~~

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

KOREAPOWVOICE CO., LTD.

REPUBLIC OF KOREA

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

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☒ Advance Order - # of Copies Five (5)

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

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.

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.

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 /David A. Fox/

Date December 1, 2014

Typed or printed name David A. Fox

Registration No. 38,807

Electronic Patent Application Fee Transmittal				
Application Number:		13591479		
Filing Date:		22-Aug-2012		
Title of Invention:		SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS		
First Named Inventor/Applicant Name:		Heui-Suck JUNG		
Filer:		David Fox/LINDA GOULD		
Attorney Docket Number:		MSF0011USC		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Printed Copy of Patent - No Color	8001	5	3	15
Total in USD (\$)				495

Electronic Acknowledgement Receipt	
EFS ID:	20831377
Application Number:	13591479
International Application Number:	
Confirmation Number:	7024
Title of Invention:	SYSTEM FOR DETECTING SPEECH INTERVAL AND RECOGNIZING CONTINUOUS SPEECH IN A NOISY ENVIRONMENT THROUGH REAL-TIME RECOGNITION OF CALL COMMANDS
First Named Inventor/Applicant Name:	Heui-Suck JUNG
Customer Number:	23413
Filer:	David Fox/LINDA GOULD
Filer Authorized By:	David Fox
Attorney Docket Number:	MSF0011USC
Receipt Date:	01-DEC-2014
Filing Date:	22-AUG-2012
Time Stamp:	17:07:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$495
RAM confirmation Number	4372
Deposit Account	061130
Authorized User	FOX, DAVID A.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	7BD4102.pdf	110355	no	1
			71da6d0bb1edd0afe2d8d3d356401cd62cd24e84		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32103	no	2
			fd07e7c791807dab151b8bddb0c0bb25a8cf82c5		
Warnings:					
Information:					
Total Files Size (in bytes):			142458		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/591,479	01/06/2015	8930196	MSF0011USC	7024

23413 7590 12/17/2014
CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

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 Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Heui-Suck JUNG, Incheon, KOREA, REPUBLIC OF;
Se-Hoon CHIN, Seoul, KOREA, REPUBLIC OF;
Tae-Young ROH, Bucheon-si, KOREA, REPUBLIC OF;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.