PTO/SB/05 (08-08)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	090611-0391838
First Inventor	Philippe Di Cristo, et al.
Title	System and Method of Supporting Adaptive Misrecognition in Conversational Speech
Express Mail Label No.	

APPLICATION ELEMENTS

See *MPEP chapter 600 concerning utility patent application contents.*

1. ☐ **Fee Transmittal Form** (e.g., PTO/SB/17)
2. ☒ **Applicant claims small entity status.** See 37 CFR 1.27.
3. ☒ **Specification** [*Total Pages* 60]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. ☒ **Drawing(s)** (35 U.S. C. *113*) [*Total Sheets* 9]
5. **Oath or Declaration** [*Total Sheets* 2]
   a. ☐ Newly executed (original or copy)
   b. ☒ A copy from a prior application (37 CFR 1.63(d))
   (for continuation/divisional with Box 18 completed)
   i. ☐ DELETION OF INVENTOR(s)
   Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☒ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   ☐ Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, items a. - c. are required)*
   a. ☐ Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents**
P.O. Box 1450
Alexandria VA 22313-1450

ACCOMPANYING APPLICATION PARTS

9. ☐ **Assignment Papers** (cover sheet & document(s))
   Name of Assignee _____
10. ☐ **37 CFR 3.73(b) Statement** *(when there is an assignee)* ☒ **Power of Attorney**
11. ☐ **English Translation Document** *(if applicable)*
12. ☒ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
13. ☐ **Preliminary Amendment**
14. ☐ **Return Receipt Postcard** (MPEP 503)
    (Should be specifically itemized)
15. ☐ **Certified Copy of Priority Document(s)**
    (if foreign priority is claimed)
16. ☐ **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other: _____

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*

☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: 12/571,795

Prior application information: *Examiner* Matthew J. Sked *Art Unit:* 2626

19. CORRESPONDENCE ADDRESS

☒ The address associated with Customer Number 00909 ***OR*** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature		Date	February 7, 2011
Name (Print/Type)	Syed Jafar Ali	Registration No. (Attorney/Agent)	58780

This collection of information is required by 37 CFR 1.53(b). 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. 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.

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MICROSOFT CORP.
EXHIBIT 1002

Attorney Docket No. 090611-0391838 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Philippe Di Cristo, *et al.*

Application No.:	**New**	Confirmation No.:	Unassigned
Filed:	February 7, 2011	Group No.:	Unassigned
		Examiner:	Unassigned

For: SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

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

APPLICATION DATA SHEET
37 CFR § 1.76

BIBLIOGRAPHIC DATA

1. Applicant information

First Applicant: Philippe Di Cristo
Citizenship: France
Residence: 177 107th Avenue, N.E., #1007, Bellevue, Washington 98004.

Second Applicant: Chris Weider
Citizenship: United States of America
Residence: 2818 Grand Avenue, #B-508, Everett, Washington 98201.

Third Applicant: Robert A. Kennewick
Citizenship: United States of America
Residence: 2204 S. Eddy Street, Seattle, Washington 98108.

2. Correspondence information

Correspondence for this application should be addressed as follows:

Customer No.: 00909

3. Application information

Title of the Invention:	**Error! Reference source not found.**
Attorney Docket Number:	090611-0391838 Small Entity Status Claimed ☒
Total number of drawing sheets:	9
Type of application:	Utility

4. Representative information.

The following have a power of attorney or authorization of agent in this application:

Customer No.: 00909

5. Domestic Priority information.

Domestic priority for this application is claimed as follows:

35 U.S.C. § 120

Application No.	Filed	Status	Relationship
12/571,795	October 1, 2009	Pending	Parent
11/200,164	August 10, 2005	Issued as U.S. Patent No. 7,620,549 on November 17, 2009	Grandparent

6. Assignee information

The assignee of this application is:

VoiceBox Technologies, Inc.
10505 N.E. 38th Place, Building 9
Kirkland, Washington 98033

Extent of interest of assignee in application: Entire right, title and interest.

Date: February 7, 2011

PILLSBURY WINTHROP SHAW PITTMAN LLP
P.O. Box 10500
McLean, VA 22102
Main: (703) 770-7900
Fax: (703) 770-7901

Syed Jafar Ali
Registration No. 58,780
Direct Dial: (703) 770-7540

Customer No. 00909

COMBINED DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As the below named inventors, we hereby declare that:

Our residences, post office addresses and citizenships are as stated next to our names;

We believe that we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled:

"SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH"

the specification of which is attached hereto.

We have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above;

We acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information which is known to us to be material to the patentability of said invention in accordance with 37 C.F.R. § 1.56;

We do not know and do not believe said invention was ever known or used in the United States of America before our invention thereof, or patented or described in any printed publication in any country before our invention thereof or more than one year prior to said application; that said invention was not in public use or on sale in the United States of America more than one year prior to said application; that said invention has not been patented or made the subject of an inventor's certificate issued before the date of said application in any country foreign to the United States of America on any application filed by us or our legal representatives or assigns more than six months prior to said application;

We hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

_____ (Application Number) _____ (Filing Date) (day, month, year)

Aug. 10. 2005 2:07PM Voicebox Technologies No. 1284 P. 2

We hereby appoint the following attorneys and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

James G. Gatto	Registration No. 32,694
Rick A. Toering	Registration No. 43,195
Bradford C. Blaise	Registration No. 47,429
Sean L. Ingram	Registration No. 48,283

Address all telephone calls to James G. Gatto at telephone number 703-905-2054. Address all correspondence to Customer Number

00909

We hereby declare that all statements made herein of our 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.

Full name of first inventor: **Philippe Di Cristo**

Inventor's signature _____ Date 8/10/05

Residence: 177 107th Avenue, N.E., #1007
Bellevue, Washington 98004

Citizen of: France

Post Office Address: Same as residence

Full name of second inventor: **Chris Weider**

Inventor's signature _____ Date 8/10/05

Residence: 2818 Grand Avenue, #B-508
Everett, Washington 98201

Citizen of: United States of America

Post Office Address: Same as residence

Full name of third inventor: **Robert A. Kennewick**

Inventor's signature _____ Date 8/10/05

Residence: 2204 S. Eddy Street
Seattle, Washington 98108

Citizen of: United States of America

Post Office Address: Same as residence

Aug. 10. 2005 2:07PM Voicebox Technologies No. 1284 P. 3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS :	Philippe DI CRISTO *et al.*	CONFIRMATION NO.:	*Unassigned*
SERIAL NUMBER :	*Unassigned*	EXAMINER:	*Unassigned*
FILING DATE :	Herewith (February 7, 2011)	ART UNIT:	*Unassigned*
FOR :	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH		

INFORMATION DISCLOSURE STATEMENT (IDS)

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

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicants hereby make of record in the above-identified application the documents listed on the attached Form PTO-1449.

Applicants have listed publication dates on the attached PTO-1449 based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This Information Disclosure Statement is being filed within three months of the filing date of a national application other than a continued prosecution application under 37 C.F.R. § 1.53(d), or within three months of the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application, or before the mailing date of a first Office Action on the merits, or before the mailing date of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No certification or fee is required. 37 C.F.R. § 1.97(b).

The foreign patent documents and the non-patent literature documents ("Other Documents") were cited by or submitted to the Office in Application No. 12/571,795, filed October 1, 2009, which is relied upon for an earlier filing date under 35 U.S.C. § 120. Thus copies of these documents are not attached. 37 C.F.R. § 1.98(d).

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP

By_____
Syed Jafar Ali
Registration No.: 58,780

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00909

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Dated: February 7, 2011

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	Unassigned
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	Herewith (February 7, 2011)	Unassigned

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1A	4,430,669	02/07/1984	Cheung	358	122	
	1B	5,155,743	10/13/1992	Jacobs	375	28	
	1C	5,274,560	12/28/1993	LaRue	364	444	
	1D	5,377,350	12/27/1994	Skinner	395	600	
	1E	5,386,556	01/31/1995	Hedin et al.	395	600	
	1F	5,424,947	06/13/1995	Nagao et al.	364	419.08	
	1G	5,471,318	11/28/1995	Ahuja et al.	358	400	
	1H	5,475,733	12/12/1995	Eisdorfer et al.	379	52	
	1I	5,488,652	01/30/1996	Bielby *et al.*	379	88	
	1J	5,499,289	03/12/1996	Bruno et al.	379	220	
	1K	5,500,920	03/19/1996	Kupiec	395	2.79	
	1L	5,517,560	05/14/1996	Greenspan	379	114	
	1M	5,533,108	07/02/1996	Harris et al.	379	201	
	1N	5,537,436	07/16/1996	Bottoms et al.	375	222	
	1O	5,539,744	07/23/1996	Chu et al.	370	60	
	1P	5,557,667	09/17/1996	Bruno et al.	379	201	
	1Q	5,563,937	10/08/1996	Bruno et al.	379	201	
	1R	5,590,039	12/31/1996	Ikeda et al.	395	759	
	1S	5,617,407	04/01/1997	Bareis	369	275.3	
	1T	5,633,922	05/27/1997	August et al.	379	220	
	1U	5,675,629	10/07/1997	Raffel et al.	379	58	
	1V	5,696,965	12/09/1997	Dedrick	395	610	
	1W	5,708,422	01/13/1998	Blonder et al.	340	825.34	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO
	1X	WO 99/46763	09/16/1999	International				
	1Y	WO 00/21232	04/13/2000	International				
	1Z	WO 00/46792	08/10/2000	International				
	1AA	WO 01/78065	10/18/2001	International				
	1BB	WO 2004/072954	08/26/2001	International				

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

	1CC	REUTERS, "IBM to Enable Honda Drivers to Talk to Cars", Charles Schwab & Co., Inc., July 28, 2002, 1 page.
	1DD	LIN, Bor-shen, *et al.*, "A Distributed Architecture for Cooperative Spoken Dialogue Agents with Coherent Dialogue State and History", ASRU'99, 1999, 4 pages.

EXAMINER	DATE CONSIDERED

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

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	Unassigned
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	Herewith (February 7, 2011)	Unassigned

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2A	5,721,938	02/24/1998	Stuckey	395	754	
	2B	5,722,084	02/24/1998	Chakrin et al.	455	551	
	2C	5,742,763	04/21/1998	Jones	395	200.3	
	2D	5,748,841	05/05/1998	Morin *et al.*	395	2.66	
	2E	5,752,052	05/12/1998	Richardson et al.	395	759	
	2F	5,754,784	05/19/1998	Garland et al.	395	200.49	
	2G	5,761,631	06/02/1998	Nasukawa	704	9	
	2H	5,774,859	06/30/1998	Houser *et al.*	704	275	
	2I	5,794,050	08/11/1998	Dahlgren et al.	395	708	
	2J	5,794,196	08/11/1998	Yegnanarayanan *et al.*	704	255	
	2K	5,797,112	08/18/1998	Komatsu *et al.*	701	201	
	2L	5,799,276	08/25/1998	Komissarchik *et al.*	704	251	
	2M	5,802,510	09/01/1998	Jones	707	2	
	2N	5,832,221	11/03/1998	Jones	375	200.36	
	2O	5,867,817	02/02/1999	Catallo *et al.*	704	255	
	2P	5,878,385	03/02/1999	Bralich *et al.*	704	9	
	2Q	5,878,386	03/02/1999	Coughlin	704	10	
	2R	5,892,813	04/06/1999	Morin *et al.*	379	88.01	
	2S	5,895,464	04/20/1999	Bhandari *et al.*	707	3	
	2T	5,895,466	04/20/1999	Goldberg et al.	707	5	
	2U	5,902,347	05/11/1999	Backman *et al.*	701	200	
	2V	5,911,120	06/08/1999	Jarett et al.	455	417	
	2W	5,918,222	06/29/1999	Fukui *et al.*	707	1	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO
	2X	WO 2007/019318	02/15/2007	International				
	2Y	WO 2007/021587	02/22/2007	International				
	2Z	WO 2007/027546	03/08/2007	International				
	2AA	WO 2007/027989	03/08/2007	International				
	2BB	WO 2008/098039	08/14/2008	International				

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

	2CC	KUHN, Thomas, *et al.*, "Hybrid In-Car Speech Recognition for Mobile Multimedia Applications", Vehicular Technology Conference, IEEE, July 1999, pages 2009-2013.
	2DD	BELVIN, Robert, *et al.*, "Development of the HRL Route Navigation Dialogue System", Proceedings of the First International Conference on Human Language Technology Research, San Diego, 2001, pages 1-5.

EXAMINER	DATE CONSIDERED

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

402685769v1

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
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	Philippe DI CRISTO *et al.*	
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Form PTO-1449	Herewith (February 7, 2011)	Unassigned

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	3A	5,926,784	07/20/1999	Richardson et al.	704	9	
	3B	5,933,822	08/03/1999	Braden-Harder et al.	707	5	
	3C	5,953,393	09/14/1999	Culbreth et al.	379	88.25	
	3D	5,963,894	10/05/1999	Richardson et al.	704	9	
	3E	5,963,940	10/05/1999	Liddy et al.	707	5	
	3F	5,987,404	11/16/1999	Della Pietra et al.	704	9	
	3G	5,991,721	11/23/1999	Asano et al.	704	257	
	3H	5,995,119	11/30/1999	Cosatto et al.	345	473	
	3I	6,009,382	12/28/1999	Martino et al.	704	1	
	3J	6,014,559	01/11/2000	Amin	455	413	
	3K	6,021,384	02/01/2000	Gorin et al.	704	1	
	3L	6,044,347	03/28/2000	Abella et al.	704	272	
	3M	6,049,602	04/11/2000	Foladare et al.	379	265	
	3N	6,058,187	05/02/2000	Chen	380	21	
	3O	6,078,886	06/20/2000	Dragosh et al.	704	270	
	3P	6,081,774	06/27/2000	De Hita et al.	704	9	
	3Q	6,101,241	08/08/2000	Boyce et al.	379	88.01	
	3R	6,119,087	09/12/2000	Kuhn et al.	704	270	
	3S	6,134,235	10/17/2000	Goldman et al.	370	352	
	3T	6,144,667	11/07/2000	Doshi et al.	370	401	
	3U	6,144,938	11/07/2000	Surace *et al.*	704	257	
	3V	6,154,526	11/28/2000	Dahlke *et al.*	379	88.03	
	3W	6,160,883	12/12/2000	Jackson et al.	379	230	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO
	3X	WO 2008/118195	10/02/2008	International				
	3Y	WO 2009/075912	06/18/2009	International				
	3Z	WO 2009/145796	12/03/2009	International				
	3AA	WO 2010/096752	08/26/2010	International				

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

	3BB	LIND, R., *et al.*, "The Network Vehicle—A Glimpse into the Future of Mobile Multi-Media", IEEE Aerosp. Electron. Systems Magazine, Volume 14, No. 9, September 1999, pages 27-32.
	3CC	ZHAO, Yilin, "Telematics: Safe and Fun Driving", IEEE Intelligent Systems, Volume 17, Issue 1, 2002, pages 10-14.

EXAMINER	DATE CONSIDERED

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

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
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	Applicant(s)	
	Philippe DI CRISTO *et al.*	
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U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	4A	6,173,279	01/09/2001	Levin et al.	707	5	
	4B	6,175,858	01/16/2001	Bulfer et al.	709	206	
	4C	6,185,535	02/06/2001	Hedin *et al.*	704	270	
	4D	6,192,110	02/20/2001	Abella et al.	379	88.01	
	4E	6,192,338	02/20/2001	Haszto et al.	704	257	
	4F	6,195,634	02/27/2001	Dudemaine *et al.*	704	231	
	4G	6,195,651	02/27/2001	Handel *et al.*	707	2	
	4H	6,208,972	03/27/2001	Grant *et al.*	704	275	
	4I	6,219,346	04/17/2001	Maxemchuk	370	338	
	4J	6,219,643	04/17/2001	Cohen et al.	704	257	
	4K	6,226,612	05/01/2001	Srenger *et al.*	704	256	
	4L	6,233,556	05/15/2001	Teunen et al.	704	250	
	4M	6,233,559	05/15/2001	Balakrishnan	704	275	
	4N	6,246,981	06/12/2001	Papineni et al.	704	235	
	4O	6,272,455	08/07/2001	Hoshen et al.	704	1	
	4P	6,288,319	09/11/2001	Catona	84	609	
	4Q	6,292,767	09/18/2001	Jackson et al.	704	1	
	4R	6,308,151	10/23/2001	Smith	704	235	
	4S	6,314,402	11/06/2001	Monaco et al.	704	275	
	4T	6,366,886	04/02/2002	Dragosh et al.	704	270.1	
	4U	6,374,214	04/16/2002	Friedland *et al.*	704	235	
	4V	6,381,535	04/30/2002	Durocher *et al.*	701	202	
	4W	6,385,596	05/07/2002	Wiser *et al.*	705	51	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

	4X	CHAI *et al.*, "MIND: A Semantics-Based Multimodal Interpretation Framework for Conversational System", Proceedings of the International CLASS Workshop on Natural, Intelligent and Effective Interaction in Multimodal Dialogue Systems, June 2002, pages 37-46.
	4Y	CHEYER *et al.*, "Multimodal Maps: An Agent-Based Approach", International Conference on Cooperative Multimodal Communication (CMC/95), May 24-26, 1995, pages 111-121.

EXAMINER	DATE CONSIDERED

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

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
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	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	Herewith (February 7, 2011)	Unassigned

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5A	6,385,646	05/07/2002	Brown et al.	709	217	
	5B	6,393,428	05/21/2002	Miller et al.	707	102	
	5C	6,404,878	06/11/2002	Jackson et al.	379	221.01	
	5D	6,408,272	06/18/2002	White *et al.*	704	270.1	
	5E	6,411,810	06/25/2002	Maxemchuk	455	453	
	5F	6,415,257	07/02/2002	Junqua *et al.*	704	275	
	5G	6,418,210	07/09/2002	Sayko	379	142.15	
	5H	6,420,975	07/16/2002	DeLine *et al.*	340	815.4	
	5I	6,430,285	08/06/2002	Bauer et al.	379	265.01	
	5J	6,430,531	08/06/2002	Polish	704	257	
	5K	6,434,523	08/13/2002	Monaco	704	257	
	5L	6,434,524	08/13/2002	Weber	704	257	
	5M	6,442,522	08/27/2002	Carberry et al.	704	257	
	5N	6,446,114	09/03/2002	Bulfer et al.	709	206	
	5O	6,453,153	09/17/2002	Bowker et al.	455	67.4	
	5P	6,453,292	09/17/2002	Ramaswamy et al.	704	235	
	5Q	6,456,711	09/24/2002	Cheung et al.	379	265.09	
	5R	6,466,654	10/15/2002	Cooper *et al.*	379	88.01	
	5S	6,466,899	10/15/2002	Yano *et al.*	704	1	
	5T	6,470,315	10/22/2002	Netsch *et al.*	704	256	
	5U	6,498,797	12/24/2002	Anerousis et al.	370	522	
	5V	6,499,013	12/24/2002	Weber	704	257	
	5W	6,501,833	12/31/2002	Phillips *et al.*	379	88.07	

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	5X	ELIO *et al.*, "On Abstract Task Models and Conversation Policies" in Workshop on Specifying and Implementing Conversation Policies, Autonomous Agents '99, Seattle, 1999, 10 pages.
	5Y	TURUNEN, "Adaptive Interaction Methods in Speech User Interfaces", Conference on Human Factors in Computing Systems, Seattle, Washington, 2001, pages 91-92.

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	6A	6,501,834	12/31/2002	Milewski et al.	379	93.24	
	6B	6,513,006	01/28/2003	Howard *et al.*	704	257	
	6C	6,523,061	02/18/2003	Halverson et al.	709	202	
	6D	6,532,444	03/11/2003	Weber	704	257	
	6E	6,539,348	03/25/2003	Bond et al.	704	9	
	6F	6,553,372	04/22/2003	Brassell et al.	707	5	
	6G	6,556,970	04/29/2003	Sasaki *et al.*	704	257	
	6H	6,556,973	04/29/2003	Lewin	704	277	
	6I	6,560,576	05/06/2003	Cohen et al.	704	270	
	6J	6,567,778	05/20/2003	Chao Chang et al.	704	257	
	6K	6,567,797	05/20/2003	Schuetze *et al.*	707	2	
	6L	6,570,555	05/27/2003	Prevost *et al.*	345	156	
	6M	6,570,964	05/27/2003	Murveit et al.	379	67.1	
	6N	6,574,597	06/03/2003	Mohri *et al.*	704	251	
	6O	6,574,624	06/03/2003	Johnson et al.	707	5	
	6P	6,581,103	06/17/2003	Dengler	709	231	
	6Q	6,594,257	07/15/2003	Doshi et al.	370	352	
	6R	6,598,018	07/22/2003	Junqua	704	251	
	6S	6,604,075	08/05/2003	Brown *et al.*	704	270.1	
	6T	6,604,077	08/05/2003	Dragosh et al.	704	270.1	
	6U	6,611,692	08/26/2003	Raffel et al.	455	552	
	6V	6,614,773	09/02/2003	Maxemchuk	370	337	
	6W	6,615,172	09/02/2003	Bennett *et al.*	704	257	

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	6X	MAO, Mark Z., "Automatic Training Set Segmentation for Multi-Pass Speech Recognition", Department of Electrical Engineering, Stanford University, CA, copyright 2005, IEEE, pages I-685 to I-688.
	6Y	VANHOUCKE, Vincent, "Confidence Scoring and Rejection Using Multi-Pass Speech Recognition", Nuance Communications, Menlo Park, CA, 2005, 4 pages.

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*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	7A	6,622,119	09/16/2003	Ramaswamy *et al.*	704	9	
	7B	6,629,066	09/30/2003	Jackson et al.	704	9	
	7C	6,631,346	10/07/2003	Karaorman *et al.*	704	9	
	7D	6,643,620	11/04/2003	Contolini *et al.*	704	270	
	7E	6,650,747	11/18/2003	Bala et al.	379	265.06	
	7F	6,658,388	12/02/2003	Kleindienst *et al.*	704	275	
	7G	6,678,680	01/13/2004	Woo	707	6	
	7H	6,681,206	01/20/2004	Gorin *et al.*	704	243	
	7I	6,691,151	02/10/2004	Cheyer et al.	709	202	
	7J	6,708,150	03/16/2004	Hirayama *et al.*	704	243	
	7K	6,721,001	04/13/2004	Berstis	348	231.3	
	7L	6,721,706	04/13/2004	Strubbe *et al.*	704	275	
	7M	6,735,592	05/11/2004	Neumann *et al.*	707	101	
	7N	6,741,931	05/25/2004	Kohut *et al.*	701	209	
	7O	6,742,021	05/25/2004	Halverson *et al.*	709	218	
	7P	6,751,591	06/15/2004	Gorin *et al.*	704	257	
	7Q	6,751,612	06/15/2004	Schuetze *et al.*	707	4	
	7R	6,757,718	06/29/2004	Halverson *et al.*	709	218	
	7S	6,795,808	09/21/2004	Strubbe *et al.*	704	275	
	7T	6,801,604	10/05/2004	Maes *et al.*	379	88.17	
	7U	6,801,893	10/05/2004	Backfried *et al.*	704	257	
	7V	6,829,603	12/07/2004	Chai *et al.*	707	5	
	7W	6,833,848	12/21/2004	Wolff *et al.*	345	719	

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	7X	WENG, Fuliang, *et al.*, "Efficient Lattice Representation and Generation", Speech Technology and Research Laboratory, SRI International, Menlo Park, CA, 1998, 4 pages.
	7Y	EL MELIANI *et al.*, "A Syllabic-Filler-Based Continuous Speech Recognizer for Unlimited Vocabulary", Canadian Conference on Electrical and Computer Engineering, Volume 2, September 5-8, 1995, pages 1007-1010.

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	8A	6,856,990	02/15/2005	Barile *et al.*	707	10	
	8B	6,865,481	03/08/2005	Kawazoe *et al.*	701	211	
	8C	6,877,134	04/05/2005	Fuller *et al.*	715	500.1	
	8D	6,901,366	05/31/2005	Kuhn *et al.*	704	275	
	8E	6,937,977	08/30/2005	Gerson	704	201	
	8F	6,944,594	09/13/2005	Busayapongchai *et al.*	704	275	
	8G	6,950,821	09/27/2005	Faybishenko *et al.*	707	10	
	8H	6,954,755	10/11/2005	Reisman	707	10	
	8I	6,973,387	12/06/2005	Masclet *et al.*	701	211	
	8J	6,980,092	12/27/2005	Turnbull *et al.*	340	425.5	
	8K	6,990,513	01/24/2006	Belfiore *et al.*	709	203	
	8L	6,996,531	02/07/2006	Korall *et al.*	704	270	
	8M	7,016,849	03/21/2006	Arnold *et al.*	704	275	
	8N	7,020,609	03/28/2006	Thrift *et al.*	704	270.1	
	8O	7,027,975	04/11/2006	Pazandak *et al.*	704	9	
	8P	7,062,488	06/13/2006	Reisman	707	8	
	8Q	7,082,469	07/25/2006	Gold *et al.*	709	231	
	8R	7,092,928	08/15/2006	Elad *et al.*	706	60	
	8S	7,127,400	10/24/2006	Koch	704	270.1	
	8T	7,136,875	11/14/2006	Anderson *et al.*	707	104.1	
	8U	7,137,126	11/14/2006	Coffman *et al.*	719	328	
	8V	7,146,319	12/05/2006	Hunt	704	254	
	8W	7,203,644	04/10/2007	Anderson *et al.*	704	246	

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	8X	ARRINGTON, Michael, "Google Redefines GPS Navigation Landscape: Google Maps Navigation for Android 2.0", TechCrunch, printed from the Internet <http://www.techcrunch.com/2009/10/28/google-redefines-car-gps-navigation-google-maps-navigation-android/>, October 28, 2009, 4 pages.
	8Y	BAZZI, Issam *et al.*, "Heterogeneous Lexical Units for Automatic Speech Recognition: Preliminary Investigations", Processing of the IEEE International Conference on Acoustics, Speech, and Signal Processing, Volume 3, June 5-9, 2000, XP010507574, pages 1257-1260.

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	9A	7,228,276	06/05/2007	Omote *et al.*	704	243	
	9B	7,231,343	06/12/2007	Treadgold *et al.*	704	9	
	9C	7,289,606	10/30/2007	Sibal *et al.*	379	52	
	9D	7,301,093	11/27/2007	Sater *et al.*	84	615	
	9E	7,340,040	03/04/2008	Saylor *et al.*	379	67.1	
	9F	7,376,645	05/20/2008	Bernard	707	3	
	9G	7,386,443	06/10/2008	Parthasarathy *et al.*	704	201	
	9H	7,398,209	07/08/2008	Kennewick *et al.*	704	255	
	9I	7,415,414	08/19/2008	Azara *et al.*	704	270	
	9J	7,424,431	09/09/2008	Greene *et al.*	704	270	
	9K	7,461,059	12/02/2008	Richardson *et al.*	707	5	
	9L	7,487,088	02/03/2009	Gorin *et al.*	704	240	
	9M	7,493,559	02/17/2009	Wolff *et al.*	715	727	
	9N	7,502,738	03/10/2009	Kennewick *et al.*	704	257	
	9O	7,620,549	11/17/2009	Di Cristo *et al.*	704	257	
	9P	7,634,409	12/15/2009	Kennewick *et al.*	704	257	
	9Q	7,640,160	12/29/2009	Di Cristo *et al.*	704	257	
	9R	7,693,720	04/06/2010	Kennewick *et al.*	704	275	
	9S	7,809,570	10/05/2010	Kennewick *et al.*	704	257	
	9T	7,818,176	10/19/2010	Freeman *et al.*	704	270	
	9U	2001/0041980	11/15/2001	Howard *et al.*	704	270	
	9V	2002/0035501	03/21/2002	Handel *et al.*	705	10	
	9W	2002/0049805	04/25/2002	Yamada *et al.*	709	202	

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	9X	O'SHAUGHNESSY, Douglas, "Interacting with Computers by Voice: Automatic Speech Recognition and Synthesis", Proceedings of the IEEE, Volume 91, No. 9, September 1, 2003, XP011100665, pages 1272-1305.

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	10A	2002/0065568	05/30/2002	Silfvast *et al.*	700	94	
	10B	2002/0069059	06/06/2002	Smith	704	257	
	10C	2002/0082911	06/27/2002	Dunn *et al.*	705	14	
	10D	2002/0087525	07/04/2002	Abbott *et al.*	707	3	
	10E	2002/0120609	08/29/2002	Lang *et al.*	707	1	
	10F	2002/0124050	09/05/2002	Middeljans	709	203	
	10G	2002/0138248	09/26/2002	Corston-Oliver *et al.*	704	1	
	10H	2002/0143535	10/03/2002	Kist *et al.*	704	251	
	10I	2002/0188602	12/12/2002	Stubler *et al.*	707	3	
	10J	2002/0198714	12/26/2002	Zhou	704	252	
	10K	2003/0014261	01/16/2003	Kageyama	704	275	
	10L	2003/0046346	03/06/2003	Mumick *et al.*	709	205	
	10M	2003/0064709	04/03/2003	Gailey *et al.*	455	412	
	10N	2003/0088421	05/08/2003	Maes *et al.*	704	270.1	
	10O	2003/0097249	05/22/2003	Walker *et al.*	704	1	
	10P	2003/0112267	06/19/2003	Belrose	345	728	
	10Q	2003/0135488	07/17/2003	Amir *et al.*	707	3	
	10R	2003/0182132	09/25/2003	Niemoeller	704	275	
	10S	2003/0236664	12/25/2003	Sharma	704	251	
	10T	2004/0006475	01/08/2004	Ehlen *et al.*	704	270.1	
	10U	2004/0025115	02/05/2004	Sienel *et al.*	715	513	
	10V	2004/0044516	03/04/2004	Kennewick *et al.*	704	5	
	10W	2004/0166832	08/26/2004	Portman *et al.*	455	412.1	

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	11A	2004/0193408	09/30/2004	Hunt	704	209	
	11B	2004/0193420	09/30/2004	Kennewick *et al.*	704	257	
	11C	2004/0199375	10/07/2004	Ehsani *et al.*	704	4	
	11D	2004/0243417	12/02/2004	Pitts, III *et al.*	704	276	
	11E	2005/0015256	01/20/2005	Kargman	704	272	
	11F	2005/0021334	01/27/2005	Iwahashi	704	240	
	11G	2005/0021826	01/27/2005	Kumar	709	232	
	11H	2005/0033574	02/10/2005	Kim *et al.*	704	251	
	11I	2005/0043940	02/24/2005	Elder	704	9	
	11J	2005/0114116	05/26/2005	Fiedler	704	201	
	11K	2005/0137850	06/23/2005	Odell	704	4	
	11L	2005/0246174	11/03/2005	DeGolia	704	270	
	11M	2006/0206310	09/14/2006	Ravikumar *et al.*	704	9	
	11N	2007/0033005	02/08/2007	Cristo *et al.*	704	9	
	11O	2007/0038436	02/15/2007	Cristo *et al.*	704	9	
	11P	2007/0043574	02/22/2007	Coffman *et al.*	704	275	
	11Q	2007/0050191	03/01/2007	Weider *et al.*	704	275	
	11R	2007/0055525	03/08/2007	Kennewick *et al.*	704	257	
	11S	2007/0179778	08/02/2007	Gong *et al.*	704	9	
	11T	2007/0186165	08/09/2007	Maislos *et al.*	715	728	
	11U	2007/0214182	09/13/2007	Rosenberg	707	104.1	
	11V	2007/0250901	10/25/2007	McIntire *et al.*	725	146	
	11W	2007/0265850	11/15/2007	Kennewick *et al.*	704	257	

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	12A	2007/0299824	12/27/2007	Pan *et al.*	707	3	
	12B	2008/0091406	04/17/2008	Baldwin *et al.*	704	4	
	12C	2008/0103761	05/01/2008	Printz *et al.*	704	9	
	12D	2008/0115163	05/15/2008	Gilboa *et al.*	725	34	
	12E	2008/0133215	06/05/2008	Sarukkai	704	2	
	12F	2008/0140385	06/12/2008	Mahajan *et al.*	704	9	
	12G	2008/0177530	07/24/2008	Cross *et al.*	704	4	
	12H	2008/0189110	08/07/2008	Freeman *et al.*	704	251	
	12I	2008/0235023	09/25/2008	Kennewick *et al.*	704	257	
	12J	2008/0235027	09/25/2008	Cross	704	270.1	
	12K	2008/0319751	12/25/2008	Kennewick *et al.*	704	257	
	12L	2009/0117885	05/07/2009	Roth	455	414.3	
	12M	2009/0144271	06/04/2009	Richardson *et al.*	707	5	
	12N	2009/0150156	06/11/2009	Kennewick *et al.*	704	257	
	12O	2009/0171664	07/02/2009	Kennewick *et al.*	704	257	
	12P	2009/0216540	08/27/2009	Tessel *et al.*	704	275	
	12Q	2009/0299745	12/03/2009	Kennewick *et al.*	704	257	
	12R	2010/0023320	01/28/2010	Di Cristo *et al.*	704	9	
	12S	2010/0049501	02/25/2010	Kennewick *et al.*	704	9	
	12T	2010/0049514	02/25/2010	Kennewick *et al.*	704	233	
	12U	2010/0057443	03/04/2010	Di Cristo *et al.*	704	9	
	12V	2010/0063880	03/11/2010	Atsmon *et al.*	705	14.53	
	12W	2010/0145700	06/10/2010	Kennewick *et al.*	704	257	

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	13A	2010/0204986	08/12/2010	Kennewick *et al.*	704	226	
	13B	2010/0204994	08/12/2010	Kennewick *et al.*	704	257	
	13C	2010/0217604	08/26/2010	Baldwin *et al.*	704	275	
	13D	2010/0286985	11/11/2010	Kennewick *et al.*	704	257	
	13E	2010/0299142	11/25/2010	Freeman *et al.*	704	9	

FOREIGN PATENT DOCUMENTS

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SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

CROSS-REFERENCE TO RELATED APPLICATIONS

[01] This application is a continuation of U.S. Patent Application Serial No. 12/571,795, entitled "System and Method of Supporting Adaptive Misrecognition in Conversational Speech," filed October 1, 2009, which is a continuation of U.S. Patent Application Serial No. 11/200,164, entitled "System and Method of Supporting Adaptive Misrecognition in Conversational Speech," filed August 10, 2005, which issued as U.S. Patent No. 7,620,549 on November 17, 2009, the contents of which are hereby incorporated by reference in their entirety.

FIELD OF THE INVENTION

[02] The invention relates to providing conversational human-machine interfaces for controlling devices through a speech interface and/or a combination of a speech interface and a non-speech interface. More specifically, the invention allows users to submit natural language commands via the speech interface and/or the non-speech interface. The invention further allows users to control devices and systems either locally or remotely.

BACKGROUND OF THE RELATED ART

[03] A machine's ability to communicate with humans in a natural manner remains a difficult problem. Cognitive research on human interaction shows that verbal communication, such as a person asking a question or giving a command, typically relies heavily on context and domain knowledge of the target person. By contrast, machine-based queries (e.g., questions, commands, requests, and/or other types of communications) may be highly structured and may not be inherently natural to the human user. Thus, verbal communications and machine processing of requests that are extracted from the verbal communications may be fundamentally incompatible. Yet the ability to allow a person to make natural language speech-based request remains a desirable goal.

[04] Speech recognition has steadily improved in accuracy and today is successfully used in a wide range of applications. Natural language processing has been applied to the parsing of speech queries. Yet, current systems do not reliably provide a complete environment for users to submit speech and/or non-speech communications through natural language queries that are processed to provide natural responses. There remain a number of significant barriers to creation of a complete speech-based and/or non-speech-based natural language query and response environment.

SUMMARY OF THE INVENTION

[05] According to an aspect of the invention, one object of the invention is to overcome these and other drawbacks of prior systems.

[06] According to one aspect of the invention, users may provide the system with spoken utterances and/or other communications in a natural language format, including imperfect information such as, incomplete thoughts, incomplete sentences, incomplete phrases, slang terminology, repeated words, word variations, synonyms, or other imperfect information. In order for machines (e.g., computer devices) to properly respond to questions and/or commands that are presented in the natural language format, the questions and/or commands may be parsed and interpreted to formulate machine processable queries and algorithms.

[07] In another aspect of the invention, systems are provided for overcoming the deficiencies of prior systems through the application of a complete speech-based command generation, information retrieval, presentation and command environment or a combination of speech-based and non-speech-based command generation, information retrieval, presentation and command environment. This environment makes maximum use of context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for one or more users to submit queries or commands to multiple domains. Through this integrated approach, a complete speech-based natural language query and response environment may be created. Alternatively, a combination of speech-based and non-speech-based natural language query and response environment may be created. Further, at each step in the process, accommodation may be made for full or partial failure and graceful recovery. The robustness

to partial failure is achieved through the use of probabilistic and fuzzy reasoning at several stages of the process. This robustness to partial failure promotes the feeling of a natural response to questions and commands.

[08] According to another aspect of the invention, the system may include a speech unit interface device that receives utterances, including spoken natural language queries, commands and/or other utterances from a user, and a computer device or system that receives input from the speech unit and processes the input (e.g., retrieves information responsive to the query, takes action consistent with the command and performs other functions as detailed herein). The system may further generate a natural language response and/or generate a natural language message, such as an alert message, without any prompting from a user. According to another embodiment of the invention, the non-speech interface may be provided in addition to, or in place of, the speech unit interface. For example, the non-speech interface may communicate non-speech information, such as textual communications, graphical or tabular information, or other non-speech information.

[09] According to one embodiment of the invention, multi-modal input may be received from users at a conversational speech analyzer that is coupled to several components, including a general cognitive model, an environmental model, a personalized cognitive model, and an adaptive misrecognition analysis engine, or other components. According to one embodiment of the invention, the conversational speech analyzer may include one or more speech recognition engines that transcribe utterances to text.

[10] According to one embodiment of the invention, the environmental model may be accessed to determine user location, user activity, track user actions, and/or other environmental information to invoke context, domain knowledge, preferences, and/or other cognitive qualities to enhance the interpretation of questions and/or commands. The conversational speech analyzer may also access the general cognitive model and/or the personalized cognitive model to further refine context, domain knowledge, preferences, and/or other cognitive qualities to enhance the interpretation of questions and/or commands. Based on information received from the general cognitive model, environmental model and/or the

personalized cognitive model, the system may enhance responses to commands and questions by including a prediction of user behavior.

[11] An adaptive misrecognition analysis engine may be provided to analyze and store speech and non-speech data, including transcribed utterances, which are identified as being unrecognized or incorrectly recognized by the conversational speech analyzer. Upon a determination that data is unrecognized, the system may generate an unrecognized event. According to one embodiment of the invention, the system may implement one or more techniques to determine that data is incorrectly recognized. When the system misrecognizes a request, the user typically provides immediate feedback, such as overriding the command in a time shorter than the expected time execution time of the command, issuing a stop command, or taking other action. The user's actions may be analyzed in a statistical model to determine a frequency occurrence of misrecognitions for particular commands, with the results being used to update the corresponding personalized cognitive model.

[12] According to another embodiment of the invention, the conversational speech analyzer may access the personalized cognitive model to proactively select a next best (or nth best) match for the received data. A match may be confirmed by user actions that include the user not immediately canceling the command. The misrecognitions may also be analyzed to potentially determine personalized tuning parameters for the speech recognition components of the system. For example, the system may tune the speech recognition engine over time to increase recognition by analyzing how the speech recognition engine misrecognizes the utterance.

[13] According to one embodiment of the invention, infrastructure may be provided to maintain context information during multimodal interactions, such as speech and/or non-speech interactions. According to one exemplary embodiment of the invention, context information may be maintained in a multimodal environment by providing communication channels between multimodal devices, or mobile devices, and the system. The communication channels allow the system to receive multimodal input such as text-based commands and questions and/or voice-based commands and questions. According to another embodiment of the invention, the multimodal input may include a string of text, such as keywords, that are

received as commands or questions. According to yet another embodiment of the invention, the system may synchronize the context between the multimodal devices and the speech-based units. In order to send a response to the corresponding device, the system may track the source and send the response to the corresponding speech interface or the non-speech interface.

[14] According to an alternative embodiment of the invention, context information may be maintained using a context manager that may be centrally positioned to receive input from multiple sources and to provide output to multiple sources. According to one embodiment, the devices that communicate with the context manager may register through a registration module and may subscribe to one or more events. According to another embodiment of the invention, the context manager may receive input in Context XML form, for example. The other registered devices may be informed of context changes through a context tracking module to enable synchronizing of context across the registered modules. According to one embodiment of the invention, registered modules may be added or removed from the system. The registered modules may include dynamic link libraries (DLLs) that are specific to multimodal devices.

[15] According to yet another alternative embodiment of the invention, context information may be determined from a command or request that is presented in a textual format and/or a command or request that is presented as a verbal utterance and processed using a multi-pass automatic speech recognition module that transcribes the verbal utterance to a textual format. The multi-pass automatic speech recognition module may use a dictation grammar or a large vocabulary grammar, among other resources, to transcribe the verbal utterance into a text message. On platforms where a dictation grammar is not available, the multi-pass automatic speech recognition may use a virtual dictation grammar that uses decoy words for out-of-vocabulary words. Decoy words may include utility words, nonsense words, isolated syllables, isolated distinct sounds and other decoy words.

[16] According to one embodiment of the invention, the text message may be searched for a particular character, group of characters, word, group of words, and other text combinations. The text combination may be compared against entries in a context description grammar that is

associated with each agent. If a match is identified between an active grammar in the context description grammar and the command and/or request, then the match may be scored. The agents may be ranked based on the determined score. In generating an aggregate response from the one or more responses received from the agents, the ordering of the responses from the individual agents may be determined based on the rank of agents. The aggregate response may be generated by a response generator module. Agents may update a context stack, which includes an ordered list of command contexts, to enable follow-up requests.

[17] According to another aspect of the invention, the speech unit and/or multimodal device may be incorporated into the computer device or system, or may be separate structures. If separate structures are provided, the speech unit and/or multimodal devices may be connected to the computer device via a wired or wireless connection. If a wireless connection is provided, a base unit may be connected to the computer, internally or externally, to communicate with the speech unit and/or multimodal device.

[18] According to another aspect of the invention, the computer devices or systems may comprise stand alone or networked PCs, personal digital assistants (PDAs), cellular telephones, or other computer devices or systems. For convenience, these and other computer alternatives are referred to as computers. One aspect of the invention comprises software that may be installed onto the computer, where the software may include one or more of the following modules: a non-speech information receiving module; a speech recognition module that captures user utterances; a parser that parses the utterance; a text to speech engine module that converts the text to speech; a network interface that enables the computer to interface with one or more networks; a non-speech interface module and an event manager for managing events. Preferably, the event manager is in communication with a context description grammar, a user profile module that enables user profiles to be created, modified, and accessed, a personality module that enables various personalities to be created and used, an agent module, an update manager, a cognitive model that provides statistical abstracts of user interaction patterns with the system, one or more databases, and other components.

[19] According to another aspect of the invention domain specific behavior and information may be organized into data managers. Data managers are autonomous executables that

receive, process, and respond to user questions, queries and commands. The data managers provide complete, convenient and re-distributable packages or modules of functionality, typically for a specific domain or application. Data managers may be complete packages of executable code, scripts, links to information, and other forms of communication data that provide a specific package of functionality, usually in a specific domain. In other words, data managers include components for extending the functionality to a new domain. Further, data managers and their associated data may be updated remotely over a network as new behavior is added or new information becomes available. Data managers may use system resources and the services of other, typically more specialized, data managers. Data managers may be distributed and redistributed in a number of ways including on removable storage media, transfer over networks or attached to emails and other messages. An update manager may be used to add new data managers to the system or update existing data managers.

[20] According to another aspect of the invention, license management capabilities allowing the sale of data managers by third parties to one or more users on a one time or subscription basis may be provided. In addition, users with particular expertise may create data managers, update existing data managers by adding new behaviors and information, and making these data managers for other users as agents.

[21] In order to enhance the natural query and response environment, the system may format results to increase understandability to users. Formatting and presentation of results may be based on the context of the questions, the contents of the response being presented, the history of the interaction with the user, the user's preferences and interests and the nature of the domain. By contrast, rigid, highly formatted, or structured presentation of results may be deemed unnatural by many users.

[22] According to another embodiment of the invention, the system may simulate some aspects of a human "personality." In some cases, the presentation of the response and the terms that are used to provide the response may be randomized to avoid the appearance of rigidly formatted or mechanical responses. The use of other simulated personality characteristics is also desirable. For example, a response that may be upsetting to the user may be presented in a sympathetic manner. Furthermore, results of requests may be long text

strings, lists, tables or other lengthy sets of data. Natural presentation of this type of information presents particular challenges because simply reading the long response is generally not preferred. Instead, the system may parse important sections from the response and may initially provide only reports. Determining what parts of a long response are presented may be based on the context of the questions, the contents of the response being presented, the history of the interaction with the user, the user's preferences and interests and the nature of the domain. At the same time, the system may give the user interactive control over what information to present and how much information to present, to stop the response all together, or to take other actions.

[23] According to another aspect of the invention, the system may process and respond to questions, requests and/or commands. Keywords or context may be used to determine whether the received utterance and/or textual message includes a request or command. For example, utterances may include aspects of questions, requests and/or commands. For example, a user may utter "record my favorite TV program." A request is processed to determine the name, the channel, and time for the user's favorite TV program. A command must be executed to set a video recorder to capture this program.

[24] For utterances including questions and/or requests, the system may perform multiple steps that may include one or more of:

- capturing the user's questions and/or requests through speech recognition components that operate in a variety of real-world environments;
- parsing and interpreting the question and/or request;
- determining the domain of expertise and context, invoking the proper resources, including agents;
- formulating one or more requests to one or more local and/or network data sources or sending appropriate commands to local or remote devices or the system itself;
- performing presentation formatting, variable substitutions and transformations to modify the requests to a form that yields desired results from the available sources;

- executing the multiple requests or commands in an asynchronous manner and dealing gracefully with failures;
- extracting or scraping the desired information from the one or more results, which may be returned in any one of a number of different formats;
- evaluating and interpreting the results, including processing of errors to provide one or more results judged to be "best," even if the results are ambiguous, incomplete, or conflicting;
- performing formatting, variable substitutions and transformations to modify the results to a form most easily understood by the user; and
- presenting the compound result, through a text to speech engine or a multimodal interface, to the user in a useful and expected manner.

[25] The above steps may be performed with knowledge of the domain of expertise, the context for the question or command, domain specific information, the history of the user's interactions, user preferences, available information sources or commands, and responses obtained from the sources.

[26] Probabilistic or fuzzy set decision and matching methods may be applied to deal with inconsistent, ambiguous, conflicting and incomplete information or responses. In addition, asynchronous queries may be used to provide rapid and graceful failure of requests or commands that allow the system to robustly return results quickly and in a manner that seems natural to the user.

[27] Many everyday questions are inherently subjective and result in answers that are a matter of opinion or consensus, as much as fact. Such questions are often ad hoc in their nature, as well. The system, according to another aspect of the invention, may use adaptive, probabilistic, and fuzzy set decision and matching methods to identify the subjective nature of the question and to evaluate a range of possible answers, wherein one or more answers may be selected that most accurately represent the type of result desired by the user.

[28] The context and expected results from a particular question may be highly dependent on the individual asking the question. Therefore, the system may create, store and use personal profile information for each user. Information in the profile may be added and

updated automatically as the user uses the system or may be manually added or updated by the user or by others. Domain specific agents may collect, store and use specific profile information, as may be required for optimal operations. Users may create commands for regularly used reports, automatically generated alerts, and other requests and for the formatting and presentation of results. The system may use profile data in interpreting questions, formulating requests, interpreting request results and presenting answers to the user. Examples of information in a user profile includes, history of questions asked, session histories, formatting and presentation preferences, special word spelling, terms of interest, special data sources of interest, age, sex, education, location or address, place of business, type of business, investments, hobbies, sports interests, news interests and other profile data.

[29] According to one aspect of the invention, the system may attempt to provide rapid responses in order to provide a natural question and response environment. The rapid responses may be provided without obtaining additional information. The system may determine agent composition, context and/or domain for a user's question or command, for example, by using a real-time scoring system or other technique. Based on this determination, the system may trigger one or more agents to respond to the user's question or command. The agents may make one or more requests and rapidly return a formatted response. Thus, users may receive direct responses to a set of questions, each with a different response or context. In some cases, the available information, including the request results, may not adequately answer the questions presented. In such situations, the user may be asked one or more follow-up questions to resolve the ambiguity. Additional requests may then be made before an adequate response is provided. In these cases, the system may use context information, user profile information and/or domain specific information to minimize the interaction with the user required to deliver a response.

[30] If the confidence level of the domain or context score is not high enough to ensure a reliable response, the system may request that the user verify that the question or command is correctly understood. In general, the question may be phrased to indicate the context of the question including all criteria or parameters. If the user confirms that the question is correct, the system may proceed to produce a response. Otherwise, either the user can rephrase the

original question, perhaps adding additional information to remove ambiguity, or the system may ask one or more questions to attempt to resolve the ambiguity or other actions may taken.

[31] According to one aspect of the invention, the system may accept any natural language question or command and, as a result, may be subject to ambiguous requests. To assist users in formulating concise questions and commands, the system may support a voice query language. The language may help users clearly specify the keywords or contexts of the question or command along with the parameters or criteria. The system may provide built in training capabilities to help the user learn the best methods to formulate their questions and commands.

[32] In order to make the responses to user's questions and commands seem more natural, the system may employ one or more dynamically invokable personalities and/or emotional models. Personalities and emotional models have specific characteristics that simulate the behavioral characteristics of real humans. Examples of these characteristics include sympathy, irritation, and helpfulness and associated emotions. The personality also randomizes aspects of responses, just as a real human would do. This behavior includes randomization of terms used and the order of presentation of information. Characteristics of the personality and/or emotions are invoked using probabilistic or fuzzy set decision and matching methods and using criteria, including the context for the question, the history of the user's interaction, user preferences, information sources available, and responses obtained from the sources.

[33] According to another aspect of the invention, special procedures may be employed to present information in the form of long text strings, tables, lists or other long response sets. Simply presenting a long set of information in an ordered manner may not be considered natural or what most users have in mind. The system may use probabilistic or fuzzy set matching methods to extract relevant information and present these subsets first. Further the system may provide commands allowing users to skip through the list, find keywords or key information in the list or stop processing the list altogether.

[34] In addition to the ability to process user questions and commands, the invention may provide local or remote control functions for the system or for other devices. Users may initiate commands locally or remotely. Several techniques for executing remote operations are

possible, for example, the use of a telephone or other audio connection. Other remote command techniques may be used. The processing of these commands may be performed in a nearly identical manner to a question. One difference being that the result of the command is generally an action rather than a response. Examples of control operations supported by the invention include, finding and playing music, film, games or other entertainment media, control of the appliances or other electronic or electro-mechanical devices, security systems control, audio, text and video conferencing (including Voice over IP conferencing), operating integrated messaging environments and other control operations.

[35] By using an optional analog or digital telephone interface or a data network interface, the invention can provide remote control capability of the computer or and auxiliary devices connected to the computer. For example, if the computer is connected via an interface to one or more auxiliary devices, a remote user can use this capability to remotely control or program the operation of the auxiliary device. For example, this enables recording of a television program, checking the status of a home security system, checking voice mail messages, hearing and responding to email messages, and much more. For each user command utterance, the system may execute a number of steps possibly including:

- capturing the user's command through speech recognition that operates in a variety of real-world environments;
- parsing and interpreting the command;
- determining the domain for the command and context, invoking the proper resources, including agents;
- formulating device specific commands for the system or external devices;
- routing commands to the system, or external devices, including external devices connected to data networks;
- receiving and processing results of commands, including errors; and
- optionally, providing responses to users indicating the success or failure of the command, and possibly including state information.

[36] The system may be used in conjunction with a wide range of platform environments. These environments may include, as a peripheral to a PC, a portable or wearable computer or

other computer, embedded in a PC or other computer, on a personal digital assistant, such as a PDA with wireless networking capability, in a specialized device such as a bar code scanner or payment terminal, on a wireless telephone, or other platforms. If the invention is used with a mobile or portable device that has position location capability, the location data can be used by the invention as part of the context for user questions. A user may use the system on one or more devices. In this case, history and profile information for the user may be synchronized between the multiple devices on a periodic basis or other basis.

[37] According to another aspect of the invention, the system may be deployed in a network of devices that use a common base of agents, data, information, user profiles and histories. Each user can then interact with, and receive, the same services and applications at any location equipped with the required device on the network. For example, multiple devices on which the invention is deployed, and connected to a network, can be placed at different locations throughout a home, place of business or other location. In such a case, the system may use the location of the particular device addressed by the user as part of the context for the questions asked.

[38] According to one embodiment of the invention, the system may support multiple users that access the system at different times. According to another embodiment of the invention, the system may support multiple users that access the system during a same session in an interleaved or overlapping manner. The system may recognize the multiple users by name, voice, or other characteristic and may invoke a correct profile for each user. If multiple users are addressing the system in overlapping or interleaved sessions, the system may identify the multiple users and may invoke one or more corresponding profiles. For applications that require security safeguards, the multiple users may be verified using voiceprint matching, password or pass-phrase matching, or other security safeguards.

[39] When multiple users are engaged in interleaved sessions, the system may gracefully resolve conflicts using a probabilistic or fuzzy set decision method for each user. This process may simulate the manner in which a human would address multiple questions from various sources. For example, the system may answer short questions first in time while answering

longer questions later in time. Alternatively, the system may answer questions in the order that they are received, among other configurations.

[40] Given the desire for domain specific behavior, user specific behavior and domain specific information, the system, according to another aspect of the invention, may allow both users and content providers to extend the system capabilities, add data to local data sources, and add references to network data sources. To allow coverage of the widest possible range of topics, the system may allow third party content developers to develop, distribute and sell specialized or domain specific system programs and information. Content may be created though creation of new data managers, scripting existing data managers, adding new data to agents or databases and adding or modifying links to information sources. Distribution of this information is sensitive to the user's interests and use history and to their willingness to pay or not.

[41] According to another aspect of the invention, the system may allow users to disseminate their knowledge without programming. The system may include mechanisms that allow users to post and distribute data managers and information in their particular areas of expertise, to improve system capability. Further, users can extend the system and configure it to their own preferences, add information to their profile to define new questions or queries, extend and modify existing questions and queries, add new data sources, update data sources, set preferences and specify presentation parameters for results.

[42] Since the invention may operate in many environments, including environments with background noise, point noise sources and people holding conversations, filtering of speech input may be performed. The invention may use, for example, either one-dimensional or two-dimensional array microphones to receive human speech. The array microphones may be fixed or employ dynamic beam forming techniques. The array pattern may be adjusted to maximize gain in the direction of the user and to null point noise sources. Speech received at the microphones may then be processed with analog or digital filters to optimize the bandwidth, cancel echoes, and notch-out narrow band noise sources. Following filtering, the system may use variable rate sampling to maximize the fidelity of the encoded speech, while minimizing

required bandwidth. This procedure may be particularly useful in cases where the encoded speech is transmitted over a wireless network or link.

[43] Some example applications for the invention include, but are not limited to, the following:

- white pages and yellow pages lookups to find email addresses, telephone numbers, street addresses, and other information for businesses and individuals;
- personal address book, calendars and reminders for each user;
- automatic telephone dialing, reading and sending emails and pages by voice and other communications control functions;
- map, location and direction applications;
- movie or other entertainment locator, review information and ticket purchasing;
- television, radio or other home entertainment schedule, review information and device control from a local or remote user;
- weather information for the local area or other locations;
- stock and other investment information including, prices, company reports, profiles, company information, business news stories, company reports, analysis, price alerts, news alerts, portfolio reports, portfolio plans, etc.;
- flight or other scheduled transportation information and ticketing;
- reservations for hotels, rental cars and other travel services;
- local, national and international news information including headlines of interest by subject or location, story summaries, full stories, audio and video retrieval and play for stories;
- sports scores, news stories, schedules, alerts, statistics, back ground and history information, etc.;
- ability to subscribe interactively to multimedia information channels, including sports, news, business, different types of music and entertainment, applying user specific preferences for extracting and presenting information;
- rights management for information or content used or published;

- horoscopes, daily jokes and comics, crossword puzzle retrieval and display and related entertainment or diversions;
- recipes, meal planning, nutrition information and planning, shopping lists and other home organization related activities;
- as an interface to auctions and online shopping, and where the system can manage payment or an electronic wallet;
- management of network communications and conferencing, including telecommunications, email, instant messaging, Voice over IP communications and conferencing, local and wide area video and audio conferencing, pages and alerts;
- location, selection, management of play lists and play control of interactive entertainment from local or network sources including, video on demand, digital audio, such as MP3 format material, interactive games, web radio and video broadcasts;
- organization and calendar management for families, businesses and other groups of users including the management of, meetings, appointments, and events; and
- interactive educational programs using local and network material, with lesson material level set based on user's profile, and including, interactive multimedia lessons, religious instruction, calculator, dictionary and spelling, language training, foreign language translation and encyclopedias and other reference material.

[44] It will be appreciated that the foregoing statements of the features of the invention are not intended as exhaustive or limiting, the proper scope thereof being appreciated by reference to this entire disclosure and reasonably apparent variations and extensions thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[45] The invention will be described by reference to the preferred and alternative embodiments thereof in conjunction with the drawings in which:

[46] Figure 1 is an overall diagrammatic view according to one embodiment of the invention.

[47] Figure 2 is a schematic block diagram showing the agent architecture according to one embodiment of the invention.

[48] Figure 3 is a high level process for receiving natural language speech-based queries and/or commands and generating a response according to one embodiment of the invention.

[49] Figure 4A is a process for receiving natural language speech-based queries and/or commands and generating a response according to one embodiment of the invention.

[50] Figure 4B is a process for receiving natural language speech-based commands in order to locally or remotely control functions of devices according to one embodiment of the invention.

[51] Figure 5 is a process for correctly interpreting a user's utterance according to one embodiment of the invention.

[52] Figure 6 is a process for determining the proper domain agents to invoke and the properly formatted queries and/or commands that is to be submitted to the agents according to one embodiment of the invention.

[53] Figure 7 illustrates a diagram for centrally maintaining context, according to one embodiment of the invention.

[54] Figure 8 illustrates a system diagram for an enhanced conversational voice user interface according to one embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[55] Barriers to natural human request-response interaction between humans and machines include that natural language queries may be incomplete in their definition. Furthermore, context of previous questions, knowledge of the domain, and/or the user's history of interests and preferences may be needed to properly interpret questions and/or commands. Thus, natural language questions may not be easily transformed to machine processable form. Compounding this problem, natural language questions may be ambiguous or subjective. In these cases, forming a machine processable query and returning a natural language response may be difficult.

[56] In order for machines (e.g., computer devices) to properly respond to questions or commands that are submitted in a natural language form, machine processable queries and algorithms may be formulated after the natural form questions or commands have been parsed and interpreted. Algorithms describe how the machines should gather data to respond to the questions or commands. Depending on the nature of the questions or commands, there may not be a simple set of requests and/or algorithms that will return an adequate response. Several requests and algorithms may need to be initiated and even these requests and algorithms may need to be chained or concatenated to achieve a complete response. Further, no single available source may contain the entire set of results needed to generate a complete response. Thus, multiple requests and/or algorithms, perhaps with several parts, may be generated to access multiple data sources that are located locally, remotely, or both. Not all of the data sources, requests and/or algorithms may return useful results or any results at all.

[57] Useful results that are returned are often embedded in other information and may need to be extracted from the other information. For example, a few keywords or numbers may need to be "scraped" from a larger amount of other information in a text string, table, list, page, video stream or other information. At the same time, extraneous information including graphics or pictures may be removed to process the response. In any case, the multiple results must be evaluated and combined to form the best possible response, even in cases where some requests do not return useful results or fail to produce results entirely. In cases where the question is determined to be ambiguous or the result is inherently subjective, determining the results to present in the response is a complex process. Finally, to maintain a natural interaction, responses should be returned to the user rapidly. Managing and evaluating complex and uncertain requests, while maintaining real-time performance, is a significant challenge.

[58] The following detailed description refers to the accompanying drawings and describes exemplary embodiments of the invention. Other embodiments are possible and modifications may be made to the exemplary embodiments without departing from the spirit, functionality and scope of the invention. Therefore, the following detailed descriptions are not meant to limit the invention.

[59] The invention provides a complete speech-based information query, processing and presentation environment or a combination of speech-based and non-speech-based information query, processing and presentation environment. In addition, the invention may be useful for controlling the system itself and/or external devices. This integrated environment makes maximum use of context, prior information and domain and user specific profile data to achieve a natural environment for one or more users submitting requests or commands in multiple domains. Through this integrated approach, a complete speech-based natural language query, algorithm and response environment or a combination of speech-based and non-speech-based command, algorithm and response environment may be created. Figure 1 shows one exemplary schematic diagram view of a system 90 according to an embodiment of the invention.

[60] The system 90 may include a main unit 98, speech units 128, and multi-modal devices 155. Alternatively, the system 98 may include completely separate systems for main unit 98, speech units 128 and multi-modal devices 155. The event manager 100 may mediate interactions between other components of main unit 98. The event manager 100 provides a multi-threaded environment allowing the system 98 to operate on multiple commands or questions from multiple user sessions, without conflict, and in an efficient manner to maintain real-time response capabilities.

[61] Figure 8 illustrates one exemplary embodiment of an enhanced conversational user interface 800 that receives multi-modal input from users 802 and communicates with a conversational speech analyzer 804. The conversational speech analyzer 804 may be coupled to several components, including a general cognitive model 806, an environmental model 808, a personalized cognitive model 810, and an adaptive misrecognition analysis engine 812, or other components. According to one embodiment of the invention, the conversational speech analyzer 804 may include one or more speech recognition engines that transcribe utterances to textual messages. The transcription may be performed using one or more conversational grammars, a context description grammar 112, or other transcription methods. According to one embodiment of the invention, data that is entered in a text format may be merged with data that is transcribed to a textual format from the utterance. Conversational speech analyzer

804 also may include a semantic knowledge-based model that analyzes the text message and detects command components.

[62] According to one embodiment of the invention, personalized cognitive model 810 is a model derived from a user's interaction pattern with the system and may be used to predict what actions the user may take next in time, thus assisting with speech recognition and/or question or command recognition. Personalized cognitive model 810 may track actions performed by the user. When the system is attempting to predict user behavior, the personalized cognitive model may be consulted first. The system may have multiple personalized cognitive models, wherein one or more may correspond to each user.

[63] According to another embodiment of the invention, general cognitive model 806 is a statistical abstract that corresponds to interaction patterns with the system for multiple users. Data stored within general cognitive model 806 may be used to predict a user's next action, thus assisting with speech recognition and/or question or command recognition. The general cognitive model 806 may also track what actions a particular user has performed and may be used when the user interacts with the system in a way that is not handled in the personalized cognitive model.

[64] According to one embodiment of the invention, the environmental model 808 may include information associated with the user's environment and surroundings. The information may include the type of environment that a user is in (e.g., quiet or noisy), details of a microphone and/or speaker system, the user's current global position and movement, as may be determined by GPS, current system status, such as what song/movie is playing, is the system in the midst of retrieving something, or other system status, details on all voice-enabled devices in the immediate vicinity, such as a presence of a voice-enabled TV, stereo, and DVD player in the same room, a user's credit card information, such as numbers and current balances, wherein the user may ask a mobile telephone to download and pay for a video and the system may respond that there are insufficient funds, or other information. The information may be accessed to invoke a context, domain knowledge, preferences, and/or other cognitive quality that enhances the interpretation of questions and/or commands.

[65] The conversational speech analyzer 804 may also access the general cognitive model 806 and/or the personalized cognitive model 810 to further refine context, domain knowledge, preferences, and/or other cognitive qualities to enhance the interpretation of questions and/or commands. Based on information received from general cognitive model 806, environmental model 808 and/or the personalized cognitive model 810, the system may enhance responses to commands and questions by including a prediction of user behavior.

[66] Adaptive Misrecognition Analysis Engine 812 may analyze and store textual messages, including transcribed utterances that are identified as being unrecognized or incorrectly recognized by conversational speech analyzer 804. Upon a determination that text is unrecognized, the system may generate an unrecognized event. For example, an unrecognized event may result from not finding a match to text and/or transcribed utterance.

[67] According to one embodiment of the invention, the system may implement one or more techniques to determine that textual messages are incorrectly recognized. For example, the user may command the system to play a specific song title and the system may misrecognize the requested song title and provide a song having a different title, the system may misrecognize an incorrect song title and provide a song having a different than requested title, the system may misrecognize a correct song title and provide a song having an invalid song title, among other variations. When the system misrecognizes a request, the user typically provides immediate feedback such as, overriding the command in a time shorter than the expected time execution time of the command, repeating the original request, issuing a stop command, or taking other action, wherein the action may be presented verbally, non-verbally by pushing a selected button on a cell phone or remote control, or both, among other configurations. According to one embodiment of the invention, the system may detect the user action and may prompt the user to re-phrase the request to enable the system to modify words in the query. The user's actions may be analyzed in a statistical model to determine a frequency occurrence of misrecognitions for particular commands, with the results being used to update the corresponding personalized cognitive model 810.

[68] According to another embodiment of the invention, the conversational speech analyzer 804 may access the personalized cognitive model 810 to proactively select a next best (or nth

best) match for the received text. A match may be confirmed by user actions that include the user not immediately canceling the command. The misrecognitions may also be analyzed to potentially determine personalized tuning parameters for the speech recognition components of the system. For example, the system may, over time, tune the speech recognition engine to increase recognition by analyzing how the speech recognition engine misrecognizes the verbal utterance.

[69] Agents 106 may include a collection of grammars, criteria handlers, and algorithms that are accessed to respond to a set of requests and/or commands. Agents 106 further may contain packages of both generic and domain specific behavior for the system 98. Agents 106 may use nonvolatile storage for data, parameters, history information, and locally stored content provided in the system databases 102 or other local sources. One or more user profiles 110 may be provided that includes user specific data, parameters, and session and history information for determining the behavior of agents 106. One or more personality modules 108 may be provided in a data determining system that includes personality characteristics for agents 106. The update manager 104 manages the automatic and manual loading and updating of agents 106 and their associated data from the Internet 146 or other network through the network interface 116.

[70] According to one embodiment of the invention, the speech-based interface for the system 90 may include one or more speech units 128. Speech units 128 may include one or more microphones, for example array microphone 134, to receive the utterances from the user. The speech received at the microphone 134 may be processed by filter 132 and passed to the speech coder 138 for encoding and compression. In one embodiment, a transceiver module 130 may transmit the coded speech to the main unit 98. Coded speech received from the main unit 98 is detected by the transceiver 130, then decoded and decompressed by the speech coder 138 and annunciated by the speaker 136.

[71] According to one embodiment of the invention, the non-speech-based interface for the system 90 may include one or more multi-modal devices 155 that may include mobile devices, stand alone or networked computers, personal digital assistances (PDAs), portable computer devices, or other multi-modal devices.

[72] The speech units 128, multi-modal devices 155 and the main unit 98 may communicate over a communication link. The communication link may include a wired or wireless link. According to one embodiment, the communication link may comprise an RF link. The transceiver 130 on the speech unit may communicate coded speech data bi-directionally over the communication link with the transceiver 126 on the main unit 98. According to another embodiment, RF link may use any standard local area wireless data protocols including the IEEE 802.11, Bluetooth or other standards. Alternatively, an infrared data link conforming to any suitable standard such as IrDA or other infrared standards can be used. In an alternative embodiment, wires may connect the speech unit 128 and the main unit 98, eliminating the need for one speech coder 138. Other wired or wireless analog or digital transmission techniques can be used.

[73] According to one embodiment of the invention, coded speech received at the transceiver 126 on the main unit 98 may be passed to the speech coder 122 for decoding and decompression. The decoded speech may be processed by the speech recognition engine 120 using the context description grammar module 112, among other information. Any recognized information may be processed by the parser 118, which transforms information into complete algorithms and questions using data supplied by knowledge agents. Knowledge agents may be selected from the plurality of agents 106 using a grammar stack, wherein the knowledge agents provide information for generating a response to the question or command. The knowledge agents may then process the commands or questions by creating requests that are submitted to local databases 102 or submitted through the network interface 116 to external data sources over the Internet 146 or external other networks. Algorithms typically result in actions taken by the system 90 itself (i.e., pause or stop), or to a remote device or data source (i.e., download data or program, or control a remote device), through the network interface to the Internet or other data interface.

[74] According to one embodiment of the invention, knowledge agents may return results of questions as responses to users. The responses may be created using the results of information requests, the system personality 108, the user preferences, other data in the user profile 110, and/or other information. Agents 106 may present these results using the speech unit 128.

The agents 106 may create a response string, which is sent to the text to speech engine 124. The text to speech engine 124 may generate the utterances, which may be encoded and compressed by the speech coder 122. Once coded, the utterances are transmitted from the main unit 98 by the transceiver 126 to the transceiver 130 on the speech unit 128. The utterance is then decoded and decompressed by the speech coder 138 and output by the speaker 136. Alternatively, agents 106 may present the results using multi-modal devices 155.

[75] The non-speech interface 114 may be integral with, or separate from, the multi-modal devices 155 and may be used as a substitute or may complement the speech interface. For example, non-speech interface 114 may be used to present and to interact with non-speech (e.g., graphical or tabular) information in a manner more easily understood by the user. According to one embodiment of the invention, multimodal support may be provided to maintain the context during both voice interaction and interaction through the non-speech interface 114. In one exemplary embodiment, a communication channel may be opened between multimodal devices 155 and the main user interface system 90 to allow multimodal devices 155 to input text commands and questions. The multimodal devices 155 may receive and/or provide one or more types of communications, including speech, text, digital audio files, dual-tone-multi-frequency (DTMF) or other communication types. According to another embodiment of the invention, multimodal devices 155 may send a string of text or keywords for a command or question. The main interface system 90 may synchronize the context between multimodal device 155 and the speech units 128. In order to send a response to the corresponding device, the main user interface system 90 may track where the input came from so that the response may be sent to a TTS or multi-modal device 155.

[76] According to an alternative embodiment of the invention illustrated in Figure 7, a context manager 702 may be centrally maintained to allow input from and output to multiple mobile devices 36. Each of the mobile devices may communicate with the context manager 702 to register via registration module 712, wherein registration may indicate events that the mobile devices 36 may subscribe to. The context manager 702 may receive input in Context XML form, for example. The other registered mobile devices 36 may be informed of context changes through context tracking module 714, thereby synchronizing the context across the

registered mobile devices 36. According to one embodiment of the invention, registered terminal devices may be added or removed. The registered terminal devices may be dynamic link libraries (DLLs) that may be specific to a multimodal device.

[77] According to yet another alternative embodiment of the invention, context information may be determined from a command or request that is presented as a text message and/or a command or request that is presented as a verbal utterance and processed using a multi-pass automatic speech recognition module that transcribes the verbal utterance to a text message. The multi-pass automatic speech recognition module may use a dictation grammar or a large vocabulary grammar, among other resources, to transcribe the verbal utterance into a text message. On platforms where a dictation grammar is not available, the multi-pass automatic speech recognition may use a virtual dictation grammar that uses decoy words for out-of-vocabulary words. Decoy words may include utility words, nonsense words, isolated syllables, isolated distinct sounds and other decoy words.

[78] According to one embodiment of the invention, the text message may be searched for a particular character, group of characters, word, group of words, and other text combinations. The text combination may be compared against entries in a context description grammar that is associated with each agent 106. If a match is identified between an active grammar in the context description grammar and the command and/or request, then the match may be scored. The agents 106 may be ranked based on the determined score. In generating an aggregate response from the one or more responses received from the agents 106, the ordering of the responses from the individual agents may be determined based on the rank of agents 106. The aggregate response may be generated by a response generator module. Agents 106 may update a context stack, which includes an ordered list of command contexts, to enable follow-up requests.

[79] According to another embodiment of the invention, if a match is not found, or only a partial match is found, between the text message and active grammars, then a knowledge-enhanced speech recognition system may be used to semantically broaden the search. The knowledge-enhanced speech recognition system may be used to determine the intent of the request and/or to correct false recognitions. The knowledge-enhanced speech recognition may

access a set of expected contexts that are stored in a context stack to determine a most likely context. The knowledge-enhanced speech recognition may use context specific matchers that are able to identify context such as time, location, numbers, dates, categories (e.g., music, movies, television, addresses, etc.) and other context. The matching may be performed by comparing a character, group of characters, a word, group of words, and other text combinations. Alternatively, or in addition to text based matching, the matching may be performed using phonetic matching, among other techniques. The results of any match may be used to generate a command and/or request that may be communicated to agents 106 for additional processing. According to one embodiment of the invention, non-speech interface 114 may show system, state and history information in a more concise manner than is possible through the speech interface. Non-speech interface 114 may be accessed to create or extend capabilities of agents 106. These operations may include scripting of agents, adding data to the agent or databases 102 used by the agent, adding links to information sources, among other operations.

[80] According to another embodiment of the invention, system 90 may include different types of agents 106. For example, generic and domain specific behavior and information may be organized into domain agents. A system agent, on the other hand, may provide default functionality and basic services. The domain agents provide complete, convenient and re-distributable packages or modules for each application area. In other words, the domain agents include data that is needed to extend or modify the functionality of the system 90 in a current or new domain. Further, domain agents and their associated data can be updated remotely over a network as new behavior is added or new information becomes available. Domain agents may use the services of other, typically more specialized, data managers and the system agent 150. Agents are distributed and redistributed in a number of ways including on removable storage media, transfer over networks or attached to emails and other messages. The invention may provide license management capability allowing the sale of data managers by third parties to one or more users on a one time or subscription basis. In addition, users with particular expertise may create data managers, update existing data managers by adding new behaviors and information, and make these data managers to other users as agents. A

block diagram of an agent architecture according to an embodiment of the invention is shown in Figure 2.

[81] Agents 106 may receive and return events to the event manager 100. Both system agents 150 and domain agents 156 may receive questions and commands from the parser 118. Based on keywords in the questions and commands and the structures of the questions and commands, the parser may invoke selected agents. Agents use the nonvolatile storage for data, parameters, history information and local content provided in the system databases 102.

[82] According to one embodiment of the invention, when the system starts-up or boots-up, the agent manager 154 may load and initialize the system agent 150 and the one or more domain agents 156. Agent manager 154 includes knowledge of agents 106 and maps agents 106 to the agent library 158. At shutdown, the agent manager may unload the agents 106. The agent manager 154 also performs license management functions for the domain agents 156 and content in the databases 102.

[83] The system agent 150 manages the criteria handlers 152 that handle specific parameters or values (criteria) used to determine context for questions and commands. According to one embodiment of the invention, criteria handlers 152 include parsing routines that are specialized to recognize particular parts of speech, such as times, locations, movie titles, and other parts of speech. The criteria handlers 152 may identify matching phrases and extract semantic attributes from the phrases. Both the system agent 150 and the domain agents 156 may use the criteria handlers 152. The various domain agents 156 may use the services of the system agent 150 and of other, typically more specialized, domain agents 156. The system agent 150 and the domain agents 156 may use the services of the agent library 158, which contains utilities for commonly used functions. According to one embodiment of the invention, the agent library may be a dynamic link library that implements one or more agents. The agent library may include utilities for text and string handling, network communications, database lookup and management, fuzzy and probabilistic evaluation, text to speech formats, and other utilities.

[84] Domain agents 156 may be data-driven, scripted or created with compiled code. A base of generic agent may be used as the starting point for data-driven or scripted agents. Agents

created with compiled code are typically built into dynamically linkable or loadable libraries. Developers of agents can add new functionality to the agent library 158 as required. Details of agent distribution and update, and agent creation or modification are discussed in sections below.

[85] According to another embodiment of the invention, capabilities are provided to distribute and update system agents 150, domain agents 156, agent library 158 components, databases 102, and context description grammar 112 over wireless or wired networks 136, including dial-up networks using the update manager 104. The network interface 116 may provide connections to one or more networks. The update manager 104 may also manage the downloading and installation of core system updates. The agent manager 154 may perform license management functions for the domain agents and the databases. The update manager 104 and agent manager 154 may perform these functions for all agents and database content including, agents and content available to all users or agents and/or content available to selected users. Examples of agent and database components added or updated on a periodic basis include:

- agents for new domains;
- additional domain knowledge for agents;
- new keywords for a domain, which can include names of politicians, athletes, entertainers, names of new movies or songs, etc. who have achieved recent prominence;
- links to a preferred set of information sources for the domains covered including links for, entertainment, news, sports, weather, etc.;
- updates to domain information based on, for example, changes to tax laws, company mergers, changing political boundaries;
- updates to content, including dictionaries, encyclopedias and almanacs; and
- other content and database components.

[86] When a user requires or selects a new domain agent 156 or database element 102, the update manager 104 may connect to their source on the network 146 though the network interface 116, download and install the agent or data. To save system resources and to comply

with any license conditions, the update manager 104 may uninstall agents that are no longer in use. In one embodiment of the invention, the update manager 104 may periodically queries one or more sources of the licensed agents and database components to locate and download updates to agent executables, scripts or data as they become available. Alternatively, the agent sources may initiate the downloading of agent updates of the registered or licensed agents to the update manager as they become available.

[87] The agent manager 154 may provide license management clients that are capable of executing most any license terms and conditions. When a particular agent 106 and/or database element 102 is selected based on a submitted command, the agent manager 154 verifies that the use of the agent or data element is within the allowed terms and conditions, and if so, invokes the agent or allows access to the data element. License management schemes that can be implemented through the agent manager 154 include outright purchase, subscription for updates, one time or limited time use. Use of shared agents and data elements (such as those down-loaded from web sites maintained by groups of domain experts) may also be managed by the agent manager 154.

[88] If questions or commands do not match an agent that is currently loaded on the system, the agent manager 154 may search the network 146 through the network interface 116 to find a source for a suitable agent. Once located, the agent can be loaded under the control of the update manager 104, within the terms and conditions of the license agreement, as enforced by the agent manager.

[89] New commands, keywords, information, or information sources can be added to any domain agent 156 by changing agent data or scripting. These configuration capabilities may allow users and content developers to extend and modify the behavior of existing domain agents 156 or to create new domain agents 156 from a generic agent without the need to create new compiled code. Thus, the modification of the domain agents 156 may range from minor data-driven updates by even the most casual users, such as specifying the spelling of words, to development of complex behavior using the scripting language as would typically be done by a domain expert. The user can create and manage modifications to domain agents 156 through speech interface commands or using non-speech interface 114. User-specific

modifications of domain agents 156 are stored in conjunction with the user's profile 110 and accessed by the domain agent 156 at run-time.

[90] The data used to configure data driven agents 156 are structured in a manner to facilitate efficient evaluation and to help developers with organization. These data are used not only by the agents 156, but also by the speech recognition engine 120, the text to speech engine 124, and the parser 118. Examples of some major categories of data include:

1. Content packages include questions or commands. Each command or question or group of commands or questions includes contexts used for creation of one or more requests. The domain agent 156 passes a context description grammar expression to the parser 118 for evaluation of a context or question. An initial or default context is typically supplied for each command or question. The command or question may include a grammar for the management and evaluation of the context stack.

2. Page lists or pointers to other local or network content sources. For each page or content source there is a pointer (e.g., URL, URI, or other pointer) to the page or source. Each page has specific scraping information used to extract the data of interest. The scraping information includes matching patterns, HTML or other format parsing information.

3. A response list, determining the response of the domain agent 156 to a particular command or question given the context, the user profile and the information retrieved. Responses can include diagnostic error messages or requests for more information if the question or command cannot yet be resolved from the known information. Responses can be based on or dependent on thresholds or probabilistic or fuzzy weights for the variables.

4. Substitution lists containing variable substitutions and transformations, often applied by the agents 150, 156 in the formatting of queries and results. For example, a stock domain specific agent 156 would use a substitution list of company trading symbols, company names and commonly used abbreviations. Substitutions

and transformations can be performed on commands and questions to create precise queries, which can be applied against one or more information sources or to results for creating more meaningful output to the user. Substitution lists also include information for optimally dealing with structured information, such as HTTP formatted page parsing and evaluation.

5. Personalities used for responses. Personalities are constructed by combining multiple traits in a weighted manner. Weights can be specified for each agent's domain area to create one or more specific personalities. Examples of personality traits include sarcasm, humor, irritation, and sympathy, and other traits.

6. Public and user specific parameters for sources, substitutions, transformations, variables or criteria. The public parameter lists are part of the agent package 156. The user specific parameters are contained in the user profile 110.

[91] Commands and questions are interpreted, queries formulated, responses created and results presented based on the users personal or user profile 110 values. Personal profiles may include information specific to the individual, their interests, their special use of terminology, the history of their interactions with the system, and domains of interest. The personal profile data may be used by the agents 106, the speech recognition engine 120, the text to speech engine 124, and the parser 118. Preferences can include, special (modified) commands, past behavior or history, questions, information sources, formats, reports, and alerts. User profile data can be manually entered by the user and/or can be learned by the system 90 based on user behavior. User profile values may include:

- spelling preferences;
- date of birth for user, family and friends;
- income level;
- gender;
- occupation;
- location information such as, home address, neighborhood, and business address;

- car type;
- telecommunications and other service providers and services;
- financial and investment information;
- synonyms (i.e., a nick name for someone);
- special spelling;
- keywords;
- transformation or substitution variables;
- domains of interest; and
- other values.

[92] End users may use the data driven agent 156 extension and modification facilities and values stored in user profiles 110 to create special reports, packages of queries, alerts and output formats. A single alert or report can be configured to use multiple data sources, values, and other variables (i.e., time, location, etc.) to determine when alerts should be sent. For example, an alert can be generated by sampling a stock price every fifteen minutes and sending an alert if the price drops below some value. To create a report, the user first specifies a set of commands or questions. Next, the user creates or selects a format for the report. Finally the user may name the report. A report can have variable parameters. For example, users may create a company stock report, and execute the report by stating its name and the company name, which gives the user selected information and in a specified format for that company. In another example, users can create a "morning" report, which presents selected multimedia information from different sources (news, sports, traffic, and weather) in the order and formats desired. Alerts and reports can be created using only voice commands and responses, commands and responses through non-speech interface 114, or a combination of the two. To create a report, alert, or other specialized behavior, the user performs a number of steps including:

- specify the command to run a report or alert;
- specify the question or questions, including keywords, used for a query;
- set the criteria for running the report such as on command or when a particular condition is met;

- define preferred information sources;
- define preferences for order of result evaluation by source, value, etc.;
- specify the presentation medium for a report or alert, such as an email, the text to speech engine, a message to a pager, or a text and graphics display; and
- specify the preferred format for the report, such as information to be presented, order of information to be presented, preferred abbreviations or other variable substitutions.

[93] Filtering and noise elimination may be important in facilitating the various functionalities of system 90. Recognition and parsing of the user's speech may be implemented with good signal to noise ratio at the input to the speech recognition engine 120. To provide acceptable results, a set of acoustic models, an array microphone 134 a filter 132, or other components, may be employed. If a good signal to noise ratio cannot be achieved, a noise identification algorithm may be used and the appropriate acoustic model, for example, one that has been trained in conditions similar to the identified noise, may be selected. According to an embodiment of the invention, the microphone array, filters and speech coder 138 are physically separated from the main unit 98 into a speech unit 128, and connected using a wireless link. Since bandwidth on a wireless connection is at a premium, the speech coder dynamically adapts the digitization rate and compression of the captured speech.

[94] The speech unit 128 may use an array of microphones 134 to provide better directional signal capture and noise elimination than can be achieved with a single microphone. The microphone array can be one-dimensional (a linear array) or two-dimensional (a circle, square, triangle or other suitable shape). The beam pattern of the array can be fixed or made adaptive though use of analog or digital phase shifting circuitry. The pattern of the active array is steered to point in the direction of the one or more users speaking. At the same time, nulls can be added to the pattern to notch out point or limited area noise sources. The use of the array microphone also helps reduce the cross talk between output from the text to speech engine 124 through the speaker 136 and detection of the user's speech.

[95] The microphone can be complemented with an analog or digital (i.e., Voice over IP) speech interface. This interface allows a remote user to connect to the system and interact with the system in the same manner possible if they were physically present.

[96] The speech unit 128, according to an embodiment of the invention, may use an analog or digital filter 132 between the array microphone 134 and the speech coder 138. The pass band of the filter is set to optimize the signal to noise ratio at the input to the speech recognition engine 120. In some embodiments, the filter is adaptive, using band shaping combined with notch filtering to reject narrow-band noise. In one embodiment of the invention, the system 90 may employ adaptive echo cancellation in the filter. The echo cancellation helps prevent cross talk between output from the text to speech engine and detection of the user's speech as well as suppression of environmentally caused echoes. Calculations are conducted for comparing the background noise to the signal received from the user's speech to optimize the band-shaping parameters of the adaptive filter. Those skilled in the art will be familiar with multiple techniques used to construct suitable digital and analog filters.

[97] The speech received by the array microphone 134 and passed through the filter 132 may be sent to the speech digitizer or coder 138. The speech coder 138 may use adaptive lossy audio compression to optimize bandwidth requirements for the transmission of the coded speech to the speech recognition engine 120 over a wireless link. The lossy coding may be optimized to preserve only the components of the speech signal required for optimal recognition. Further, the lossy compression algorithms that may be used may be designed to prevent even momentary gaps in the signal stream, which can cause severe errors in the speech recognition engine. The digitized speech may be buffered in the coder and the coder may adapt the output data rate to optimize the use of the available bandwidth. The use of the adaptive speech coder is particularly advantageous when a band-limited wireless link is used between the coder and the speech recognition engine.

[98] In an alternative embodiment, the array microphone can be replaced by a set of physically distributed microphones or a headset worn by the user. The distributed microphones can be placed in different parts of a room or in different rooms. The distributed

microphones can create a three-dimensional array to improve signal to noise ratio. The headset may use a wireless or wired connection.

[99] While the invention is intended to be able to accept most any natural language question or command, ambiguity may be a problem. To assist users formulate concise questions and commands, the system 90 may support a voice query language. The language is structured to allow a variety of queries with minimal ambiguity. Thus, the voice query language helps users clearly specify the keywords or contexts of the question or command along with the parameters or criteria. The language provides a grammar to clearly specify the keyword used to determine the context and a set of one or criteria or parameters. A user asking a question or stating a command in the voice query language is nearly always guaranteed to receive a response.

[100] The voice query language may be sensitive to the contents of the context stack, wherein a context defines a set of questions that can be activated or deactivated during a conversation. According to one embodiment, each agent may designate one context to be the root context that defines base algorithms that the agent implements. Thus, following-on questions can be asked using an abbreviated grammar, since keywords and criteria can be inherited from the context stack. For example, the user can simply ask about another keyword if the criteria of the question remain constant.

[101] The system 90 may provide built in training capabilities to help the user learn the best methods to formulate their questions and commands. The interactive training allows users to audibly or visibly see the machine interpretation of their queries and provides suggestions on how to better structure a query. Using the interactive training users can quickly become comfortable with the voice query language and at the same time learn how to optimize the amount of information required with each step of a dialog.

[102] The output of the speech coder 122 may be fed to the speech recognition engine 120. The speech recognition engine 120 recognizes words and phrases, using information in the context description grammar 112, and passes these to the parser 118 for interpretation. The speech recognition engine 120 may determine the user's identity by voice and name for each utterance. Recognized words and phrases may be tagged with this identity in all further

processing. Thus, as multiple users engage in overlapping sessions, the tags added by the speech recognition engine 120 to each utterance allows other components of the system 90 to tie that utterance to the correct user and dialog. The user recognition capability may further be used as a security measure for applications, such as auctions or online shopping, where this is required. Voice characteristics of each user may be contained in the user profile 110.

[103] According to one embodiment of the invention, users may start a dialog with the system 90 when they first address it. This can be done by speaking a generic word ("computer") or addressing a specific name ("Fred"), which may be generally tied to a system personality 108. Once the user starts the dialog, it may be recognized by the speech recognition engine 120, using unique characteristics of the user's speech. At the end of a dialog or to interrupt a dialog, the user may utter a dismissal word ("good bye").

[104] According to another embodiment of the invention, the system 90 may employ a speech recognition engine 120 that gains improved word recognition accuracy using data from context description grammar 112, user profiles 110, and the agents 106, among other components. At the same time, the fuzzy set possibilities or prior probabilities for the words in the context description grammar may be dynamically updated to maximize the probability of correct recognition at each stage of the dialog. The probabilities or possibilities may be dynamically updated based on a number of criteria including the application domain, the questions or commands, contexts, the user profile and preferences, user dialog history, the recognizer dictionary and phrase tables, and word spellings, among other criteria.

[105] For uncommon words or new vocabulary words, a user may be given the option to spell the words. The spelling may be done by saying the names or the letters or using a phonetic alphabet. The phonetic alphabet can be a default one or one of the user's choosing.

[106] Alternatively, when a user submits a word that is not recognized at all or is not correctly recognized by the speech recognition engine 120 then the user may be asked to spell the word. The speech recognition engine 120 determines this condition based on confidence level for the scoring process. The word may be looked up in a dictionary and the pronunciation for the word is added to the dictionary, the agent 106, and/or the user's profile 110. The word pronunciation can then be associated with the domain, the question, the context and the user.

Through this process, the speech recognition engine learns with time and improves in accuracy. To assist users in spelling words, an individualized phonetic alphabet can be used. Each user can modify the standard phonetic alphabets with words, which they can remember more easily.

[107] Once the words and/or phrases have been recognized by the speech recognition engine 120, the tokens and user identification is passed to the parser 118. The parser 118 examines the tokens for the questions or commands, context and criteria. The parser 118 determines a context for an utterance by applying prior probabilities or fuzzy possibilities to keyword matching, user profile 110, and dialog history. The context of a question or command determines the domain and thereby, the domain agent 156, if any, to be evoked. For example, a question with the keywords "temperature" implies a context value of weather for the question. The parser dynamically receives keyword and associated prior probability or fuzzy possibility updates from the system agent 150 or an already active domain agent 156. Based on these probabilities or possibilities the possible contexts are scored and the top one or few are used for further processing.

[108] The parser 118 uses a scoring system to determine the most likely context or domain for a user's question and/or command. The score is determined from weighing a number of factors, which include the user profile 110, the domain agent's data content, and previous context. Based on this scoring, the system 90 invokes the correct agent. If the confidence level of the score is not high enough to ensure a reliable response, the system 90 may ask the user to verify whether the question and/or command is correctly understood.

[109] In general, the question that is asked by the system 90 may be phrased to indicate the context of the question including all criteria or parameters. For example, the question can be in the form of: "Did I understand that you want such-and-such?" If the user confirms that the question is correct the system proceeds to produce a response. Otherwise, the user can rephrase the original question, perhaps adding additional information to remove ambiguity, or the system can ask one or more questions to attempt to resolve the ambiguity.

[110] Once the context for the question or command has been determined, the parser 118 can invoke the correct agent 156, 150. To formulate a question or command in the regular grammar used by agents, the parser 118 may determine required and optional values for the

criteria or parameters. These criteria may have been explicitly supplied by the user or may need to be inferred. The parser 118 may make use of the criteria handlers 152 supplied by the system agent 150. The criteria handlers 152 may provide context sensitive procedures for extracting the criteria or parameters from the user's questions or commands. Some criteria are determined by executing algorithms in the agent, while others may be determined by applying probabilistic of fuzzy reasoning to tables of possible values. Prior probabilities or fuzzy possibilities and associated values are received from a number of sources including the history of the dialog, the user profile 110, and the agent. Based on user responses, the prior probabilities or fuzzy possibilities are updated as the system learns the desired behavior. For a weather context, examples of criteria include, location, date and time. Other criteria can include command criteria (i.e., yes/no, on/off, pause, stop), and spelling. Special criteria handlers are available from the system agent for processing lists, tables, barge-in commands, long strings of text, and system commands.

[111] The criteria handlers 152 operate iteratively or recursively on the criteria extracted to eliminate ambiguity. This processing helps reduce the ambiguity in the user's question or command. For example, if the user has a place name (or other proper noun) in their utterance, the parser 118 can use services of the domain agent 156 to look up tables in the databases 102 for place names or can attempt to determine which word is the proper noun from the syntax of the utterance. In another example, the user asks "what about flight one hundred and twenty too?" The parser and domain agent use flight information in the database and network information along with context to determine the most plausible interpretation among "flight one hundred and flight twenty also," "flight one hundred and flight twenty two," "flight one hundred and twenty two," and the like.

[112] Once the context and the criteria are determined, the parser 118 may form the question or command in a standard format or hierarchical data structure used for processing by the agents 150, 156. The parser 118 may fill in all required and some optional tokens for the grammar of the context. Often the tokens must be transformed to values and forms acceptable to the agents. The parser obtains the required transformations from the agents, dialog history

or user profile 110. Examples of transformations or substitutions performed by the parser on tokens include:

- substituting a stock symbol for a company name or abbreviation;
- substituting a numerical value for a word or words;
- adding a zip code to an address; and
- changing a place or other name to a commonly used standard abbreviation.

[113] The agents 150, 156 may receive a command or question once the parser 118 has placed it in the required standard format. Based on the context, the parser 118 evokes the correct agent to process the question or command.

[114] Commands can be directed to the system 90 or to an external entity. System commands are generally directed to the system agent 150. Commands for external entities are generally processed by a domain agent 156, which includes the command context and behavior for the external entity.

[115] Specific questions are generally directed to one of the domain agents 156. Based on the question or context and the parameters or criteria, the domain agent creates one or more queries to one or more local or external information sources. Questions can be objective or subjective in nature. Results for objective questions can often be obtained by structured queries to one or more local or network information sources. Even for objective questions, the system 90 may need to apply probabilistic or fuzzy set analysis to deal with cases of conflicting information or incomplete information. Information to answer subjective questions is generally obtained by one or more ad-hoc queries to local or network data sources, followed by probabilistic or fuzzy set evaluation of the one results to determine a best answer.

[116] Once the domain agent 156 has formulated the one or more queries, they may be sent to local and/or network information sources. The queries are performed in an asynchronous manner to account for the fact that sources respond at different speeds or may fail to respond at all. Duplicate queries are sent to different information sources to ensure that at least one source responds with a useful result in a timely manner. Further, if multiple results are received in a timely manner, they can be scored by the system to determine which data is most reliable or appropriate. Examples of data sources accommodated include, HTTP data sources,

sources with meta-data in various formats including XML, entertainment audio, video and game files including MP3, databases using query languages and structured responses such as SQL, and other data sources.

[117] The local information sources can be stored in one or more system databases 102 or can be on any local data storage such as a set of CDs or DVDs in a player or other local data storage. Network information sources can be connected to the Internet 136 or other network and accessed through a series of plug-ins or adaptors, known as pluggable sources, in the network interface 116. The pluggable sources in the network interface 116 may be capable of executing the protocols and interpreting the data formats for the data sources of interest. The pluggable sources may provide information, scraping data and procedures for each source to the domain agents 156. If a new type of data source is to be used, a new plug-in or adaptor can be added to the network interface 116.

[118] The domain agent 156 evaluates the results of the one or more queries as they arrive. The domain agent 156 scores the relevance of the results based on results already received, the context, the criteria, the history of the dialog, the user profile 110 and domain specific information using probabilistic or fuzzy scoring techniques. Part of the dialog history is maintained in a context stack. The weight of each context for the scoring is based on the relevance of one context to another and the age of the contexts. Other scoring variables can be associated through the context stack. Contexts can also be exclusive, so that previous contexts have no weight in the scoring.

[119] Based on the continuous scoring processes, the domain agent 156 may determine if a single best answer can be extracted. For most questions, the desired result has a set of tokens that must be found to formulate an answer. Once a value has been found for each of these tokens, the results are ready for presentation to the user. For example, for a question on weather, the tokens can include the date, day of week, predicted high temperature, predicted low temperature, chance of precipitation, expected cloud cover, expected type of precipitation and other tokens. Results processed in this manner include error messages. For subjective questions, this determination is made by determining a most likely answer or answers,

extracted by matching of the results received. If no satisfactory answer can be inferred from the results of the query, the agent can do one of the following:

1. Ask the user for more information, typically through the speech interface, and based on the results obtained formulate new queries. This approach is applied when an irresolvable ambiguity arises in the formulation of a response.

2. Formulate new queries based on the results received from the first set of queries. This approach is typically applied in cases where the responses received do not contain all the required information. Information sources to query can be inferred from the results already obtained (i.e., links in an HTML document) or from other sources. Using this approach one or more sets of queries and responses can be chained without the need for action by the user.

3. Wait for additional queries to return results.

[120] In any case, the domain agent 156 may continue to make requests and evaluate results until a satisfactory response is constructed. In doing so, the agent can start several overlapping query paths or threads of inquiry, typically mediated by the event manager 100. This technique, combined with the use of asynchronous queries from multiple data sources, provides the real-time response performance required for a natural interaction with the user.

[121] The domain agent 156 may apply conditional scraping operations to each query response as it is received. The conditional scraping actions depend on the context, the criteria, user profile 110, and domain agent coding and data. For each token to be extracted, scraping criteria 152 may be created using the services of the system agent 150. The scraping criteria use format specific scraping methods including, tables, lists, text, and other scraping methods. One or more scraping criteria can be applied to a page or results set. Once additional results are received, the domain agent 156 can create new scraping criteria to apply to results already acquired. The conditional scraping process removes extraneous information, such as graphics, which need not be further processed or stored, improving system performance.

[122] The domain agent 156 may strongly influence how the results are presented. For instance, once the domain agent 156 has created a satisfactory response to a question, the

agent 156 may format that response for presentation. Typically, the domain agent 156 formats the response into the markup format used by the text to speech engine 124. The domain agent 156 may also format the result presentation using available format templates and based on the context, the criteria, and the user profile 110. Variable substitutions and transformations may be performed by the agent 156 to produce a response best understood and most natural to the user. Further, the order of presentation of tokens and the exact terminology used to create a more natural response to the user may be varied by the agent 156. The domain agent 156 may also select the presentation personality 108 to be used.

[123] The domain agent 156 may select the presentation template, determine order of presentation for tokens and determine variable substitutions and transformations using probabilistic or fuzzy set decision methods. The template used to form the presentation can be from the domain agent itself or from the user profile 110. The user profile 110 can completely specify the presentation format or can be used to select and then modify an existing presentation format. Selection and formatting of presentation templates can also depend on the presentation personality modules 108. At the same time, the characteristics of the personality used for the response are dynamically determined using probabilities or fuzzy possibilities derived from the context, the criteria, the domain agent itself and the user profile 110.

[124] The domain agent 156 may apply a number of transformations to the tokens before presentation to the user. These variable substitutions and transformations are derived from a number of sources including, domain information carried by the agent, the context, the token values, the criteria, the personality module 108 to be used, and the user profile 110. Examples of variable substitutions and transformations include:

- substitution of words for numbers;
- substitution of names for acronyms or symbols (i.e., trading symbols);
- use of formatting information derived from the information sources (i.e., HTML tags);
- nature of the response including, text, long text, list, table;
- possible missing information or errors;

- units for measurement (i.e., English or metric); and
- preferred terminology from the user profile 110 or presentation personality 108.

[125] The system 90, according to another embodiment of the invention, may provide special purpose presentation capabilities for long text strings, tables, lists and other large results sets. Domain agents 156 may use special formatting templates for such results. The system agent 150 may provide special criteria handlers 152 for presentation and user commands for large results sets. The presentation templates used by the domain agents 156 for large results sets typically include methods for summarizing the results and then allowing the user to query the result in more detail. For example, initially only short summaries such as headlines or key numbers are presented. The user can then query the results set further. The criteria handlers 152 provide users with the capability to browse large results sets. Commands provided by the criteria handlers 152 for large results sets include, stop, pause, skip, rewind, start, and forward.

[126] Some information, in formats such as video, pictures and graphics, may be best presented in a displayed format. The domain agents 156 may apply suitable presentation templates in these cases and present the information through the graphical user interface 114. The system agent 150 provides special criteria handlers 152 for presentation and user commands for display presentation and control.

[127] Figure 3 illustrates a high level process 300 for receiving natural language speech-based queries and/or commands and generating a response according to an embodiment of the invention. The process 300 comprises of individual steps, several of which may be repetitive in order to accommodate partial failures. The process 300 may begin when a user's utterance is received and processed at 302. The user utterance may be a query and/or a command and may be of a natural language speech-based form. After receiving the natural language query and/or command, the query and/or command may be processed so that the data is in a more machine understandable format such as in a digital format. Once the utterance has been converted into an understandable format, the utterance may be processed so that at least an approximate meaning of the utterance can be determined at 304. This may be accomplished by, for example, the use of stored dictionaries, phrases, user profiles, domain agent data, and other

data. Based on the approximate meaning of the utterance, one or more correctly formatted queries and/or commands may be generated.

[128] A user created query and/or command may require that multiple requests and/or commands may be needed in order to generate the desired response or action. Further, depending upon the context in which the query and/or command has been submitted (e.g., who is the user, what is the subject the query and/or command directed to, at what time or location is the query and/or command being directed to, and other parameters used in defining the query and/or command), a specific format for the query and/or command may be required. For instance, each of the domain agents 156 may require that requests and/or commands be formatted in a specific manner. Thus at 306, one or more properly formatted queries and/or commands may be generated. Operations 304 and 306 may be repeated in order to obtain the correct interpretation of the user utterance and result in the desired response and/or action. Once the properly formatted queries and/or commands are generated, the appropriate action may be taken at 308. This may require that the properly formatted queries and/or commands be sent to specific domain agent[s], information source[s], device[s], or other appropriate destination[s] that can fulfill the requirements of the query and/or command. Once the appropriate action[s] have been executed, this event may be recorded to, for example, the user's profile, database and/or one or more agents at 310. Such data may be useful for future user inquires and commands. After the action[s] have been performed, a response, if need be, may be generated and forwarded to the user and/or third parties at 312.

[129] In the case of a query for retrieving data, the response would contain the requested information. In the case of a command, the response may be a confirmation that a specific action[s] has been executed. The response may be in the form of a natural language format. The response may also be formatted to reflect a particular personality or tone to the response in order to make the response more "human." The response may be relayed to the user and/or third parties as an audio message and/or a visual message displayed on a user interface.

[130] Figure 4A illustrates an exemplary process 400 for receiving natural language speech-based requests and/or commands and generating a response using the system 90 according to another embodiment of the invention. The process 400 may begin when a user's utterance

(i.e., user query and/or command) is captured using speech recognition that operates in a variety of real-world environments at 402. Once the utterance is captured, it is parsed and interpreted to determine the query and/or command contained in the utterance at 404. According to one embodiment of the invention, the utterance may be transcribed to text and analyzed using the general cognitive model 806, the environmental model 808, and/or the personalized cognitive model 810. Next, the request and/or command are reviewed to determine the domain of expertise required and the context of the query, invoking the proper resources including, for example, agents at 406. The original query and/or command submitted by the user may require that multiple queries and/or commands be generated.

[131] For instance, suppose a user is interested in retrieving the value of her stock portfolio. The user may utter "please get the value of my stock portfolio." The system 90 may review this request together with stored data such as the user's profile, environmental model 808, and/or personalized cognitive model 810, to determine keywords such as "get the value" and "my stock portfolio." The system 90 may then generate requests to determine the stocks in the user's portfolio, the number of shares and the source for current pricing information. These queries may then be sent to one or more agent domains, such as a domain which may access a database containing the user's profile and a domain which accesses stock pricing sources to determine the answers to these questions.

[132] Requests may be sent to these domain agents or sources in order to obtain the desired data. Thus, at operation 408, one or more requests may be formulated and sent to one or more local and/or network data sources and/or appropriate commands may be sent to local or remote devices or the system itself. The requests are then sent to the designated agent[s]. The agents may then, in turn, generate their own requests and/or commands to be sent to, for example, local or remote information sources to retrieve needed data. The agent generated requests and/or commands may be formatted according to the requirements of the target sources and variable substitutions and transformations are performed to modify the requests to a form most likely to yield desired results from the available sources at 410. Once the requests are formatted correctly, they may be executed in an asynchronous manner and dealing gracefully with failures at 412. As a result of the execution of the requests, results may

be returned by the domain agents and/or sources. The system 90 may then extract or scrape the desired information from the one or more results, which may be returned in any one of a number of different formats at 414. That is, the results sought by a user may be the summary or the results of further processing of information obtained from several sources for example.

[133] Next, the results may be evaluated and interpreted including processing of errors, and gathering and combining them into a single best result judged to be "best" even if the results are ambiguous, incomplete, or conflicting at 416. Once the best results are determined, any required formatting is performed. At operation 418, variable substitutions and transformations may be used to modify the results. Finally, at operation 420, the compound results may be presented to the user in a useful and expected manner through the text to speech engine 124. The process 400 may be performed while accounting for the domain of expertise required, the context in which the question or command is presented, the domain specific information available, the history of the user's interaction, the user preferences, the information sources or commands that are available, and responses obtained from the sources.

[134] At each stage of process 400, probabilistic or fuzzy set decision and matching methods may be applied to deal with inconsistent, ambiguous, conflicting and incomplete information or responses. In addition, the use of asynchronous queries that may result in rapid and graceful failure of some queries or commands may allow the system 90 to robustly return results quickly and in a manner that seems natural to the user.

[135] Figure 4B illustrates an exemplary process 450 for receiving natural language speech-based commands in order to locally or remotely control functions of the system 90, or for other devices, according to another embodiment of the invention. The process 450 may begin when a user's utterance (i.e., user query and/or command) is captured using speech recognition systems that operate in a variety of real-world environments at 452. Once the utterance is captured, it is parsed and interpreted to determine the command that is contained in the utterance at operation 454.

[136] Next, at operation 456, the command is reviewed to determine the domain for the command and context and invoke the proper resources, including selecting of agents. The original command submitted by the user will often require that multiple queries and/or

commands be generated. For instance, suppose a user is interested in recording his favorite television program. The user may utter "please record my favorite TV program." The system 90 may review this request together with stored data such as the user's profile and determine keywords such as "record" and "my favorite TV program." The system 90 may then generate queries to determine the name, the channel, and time for the user's favorite TV program. These queries may then be sent to a domain agent, which may access a database containing the user's profile and determine the answers to these questions. A command may then be sent to a video recorder ordering the video recorder to record the selected TV program. Thus, at operation 458, one or more queries may be formulated that are to be sent to one or more local and/or network data sources. Appropriate commands may be sent to local or remote devices or the system itself. Next, at operation 460, the generated commands may be routed to the appropriate system[s] and/or external devices. Once the commands have been executed, results including errors may be received and processed at 462. The results of the executed commands may be optionally presented to the user at operation 464.

[137] Some of the operations depicting in Figure 4A may be performed using multiple steps that may be repetitive. For instance, in operation 404, the user's utterance is parsed and interpreted in order to determine the meaning of the utterance. System 90 may make an initial interpretation of the utterance based on the data stored in, for example, the context description grammar module 112, user profiles 110, agents 106 and the databases 102. A real-time scoring system or other techniques may be applied to the interpretation results in order to generate a domain or a context score. If the confidence level of the domain or context score is not high enough to ensure a reliable response, the system 90 can request that the user verify the question or command is correctly understood. In general, the question may be phrased to indicate the context of the question including all criteria or parameters. If the user confirms that the question is correct, the system 90 may proceed to produce a response. Otherwise, either the user can rephrase the original question, perhaps adding additional information to remove ambiguity, or the system may ask one or more questions to attempt to resolve the ambiguity or other actions may taken.

[138] Figure 5 illustrates a process 500 for correctly interpreting a user's utterance according to one embodiment of the invention. The process 500 generally represents operations 402 and 404 of process 400. Initially the user's utterance is inputted into the system 90 at operation 502. The input is then interpreted at 504 using, for example, various sources of stored data such as user profiles, agent data, dictionary and phrases, and other relevant data. The interpretation is then scored using, for instance, a weighted scoring system as described previously at 506. Once a score is obtained, the confidence level of the interpretation may be analyzed to determine if it is satisfactory at operation 508. In other words, the determination relates to whether the score or confidence level given to the interpretation exceeds a certain value. If the confidence level is determined to be unsatisfactory, then a request may be submitted to the user requesting that the user verify the interpretation at 510 and 512. If the user is unsatisfied with the interpretation, he/she may be asked to rephrase the utterance and/or provide additional information at 514. Once the user provides the rephrased utterance and/or additional information, the process 500 returns to the beginning at operation 502. If, on the other hand, the user is satisfied with the interpretation, then the process 400 for receiving natural language speech-based requests and/or commands, and generating a response, may continue at operation 516. Once the meaning of the utterance has been determined, the appropriate domain agent[s] and the query and/or commands may be properly formatted for the agent[s].

[139] Figure 6 illustrates a process 600 for determining the proper domain agent[s] to invoke and the proper format for queries and/or commands that are submitted to the agents 106, as generally depicted in steps 406-408 of Figure 4A. In order to formulate a question or command in the regular grammar used by agents 106, a determination may be made as to the required and optional values for the criteria or parameters of the queries and/or commands. These criteria may have been explicitly supplied by the user or may need to be inferred. Thus, the properly interpreted query and/or command that is generated by, for example, operations 404 and 454 of Figures 4A and 4B, is parsed at operation 602.

[140] The content of the properly interpreted request and/or command is then analyzed to determine the criteria and/or parameters of the properly interpreted request and/or command

at 604. A context sensitive procedure for extracting the criteria or parameters from the properly interpreted request and/or command may be used. Some criteria are determined by executing algorithms in the agent, while others may be determined by applying probabilistic of fuzzy reasoning to tables of possible values. Prior probabilities or fuzzy possibilities and associated values are received from a number of sources including the history of the dialog, the user profile 110, and the agent.

[141] Based on user responses, the prior probabilities or fuzzy possibilities are updated as the system 90 learns the desired behavior. For a weather context, examples of criteria include, location, date and time. Other criteria can include command criteria (i.e., yes/no, on/off, pause, stop), and spelling. The process for determining criteria may be iterative or recursive in order to eliminate ambiguity in the user's question or command. For example, if the user has a place name (or other proper noun) in their utterance, tables in the databases 102 may be reviewed for place names or an attempt may be made to determine which word is the proper noun from the syntax of the utterance. In another example, the user asks "what about flight one hundred and twenty too?" In such a situation, flight information in the database and network information along with context may be used to determine the most plausible interpretation among "flight one hundred and flight twenty also," "flight one hundred and flight twenty two," "flight one hundred and twenty two," and the like. Once the parameters and criteria for the query and/or command have been established, the proper agents 106 may be selected at 606.

[142] After selecting the agents 106, at operation 608, a properly formatted query and/or command that will be submitted to the agents 106 may be determined. The query and/or command may be in a standard format or may be a hierarchical data structure used for processing by the agent 106. In order to submit the properly formatted query and/or command to the agent 106, all of the required, and some optional tokens, for the grammar of the context may be filled in. Often the tokens must be transformed to values and forms acceptable to the agents. The required transformations may be obtained from the agents, dialog history or user profile 110. Examples of transformations or substitutions that may be

performed were provided above. Once the properly formatted queries and/or commands are generated, the process (e.g., process 400) may continue at 610.

[143] While specific embodiments of the invention have been described above, it will be appreciated that the invention may be practiced otherwise than as described. For example, the invention may take the form of a computer program containing one or more sequences of machine-readable instructions describing a method as disclosed above, or a data storage medium (e.g., semiconductor memory, magnetic or optical disk) having such a computer program stored therein.

[144] The descriptions above are intended to be illustrative, not limiting. Thus, it will be apparent to one skilled in the art that modifications may be made to the invention as described without departing from the scope of the claims set out below.

CLAIMS

What is claimed is:

1. A system for processing natural language utterances, comprising:

a multimodal device configured to receive a natural language utterance;

a speech recognition engine configured to recognize one or more words from the natural language utterance;

a parser configured to generate an interpretation of the natural language utterance from the one or more recognized words, and further configured to generate a request based on the interpretation of the natural language utterance;

a domain agent configured to process the generated request; and

an adaptive misrecognition engine configured to monitor one or more actions associated with the domain agent processing the request and determine whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions.

2. The system of claim 1, wherein the adaptive misrecognition engine is further configured to generate an unrecognized event in response to determining that the interpretation of the natural language utterance is incorrect.

3. The system of claim 2, further comprising an analyzer configured to:

analyze the unrecognized event to determine how the natural language utterance was incorrectly interpreted; and

determine one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

4. The system of claim 1, further comprising an analyzer configured to:

track an interaction pattern with the system over time for a user that provided the natural language utterance;

generate a personalized cognitive model for the user based on the interaction pattern tracked for the user; and

use the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

5. The system of claim 1, further comprising an analyzer configured to track interaction patterns with the system over time for a plurality users.

6. The system of claim 5, wherein the analyzer is further configured to generate a generalized cognitive model for the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns.

7. The system of claim 6, wherein the analyzer is further configured to use the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

8. The system of claim 1, further comprising an analyzer configured to generate an environmental model that includes information associated with at least one of environmental conditions or surroundings associated with a user that provided the natural language utterance.

9. The system of claim 8, wherein the environmental conditions or surroundings include one or more of a global position of the user, movement information associated with the user, quiet or noisy conditions associated with an environment of the user, or a vicinity to one or more voice-enabled devices.

10. The system of claim 8, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

11. The system of claim 1, further comprising:

a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:

compare one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

provide a relevance score for each of the identified matching contexts; and

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the generated request is associated with the selected context; and

a response generating module configured to:

communicate the request to the domain agent associated with the selected context; and

generate a response to the natural language utterance using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

12. The system of claim 11, wherein the response generated by the response generating module includes an aggregation of the content gathered as a result of the domain agent processing the request.

13. The system of claim 11, further comprising a personality module configured to format the response.

14. The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to compare the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

15. The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to apply prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

16. The system of claim 11, wherein the domain agent is further configured to direct a query to at least one of a local information source or a network information source to process the request.

17. The system of claim 16, wherein the domain agent is further configured to evaluate a plurality of responses to the query to process the request.

18. The system of claim 11, wherein the domain agent is further configured to direct a command to at least one of a local device or a remote device to process the request.

19. The system of claim 1, wherein the multimodal device includes at least one of a personal digital assistant, a cellular telephone, a portable computer, or a desktop computer.

20. The system of claim 1, wherein the multimodal device is further configured to subsequently receive one or more follow-up multimodal inputs.

21. The system of claim 20, wherein the speech recognition engine is further configured to recognize one or more words from a natural language utterance provided in the follow-up multimodal input, and wherein the parser is further configured to generate an interpretation of the follow-up multimodal input from the one or more words recognized from the natural language utterance provided in the follow-up multimodal input.

22. The system of claim 20, wherein the follow-up multimodal input includes a follow-up request associated with a same context as the request being processed by the domain agent.

23. The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to a user providing a subsequent request to stop the request being processed by the domain agent.

24. The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to a user repeating the natural language utterance.

25. The system of claim 1, wherein the multimodal device is further configured to receive a non-speech input relating to the natural language utterance, and wherein the system further comprises:

a transcription module configured to transcribe the non-speech input to create a non-speech-based transcription; and

a merging module configured to merge the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance from the merged transcription.

26. A method for processing natural language utterances, comprising:

receiving a natural language utterance at a multimodal device;

recognizing one or more words from the natural language utterance using a speech recognition engine coupled to the multimodal device;

generating an interpretation of the natural language utterance from the one or more recognized words using a parser coupled to the multimodal device, wherein the parser generates a request based on the interpretation of the natural language utterance;

invoking a domain agent configured to process the generated request;

monitoring one or more actions associated with the domain agent processing the request using an adaptive misrecognition engine; and

determining, at the adaptive misrecognition engine, whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions.

27. The method of claim 26, wherein the adaptive misrecognition engine generates an unrecognized event in response to determining that the interpretation of the natural language utterance is incorrect.

28. The method of claim 27, further comprising:

analyzing the unrecognized event to determine how the natural language utterance was incorrectly interpreted; and

determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

29. The method of claim 26, further comprising:

tracking an interaction pattern over time for a user that provided the natural language utterance;

generating a personalized cognitive model for the user based on the interaction pattern tracked for the user; and

using the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

30. The method of claim 26, further comprising tracking interaction patterns over time for a plurality of users.

31. The method of claim 30, further comprising generating a generalized cognitive model for the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns.

32. The method of claim 31, further comprising using the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

33. The method of claim 26, further comprising generating an environmental model that includes information associated with at least one of environmental conditions or surroundings associated with a user that provided the natural language utterance.

34. The method of claim 33, wherein the environmental conditions or surroundings include one or more of a global position of the user, movement information associated with the user, quiet or noisy conditions associated with an environment of the user, or a vicinity to one or more voice-enabled devices.

35. The method of claim 33, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

36. The method of claim 26, further comprising determining a most likely context for the natural language utterance using a knowledge-enhanced speech recognition engine, wherein determining the most likely context further includes:

comparing one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

providing a relevance score for each of identified matching contexts;

selecting the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the generated request is associated with the selected context;

communicating the request to the domain agent associated with the selected context; and

generating a response to the natural language utterance using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

37. The method of claim 36, wherein the response includes an aggregation of the content gathered as a result of the domain agent processing the request.

38. The method of claim 36, further comprising formatting the response using a personality module.

39. The method of claim 36, wherein the knowledge-enhanced speech recognition engine further compares the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

40. The method of claim 36, wherein the knowledge-enhanced speech recognition engine further applies prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

41. The method of claim 26, further comprising receiving one or more follow-up multimodal inputs at the multimodal device.

42. The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to a user providing a subsequent request to stop the request being processed by the domain agent.

43. The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to a user repeating the natural language utterance.

44. The method of claim 26, further comprising:

receiving a non-speech input relating to the natural language utterance at the multimodal device;

transcribing the non-speech input to create a non-speech-based transcription; and

merging the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance from the merged transcription.

ABSTRACT

A system and method are provided for receiving speech and/or non-speech communications of natural language questions and/or commands and executing the questions and/or commands. The invention provides a conversational human-machine interface that includes a conversational speech analyzer, a general cognitive model, an environmental model, and a personalized cognitive model to determine context, domain knowledge, and invoke prior information to interpret a spoken utterance or a received non-spoken message. The system and method creates, stores, and uses extensive personal profile information for each user, thereby improving the reliability of determining the context of the speech or non-speech communication and presenting the expected results for a particular question or command.

FIGURE 1

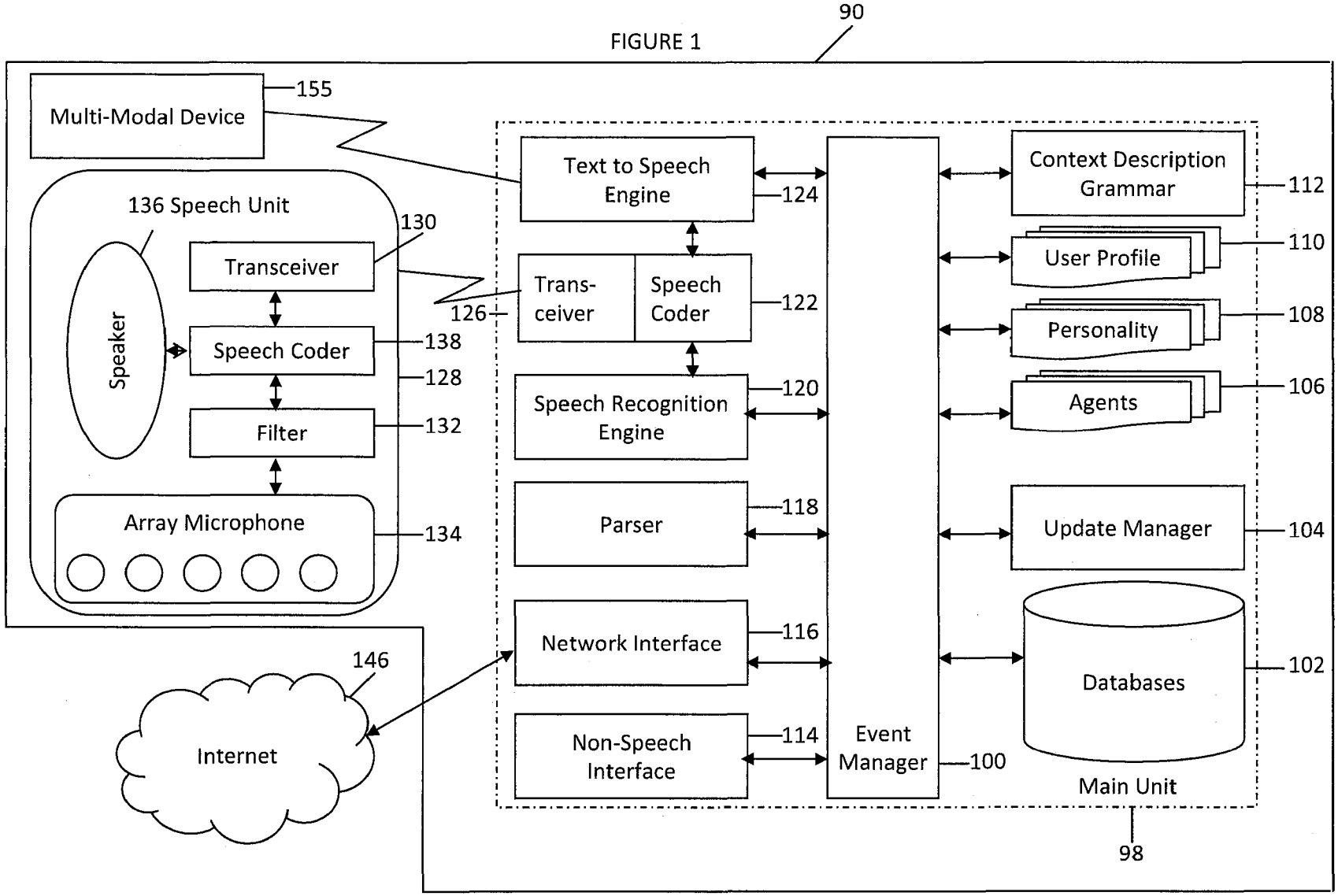

90
Multi-Modal Device
155
136 Speech Unit
130
Transceiver
Speaker
Speech Coder
138
128
Filter
132
Array Microphone
134
146
Internet
Text to Speech Engine
124
Trans-ceiver
126
Speech Coder
122
Speech Recognition Engine
120
Parser
118
Network Interface
116
Non-Speech Interface
114
Event Manager
100
Context Description Grammar
112
User Profile
110
Personality
108
Agents
106
Update Manager
104
Databases
102
Main Unit
98

FIGURE 2

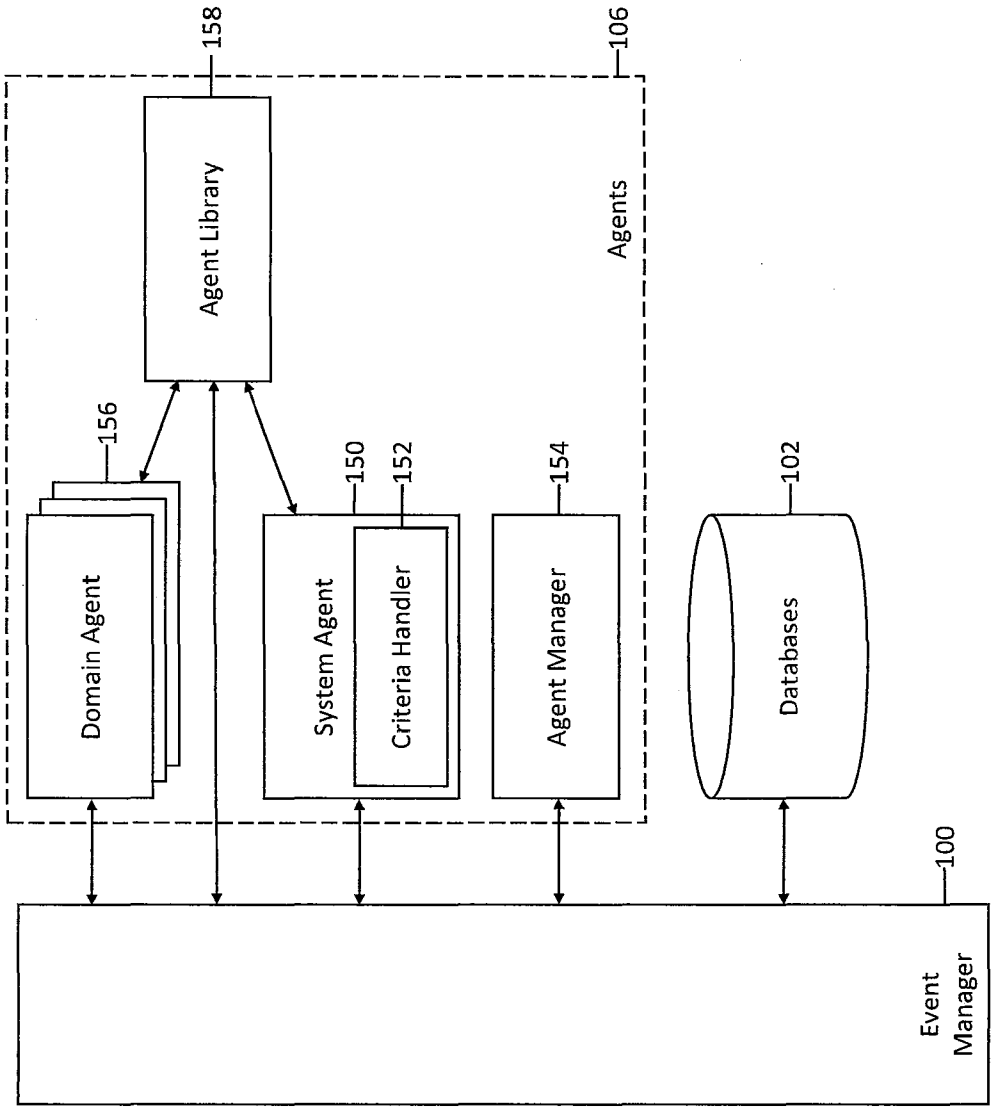

158
106
Agent Library
Agents
156
Domain Agent
150
152
System Agent
Criteria Handler
154
Agent Manager
102
Databases
100
Event Manager

FIGURE 3

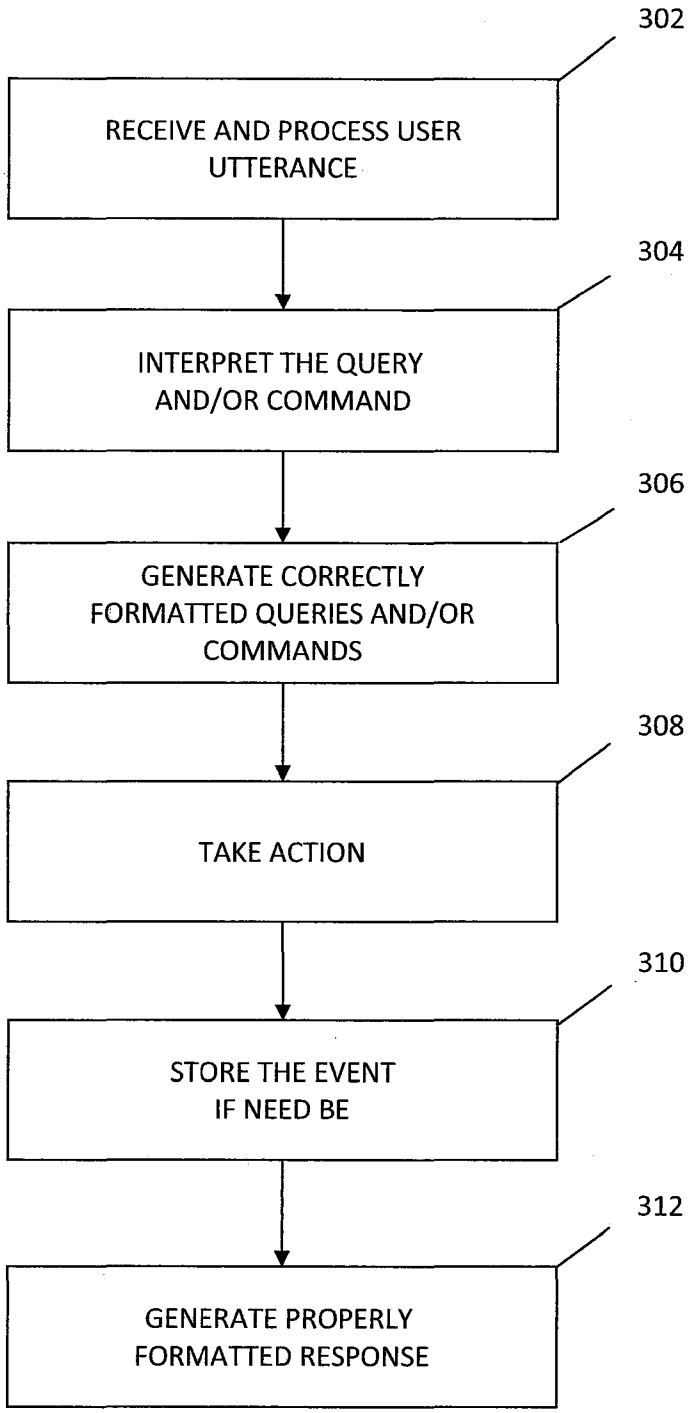

300
302
RECEIVE AND PROCESS USER UTTERANCE
304
INTERPRET THE QUERY AND/OR COMMAND
306
GENERATE CORRECTLY FORMATTED QUERIES AND/OR COMMANDS
308
TAKE ACTION
310
STORE THE EVENT IF NEED BE
312
GENERATE PROPERLY FORMATTED RESPONSE

FIGURE 4A

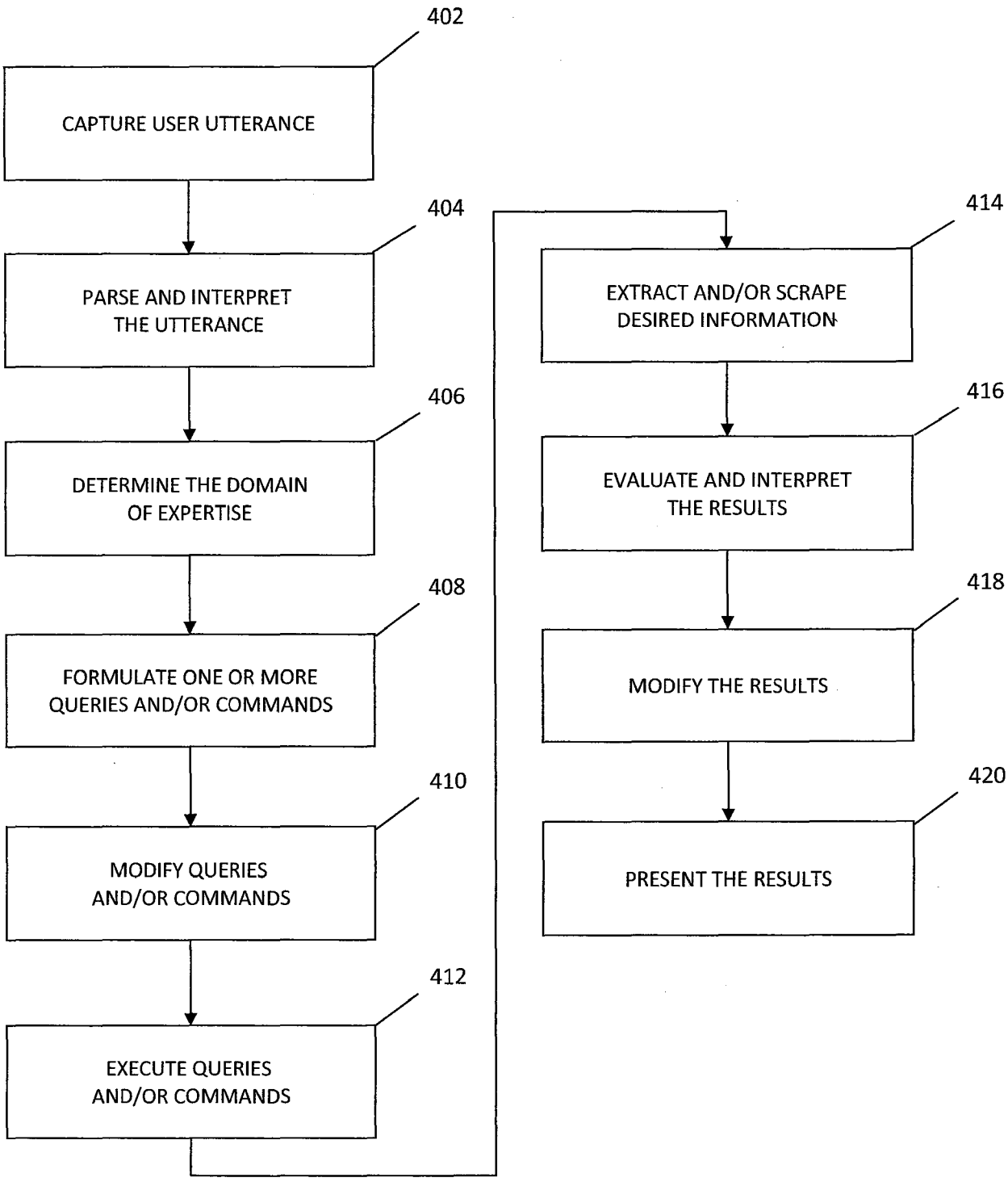

400
402
CAPTURE USER UTTERANCE
404
PARSE AND INTERPRET THE UTTERANCE
406
DETERMINE THE DOMAIN OF EXPERTISE
408
FORMULATE ONE OR MORE QUERIES AND/OR COMMANDS
410
MODIFY QUERIES AND/OR COMMANDS
412
EXECUTE QUERIES AND/OR COMMANDS
414
EXTRACT AND/OR SCRAPE DESIRED INFORMATION
416
EVALUATE AND INTERPRET THE RESULTS
418
MODIFY THE RESULTS
420
PRESENT THE RESULTS

FIGURE 4B

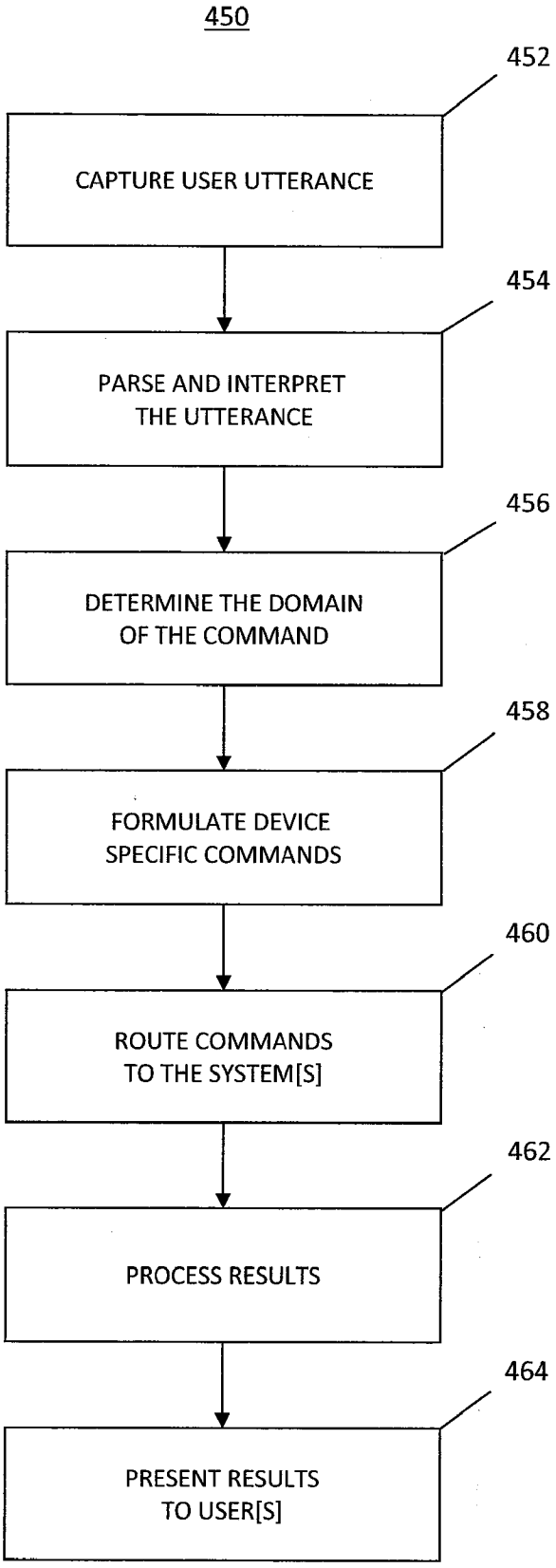

450
452
CAPTURE USER UTTERANCE
454
PARSE AND INTERPRET THE UTTERANCE
456
DETERMINE THE DOMAIN OF THE COMMAND
458
FORMULATE DEVICE SPECIFIC COMMANDS
460
ROUTE COMMANDS TO THE SYSTEM[S]
462
PROCESS RESULTS
464
PRESENT RESULTS TO USER[S]

FIGURE 5

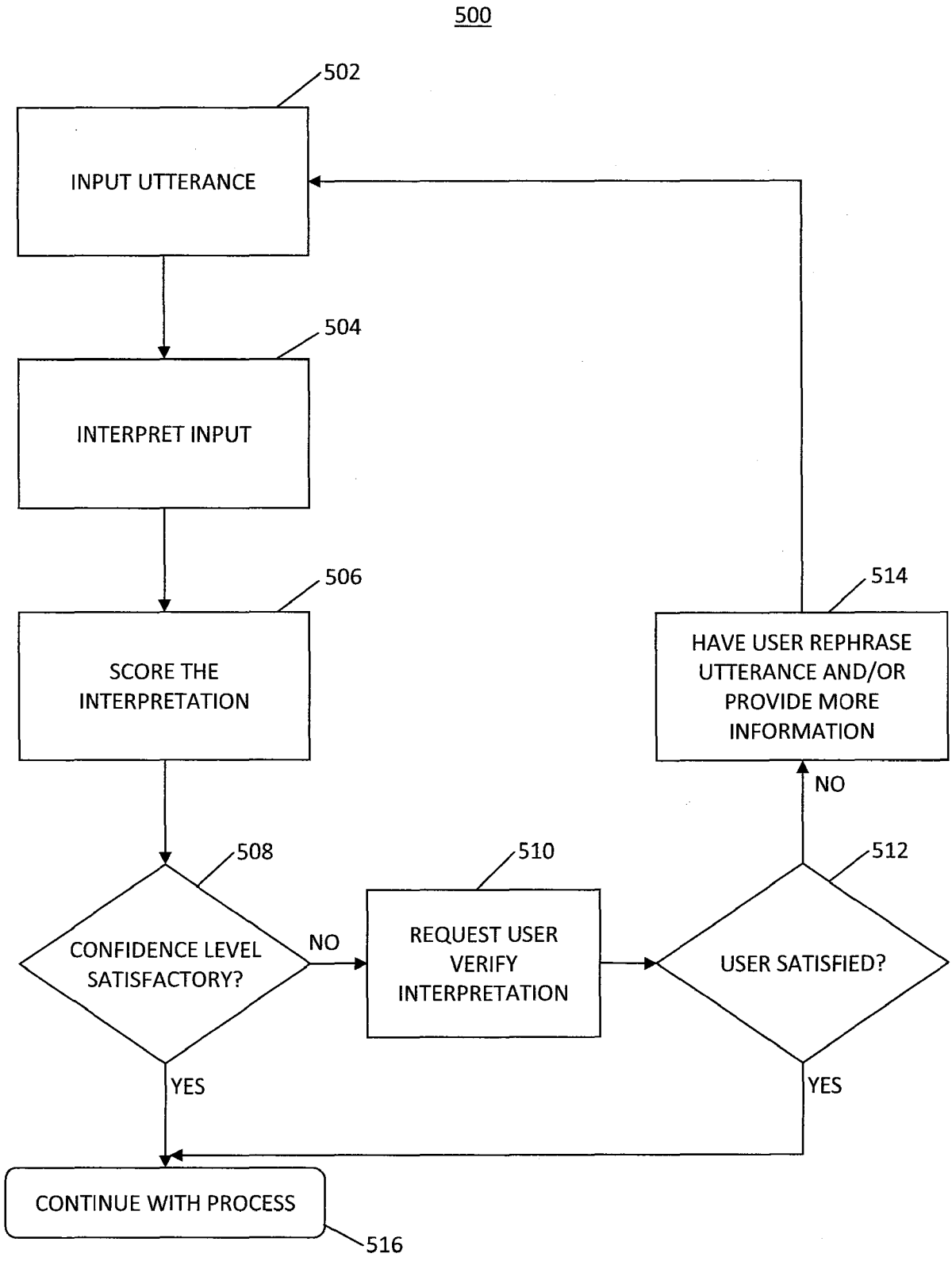

500
502
INPUT UTTERANCE
504
INTERPRET INPUT
506
SCORE THE INTERPRETATION
508
CONFIDENCE LEVEL SATISFACTORY?
NO
YES
510
REQUEST USER VERIFY INTERPRETATION
512
USER SATISFIED?
NO
YES
514
HAVE USER REPHRASE UTTERANCE AND/OR PROVIDE MORE INFORMATION
516
CONTINUE WITH PROCESS

FIGURE 6

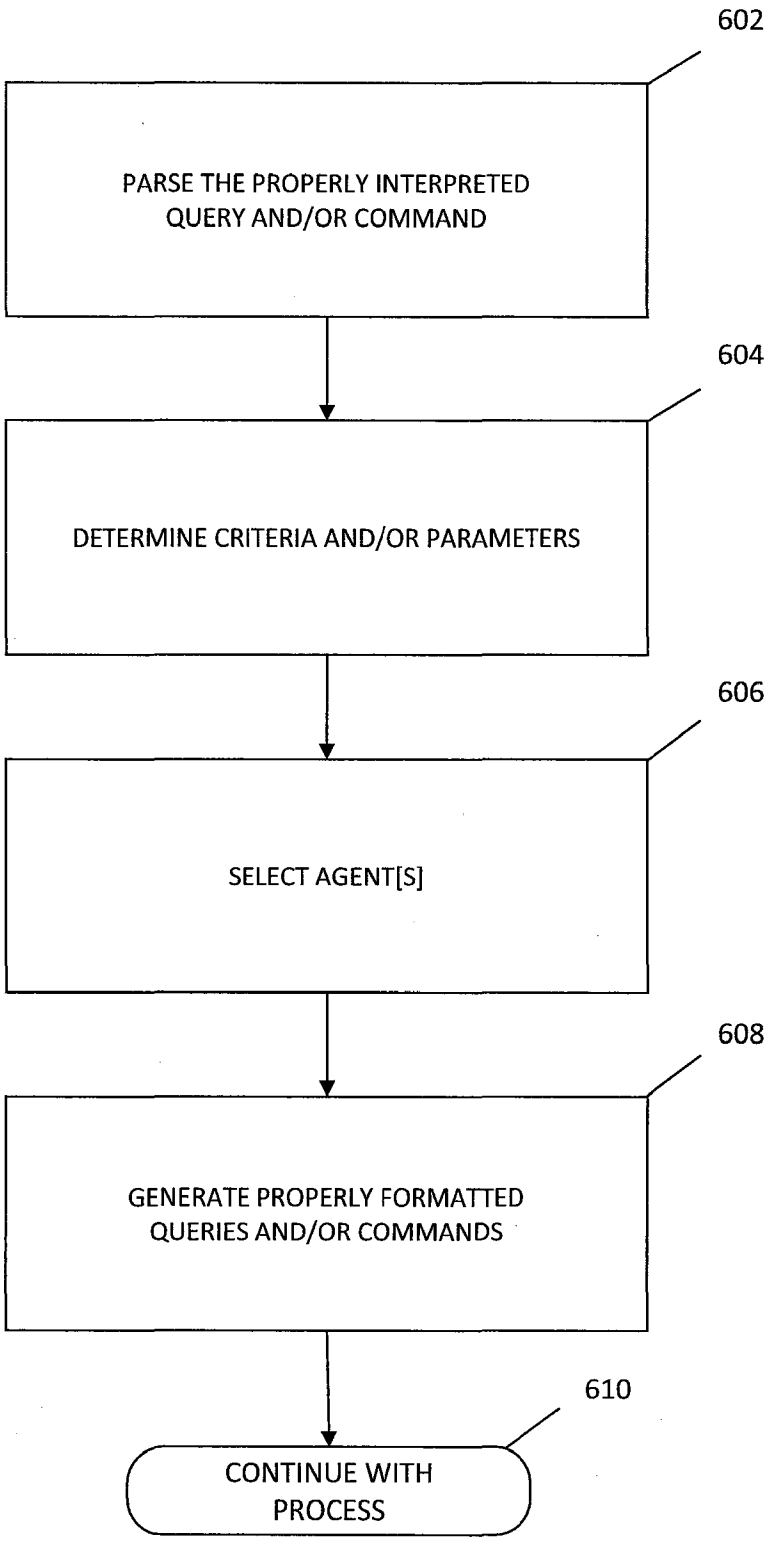
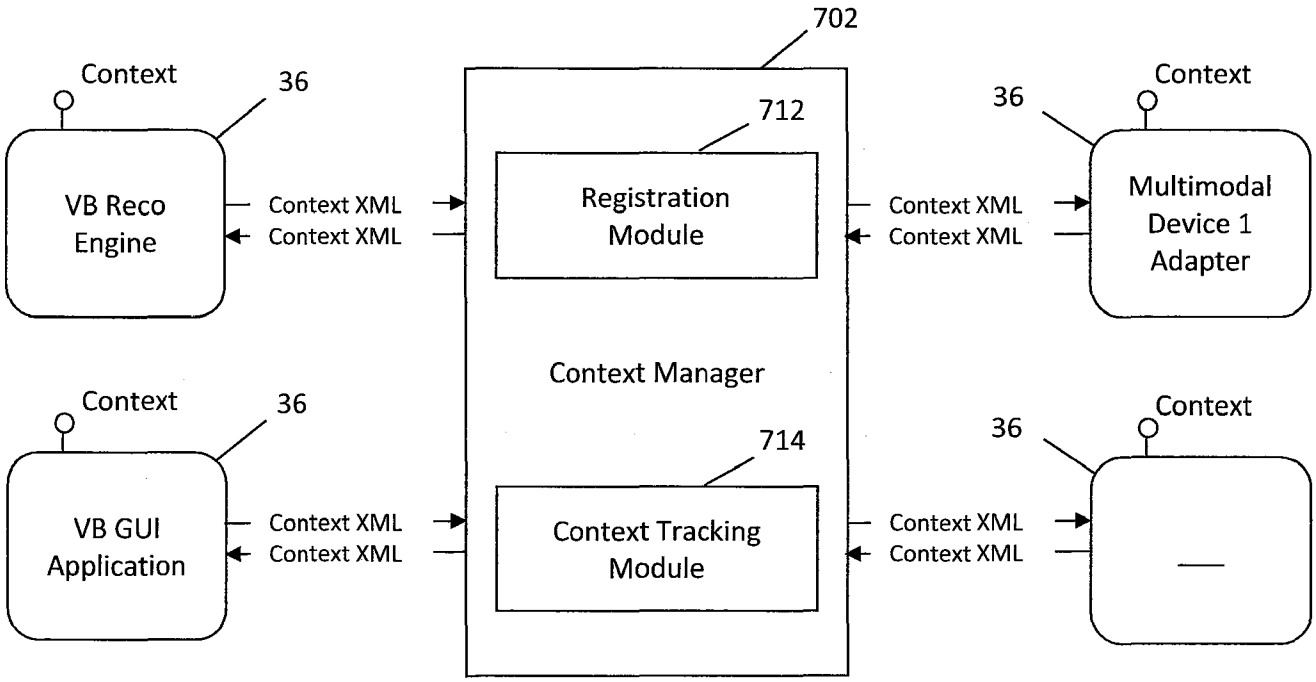

600
602
PARSE THE PROPERLY INTERPRETED QUERY AND/OR COMMAND
604
DETERMINE CRITERIA AND/OR PARAMETERS
606
SELECT AGENT[S]
608
GENERATE PROPERLY FORMATTED QUERIES AND/OR COMMANDS
610
CONTINUE WITH PROCESS

FIGURE 7

700


702
Context
36
712
Registration Module
Context
36
VB Reco Engine
Context XML
Context XML
Context XML
Context XML
Multimodal Device 1 Adapter
Context Manager
Context
36
714
Context
36
VB GUI Application
Context XML
Context XML
Context Tracking Module
Context XML
Context XML
—

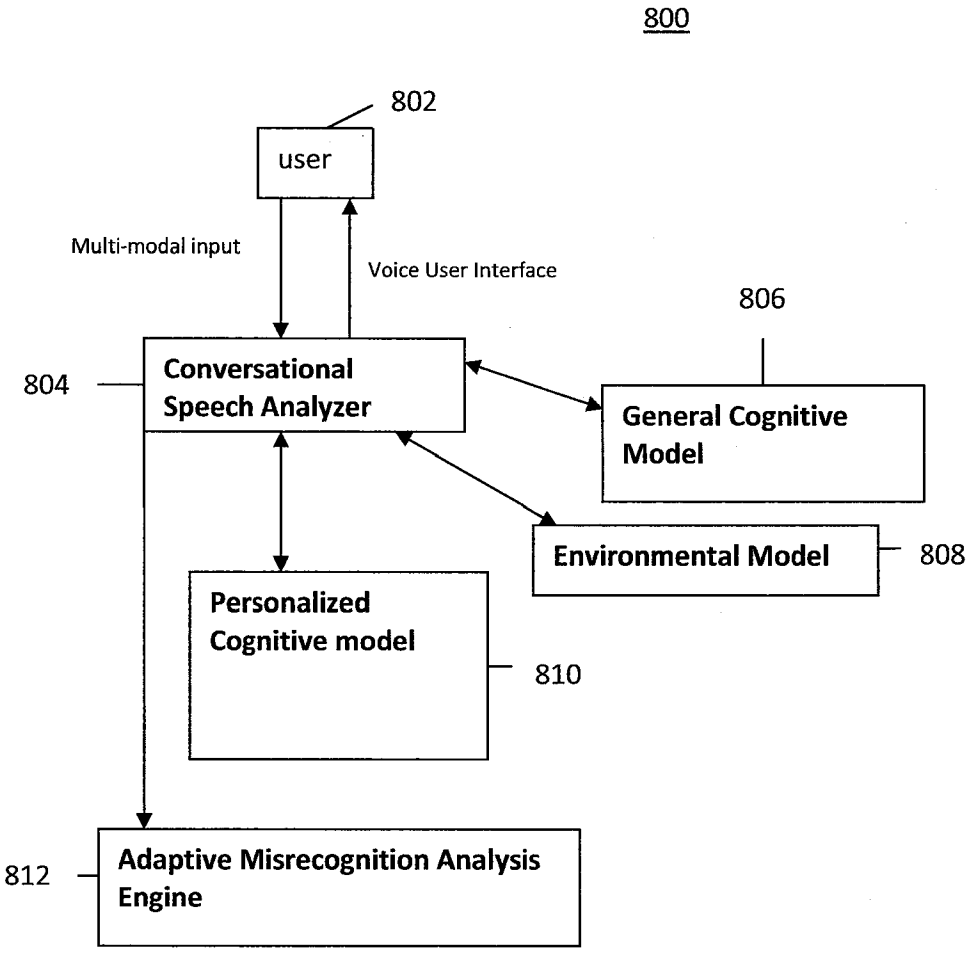

800
802
user
Multi-modal input
Voice User Interface
806
804
Conversational Speech Analyzer
General Cognitive Model
Environmental Model
808
Personalized Cognitive model
810
812
Adaptive Misrecognition Analysis Engine

FIGURE 8

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe Di Cristo
Filer:	Syed Jafar Ali/Miriam E. Nelsen
Attorney Docket Number:	090611-0391838

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	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Claims in excess of 20	2202	24	26	624
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1086**

Electronic Acknowledgement Receipt

EFS ID:	9392101
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe Di Cristo
Customer Number:	00909
Filer:	Syed Jafar Ali/Miriam E. Nelsen
Filer Authorized By:	Syed Jafar Ali
Attorney Docket Number:	090611-0391838
Receipt Date:	07-FEB-2011
Filing Date:	
Time Stamp:	17:40:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1086
RAM confirmation Number	4640
Deposit Account	033975
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		090611-0391838_ApplicationPapers.pdf	934208 af300b5af9ca427a3273e94f18ecc7a7aa249c62	yes	20

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal of New Application	1	1
Application Data Sheet	2	3
Oath or Declaration filed	4	5
Transmittal Letter	6	7
Information Disclosure Statement (IDS) Filed (SB/08)	8	20

Warnings:

Information:

2		090611-0391838_Specification.pdf	2850937 2f3d1c5c85bebc4f57965a1ec12996498511731b	yes	60

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	50
Claims	51	59
Abstract	60	60

Warnings:

Information:

3	Drawings-only black and white line drawings	090611-0391838_Drawings.pdf	107800 57d8ec248a82761e4ed6b3c151fb3bcc0ad50154	no	9

Warnings:

Information:

4	Fee Worksheet (PTO-875)	fee-info.pdf	36798 b39298bbd551b8a00142317d7965a3b384080491	no	2

Warnings:

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Total Files Size (in bytes):	3929743

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New International Application Filed with the USPTO as a Receiving Office
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/022,370

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)	SMALL ENTITY		OR	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	82		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	44 minus 20 =	* 24	x 26 =	624	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	x 110 =	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 $270 ($135 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			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1086		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT A	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))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	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))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	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 found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/022,370	02/07/2011	2626	1086	090611-0391838	44	2

CONFIRMATION NO. 6569

909
PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

FILING RECEIPT

OC000000046035655

Date Mailed: 02/22/2011

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)

Philippe Di Cristo, Bellevue, WA;
Chris Weider, Everett, WA;
Robert A. Kennewick, Seattle, WA;

Assignment For Published Patent Application

VoiceBox Technologies, Inc., Kirkland, WA

Power of Attorney:

James Gatto--32694
Rick Toering--43195
Bradford Blaise--47429
Sean Ingram--48283

Domestic Priority data as claimed by applicant

This application is a CON of 12/571,795 10/01/2009
which is a CON of 11/200,164 08/10/2005 PAT 7,620,549

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.)

If Required, Foreign Filing License Granted: 02/15/2011
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/022,370**
Projected Publication Date: 06/02/2011
Non-Publication Request: No
Early Publication Request: No

**** SMALL ENTITY ****

Title

SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

Preliminary Class

704

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838

CONFIRMATION NO. 6569

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PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

PUBLICATION NOTICE

OC00000048002542

Title:SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

Publication No.US-2011-0131036-A1
Publication Date:06/02/2011

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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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

909 7590 06/20/2012

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER	
SKED, MATTHEW J	

ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
06/20/2012	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):

docket_ip@pillsburylaw.com
margaret.drosos@pillsburylaw.com

Office Action Summary	Application No.	Applicant(s)	
	13/022,370	DICRISTO ET AL.	
	Examiner	Art Unit	
	MATTHEW SKED	2626	

-- 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) *1-44* 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) *1-44* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

11)☒ The drawing(s) filed on *07 February 2011* 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).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ 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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-44 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of U.S. Patent No. 7,620,549. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-44 in the instant application are generic to all that is recited in each of claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of the patent. That is, claims 1-44 are anticipated by claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of the patent.

3. Claims 1-44 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of copending Application No. 12/571,795. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-44 in the instant application are generic to all that is recited in each of claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of the copending application. That is, claims 1-44 are anticipated by claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. The claim chart illustrating the corresponding claims is below:

13/022,370	12/571,795	7,620,549

1	4	1 & 29
2	4	5
3	13	5
4	4	6
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19	22	24
20	23	1
21	24	2

22	25	3
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26	32	4 & 30
27	32	30
28	41	30
29	32	31
30	34	34
31	35	35
32	36	36
33	38	38
34	39	39
35	40	40
36	42	41
37	43	42
38	44	43
39	45	44
40	46	45
41	47	1
42	48	47

43	49	48
44	50	49

Claim Rejections - 35 USC § 103

5. The following is a quotation of 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 negatived by the manner in which the invention was made.

6. Claims 1, 2, 5, 8-22, 25-27, 30, 33-41 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman et al. (U.S. Pat. 7,137,126) in view of Kupiec (U.S. Pat. 5,500,920), both cited by the Applicant.

As per claims 1 and 26, Coffman teaches a system and method for processing natural language utterances, comprising:

a multimodal device configured to receive a natural language utterance (multi-modal input with speech and keyboard input, Fig. 6, elements 600 and 601);

a speech recognition engine configured to recognize one or more words from-the natural language utterance (speech recognizer, Fig. 6, element 604);

a parser configured to generate an interpretation of the natural language utterance from the one or more recognized words, and further configured to generate a request based on the interpretation of the natural language utterance (NLU processing, col. 27, line 65 to col. 28, line 38 and Fig. 6, element 605); and

a domain agent configured to process the generated request (conversational virtual machine (CVM) , col. 27, line 65 to col. 28, line 38 and Fig. 6, element 401).

Coffman teaches monitoring backend accesses and determining if the query is complete, incomplete, incorrect or ambiguous (col. 27, line 65 to col. 28, line 38) but does not teach an adaptive misrecognition engine configured to: monitor one or more actions associated with the domain agent processing the request; and determine whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions.

Kupiec teaches a speech recognition system which monitors one or more actions associated with an agent processing the request; and determines whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions (the correct hypothesis is judged to be correct based upon the returned results from the query constructor and information retrieval, col. 11, line 10, to col. 12, line 33).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman wherein the adaptive misrecognition engine monitors one or more actions associated with an agent processing the request; and determines whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions as taught by Kupiec because it is more efficient to use the results of the agent processing then to calculate further statistics of the recognizer.

7. As per claims 2 and 27, Coffman teaches wherein the adaptive misrecognition engine is further configured to generate an unrecognized event if the interpretation of the natural language utterance is determined to be incorrect (determines if the query is complete, incomplete, incorrect or ambiguous, col. 27, line 65 to col. 28, line 38).

8. As per claims 5 and 30, Coffman teaches the analyzer is configured to track interaction patterns with the system over time for a plurality of users (different user preferences for each user, col. 36, lines 4-26).

9. As per claims 8 and 33, Coffman further discloses that the environmental model includes information associated with user environmental conditions or surroundings (context stack comprises information of current application, col. 16, lines 18-33).

10. As per claims 9 and 34, Coffman further discloses that the user environmental conditions include (i) a user global position (position, col. 42, lines 33-39).

11. As per claims 10 and 35, Coffman further discloses that the environmental model provides (i) context (col. 16, lines 18-33).

12. As per claims 11 and 36, Coffman teaches a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:

identify, one or more contexts a search module that completely, or partially, match one or more searches the query, for text combinations, wherein identifying the one or more contexts includes comparing a comparison module that compares the text combinations against one or more grammar expression entries in a context description

grammar (complete queries are compared to a context stack 405 at the level of the natural language processing (NLU, i.e. grammar), column 31, lines 23-30);

provide a relevance score for each of identified matching contexts (queries are compared to the context stack and assigned a likelihood score, column 30, lines 10-35); and

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the generated request is associated with the selected context (task dispatcher 402 directs input streams to the appropriate application or device, column 30, lines 36-50 and column 41, lines 35-40); and

a response generating module configured to:

communicate that communicates with the request to the domain agent associated with the selected context; and generate a response to the natural language utterance using domain agents to content gathered as a result of by the-domain agent processing agents and that generates a response from the request, wherein the response arranges the content in an order based on the relevance scores results from for the identified matching contexts (output streams of multiple tasks at multiple applications and devices are prioritized based on the priorities assigned by the task dispatcher 402, column 29, lines 14-23 and lines 34-39).

13. As per claims 12 and 37, Coffman further discloses that the response generating module generates an aggregate response (output is aggregated by priorities assigned by task dispatcher, col. 29, lines 34-39).

14. As per claims 13 and 38, Coffman teaches a personality module configured to format the response (conversational facilities with multiple personalities, column 13, lines 58-67).

15. As per claims 14 and 39, Coffman teaches wherein the knowledge-enhanced speech recognition engine identifying one or more contexts further includes comparing the text combinations against a context stack that stores one or more expected contexts (queries are compared to the context stack and assigned a likelihood score, column 30, lines 10-35).

16. As per claims 15 and 40, Coffman teaches wherein the knowledge-enhanced speech recognition identifying the one or more contexts further includes applying prior probabilities (likelihoods, column 30, lines 10-35) or fuzzy possibilities to at least one of keyword matching, user profiles, a dialog history (the context stack includes a past history of discourses, column 22, lines 20-28).

17. As per claim 16, Coffman teaches wherein the domain agent is further configured to direct a query to a local information source to process the request (backend application, Fig. 6, element 608).

18. As per claim 17, Kupiec teaches wherein the domain agent is further configured to evaluate a plurality of responses to the query to process the request (retrieved documents, col. 12, lines 1-14).

19. As per claim 18, Coffman teaches wherein the domain agent is further configured to direct a command to a local device to process the request (backend application, Fig. 6, element 608).

20. As per claim 19, Coffman teaches the terminal device includes at least one of a personal digital assistant (Fig. 7, PDA 709), a cellular telephone (phone 711), a portable computer (laptop 708), a desktop computer (workstation 708), (i.e. all devices of Fig. 7, column 41, lines 14-17).

21. As per claims 20 and 41, Coffman teaches wherein the multimodal device is further configured to subsequently receive one or more follow-up multimodal inputs (incomplete commands cause a mixed initiative completion or correction process, speech based or non-speech based, column 31, lines 50-67).

22. As per claim 21, Coffman discloses wherein the speech recognition engine is further configured to recognize one or more words from a natural language utterance provided in the follow-up multimodal input and wherein the parser is further configured to generate an interpretation of the follow-up multimodal input from the one or more words recognized from the natural language utterance provided in the follow-up multimodal input (mixed initiative allows a user to complete, modify or correct via a dialog with the system, col. 8, lines 21-63).

23. As per claim 22, Coffman discloses the follow-up multimodal input includes a follow-up request associated with a same context as the request being processed by the domain agent (during completion or correction of the original query, the previous context stack status is restored, column 31, lines 50-67).

24. As per claims 25 and 49, Coffman teaches wherein the multimodal device is further configured to receive a non-speech input relating to the natural language

utterance (multi-modal input with keyboard input, Fig. 6, element 601); and wherein the system further comprises:

a transcription module that transcribes the non-speech communications to create a non-speech-based transcription (both speech and non-speech are converted to ASCII text, col. 27, line 65 to col. 28, line 57); and

a merging module that merges the recognized words and the non-speech-based transcription to generate a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance from the merged transcription (transcripts are merged, col. 28, lines 39-57).

25. Claims 3 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec and taken in further view of Anderson et al. (U.S. Pat. 7,203,644), cited by the Applicant.

Coffman and Kupiec do not teach an analyzer configured to analyze the unrecognized event to determine how the natural language utterance was incorrectly interpreted; and determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

Anderson teaches a speech recognition system for interacting with a speech application that uses feedback of the recognition results in order to adapt the grammar filed used by the recognition engine (col. 2, line 61 to col. 4, line 12).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Coffman and Kupiec to include an analyzer configured to analyze the unrecognized event to determine how the natural language utterance was incorrectly interpreted; and determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request as taught by Anderson because it would improve subsequent recognition results.

26. Claims 4, 6, 7, 29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec and taken in further view of Ramaswamy et al. (U.S. Pat. 6,622,119).

As per claims 4 and 29, Coffman teaches an analyzer configured to track an interaction pattern with the system over time for a user that provided the natural language utterance and generate a personalized cognitive model for the user based on the interaction pattern tracked for the user (user history is logged and used to tailor the prompts to the user, col. 15, line 50 to col. 16, line 17).

Coffman and Kupiec do not specifically teach using the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

Ramaswamy teaches a multi-modal dialog system using both speech recognition and natural language processing which includes a command predictor that uses a

cognitive model to predict a user's next command (abstract, col. 4, lines 1-58, Fig. 1 and Fig. 2, element 204).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman and Kupiec to use the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request because, as taught by Ramaswamy, it would improve the accuracy of the natural language processing (col. 1, lines 23-33).

27. As per claims 6 and 31, Coffman teaches wherein the analyzer is further configured to generate a generalized cognitive model for the plurality of users based on the interaction patterns tracked for the plurality of users (history is logged and used to tailor the prompts wherein user information is optional, col. 15, line 50 to col. 16, line 17).

Coffman and Kupiec do not teach the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns.

Ramaswamy teaches the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns (prediction model calculated from conditional probabilities, col. 5, line 13 to col. 6, line 47).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman so teaches the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns as taught by Ramaswamy because basing the model in statistics would create a more robust model that can better handle changes in behavior.

28. As per claims 7 and 32, Coffman and Kupiec do not specifically teach using the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

Ramaswamy teaches a multi-modal dialog system using both speech recognition and natural language processing which includes a command predictor that uses a cognitive model to predict a user's next command (abstract, col. 4, lines 1-58, Fig. 1 and Fig. 2, element 204).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman and Kupiec to use the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request because, as taught by Ramaswamy, it would improve the accuracy of the natural language processing (col. 1, lines 23-33).

29. Claims 23, 24, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec and taken in further view of Houser et al. (U.S. Pat. 5,774,859).

Coffman and Kupiec do not teach the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect if a user provides a subsequent request to stop the request being processed (repeat the utterance) by the domain agent.

Houser teaches a speech recognition system wherein the system assumes a misrecognition of a first utterance when the user repeats the utterance twice (col. 19, lines 27-60).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman and Kupiec to determine an utterance is incorrect if the user provides a subsequent request to stop the request being processed as taught by Houser because it would allow the system to react to the user who can better judge the correctness of the recognition.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW SKED whose telephone number is (571)272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pierre-Louis Desir can be reached on (571) 272-7799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. 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.

/Matthew J Sked/
Primary Examiner, Art Unit 2626

Notice of References Cited	Application/Control No. 13/022,370	Applicant(s)/Patent Under Reexamination DICRISTO ET AL.	
	Examiner MATTHEW SKED	Art Unit 2626	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,729,920	06-2010	Chaar 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)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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BIB DATA SHEET

CONFIRMATION NO. 6569

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/022,370	02/07/2011	704	2626	090611-0391838

APPLICANTS

Philippe DiCristo, Bellevue, WA;
Chris Weider, Everett, WA;
Robert A. Kennewick, Seattle, WA;

**** CONTINUING DATA ***************************

This application is a CON of 12/571,795 10/01/2009
which is a CON of 11/200,164 08/10/2005 PAT 7,620,549

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
02/15/2011

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /MATTHEW J SKED/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		WA	9	44	2

ADDRESS

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102
UNITED STATES

TITLE

SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

FILING FEE RECEIVED		
1086	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

BIB (Rev. 05/07).

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	Unassigned
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	Herewith (February 7, 2011)	Unassigned

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
/M.S./	1A	4,430,669	02/07/1984	Cheung	358	122	
	1B	5,155,743	10/13/1992	Jacobs	375	28	
	1C	5,274,560	12/28/1993	LaRue	364	444	
	1D	5,377,350	12/27/1994	Skinner	395	600	
	1E	5,386,556	01/31/1995	Hedin et al.	395	600	
	1F	5,424,947	06/13/1995	Nagao et al.	364	419.08	
	1G	5,471,318	11/28/1995	Ahuja et al.	358	400	
	1H	5,475,733	12/12/1995	Eisdorfer et al.	379	52	
	1I	5,488,652	01/30/1996	Bielby *et al.*	379	88	
	1J	5,499,289	03/12/1996	Bruno et al.	379	220	
	1K	5,500,920	03/19/1996	Kupiec	395	2.79	
	1L	5,517,560	05/14/1996	Greenspan	379	114	
	1M	5,533,108	07/02/1996	Harris et al.	379	201	
	1N	5,537,436	07/16/1996	Bottoms et al.	375	222	
	1O	5,539,744	07/23/1996	Chu et al.	370	60	
	1P	5,557,667	09/17/1996	Bruno et al.	379	201	
	1Q	5,563,937	10/08/1996	Bruno et al.	379	201	
	1R	5,590,039	12/31/1996	Ikeda et al.	395	759	
	1S	5,617,407	04/01/1997	Bareis	369	275.3	
	1T	5,633,922	05/27/1997	August et al.	379	220	
	1U	5,675,629	10/07/1997	Raffel et al.	379	58	
	1V	5,696,965	12/09/1997	Dedrick	395	610	
	1W	5,708,422	01/13/1998	Blonder et al.	340	825.34	

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	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO
/M.S./	1X	WO 99/46763	09/16/1999	International				
	1Y	WO 00/21232	04/13/2000	International				
	1Z	WO 00/46792	08/10/2000	International				
	1AA	WO 01/78065	10/18/2001	International				
	1BB	WO 2004/072954	08/26/2001	International				

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/M.S./	1CC	REUTERS, "IBM to Enable Honda Drivers to Talk to Cars", Charles Schwab & Co., Inc., July 28, 2002, 1 page.
/M.S./	1DD	LIN, Bor-shen, *et al.*, "A Distributed Architecture for Cooperative Spoken Dialogue Agents with Coherent Dialogue State and History", ASRU'99, 1999, 4 pages.

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*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
/M.S./	2A	5,721,938	02/24/1998	Stuckey	395	754	
	2B	5,722,084	02/24/1998	Chakrin et al.	455	551	
	2C	5,742,763	04/21/1998	Jones	395	200.3	
	2D	5,748,841	05/05/1998	Morin *et al.*	395	2.66	
	2E	5,752,052	05/12/1998	Richardson et al.	395	759	
	2F	5,754,784	05/19/1998	Garland et al.	395	200.49	
	2G	5,761,631	06/02/1998	Nasukawa	704	9	
	2H	5,774,859	06/30/1998	Houser *et al.*	704	275	
	2I	5,794,050	08/11/1998	Dahlgren et al.	395	708	
	2J	5,794,196	08/11/1998	Yegnanarayanan *et al.*	704	255	
	2K	5,797,112	08/18/1998	Komatsu *et al.*	701	201	
	2L	5,799,276	08/25/1998	Komissarchik *et al.*	704	251	
	2M	5,802,510	09/01/1998	Jones	707	2	
	2N	5,832,221	11/03/1998	Jones	375	200.36	
	2O	5,867,817	02/02/1999	Catallo *et al.*	704	255	
	2P	5,878,385	03/02/1999	Bralich *et al.*	704	9	
	2Q	5,878,386	03/02/1999	Coughlin	704	10	
	2R	5,892,813	04/06/1999	Morin *et al.*	379	88.01	
	2S	5,895,464	04/20/1999	Bhandari *et al.*	707	3	
	2T	5,895,466	04/20/1999	Goldberg et al.	707	5	
	2U	5,902,347	05/11/1999	Backman *et al.*	701	200	
	2V	5,911,120	06/08/1999	Jarett et al.	455	417	
	2W	5,918,222	06/29/1999	Fukui *et al.*	707	1	

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	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO
/M.S./	2X	WO 2007/019318	02/15/2007	International				
	2Y	WO 2007/021587	02/22/2007	International				
	2Z	WO 2007/027546	03/08/2007	International				
	2AA	WO 2007/027989	03/08/2007	International				
	2BB	WO 2008/098039	08/14/2008	International				

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/M.S./	2CC	KUHN, Thomas, *et al.*, "Hybrid In-Car Speech Recognition for Mobile Multimedia Applications", Vehicular Technology Conference, IEEE, July 1999, pages 2009-2013.
/M.S./	2DD	BELVIN, Robert, *et al.*, "Development of the HRL Route Navigation Dialogue System", Proceedings of the First International Conference on Human Language Technology Research, San Diego, 2001, pages 1-5.

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*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
/M.S./	3A	5,926,784	07/20/1999	Richardson et al.	704	9	
	3B	5,933,822	08/03/1999	Braden-Harder et al.	707	5	
	3C	5,953,393	09/14/1999	Culbreth et al.	379	88.25	
	3D	5,963,894	10/05/1999	Richardson et al.	704	9	
	3E	5,963,940	10/05/1999	Liddy et al.	707	5	
	3F	5,987,404	11/16/1999	Della Pietra et al.	704	9	
	3G	5,991,721	11/23/1999	Asano et al.	704	257	
	3H	5,995,119	11/30/1999	Cosatto et al.	345	473	
	3I	6,009,382	12/28/1999	Martino et al.	704	1	
	3J	6,014,559	01/11/2000	Amin	455	413	
	3K	6,021,384	02/01/2000	Gorin et al.	704	1	
	3L	6,044,347	03/28/2000	Abella et al.	704	272	
	3M	6,049,602	04/11/2000	Foladare et al.	379	265	
	3N	6,058,187	05/02/2000	Chen	380	21	
	3O	6,078,886	06/20/2000	Dragosh et al.	704	270	
	3P	6,081,774	06/27/2000	De Hita et al.	704	9	
	3Q	6,101,241	08/08/2000	Boyce et al.	379	88.01	
	3R	6,119,087	09/12/2000	Kuhn et al.	704	270	
	3S	6,134,235	10/17/2000	Goldman et al.	370	352	
	3T	6,144,667	11/07/2000	Doshi et al.	370	401	
	3U	6,144,938	11/07/2000	Surace *et al.*	704	257	
	3V	6,154,526	11/28/2000	Dahlke *et al.*	379	88.03	
	3W	6,160,883	12/12/2000	Jackson et al.	379	230	

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	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO
/M.S./	3X	WO 2008/118195	10/02/2008	International				
	3Y	WO 2009/075912	06/18/2009	International				
	3Z	WO 2009/145796	12/03/2009	International				
	3AA	WO 2010/096752	08/26/2010	International				

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/M.S./	3BB	LIND, R., *et al.*, "The Network Vehicle—A Glimpse into the Future of Mobile Multi-Media", IEEE Aerosp. Electron. Systems Magazine, Volume 14, No. 9, September 1999, pages 27-32.
/M.S./	3CC	ZHAO, Yilin, "Telematics: Safe and Fun Driving", IEEE Intelligent Systems, Volume 17, Issue 1, 2002, pages 10-14.

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/M.S./	4A	6,173,279	01/09/2001	Levin et al.	707	5	
	4B	6,175,858	01/16/2001	Bulfer et al.	709	206	
	4C	6,185,535	02/06/2001	Hedin *et al.*	704	270	
	4D	6,192,110	02/20/2001	Abella et al.	379	88.01	
	4E	6,192,338	02/20/2001	Haszto et al.	704	257	
	4F	6,195,634	02/27/2001	Dudemaine *et al.*	704	231	
	4G	6,195,651	02/27/2001	Handel *et al.*	707	2	
	4H	6,208,972	03/27/2001	Grant *et al.*	704	275	
	4I	6,219,346	04/17/2001	Maxemchuk	370	338	
	4J	6,219,643	04/17/2001	Cohen et al.	704	257	
	4K	6,226,612	05/01/2001	Srenger *et al.*	704	256	
	4L	6,233,556	05/15/2001	Teunen et al.	704	250	
	4M	6,233,559	05/15/2001	Balakrishnan	704	275	
	4N	6,246,981	06/12/2001	Papineni et al.	704	235	
	4O	6,272,455	08/07/2001	Hoshen et al.	704	1	
	4P	6,288,319	09/11/2001	Catona	84	609	
	4Q	6,292,767	09/18/2001	Jackson et al.	704	1	
	4R	6,308,151	10/23/2001	Smith	704	235	
	4S	6,314,402	11/06/2001	Monaco et al.	704	275	
	4T	6,366,886	04/02/2002	Dragosh et al.	704	270.1	
	4U	6,374,214	04/16/2002	Friedland *et al.*	704	235	
	4V	6,381,535	04/30/2002	Durocher *et al.*	701	202	
	4W	6,385,596	05/07/2002	Wiser *et al.*	705	51	

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/M.S./	4Y	CHEYER *et al.*, "Multimodal Maps: An Agent-Based Approach", International Conference on Cooperative Multimodal Communication (CMC/95), May 24-26, 1995, pages 111-121.

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/M.S./	5A	6,385,646	05/07/2002	Brown et al.	709	217	
	5B	6,393,428	05/21/2002	Miller et al.	707	102	
	5C	6,404,878	06/11/2002	Jackson et al.	379	221.01	
	5D	6,408,272	06/18/2002	White *et al.*	704	270.1	
	5E	6,411,810	06/25/2002	Maxemchuk	455	453	
	5F	6,415,257	07/02/2002	Junqua *et al.*	704	275	
	5G	6,418,210	07/09/2002	Sayko	379	142.15	
	5H	6,420,975	07/16/2002	DeLine *et al.*	340	815.4	
	5I	6,430,285	08/06/2002	Bauer et al.	379	265.01	
	5J	6,430,531	08/06/2002	Polish	704	257	
	5K	6,434,523	08/13/2002	Monaco	704	257	
	5L	6,434,524	08/13/2002	Weber	704	257	
	5M	6,442,522	08/27/2002	Carberry et al.	704	257	
	5N	6,446,114	09/03/2002	Bulfer et al.	709	206	
	5O	6,453,153	09/17/2002	Bowker et al.	455	67.4	
	5P	6,453,292	09/17/2002	Ramaswamy et al.	704	235	
	5Q	6,456,711	09/24/2002	Cheung et al.	379	265.09	
	5R	6,466,654	10/15/2002	Cooper *et al.*	379	88.01	
	5S	6,466,899	10/15/2002	Yano *et al.*	704	1	
	5T	6,470,315	10/22/2002	Netsch *et al.*	704	256	
	5U	6,498,797	12/24/2002	Anerousis et al.	370	522	
	5V	6,499,013	12/24/2002	Weber	704	257	
	5W	6,501,833	12/31/2002	Phillips *et al.*	379	88.07	

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/M.S./	5Y	TURUNEN, "Adaptive Interaction Methods in Speech User Interfaces", Conference on Human Factors in Computing Systems, Seattle, Washington, 2001, pages 91-92.

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/M.S./	6A	6,501,834	12/31/2002	Milewski et al.	379	93.24	
	6B	6,513,006	01/28/2003	Howard *et al.*	704	257	
	6C	6,523,061	02/18/2003	Halverson et al.	709	202	
	6D	6,532,444	03/11/2003	Weber	704	257	
	6E	6,539,348	03/25/2003	Bond et al.	704	9	
	6F	6,553,372	04/22/2003	Brassell et al.	707	5	
	6G	6,556,970	04/29/2003	Sasaki *et al.*	704	257	
	6H	6,556,973	04/29/2003	Lewin	704	277	
	6I	6,560,576	05/06/2003	Cohen et al.	704	270	
	6J	6,567,778	05/20/2003	Chao Chang et al.	704	257	
	6K	6,567,797	05/20/2003	Schuetze *et al.*	707	2	
	6L	6,570,555	05/27/2003	Prevost *et al.*	345	156	
	6M	6,570,964	05/27/2003	Murveit et al.	379	67.1	
	6N	6,574,597	06/03/2003	Mohri *et al.*	704	251	
	6O	6,574,624	06/03/2003	Johnson et al.	707	5	
	6P	6,581,103	06/17/2003	Dengler	709	231	
	6Q	6,594,257	07/15/2003	Doshi et al.	370	352	
	6R	6,598,018	07/22/2003	Junqua	704	251	
	6S	6,604,075	08/05/2003	Brown *et al.*	704	270.1	
	6T	6,604,077	08/05/2003	Dragosh et al.	704	270.1	
	6U	6,611,692	08/26/2003	Raffel et al.	455	552	
	6V	6,614,773	09/02/2003	Maxemchuk	370	337	
	6W	6,615,172	09/02/2003	Bennett *et al.*	704	257	

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/M.S./	6X	MAO, Mark Z., "Automatic Training Set Segmentation for Multi-Pass Speech Recognition", Department of Electrical Engineering, Stanford University, CA, copyright 2005, IEEE, pages I-685 to I-688.
/M.S./	6Y	VANHOUCKE, Vincent, "Confidence Scoring and Rejection Using Multi-Pass Speech Recognition", Nuance Communications, Menlo Park, CA, 2005, 4 pages.

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/M.S./	7A	6,622,119	09/16/2003	Ramaswamy *et al.*	704	9	
	7B	6,629,066	09/30/2003	Jackson et al.	704	9	
	7C	6,631,346	10/07/2003	Karaorman *et al.*	704	9	
	7D	6,643,620	11/04/2003	Contolini *et al.*	704	270	
	7E	6,650,747	11/18/2003	Bala et al.	379	265.06	
	7F	6,658,388	12/02/2003	Kleindienst *et al.*	704	275	
	7G	6,678,680	01/13/2004	Woo	707	6	
	7H	6,681,206	01/20/2004	Gorin *et al.*	704	243	
	7I	6,691,151	02/10/2004	Cheyer et al.	709	202	
	7J	6,708,150	03/16/2004	Hirayama *et al.*	704	243	
	7K	6,721,001	04/13/2004	Berstis	348	231.3	
	7L	6,721,706	04/13/2004	Strubbe *et al.*	704	275	
	7M	6,735,592	05/11/2004	Neumann *et al.*	707	101	
	7N	6,741,931	05/25/2004	Kohut *et al.*	701	209	
	7O	6,742,021	05/25/2004	Halverson *et al.*	709	218	
	7P	6,751,591	06/15/2004	Gorin *et al.*	704	257	
	7Q	6,751,612	06/15/2004	Schuetze *et al.*	707	4	
	7R	6,757,718	06/29/2004	Halverson *et al.*	709	218	
	7S	6,795,808	09/21/2004	Strubbe *et al.*	704	275	
	7T	6,801,604	10/05/2004	Maes *et al.*	379	88.17	
	7U	6,801,893	10/05/2004	Backfried *et al.*	704	257	
	7V	6,829,603	12/07/2004	Chai *et al.*	707	5	
	7W	6,833,848	12/21/2004	Wolff *et al.*	345	719	

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/M.S./	7X	WENG, Fuliang, *et al.*, "Efficient Lattice Representation and Generation", Speech Technology and Research Laboratory, SRI International, Menlo Park, CA, 1998, 4 pages.
/M.S./	7Y	EL MELIANI *et al.*, "A Syllabic-Filler-Based Continuous Speech Recognizer for Unlimited Vocabulary", Canadian Conference on Electrical and Computer Engineering, Volume 2, September 5-8, 1995, pages 1007-1010.

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/M.S./	8A	6,856,990	02/15/2005	Barile *et al.*	707	10	
	8B	6,865,481	03/08/2005	Kawazoe *et al.*	701	211	
	8C	6,877,134	04/05/2005	Fuller *et al.*	715	500.1	
	8D	6,901,366	05/31/2005	Kuhn *et al.*	704	275	
	8E	6,937,977	08/30/2005	Gerson	704	201	
	8F	6,944,594	09/13/2005	Busayapongchai *et al.*	704	275	
	8G	6,950,821	09/27/2005	Faybishenko *et al.*	707	10	
	8H	6,954,755	10/11/2005	Reisman	707	10	
	8I	6,973,387	12/06/2005	Masclet *et al.*	701	211	
	8J	6,980,092	12/27/2005	Turnbull *et al.*	340	425.5	
	8K	6,990,513	01/24/2006	Belfiore *et al.*	709	203	
	8L	6,996,531	02/07/2006	Korall *et al.*	704	270	
	8M	7,016,849	03/21/2006	Arnold *et al.*	704	275	
	8N	7,020,609	03/28/2006	Thrift *et al.*	704	270.1	
	8O	7,027,975	04/11/2006	Pazandak *et al.*	704	9	
	8P	7,062,488	06/13/2006	Reisman	707	8	
	8Q	7,082,469	07/25/2006	Gold *et al.*	709	231	
	8R	7,092,928	08/15/2006	Elad *et al.*	706	60	
	8S	7,127,400	10/24/2006	Koch	704	270.1	
	8T	7,136,875	11/14/2006	Anderson *et al.*	707	104.1	
	8U	7,137,126	11/14/2006	Coffman *et al.*	719	328	
	8V	7,146,319	12/05/2006	Hunt	704	254	
	8W	7,203,644	04/10/2007	Anderson *et al.*	704	246	

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INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	Unassigned
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	Herewith (February 7, 2011)	Unassigned

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*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
/M.S./	9A	7,228,276	06/05/2007	Omote *et al.*	704	243	
	9B	7,231,343	06/12/2007	Treadgold *et al.*	704	9	
	9C	7,289,606	10/30/2007	Sibal *et al.*	379	52	
	9D	7,301,093	11/27/2007	Sater *et al.*	84	615	
	9E	7,340,040	03/04/2008	Saylor *et al.*	379	67.1	
	9F	7,376,645	05/20/2008	Bernard	707	3	
	9G	7,386,443	06/10/2008	Parthasarathy *et al.*	704	201	
	9H	7,398,209	07/08/2008	Kennewick *et al.*	704	255	
	9I	7,415,414	08/19/2008	Azara *et al.*	704	270	
	9J	7,424,431	09/09/2008	Greene *et al.*	704	270	
	9K	7,461,059	12/02/2008	Richardson *et al.*	707	5	
	9L	7,487,088	02/03/2009	Gorin *et al.*	704	240	
	9M	7,493,559	02/17/2009	Wolff *et al.*	715	727	
	9N	7,502,738	03/10/2009	Kennewick *et al.*	704	257	
	9O	7,620,549	11/17/2009	Di Cristo *et al.*	704	257	
	9P	7,634,409	12/15/2009	Kennewick *et al.*	704	257	
	9Q	7,640,160	12/29/2009	Di Cristo *et al.*	704	257	
	9R	7,693,720	04/06/2010	Kennewick *et al.*	704	275	
	9S	7,809,570	10/05/2010	Kennewick *et al.*	704	257	
	9T	7,818,176	10/19/2010	Freeman *et al.*	704	270	
	9U	2001/0041980	11/15/2001	Howard *et al.*	704	270	
	9V	2002/0035501	03/21/2002	Handel *et al.*	705	10	
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	10B	2002/0069059	06/06/2002	Smith	704	257	
	10C	2002/0082911	06/27/2002	Dunn *et al.*	705	14	
	10D	2002/0087525	07/04/2002	Abbott *et al.*	707	3	
	10E	2002/0120609	08/29/2002	Lang *et al.*	707	1	
	10F	2002/0124050	09/05/2002	Middeljans	709	203	
	10G	2002/0138248	09/26/2002	Corston-Oliver *et al.*	704	1	
	10H	2002/0143535	10/03/2002	Kist *et al.*	704	251	
	10I	2002/0188602	12/12/2002	Stubler *et al.*	707	3	
	10J	2002/0198714	12/26/2002	Zhou	704	252	
	10K	2003/0014261	01/16/2003	Kageyama	704	275	
	10L	2003/0046346	03/06/2003	Mumick *et al.*	709	205	
	10M	2003/0064709	04/03/2003	Gailey *et al.*	455	412	
	10N	2003/0088421	05/08/2003	Maes *et al.*	704	270.1	
	10O	2003/0097249	05/22/2003	Walker *et al.*	704	1	
	10P	2003/0112267	06/19/2003	Belrose	345	728	
	10Q	2003/0135488	07/17/2003	Amir *et al.*	707	3	
	10R	2003/0182132	09/25/2003	Niemoeller	704	275	
	10S	2003/0236664	12/25/2003	Sharma	704	251	
	10T	2004/0006475	01/08/2004	Ehlen *et al.*	704	270.1	
	10U	2004/0025115	02/05/2004	Sienel *et al.*	715	513	
	10V	2004/0044516	03/04/2004	Kennewick *et al.*	704	5	
	10W	2004/0166832	08/26/2004	Portman *et al.*	455	412.1	

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/Matthew Sked/	06/13/2012

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	11D	2004/0243417	12/02/2004	Pitts, III *et al.*	704	276	
	11E	2005/0015256	01/20/2005	Kargman	704	272	
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	11H	2005/0033574	02/10/2005	Kim *et al.*	704	251	
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	11K	2005/0137850	06/23/2005	Odell	704	4	
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	11M	2006/0206310	09/14/2006	Ravikumar *et al.*	704	9	
	11N	2007/0033005	02/08/2007	Cristo *et al.*	704	9	
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	11P	2007/0043574	02/22/2007	Coffman *et al.*	704	275	
	11Q	2007/0050191	03/01/2007	Weider *et al.*	704	275	
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	12M	2009/0144271	06/04/2009	Richardson *et al.*	707	5	
	12N	2009/0150156	06/11/2009	Kennewick *et al.*	704	257	
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	12S	2010/0049501	02/25/2010	Kennewick *et al.*	704	9	
	12T	2010/0049514	02/25/2010	Kennewick *et al.*	704	233	
	12U	2010/0057443	03/04/2010	Di Cristo *et al.*	704	9	
	12V	2010/0063880	03/11/2010	Atsmon *et al.*	705	14.53	
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	13B	2010/0204994	08/12/2010	Kennewick *et al.*	704	257	
	13C	2010/0217604	08/26/2010	Baldwin *et al.*	704	275	
	13D	2010/0286985	11/11/2010	Kennewick *et al.*	704	257	
	13E	2010/0299142	11/25/2010	Freeman *et al.*	704	9	

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	Art Unit
	MATTHEW SKED	2626

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search	06/13/12	/MS/

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S85	29361	(misrecogni$5 mis-recogni$5 (recogni$5 near2 (incorrect erro$5)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/13 11:06
S86	640404	(monitor$4 examin$6 inspect$4 analyz$4) near3 (action execut$4 command$4 operation act application process performance)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/13 11:14
S88	26	S87 and "704"/$.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/13 11:18
S87	334	S85 same S86	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/13 11:18
S90	2	("20030200088").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/06/14 08:48
S89	0	("20030200088").PN.	USPAT; USOCR	OR	OFF	2012/06/14 08:48
S92	29378	(misrecogni$5 mis-recogni$5 (recogni$5 near2 (incorrect erro$5)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 09:36
S91	141842	application near2 (feedback error evaluat$4 respon$5 react$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 09:36
S94	63	S93 and "704"/$.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 09:37
S93	169	S91 same S92	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 09:37
S99	61	S98 and ((history log record diary) near2 (usage utilization interaction))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 11:25
S98	1307	S95 and S97	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 11:25
S97	15335	S96.ti. S96.ab.	US-PGPUB;	OR	ON	2012/06/14

			USPAT; EPO; JPO; DERWENT; IBM_TDB			11:25
S96	107207	dialog$3 IVR "interactive voice response"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 11:25
S95	44385	"704"/$.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 11:25
S101	31	S95 and ((updat$4 adapt$5) near2 ((cognitive prediction) near2 model$5))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 11:26
S100	12	S98 and ((cognitive prediction) near2 model$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 11:26
S102	9	(misrecogni$5 mis-recogni$5 (recogni$5 near2 (incorrect erro$5))) same ((updat$4 adapt$5) near2 ((cognitive prediction) near2 model$5))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/06/14 11:27

EAST Search History (Interference)

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE PATENT APPLICATION OF:	Philippe DICRISTO *et al.*
SERIAL NO.:	13/022,370
FILING DATE:	February 7, 2011
ATTORNEY DOCKET NO.:	090611-0391838
CONFIRMATION NO.:	6569
EXAMINER:	Matthew J. SKED
ART UNIT:	2626
FOR:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

RESPONSE TO NON-FINAL OFFICE ACTION mailed 20 JUNE 2012

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Dear Madam:

In response to the Non-Final Office Action mailed June 20, 2012, please amend the above-identified application as follows:

Amendments to the Claims begin on page **2** of this paper.

Remarks begin on page **11** of this paper.

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned for under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 033975 (**Ref. No. 090611-0391838**).

LISTING OF CLAIMS:

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

1. (**Currently Amended**) A system for processing natural language utterances, comprising:

a ~~multimodal~~ device configured to receive a natural language utterance from a user;

a speech recognition engine configured to recognize one or more words from the natural language utterance;

a parser configured to generate an interpretation of the natural language utterance from the one or more recognized words, and further configured to generate a request based on the interpretation of the natural language utterance;

a domain agent configured to process the generated request; and

an adaptive misrecognition engine configured to ~~monitor one or more actions associated with the domain agent processing the request and~~ determine whether the interpretation of the natural language utterance is correct or incorrect based on whether a subsequent input is received from the user within a predetermined amount of time after outputting a response to the natural language utterance ~~based on the one or more monitored actions~~.

2. (**Currently Amended**) The system of claim 1, wherein the adaptive misrecognition engine is further configured to generate an ~~unrecognized~~ event indicative of misrecognition in response to determining that the interpretation of the natural language utterance is incorrect.

3. (**Currently Amended**) The system of claim 2, further comprising an analyzer configured to:

analyze the ~~unrecognized~~ event to determine how the natural language utterance was incorrectly interpreted; and

determine one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

4. (**Currently Amended**) The system of claim 1, further comprising an analyzer configured to:

track an interaction pattern with the system over time for [[a]] the user that provided the natural language utterance;

generate a personalized cognitive model for the user based on the interaction pattern tracked for the user; and

use the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

5. (**Original**) The system of claim 1, further comprising an analyzer configured to track interaction patterns with the system over time for a plurality users.

6. (**Original**) The system of claim 5, wherein the analyzer is further configured to generate a generalized cognitive model for the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns.

7. (**Original**) The system of claim 6, wherein the analyzer is further configured to use the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

8. (**Currently Amended**) The system of claim 1, further comprising an analyzer configured to generate an environmental model that includes information associated with at least one of an environmental condition ~~conditions~~ or surrounding ~~surroundings~~ associated with [[a]] the user that provided the natural language utterance.

9. (**Currently Amended**) The system of claim 8, wherein the environmental condition ~~conditions~~ or surrounding ~~surroundings~~ identifies ~~include~~ a level of noise associated with an environment or the surrounding of the user ~~one or more of a global position of the user, movement information associated with the user, quiet or noisy conditions associated with an environment of the user, or a vicinity to one or more voice-enabled devices~~.

10. (**Original**) The system of claim 8, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

11. (**Currently Amended**) The system of claim 1, further comprising:

a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:

compare one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

provide a relevance score for each of the identified matching contexts; and

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the generated request is associated with the selected context; and

a response generating module configured to:

communicate the request to the domain agent associated with the selected context; and

generate [[a]] the response to the natural language utterance using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

12. (**Original**) The system of claim 11, wherein the response generated by the response generating module includes an aggregation of the content gathered as a result of the domain agent processing the request.

13. (**Original**) The system of claim 11, further comprising a personality module configured to format the response.

14. (**Original**) The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to compare the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

15. (**Original**) The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to apply prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

16. (**Original**) The system of claim 11, wherein the domain agent is further configured to direct a query to at least one of a local information source or a network information source to process the request.

17. (**Original**) The system of claim 16, wherein the domain agent is further configured to evaluate a plurality of responses to the query to process the request.

18. (**Original**) The system of claim 11, wherein the domain agent is further configured to direct a command to at least one of a local device or a remote device to process the request.

19. (**Currently Amended**) The system of claim 1, wherein the ~~multimodal~~ device includes at least one of a personal digital assistant, a cellular telephone, a portable computer, or a desktop computer.

20. (**Cancelled**)

21. (**Currently Amended**) The system of claim [[20]] 1, wherein the speech recognition engine is further configured to recognize one or more words from a natural language utterance provided in the subsequent ~~follow-up multimodal~~ input, and wherein the parser is further configured to generate an interpretation of the subsequent ~~follow-up multimodal~~ input from the one or more words recognized from the natural language utterance provided in the subsequent ~~follow-up multimodal~~ input.

22. (**Currently Amended**) The system of claim [[20]] 1, wherein the subsequent ~~follow-up multimodal~~ input includes a follow-up request associated with a same context as the request being processed by the domain agent.

23. (**Currently Amended**) The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to determining that the subsequent input includes a ~~user providing a subsequent~~ request to stop the request being processed by the domain agent.

24. (**Currently Amended**) The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to [[a]] the user repeating the natural language utterance.

25. (**Currently Amended**) The system of claim 1, wherein the ~~multimodal~~ device is further configured to receive a non-speech input relating to the natural language utterance, and wherein the system further comprises:

a transcription module configured to transcribe the non-speech input to create a non-speech-based transcription; and

a merging module configured to merge the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance from the merged transcription.

26. (**Currently Amended**) A method for processing natural language utterances, comprising:

receiving a natural language utterance at a ~~multimodal~~ device from a user;

recognizing one or more words from the natural language utterance using a speech recognition engine of the ~~coupled to the multimodal~~ device;

generating an interpretation of the natural language utterance from the one or more recognized words using a parser of the ~~coupled to the multimodal~~ device, wherein the parser generates a request based on the interpretation of the natural language utterance;

invoking a domain agent configured to process the generated request;

monitoring one or more actions associated with the domain agent processing the request using an adaptive misrecognition engine; and

determining, at the adaptive misrecognition engine, whether the interpretation of the natural language utterance is correct or incorrect based on whether a subsequent input is received from the user within a predetermined amount of time after outputting a response to the natural language utterance ~~the one or more monitored actions~~.

27. (**Currently Amended**) The method of claim 26, wherein the adaptive misrecognition engine generates an ~~unrecognized~~ event indicative of misrecognition in response to determining that the interpretation of the natural language utterance is incorrect.

28. (**Currently Amended**) The method of claim 27, further comprising:

analyzing the ~~unrecognized~~ event to determine how the natural language utterance was incorrectly interpreted; and

determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

29. (**Currently Amended**) The method of claim 26, further comprising:

tracking an interaction pattern over time for [[a]] the user that provided the natural language utterance;

generating a personalized cognitive model for the user based on the interaction pattern tracked for the user; and

using the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

30. (**Original**) The method of claim 26, further comprising tracking interaction patterns over time for a plurality of users.

31. (**Original**) The method of claim 30, further comprising generating a generalized cognitive model for the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns.

32. (**Original**) The method of claim 31, further comprising using the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

33. (**Currently Amended**) The method of claim 26, further comprising generating an environmental model that includes information associated with at least one of an environmental condition ~~conditions~~ or surrounding ~~surroundings~~ associated with [[a]] the user that provided the natural language utterance.

34. (**Currently Amended**) The method of claim 33, wherein the environmental condition ~~conditions~~ or surrounding ~~surroundings~~ identifies ~~include~~ a level of noise associated with an environment or the surrounding of the user ~~one or more of a global position of the user, movement information associated with the user, quiet or noisy conditions associated with an environment of the user, or a vicinity to one or more voice-enabled devices~~.

35. (**Original**) The method of claim 33, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

36. (**Currently Amended**) The method of claim 26, further comprising determining a most likely context for the natural language utterance using a knowledge-enhanced speech recognition engine, wherein determining the most likely context further includes:

comparing one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

providing a relevance score for each of identified matching contexts;

selecting the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the generated request is associated with the selected context;

communicating the request to the domain agent associated with the selected context; and

generating [[a]] the response to the natural language utterance using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

37. (**Original**) The method of claim 36, wherein the response includes an aggregation of the content gathered as a result of the domain agent processing the request.

38. (**Original**) The method of claim 36, further comprising formatting the response using a personality module.

39. (**Original**) The method of claim 36, wherein the knowledge-enhanced speech recognition engine further compares the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

40. (**Original**) The method of claim 36, wherein the knowledge-enhanced speech recognition engine further applies prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

41. (**Cancelled**)

42. (**Currently Amended**) The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to determining that the subsequent input includes a ~~user providing a subsequent~~ request to stop the request being processed by the domain agent.

43. (**Currently Amended**) The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to [[a]] the user repeating the natural language utterance.

44. (**Currently Amended**) The method of claim 26, further comprising:

receiving a non-speech input relating to the natural language utterance at the ~~multimodal~~ device;

transcribing the non-speech input to create a non-speech-based transcription; and

merging the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance from the merged transcription.

REMARKS

In response to the Non-Final Office Action mailed June 20, 2012 (hereinafter "Office Action"), claims 1-4, 8-9, 11, 19, 21-29, 33-34, 36, and 42-44 have been amended. Claims 20 and 41 have been cancelled without prejudice or disclaimer. No new claims have been added. Therefore, claims 1-19, 21-40, and 42-44 are pending, of which claims 1 and 26 are independent. Support for the instant amendments is provided throughout the as-filed Specification. Thus, no new matter has been added. In view of the foregoing amendments and following comments, allowance of all the claims pending in the application is earnestly sought.

DOUBLE PATENTING REJECTIONS

Claims 1-19, 21-40, and 42-44 stand rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of U.S. Patent No. 7,620,549. Claims 1-19, 21-40, and 42-44 further stand *provisionally* rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of U.S. Patent Application Serial No. 12/571,795.

Solely in an effort to expedite prosecution, and in no way acquiescing in the propriety of the alleged rejections, Applicants will consider filing a terminal disclaimer once the remaining claim rejections have been withdrawn.

REJECTIONS UNDER 35 U.S.C. § 103

Claims 1, 2, 5, 8-19, 21-22, 25-27, 30, 33-39, 41 and 44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 7,137,126 to Coffman *et al.* (hereinafter "Coffman") in view of U.S. Patent No. 5,500,920 to Kupiec *et al.* (hereinafter "Kupiec"). Claims 3 and 28 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Coffman in view of Kupiec, further in view of U.S. Patent No. 7,203,644 to Anderson *et al.* (hereinafter "Anderson"). Claims 4, 6, 7, 29, 31 and 32 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Coffman in view of

Kupiec, further view of U.S. Patent No. 6,622,119 to Ramaswamy *et al.* (hereinafter "Ramaswamy"). Claims 23, 24, 42, and 43 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec, further in view of U.S. Patent No. 5,774,859 to Houser *et al.* (hereinafter "Houser").

Applicants disagree with the propriety of the alleged rejection. However, *solely* in an effort to advance prosecution, and in no way acquiescing in the propriety of the alleged rejection, independent claims 1 and 26 have each been amended to clarify aspects of the invention. For example, independent claim 1 recites, *inter alia*, the feature of:

> an adaptive misrecognition engine configured to determine whether [an] interpretation of [a] natural language utterance [from a user] is correct or incorrect based on whether a subsequent input is received from the user within a predetermined amount of time after outputting a response to the natural language utterance.

Independent claim 26 includes similar recitations.

Even assuming *arguendo* that it were deemed legally proper to modify Coffman to include the alleged teachings of Kupiec in the manner alleged by the Examiner (which Applicants do not concede), the two references, either alone or in combination, fail to teach or suggest *at least* the foregoing feature.

Coffman, for example, relates to a "conversational input/output interface" in which "[c]ommands or queries can be completed or corrected by completing missing fields or by correcting incorrect fields for [an] active task." [Coffman, at col. 28, lines 26-39]. For example, a user appears to "complete, modify, or correct a request via dialog with the system" in Coffman after the request is "deemed incomplete or ambiguous" by a dialog controller and a prompt is generated for the missing or ambiguous information. [Col. 8, line 34; col. 30, line 67 to col. 31, line 7].

Thus, even assuming *arguendo* that Coffman teaches or suggests determining whether an interpretation of a natural language utterance is correct or incorrect, which Applicants do not concede, Coffman does not teach or suggest that the determination is based on whether a subsequent input is received within a predetermined amount of time after outputting a response to the natural language utterance, nor does Coffman appear to

teach or suggest any other manner in which the determination is made. Although the controller in Coffman appears to generate a prompt for a user to complete, modify, or correct a request, the dialog controller deems the request to be incomplete or ambiguous before the user is prompted, whereas independent claims 1 and 26 recite determining whether an interpretation of a natural language utterance is correct or incorrect "based on whether a subsequent input is received from [a] user within a predetermined amount of time after outputting a response to the natural language utterance."

The foregoing deficiency in Coffman is not cured by Kupiec. Kupiec relates to "disambiguating [] words in an error-prone transcription of user input" based on proximity of words in the transcription. [Kupiec, at col. 1, line 56]. That is, "[t]he invention" in Kupiec "takes advantage of the observation that the intended words in a user's question usually are semantically related to each other and thus are likely to co-occur in a corpus within relatively close proximity of each other," whereas "words in the corpus that spuriously match incorrect phonetic transcriptions are much less likely to be semantically related to each other and thus less likely to co-occur within close proximity of each other." [Kupiec, at col. 2, lines 38-42]. Kupiec thus appears to relate to detecting incorrect phonetic transcriptions based on proximity of words, and does not teach or suggest determining that an interpretation of a natural language utterance is correct or incorrect based on whether a subsequent user input is received within a predetermined amount of time after receiving the natural language utterance or after outputting a response to the natural language utterance. Thus, Coffman and Kupiec, either alone or in combination, fail to teach or suggest each and every feature of at least independent claims 1 and 26.

For *at least* the foregoing reasons, the rejection of independent claims 1 and 26 is legally improper, and should be withdrawn. The rejection of dependent claims 2, 5, 8-19, 21-22, 25, 27, 30, 33-39, 41, and 44 is legally improper *at least* because each of dependent claims 2, 5, 8-19, 21-22, 25, 27, 30, 33-39, 41, and 44 each depend from and add features to one of independent claims 1 or 26. Further, dependent claims 3-4, 6-7, 23-24, 28-29, 31-32, and 42-43 each ultimately depend from and add features to one of independent claims 1 or 26. As discussed above, Coffman and Kupiec, either alone or in combination, fail to

teach or suggest each and every feature of independent claims 1 and 26. Even assuming *arguendo* that it were deemed legally proper to combine Coffman and Kupiec with one or more of Anderson, Ramaswamy, or Houser (which Applicants do *not* concede), the references, either alone or in combination, still fail to cure *at least* the foregoing deficiencies of Coffman and Kupiec. None of Anderson, Ramaswamy, or Houser, for example, teach or suggest determining whether an interpretation of a natural language utterance is correct or incorrect based on whether a subsequent input is received from a user within a predetermined amount of time after receiving the natural language utterance or after outputting a response to the natural language utterance. For *at least* the foregoing reason, the rejection of dependent claims 3-4, 6-7, 23-24, 28-29, 31-32, and 42-43 is legally improper, and should be withdrawn.

CONCLUSION

Having addressed each of the foregoing rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, the application is in condition for allowance. Notice to that effect is earnestly sought.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Respectfully submitted,

Date: **October 22, 2012**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS :	Philippe DI CRISTO *et al.*	CONFIRMATION No.:	6569
SERIAL NUMBER :	13/022,370	EXAMINER:	Pierre Louis Desir
FILING DATE :	February 7, 2011	ART UNIT:	2659
FOR :	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicants hereby make of record in the above-identified application the documents listed on the attached Form PTO-1449.

Applicants have listed a publication date on the attached PTO-1449 based on information presently available to the undersigned. However, the listed publication date should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This Supplemental Information Disclosure Statement is being filed more than three months after the filing date of a national application other than a continued prosecution application under 37 C.F.R. § 1.53(d), or more than three months after the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application, and after the mailing date of the first Office Action on the merits, but before the mailing date of any of a Final Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution in the application. 37 C.F.R. § 1.97(c).

Please charge the $180.00 fee [37 C.F.R. § 1.17(p)] to Deposit Account No. 03-3975. In addition, please charge any fee deficiencies, or credit any overpayment, to Deposit Account No. 03-3975 as needed to ensure consideration of the Supplemental Information Disclosure Statement.

Document 1Z was cited in a search report by a foreign patent office in a counterpart foreign application. Submission of an English language version of the search report that indicates the degree of relevance found by the foreign office is provided.

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449.

Respectfully submitted,

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INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

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*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1A	5,027,406	06/25/1991	Roberts *et al.*	381	43	
	1B	5,208,748	05/04/1993	Flores *et al.*	364	419	
	1C	5,357,596	10/18/1994	Takebayashi *et al.*	395	2.84	
	1D	5,577,165	11/19/1996	Takebayashi et al.	395	2.84	
	1E	5,608,635	03/04/1997	Tamai	364	449.3	
	1F	5,740,256	04/14/1998	Castello Da Costa *et al.*	361	94.7	
	1G	5,748,974	05/05/1998	Johnson	395	759	
	1H	5,839,107	11/17/1998	Gupta *et al.*	704	270	
	1I	5,848,396	12/08/1998	Gerace	705	10	
	1J	5,892,900	04/06/1999	Ginter *et al.*	395	186	
	1K	5,897,613	04/27/1999	Chan	704	210	
	1L	5,960,397	09/28/1999	Rahim	704	244	
	1M	5,960,399	09/28/1999	Barclay *et al.*	704	270	
	1N	5,960,447	09/28/1999	Holt *et al.*	707	500	
	1O	5,995,928	11/30/1999	Nguyen *et al.*	704	251	
	1P	6,018,708	01/25/2000	Dahan *et al.*	704	244	
	1Q	6,035,267	03/07/2000	Watanabe *et al.*	704	1	
	1R	6,049,607	04/11/2000	Marash *et al.*	379	410	
	1S	6,067,513	05/23/2000	Ishimitsu	704	233	
	1T	6,076,059	06/13/2000	Glickman *et al.*	704	260	
	1U	6,085,186	07/04/2000	Christianson *et al.*	707	3	
	1V	6,108,631	08/22/2000	Ruhl	704	270	
	1W	6,167,377	12/26/2000	Gillick *et al.*	704	240	

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	1X	1 320 043 A2	06/18/2003	Europe				
	1Y	1 646 037	04/12/2006	Europe				

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	1Z	"Statement in Accordance with the Notice from the European Patent Office dated 1 October 2007 Concerning Business Methods (OJ EPO 11/2007, 592-593), XP002456252.

EXAMINER	DATE CONSIDERED

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

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	Philippe DI CRISTO *et al.*	
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	2B	6,188,982	02/13/2001	Chiang	704	256	
	2C	6,199,043	03/06/2001	Happ	704	272	
	2D	6,208,964	03/27/2001	Sabourin	704	244	
	2E	6,233,561	05/15/2001	Junqua *et al.*	704	277	
	2F	6,236,968	05/22/2001	Kanevsky *et al.*	704	275	
	2G	6,246,990	06/12/2001	Happ	704	275	
	2H	6,266,636	07/24/2001	Kosaka *et al.*	704	244	
	2I	6,269,336	07/31/2001	Ladd *et al.*	704	270	
	2J	6,275,231	08/14/2001	Obradovich	345	349	
	2K	6,278,968	08/21/2001	Franz *et al.*	704	3	
	2L	6,301,560	10/09/2001	Masters	704	251	
	2M	6,362,748	03/26/2002	Huang	340	901	
	2N	6,366,882	04/02/2002	Bijl *et al.*	704	235	
	2O	6,377,913	04/23/2002	Coffman *et al.*	704	8	
	2P	6,393,403	05/21/2002	Majaniemi	704	275	
	2Q	6,397,181	05/28/2002	Li *et al.*	704	256	
	2R	6,405,170	06/11/2002	Phillips *et al.*	704	270	
	2S	6,429,813	08/06/2002	Feigen	342	357.13	
	2T	6,434,529	08/13/2002	Walker *et al.*	704	275	
	2U	6,456,974	09/24/2002	Baker *et al.*	704	270.1	
	2V	6,510,417	01/21/2003	Woods *et al.*	704	275	
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	3B	6,560,590	05/06/2003	Shwe *et al.*	706	55	
	3C	6,571,279	05/27/2003	Herz *et al.*	709	217	
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	3E	6,587,858	07/01/2003	Strazza	707	102	
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	3Q	6,757,544	06/29/2004	Rangarajan *et al.*	455	456.1	
	3R	6,832,230	12/14/2004	Zilliacus *et al.*	707	203	
	3S	6,850,603	02/01/2005	Eberle *et al.*	379	88.16	
	3T	6,868,380	03/15/2005	Kroeker	704	240	
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	4C	6,968,311	11/22/2005	Knockeart *et al.*	704	270	
	4D	6,975,993	12/13/2005	Keiller	704	275	
	4E	6,983,055	01/03/2006	Luo	381	313	
	4F	7,003,463	02/21/2006	Maes *et al.*	704	270.1	
	4G	7,024,364	04/04/2006	Guerra *et al.*	704	270	
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	4K	7,054,817	05/30/2006	Shao	704	270	
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	4M	7,069,220	06/27/2006	Coffman *et al.*	704	275	
	4N	7,072,834	07/04/2006	Zhou	704	244	
	4O	7,107,210	09/12/2006	Deng *et al.*	704	226	
	4P	7,107,218	09/12/2006	Preston	704	270	
	4Q	7,110,951	09/19/2006	Lemelson *et al.*	704	270	
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	4S	7,143,037	11/28/2006	Chestnut	704	251	
	4T	7,143,039	11/28/2006	Stifelman *et al.*	704	270	
	4U	7,165,028	01/16/2007	Gong	704	233	
	4V	7,184,957	02/27/2007	Brookes *et al.*	704	246	
	4W	7,190,770	03/13/2007	Ando *et al.*	379	88.01	

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	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
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	5A	7,197,069	03/27/2007	Agazzi *et al.*	375	233	
	5B	7,206,418	04/17/2007	Yang *et al.*	381	92	
	5C	7,207,011	04/17/2007	Mulvey *et al.*	715	812	
	5D	7,236,923	06/26/2007	Gupta	704	9	
	5E	7,272,212	09/18/2007	Eberle *et al.*	379	88.17	
	5F	7,277,854	10/02/2007	Bennett *et al.*	704	257	
	5G	7,283,829	10/16/2007	Christenson *et al.*	455	461	
	5H	7,283,951	10/16/2007	Marchisio *et al.*	704	9	
	5I	7,299,186	11/20/2007	Kuzunuki *et al.*	704	270.1	
	5J	7,305,381	12/04/2007	Poppink *et al.*	1	1	
	5K	7,321,850	01/22/2008	Wakita	704	10	
	5L	7,328,155	02/05/2008	Endo *et al.*	704	251	
	5M	7,337,116	02/26/2008	Charlesworth *et al.*	704	254	
	5N	7,366,285	04/29/2008	Parolkar *et al.*	379	88.17	
	5O	7,366,669	04/29/2008	Nishitani *et al.*	704	256	
	5P	7,406,421	07/29/2008	Odinak *et al.*	704	275	
	5Q	7,447,635	11/04/2008	Konopka *et al.*	704	275	
	5R	7,454,608	11/18/2008	Gopalakrishnan *et al.*	713	100	
	5S	7,472,020	12/30/2008	Brulle-Drews	701	211	
	5T	7,472,060	12/30/2008	Gorin *et al.*	704	240	
	5U	7,478,036	01/13/2009	Shen *et al.*	704	9	
	5V	7,493,259	02/17/2009	Jones *et al.*	704	257	
	5W	7,516,076	04/07/2009	Walker *et al.*	704	275	

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	6A	7,529,675	05/05/2009	Maes	704	270.1	
	6B	7,536,297	05/19/2009	Byrd *et al.*	704	10	
	6C	7,536,374	05/19/2009	Au	706	55	
	6D	7,542,894	06/02/2009	Murata	704	9	
	6E	7,546,382	06/09/2009	Healey *et al.*	709	246	
	6F	7,558,730	07/07/2009	Davis *et al.*	704	235	
	6G	7,574,362	08/11/2009	Walker *et al.*	704	275	
	6H	7,577,244	08/18/2009	Taschereau	379	218.01	
	6I	7,606,708	10/20/2009	Hwang	704	257	
	6J	7,640,006	12/29/2009	Portman *et al.*	455	412.1	
	6K	7,640,272	12/29/2009	Mahajan *et al.*	707	104.1	
	6L	7,676,365	03/09/2010	Hwang *et al.*	704	240	
	6M	7,676,369	03/09/2010	Fujimoto *et al.*	704	270	
	6N	7,684,977	03/23/2010	Morikawa	704	211	
	6O	7,729,916	06/01/2010	Coffman *et al.*	704	270	
	6P	7,729,918	06/01/2010	Walker *et al.*	704	275	
	6Q	7,748,021	06/29/2010	Obradovich	725	105	
	6R	7,788,084	08/31/2010	Brun *et al.*	704	7	
	6S	7,801,731	09/21/2010	Odinak *et al.*	704	275	
	6T	7,831,426	11/09/2010	Bennett	704	252	
	6U	7,831,433	11/09/2010	Belvin *et al.*	704	275	
	6V	7,873,519	01/18/2011	Bennett	704	257	
	6W	7,873,523	01/18/2011	Potter *et al.*	704	275	

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	7A	7,881,936	02/01/2011	Longe *et al.*	704	257	
	7B	7,894,849	02/22/2011	Kass *et al.*	455	550.1	
	7C	7,902,969	03/08/2011	Obradovich	340	439	
	7D	7,917,367	03/29/2011	Di Cristo *et al.*	704	270.1	
	7E	7,949,529	05/24/2011	Weider *et al.*	704	270	
	7F	7,949,537	05/24/2011	Walker *et al.*	704	275	
	7G	7,953,732	05/31/2011	Frank *et al.*	707	724	
	7H	7,974,875	07/05/2011	Quilici *et al.*	705	14.4	
	7I	7,983,917	07/19/2011	Kennewick *et al.*	704	257	
	7J	7,984,287	07/19/2011	Gopalakrishnan *et al.*	713	100	
	7K	8,005,683	08/23/2011	Tessel *et al.*	704	275	
	7L	8,015,006	09/06/2011	Kennewick *et al.*	704	236	
	7M	8,060,367	11/15/2011	Keaveney	704	247	
	7N	8,069,046	11/29/2011	Kennewick *et al.*	704	257	
	7O	8,073,681	12/06/2011	Baldwin *et al.*	704	9	
	7P	8,077,975	12/13/2011	Ma *et al.*	382	187	
	7Q	8,082,153	12/20/2011	Coffman *et al.*	704	270	
	7R	8,086,463	12/27/2011	Ativanichayaphong *et al.*	704	275	
	7S	8,112,275	02/07/2012	Kennewick *et al.*	704	240	
	7T	8,140,327	03/20/2012	Kennewick *et al.*	704	226	
	7U	8,140,335	03/20/2012	Kennewick *et al.*	704	257	
	7V	8,145,489	03/27/2012	Freeman *et al.*	704	257	
	7W	8,150,694	04/03/2012	Kennewick *et al.*	704	257	

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	8A	8,155,962	04/10/2012	Kennewick *et al.*	704	257	
	8B	8,170,867	05/01/2012	Germain	704	9	
	8C	8,195,468	06/05/2012	Weider *et al.*	704	275	
	8D	8,219,599	07/10/2012	Tunstall-Pedoe	707	955	
	8E	8,224,652	07/17/2012	Wang *et al.*	704	275	
	8F	2001/0049601	12/06/2001	Kroeker *et al.*	704	254	
	8G	2001/0054087	12/20/2001	Flom *et al.*	709	218	
	8H	2002/0015500	02/07/2002	Belt *et al.*	381	66	
	8I	2002/0022927	02/21/2002	Lemelson *et al.*	701	301	
	8J	2002/0029261	03/07/2002	Shibata	709	219	
	8K	2002/0032752	03/14/2002	Gold *et al.*	709	218	
	8L	2002/0069071	06/06/2002	Knockeart et al.	704	275	
	8M	2002/0133402	09/19/2002	Faber *et al.*	705	14	
	8N	2002/0161646	10/31/2002	Gailey *et al.*	705	14	
	8O	2002/0173961	11/21/2002	Guerra	704	258	
	8P	2002/0184373	12/05/2002	Maes	709	228	
	8Q	2003/0016835	01/23/2003	Elko *et al.*	381	92	
	8R	2003/0065427	04/03/2003	Funk *et al.*	701	1	
	8S	2003/0110037	06/12/2003	Walker *et al.*	704	257	
	8T	2003/0115062	06/19/2003	Walker *et al.*	704	258	
	8U	2003/0120493	06/26/2003	Gupta	704	270.1	
	8V	2003/0144846	07/31/2003	Denenberg *et al.*	704	277	
	8W	2003/0158731	08/21/2003	Falcon *et al.*	704	231	

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	9B	2003/0204492	10/30/2003	Wolf *et al.*	707	3	
	9C	2003/0206640	11/06/2003	Malvar *et al.*	381	93	
	9D	2003/0212550	11/13/2003	Ubale	704	215	
	9E	2003/0212558	11/13/2003	Matula	704	260	
	9F	2003/0212562	11/13/2003	Patel *et al.*	704	275	
	9G	2003/0225825	12/04/2003	Healey *et al.*	709	203	
	9H	2004/0098245	05/20/2004	Walker *et al.*	704	1	
	9I	2004/0117804	06/17/2004	Scahill *et al.*	719	320	
	9J	2004/0140989	07/22/2004	Papageorge	345	700	
	9K	2004/0158555	08/12/2004	Seedman *et al.*	707	3	
	9L	2004/0167771	08/26/2004	Duan *et al.*	704	10	
	9M	2004/0205671	10/14/2004	Sukehiro *et al.*	715	532	
	9N	2005/0125232	06/09/2005	Gadd	704	270.1	
	9O	2005/0137877	06/23/2005	Oesterling *et al.*	704	275	
	9P	2005/0143994	06/30/2005	Mori *et al.*	704	235	
	9Q	2005/0216254	09/29/2005	Gupta *et al.*	704	9	
	9R	2005/0234727	10/20/2005	Chiu	704	270.1	
	9S	2005/0283752	12/22/2005	Fruchter *et al.*	717	100	
	9T	2006/0041431	02/23/2006	Maes	704	270.1	
	9U	2006/0047509	03/02/2006	Ding *et al.*	704	231	
	9V	2006/0217133	09/28/2006	Christenson *et al.*	455	461	
	9W	2006/0285662	12/21/2006	Yin *et al.*	379	88.16	

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	10B	2007/0043868	02/22/2007	Kumar *et al.*	709	226	
	10C	2007/0073544	03/29/2007	Millett *et al.*	704	277	
	10D	2007/0078708	04/05/2007	Yu *et al.*	705	14	
	10E	2007/0078709	04/05/2007	Rajaram	705	14	
	10F	2007/0118357	05/24/2007	Kasravi *et al.*	704	10	
	10G	2007/0135101	06/14/2007	Ramati *et al.*	455	414.1	
	10H	2007/0146833	06/28/2007	Satomi *et al.*	358	537	
	10I	2007/0162296	07/12/2007	Altberg *et al.*	705	1	
	10J	2007/0198267	08/23/2007	Jones *et al.*	704	257	
	10K	2008/0034032	02/07/2008	Healey *et al.*	709	203	
	10L	2008/0065386	03/13/2008	Cross *et al.*	704	270	
	10M	2008/0109285	05/08/2008	Reuther *et al.*	705	7	
	10N	2008/0147410	06/19/2008	Odinak	704	270.1	
	10O	2009/0052635	02/26/2009	Jones *et al.*	379	88.02	
	10P	2009/0067599	03/12/2009	Agarwal *et al.*	379	114.21	
	10Q	2009/0106029	04/23/2009	DeLine *et al.*	704	275	
	10R	2009/0271194	10/29/2009	Davis *et al.*	704	235	
	10S	2009/0273563	11/05/2009	Pryor	345	157	
	10T	2009/0313026	12/17/2009	Coffman *et al.*	704	275	
	10U	2010/0029261	02/04/2010	Mikkelsen *et al.*	455	419	
	10V	2010/0036967	02/11/2010	Caine *et al.*	709	236	
	10W	2010/0185512	07/22/2010	Borger *et al.*	705	14.49	

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	11B	2011/0112827	05/12/2011	Kennewick *et al.*	704	9	
	11C	2011/0112921	05/12/2011	Kennewick *et al.*	705	26.1	
	11D	2011/0131045	06/02/2011	Cristo *et al.*	704	249	
	11E	2011/0231182	09/22/2011	Weider *et al.*	704	9	
	11F	2011/0231188	09/22/2011	Kennewick *et al.*	704	236	
	11G	2012/0022857	01/26/2012	Baldwin *et al.*	704	9	
	11H	2012/0101809	04/26/2012	Kennewick *et al.*	704	9	
	11I	2012/0101810	04/26/2012	Kennewick *et al.*	704	9	
	11J	2012/0109753	05/03/2012	Kennewick *et al.*	705	14.58	
	11K	2012/0150636	06/14/2012	Freeman *et al.*	705	14.49	

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(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 320 043 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.06.2003 Bulletin 2003/25

(51) Int Cl.[7]: **G06F 17/30**

(21) Application number: **02258126.8**

(22) Date of filing: **26.11.2002**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LU MC NL PT SE SK TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **13.12.2001 GB 0129788**

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(54) Multi-modal picture

(57) A system for presenting a multi-modal picture includes picture presentation equipment (37) for displaying an image (38) of the picture and for enabling a user to interact with the picture by selecting specific picture features and asking a specific query relating to the feature. A voice browser system (3) controlled according to dialog scripts (46) associated with the picture, determines an appropriate response having regard to the spoken user query and the picture feature being pointed to. Each picture can have multiple narrators associated with it and the can choose which narrator is currently active. Picture authoring apparatus is also provided.

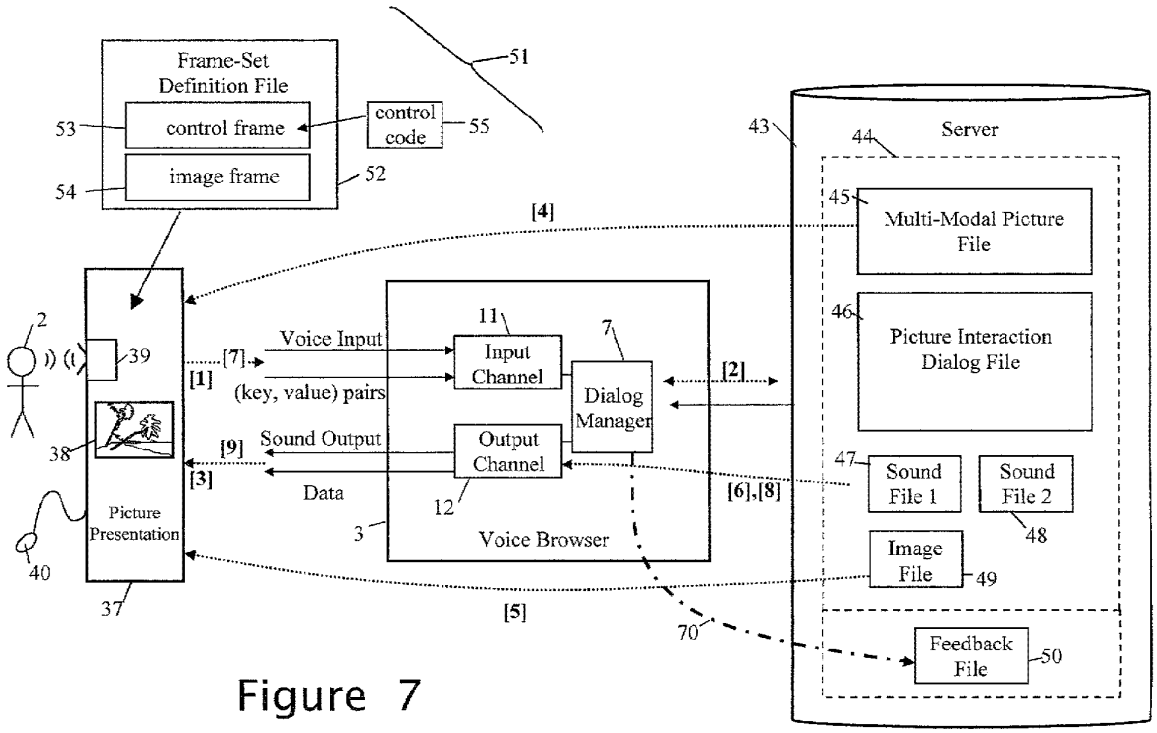


Figure 7

EP 1 320 043 A2

Printed by Jouve, 75001 PARIS (FR)

Description

Field of the Invention

[0001] The present invention relates to multi-modal pictures with which a use can interact by spoken dialog exchanges.

Background of the Invention

[0002] In recent years there has been an explosion in the number of services available over the World Wide Web on the public internet (generally referred to as the "web"), the web being composed of a myriad of pages linked together by hyperlinks and delivered by servers on request using the HTTP protocol. Each page comprises content marked up with tags to enable the receiving application (typically a GUI browser) to render the page content in the manner intended by the page author; the markup language used for standard web pages is HTML (HyperText Markup Language).

[0003] However, today far more people have access to a telephone than have access to a computer with an Internet connection. Sales of cellphones are outstripping PC sales so that many people have already or soon will have a phone within reach where ever they go. As a result, there is increasing interest in being able to access web-based services from phones. 'Voice Browsers' offer the promise of allowing everyone to access web-based services from any phone, making it practical to access the Web any time and any where, whether at home, on the move, or at work.

[0004] Voice browsers allow people to access the Web using speech synthesis, pre-recorded audio, and speech recognition. Figure 1 of the accompanying drawings illustrates the general role played by a voice browser. As can be seen, a voice browser is interposed between a user 2 and a voice page server 4. This server 4 holds voice service pages (text pages) that are marked-up with tags of a voice-related markup language (or languages). When a page is requested by the user 2, it is interpreted at a top level (dialog level) by a dialog manager 7 of the voice browser 3 and output intended for the user is passed in text form to a Text-To-Speech (TTS) converter 6 which provides appropriate voice output to the user. User voice input is converted to text by speech recognition module 5 of the voice browser 3 and the dialog manager 7 determines what action is to be taken according to the received input and the directions in the original page. The voice input / output interface can be supplemented by keypads and small displays.

[0005] In general terms, therefore, a voice browser can be considered as a largely software device which interprets a voice markup language and generate a dialog with voice output, and possibly other output modalities, and / or voice input, and possibly other modalities (this definition derives from a working draft, dated September 2000, of the Voice browser Working Group of the World Wide Web Consortium).

[0006] Voice browsers may also be used together with graphical displays, keyboards, and pointing devices (e.g. a mouse) in order to produce a rich "multimodal voice browser". Voice interfaces and the keyboard, pointing device and display maybe used as alternate interfaces to the same service or could be seen as being used together to give a rich interface using all these modes combined.

[0007] Some examples of devices that allow multimodal interactions could be multimedia PC, or a communication appliance incorporating a display, keyboard, microphone and speaker/headset, an in car Voice Browser might have display and speech interfaces that could work together, or a Kiosk.

[0008] Some services may use all the modes together to provide an enhanced user experience, for example, a user could touch a street map displayed on a touch sensitive display and say "Tell me how I get here?". Some services might offer alternate interfaces allowing the user flexibility when doing different activities. For example while driving speech could be used to access services, but a passenger might used the keyboard.

[0009] Figure 2 of the accompanying drawings shows in greater detail the components of an example voice browser for handling voice pages 15 marked up with tags related to four different voice markup languages, namely:

- tags of a dialog markup language that serves to specify voice dialog behaviour;
- tags of a multimodal markup language that extends the dialog markup language to support other input modes (keyboard, mouse, etc.) and output modes (large and small screens);
- tags of a speech grammar markup language that serve to specify the grammar of user input; and
- tags of a speech synthesis markup language that serve to specify voice characteristics, types of sentences, word emphasis, etc.

[0010] When a page 15 is loaded into the voice browser, dialog manager 7 determines from the dialog tags and multimodal tags what actions are to be taken (the dialog manager being programmed to understand both the dialog and multimodal languages 19). These actions may include auxiliary functions 18 (available at any time during page processing) accessible through APIs and including such things as database lookups, user identity and validation, telephone call control etc. When speech output to the user is called for, the semantics of the output is passed, with any

associated speech synthesis tags, to output channel 12 where a language generator 23 produces the final text to be rendered into speech by text-to-speech converter 6 and output to speaker 17. In the simplest case, the text to be rendered into speech is fully specified in the voice page 15 and the language generator 23 is not required for generating the final output text; however, in more complex cases, only semantic elements are passed, embedded in tags of a natural language semantics markup language (not depicted in Figure 2) that is understood by the language generator. The TTS converter 6 takes account of the speech synthesis tags when effecting text to speech conversion for which purpose it is cognisant of the speech synthesis markup language 25.

[0011] User voice input is received by microphone 16 and supplied to an input channel of the voice browser. Speech recogniser 5 generates text which is fed to a language understanding module 21 to produce semantics of the input for passing to the dialog manager 7. The speech recogniser 5 and language understanding module 21 work according to specific lexicon and grammar markup language 22 and, of course, take account of any grammar tags related to the current input that appear in page 15. The semantic output to the dialog manager 7 may simply be a permitted input word or may be more complex and include embedded tags of a natural language semantics markup language. The dialog manager 7 determines what action to take next (including, for example, fetching another page) based on the received user input and the dialog tags in the current page 15.

[0012] Any multimodal tags in the voice page 15 are used to control and interpret multimodal input/output. Such input/output is enabled by an appropriate recogniser 27 in the input channel 11 and an appropriate output constructor 28 in the output channel 12.

[0013] Whatever its precise form, the voice browser can be located at any point between the user and the voice page server. Figures 3 to 5 illustrate three possibilities in the case where the voice browser functionality is kept all together; many other possibilities exist when the functional components of the voice browser are separated and located in different logical/physical locations.

[0014] In Figure 3, the voice browser 3 is depicted as incorporated into an end-user system 8 (such as a PC or mobile entity) associated with user 2. In this case, the voice page server 4 is connected to the voice browser 3 by any suitable data-capable bearer service extending across one or more networks 9 that serve to provide connectivity between server 4 and end-user system 8. The data-capable bearer service is only required to carry text-based pages and therefore does not require a high bandwidth.

[0015] Figure 4 shows the voice browser 3 as co-located with the voice page server 4. In this case, voice input/output is passed across a voice network 9 between the end-user system 8 and the voice browser 3 at the voice page server site. The fact that the voice service is embodied as voice pages interpreted by a voice browser is not apparent to the user or network and the service could be implemented in other ways without the user or network being aware.

[0016] In Figure 5, the voice browser 3 is located in the network infrastructure between the end-user system 8 and the voice page server 4, voice input and output passing between the end-user system and voice browser over one network leg, and voice-page text data passing between the voice page server 4 and voice browser 3 over another network leg. This arrangement has certain advantages; in particular, by locating expensive resources (speech recognition, TTS converter) in the network, they can be used for many different users with user profiles being used to customise the voice-browser service provided to each user.

[0017] It is known to enhance pictures by providing associated speech annotations. It is an object of the present invention to provide further enhancements to such pictures.

Summary of the Invention

[0018] According to one aspect of the present invention, there is provided a system for presenting information concerning a picture to a user, the system comprising:

- a data store for holding responses, specific to said picture, in respect of specific user queries concerning particular picture features;
- a manually-operable feature-selection arrangement for enabling a user to select a feature in a displayed image of the picture, and for providing an output indication regarding what said particular feature, if any, the user has thereby selected;
- a voice dialog input-output subsystem including a speech recogniser for interpreting queries from a user;
- a control arrangement responsive to a user selecting a said particular feature and asking a specific query regarding that feature, to output the corresponding stored response.

[0019] Advantageously, each response is associated with a specified narrator and the user can opt to receive only the response of a selected narrator for either a current query or for all queries.

[0020] Preferably, provision is made for providing feedback to an author of the picture or its associated responses in the event that a user makes a query about a picture feature that is not a said particular picture feature or, although

a query about such a feature, is not a said specific query for which a response is available.

[0021] According to another aspect of the present invention, there is provided a multi-modal picture specified by data held on at least one data carrier, this data comprising:

- picture image data for displaying a picture image;
- response data indicative of voice responses intended to be given to specific user queries concerning particular picture features of the picture;
- first control data for enabling a determination to be made as to which said particular feature in the picture image, if any, a user is selecting when using a selection arrangement to indicate a feature in the displayed image; and
- second control data for determining, on the basis of a spoken user query and on which said particular picture feature is selected by the user using the selection arrangement, which said response is to be used to reply to the user query.

[0022] According to a further aspect of the present invention, there is provided a multi-modal picture comprising a hard-copy picture image, and data held on at least one data carrier, this data comprising:

- response data indicative of voice responses intended to be given to specific user queries concerning particular picture features;
- first control data for enabling a determination to be made as to which said particular feature in the picture image, if any, a user is selecting when using a selection arrangement to indicate a feature of the image; and
- second control data for determining, on the basis of a spoken user query and on which said particular picture feature is selected by the user using the selection arrangement, which said response is to be used to reply to the user query.

[0023] The present invention also encompasses the overall process of generating a multi-modal picture and using it to convey information about particular picture features to a user. Thus, according to a still further aspect of the present invention, there is provided a method of conveying information about particular features in a picture, the method comprising the steps of:

(a) creating the following specifically-associated data:

- picture image data for displaying a picture image;
- response data indicative of voice responses intended to be given to specific user queries concerning particular picture features of the picture;
- first control data for enabling a determination to be made as to which said particular feature in the picture image, if any, a user is selecting when using a selection arrangement to indicate a feature in the displayed image; and
- second control data for determining, on the basis of a spoken user query and on which said particular picture feature is selected by the user, which said response is to be used to reply to the user query;

(b) using the image data to display an image of the picture;
(c) having a user use a manually-operated selection arrangement to select a feature in the displayed image and using the first control data to determine which said particular feature in the picture image, if any, the user is selecting;
(d) receiving and interpreting a spoken query from the user to determine if a said specific query is being asked; and
(e) using the second control data to determine, on the basis of the said particular feature determined as being selected in step (c) and the said specific query determined as being asked in step (d), which said response is to be used to reply and thereupon using the response data to output the corresponding voice response.

[0024] Similarly, according to a yet further aspect of the present invention, there is provided a method of conveying information about particular features in a hard-copy picture, the method comprising the steps of:

(a) creating the following specifically-associated data:

- response data indicative of voice responses intended to be given to specific user queries concerning particular picture features in said picture;
- first control data for enabling a determination to be made as to which said particular feature in the picture, if any, a user is selecting when using a selection arrangement to indicate a feature of the picture; and
- second control data for determining, on the basis of a spoken user query and on which said particular picture

feature is selected by the user, which said response is to be used to reply to the user query;

(b) making the picture and data available to a user;
(c) having the user use a manually-operated selection arrangement to select a feature in the picture and using the first control data to determine which said particular feature in the picture, if any, the user is selecting;
(d) receiving and interpreting a spoken query from the user to determine if a said specific query is being asked; and
(e) using the second control data to determine, on the basis of the said particular feature determined as being selected in step (c) and the said specific query determined as being asked in step (d), which said response is to be used to reply and thereupon using the response data to output the corresponding voice response.

[0025] According to another aspect of the present invention, there is provided apparatus for authoring a multi-modal picture, comprising:

- a first tool for defining image hotspots associated with particular picture-image features;
- a second tool with speech recognition capability, for recording user responses input by voice, to user-specified queries each associated with a particular said picture-image feature; and
- means for automatically generating control data for determining, on the basis of a spoken user query and on which said particular picture feature is selected by a user, which said response is to be used to reply to the user query.

[0026] With respect to the above-mentioned feature regarding the provision of feedback on user queries for which responses are not available, a further independent aspect of the present invention provides a method of collecting user-interest information regarding a picture, the method comprising the steps of:

(a) presenting a picture image to a user, particular picture features in the image each having associated information that is presented to the user upon the user requesting such information;
(b) recognising a user information request, in respect of a picture feature, made by the user at least selecting that picture feature using a feature-selection arrangement; and
(c) in response to recognition of a user information request in step (b) concerning a picture feature that is other than a said particular picture feature, outputting an identifier of the concerned picture feature independently of the presented image.

[0027] This aspect of the invention may be implemented in the form of a system for collecting user-interest information regarding a picture, the system comprising:

- a data store for holding information concerning particular picture features;
- a feature-selection arrangement for enabling a user to select a feature in a displayed view of the picture, and for providing an output indication regarding what said particular feature, if any, the user has thereby selected;
- an information-output subsystem for outputting information about picture features to the user;
- a control arrangement for recognising a user information request, in respect of a picture feature, made by the user at least selecting that picture feature using the feature-selection arrangement, the control arrangement including:
  - first output means arranged to respond to a user making an information request concerning a said particular feature, by outputting the corresponding stored information via the information-output subsystem; and
  - second output means arranged to respond to a user making an information request concerning a picture feature that is other than a said particular picture feature, by outputting an identifier of the concerned picture feature for informing an author of the picture or its associated information regarding the unsatisfied information request.

Brief Description of the Drawings

[0028] A method and apparatus embodying the invention will now be described, by way of nonlimiting example, with reference to the accompanying diagrammatic drawings, in which:

. **Figure 1** is a diagram illustrating the role of a voice browser;
. **Figure 2** is a diagram showing the functional elements of a voice browser and their relationship to different types of voice markup tags;
. **Figure 3** is a diagram showing a voice service implemented with voice browser functionality located in an end-user system;

- **Figure 4** is a diagram showing a voice service implemented with voice browser functionality co-located with a voice page server;
- **Figure 5** is a diagram showing a voice service implemented with voice browser functionality located in a network between the end-user system and voice page server; and
- **Figure 6** shows an example picture image of a multi-modal picture embodying the invention;
- **Figure 7** is a diagram of a system for presenting a multi-modal picture to a user;
- **Figure 8** is a diagram showing constituent dialog blocks of a picture interaction dialog file of the Figure 6 multi-modal picture;
- **Figure 9** is a diagram of apparatus for authoring a multi-modal picture;
- **Figure 10** shows, in respect of the Figure 6 image, a user seeking information from two picture features for which there is no associated information; and
- **Figure 11** shows the Figure 6 picture image enhanced with upper and lower information bars.

Best Mode of Carrying Out the Invention

[0029] In the following description, voice dialog interaction with a user is described based on a voice page server serving a dialog page with embedded voice markup tags to a multi-modal voice browser. Unless otherwise indicated, the foregoing description of voice browsers, and their possible locations and access methods is to be taken as applying also to the described embodiments ofthe invention. Furthermore, although voice-browser based forms of voice dialog services are preferred, the present invention in its widest conception, is not limited to these forms of voice dialog service system and other suitable systems will be apparent to persons skilled in the art.

Multi-Modal Picture

[0030] Figure 6 depicts a multi-modal picture comprising a displayed picture image 30 (here shown as being of a holiday island taken, for example, whilst the author of the picture was on holiday) with which a recipient (referred to below as the "user") can interact using multiple modalities and, in particular, by spoken dialogues and the use of a pointing arrangement, such as a cursor controlled by a mouse, stylus or keyboard keys, a touch-screen detection arrangement, etc. Thus, the user can query the picture using speech input, the query being either a general query about the picture or a specific query about a particular feature (item or area) of the picture indicated by use of the pointing arrangement (for example, the user uses a mouse to move a cursor over a picture feature and then clicks a mouse button). Of course, only certain picture features will have been set up to be queried and in the Figure 6 example, there are three such features, namely a coconut tree 31, a first person 32, and a second person 33; the dashed boxes around these features represent the "hotspot" image areas set up to encompass the features, the dashed lines generally not being visible (though displaying a hotspot boundary can be used as one way of indicating the hotspot to the user - a more typical way would be, in the case of the pointing arrangement being a mouse-controlled cursor, to change the cursor image as it moved into and out of a hotspot).

[0031] Processing functionality associated with the multi-modal picture is arranged to recognize one or more one or more general queries and, for each picture feature set up for selection, one or more specific queries. For each query set to be recognized, there is a corresponding response which is output to the user when the query is recognized, this output generally being in spoken form, generated using either speech synthesis or pre-recorded audio content. Thus, for example:

General Queries - available general queries can include picture location, the date of the picture was taken, and a description of the general subject of the picture. For instance:

User: "Describe the picture"
System: "This is a picture of the XYZ beach"
User: "What is the date?"
System: "The picture was taken November last year"
User: "What is the location?"
System: "XYZ beach is in Martinique, an island that is part of the French West Indies."

(In this and other dialog examples given in the present specification, the "System" is the functionality used to present the multi-modal picture to the user and to provide for multi-modal interaction).

Specific Queries - typically, the same specific queries are available for all the selectable picture features; example specific queries are: "What it is?", "Any story?", etc. For instance:

User: "What is it"? "
System: "This is my cousin John".
User: "Any story?"
System: "John goes fishing quite often in the Caribbean Sea. One day, he just escaped a white shark attack."

[0032] The responses from the system can, of course, be more than just a simple single turn response and may involve a multi-turn structured dialog. Provision may also be made for different levels of content, for instance an initial level of public information and a lower level of private information only accessible under password control (or by some other security check procedure). Alternatively, there may be both a brief and a much fuller response .

[0033] A further possibility is to have responses from more than one narrator. Thus, a user can first obtain a response from one person associated with the picture and then a response from a different person also associated with the picture. For example, the user receives a picture from his/her parents. In the picture, the user's mother appears to be talking to someone, but the user's father looks bored. The user interaction might therefore proceed as follows:

User: "Mother, who is she?" [User uses pointing arrangement to indicate a person in the picture].
System: [In pre-recorded voice of user's mother] "This is my colleague from work. We had such a good time."
User: "Father, can you please describe the picture?"
System: [In pre-recorded voice of user's father] "We went to this rather boring evening with your mother's colleagues. They ended up talking about clothes all the time."

[0034] From the foregoing general description of a multi-modal picture, it will be appreciated that the term "multi-modal picture" covers more than just the picture image and includes also the associated dialog and the behaviour of the picture in response to user input.

Example Implementation

[0035] Figure 7 depicts an example implementation of a system for presenting a multi-modal picture.

[0036] The multi-modal picture is specified by a set 44 of related files held on a server 43, these files specifying both the image associated with the multi-modal picture and also the picture interaction dialogue associated with the picture. At least the dialogue and image files of set 44 are specifically associated with each other- that is, the association of these files is prespecified (in advance of user interaction) with the contents of the dialogue file being specifically tailored to the picture represented by the image file of the same set 44.

[0037] User 2 has local picture-presentation equipment 37; in the present case, this equipment is standard processing platform, such as a PC or portable computer, arranged to run a graphical web browser such as Microsoft's Internet Explorer. Other implementations of the picture presentation equipment 37 can alternatively be provided such as a mobile phone with a graphical display and suitable programs.

[0038] The picture-presentation equipment 37 displays the picture image of the multi-modal picture on display 38 and also provides for the input and output audio data via audio functionality 39, this audio input and output being transferred to and from a voice browser 3 (here shown as located separately from the picture picture-presentation equipment - for example, a network-based voice browser - but alternatively, integrated with the picture-presentation equipment 37). The picture-presentation equipment also has an associated pointing arrangement 40 depicted in Figure 7 as a mouse for controlling a cursor movable over the displayed picture image; other forms of pointing arrangements for selecting features of the picture image are, of course, also possible such as the use of touch pads, tracker balls or joysticks for moving an image cursor; touch-sensitive displays and other arrangements (such as a matrix of infra-red beams immediately overlying the display) for enabling a user to use a finger or stylus to point directly at a feature of the displayed image; etc..

[0039] The voice browser 3 comprises input channel 11, dialog manager 7 and output channel 12. The voice browser provides interactive dialog with the user, via the picture-presentation equipment 37, in respect of the currently-presented multi-modal picture, this dialog being in accordance with picture interaction dialog data retrieved from server 43.

[0040] The Figure 7 voice browser 3, as well as providing for voice input and output exchanges with the picture-presentation equipment 37, is also arranged to receive input data from the equipment in the form of key,value pairs indicating, for example, the selection of a particular picture feature by the user using the pointing arrangement 40 of the picture-presentation equipment. This data input is used by the dialog manager 7 in determining the course of the dialog with the user. The voice browser 3 can also provide data back to the picture-presentation equipment 37.

[0041] The picture-presentation equipment 37, voice browser 3 and server 3 inter-communicate via any suitable communications infrastructure or direct links.

[0042] Considering in more detail the files involved in the presentation of a multi-modal picture, these comprise, in addition to the set 44 of files that specify a multi-modal picture, a set of generic files 51. The multi-modal picture files

44 comprise:

- the picture file 45, this file including a source reference for the picture image file 49 to be displayed and map data defining the image hotspots;
- a picture interaction dialog file 46 containing dialog scripts;
- one or more sound files 47, 48 (such as " .wav" files) containing audio data;
- the image file 49 (such as a ".jpg" or ".gif' file) containing the image data to be displayed.

[0043] The generic files 51 can be stored locally in the picture-presentation equipment 37 or retrieved from a remote location such as the server 43. The generic files comprise:

- a frame-set definition file 52 defining two frames 53, 54 into which page files can be independently loaded; one frame 53 is used to hold a file 55 containing control code (the contents of this frame not being visible), and the other frame 54 being used to hold the picture file 45 for the multi-modal picture to be presented.
- the control code file 55 to be loaded into frame 53, the control code being in the form of a number of scripts the main purpose of which is to provide key,value pairs to the voice browser according to events detected by the browser software run by the picture-presentation equipment 37 - in particular, clicking on an image hotspot as defined in file 45 is arranged to trigger a corresponding script in the control code file 55 whereby to cause a corresponding key,value pair to be passed to the voice browser 3 to inform it that a particular picture feature (corresponding to the activated hotspot) has been selected by the user.

[0044] To use the generic files to present a particular multi-modal picture, it is necessary to provide a reference to the multi-modal picture. This reference can, for example, be manually input by the user into an initial form displayed in the image frame 54 and then used by a script to request the loading of a file into frame 54. Alternatively, the multi-modal picture reference can be included as data in a query string attached to the URL of the frame-set definition file 52 (this URL and query string being, for example, provided to the user by the author of the multi-modal picture); in this case, in response to a request for the frame-set definition file 52, server-side code could, for example, extract the data from the query string and place it in the file source reference in the definition line for frame 54 in the frame-set definition file before that file is returned to the user.

[0045] In the present example, the multi-modal picture reference used to initiate presentation of the multi-modal picture is a reference to the picture interaction dialog file 46 to be loaded into the voice browser, rather than a reference to the picture file 45 that is to be loaded into the image frame 54. Thus, the multi-modal picture reference, however obtained, is passed in a key,value pair to the voice browser 3; voice browser 3 thereupon retrieves the picture interaction dialog file 46 to the dialog manager 7 of the voice browser. The file 46 includes a reference to the picture image file 45 to be loaded into the frame 54 and this reference is returned to the picture-presentation equipment 37 where it is used to retrieve the picture file 45. Where the picture-presentation equipment 37 comprises a standard web browser, one way of achieving the above is to have the dialog file reference sent (either as a source reference in the frame-set definition file or by a script in, for example, file 55) to the voice browser in a request for a file to load into frame 54, the voice browser sending back the picture file reference as a redirection.

[0046] It will be appreciated that the multi-modal picture reference passed into the generic files could have been that of the picture file 45, the latter then being retrieved into frame 54 and including an "onLoad" event script for passing to the voice browser a reference to the interaction dialog file.

[0047] The various steps involved in presenting a multi-modal picture according to the Figure 7 implementation are summarized below with reference to the reference numerals in square brackets in Figure 7:

[1] the generic files 51 have been loaded into the picture-presentation equipment 37 and a multi-modal picture reference has been provided; as a result, a key,value pair including a reference to the picture interaction dialog file 46 is passed to the voice browser 3;

[2] voice browser retrieves the dialog file 46 from the server 43 and dialog manger 7 uses the file to control further interaction with the user;

[3] the first action taken by the dialog manager 7 under the control of dialog file 46 is to pass to the equipment the reference for the picture file 45 along with a voice greeting to the user;

[4] the picture file 45 (including a reference to the image file 49) is retrieved from server 43 and loaded into the image frame 54;

[5] the image file 49 is retrieved from the server 43 and displayed on display 38;

[6] meanwhile, the dialog manager 7 causes a sound (in sound file 47) to be played to the user to indicate that the picture is ready to receive user input (this sound can simply be an appropriate background sound such as, for the Figure 6 picture image, the sound of the sea);

[7] the user queries the picture by voice input (and possibly also by pointing to a particular area of the picture, this being indicated by a corresponding key,value pair sent to the voice browser along with the user voice input);
[8] dialog manager 7 acknowledges the receipt of the user query by causing an acknowledgement sound (in sound file 48) to be played back to the user;
[9] the dialog manager 7, having determined the appropriate response to the user query, outputs this response.

Steps [8] and [9] are repeated as many times as required by the user. In due course the user asks to exit and the dialog is terminated by the dialog manager.

[0048] Figure 8 illustrates the contents of the picture interaction dialog file 46. This file contains a number of dialog blocks 60 to 73 that contain dialog elements and/or control structures relating to dialog progression. Thus, dialog block 60 provides the initial greeting and causes the picture file reference to be passed to the equipment 37 (in step [3] above). Block 61 defines the query grammar and represents a waiting state for the dialog pending the receipt of a query from the user.

[0049] Block 62 carries out an analysis of a recognized query to determine whether it is an exit request (if so, an exit dialog block 63 is entered), a generic request, or a specific request; generic and specific requests are further analyzed to determine the nature of the query (that is, what "action" - type of information - is being requested). For a general query, the available actions are, in the present example, "date", "description", and "location; for a specific query, the action types are, in the present example, "what" and "story". Depending on the outcome of the action analysis, the dialog manager proceeds to one of blocks 64 - 66 (for a general query) or one of blocks 67 and 68 (for a specific query). The analysis carried out by dialog block 62 is on the basis of voice input only.

[0050] If the query was a general one, then block 64 is used to answer a date query, block 65 is used to respond to a description query, and block 66 is used to respond to a location query.

[0051] If the query was a specific "what" query, block 67 determines the identity of the picture feature (object) involved using the key,value pair provided to the voice browser; depending on the object identity, the dialog manager proceeds either to a "what" dialog block 70 for a coconut tree or to a "what" dialog block 71 for a French tourist. Similarly if the query was a specific "story" query, block 68 determines the identity of the picture feature (object) involved using the key,value pair provided to the voice browser; depending on the object identity, the dialog manager proceeds either to a "story" dialog block 72 for a coconut tree or to a "story" dialog block 73 for a French tourist.

[0052] After a response is provided by any one of the dialog blocks 64-66 or 70-73, the dialog manager returns to dialog block 61.

[0053] An example dialog interaction based on the Figure 6 picture and the Figure 8 dialog structure is given below; in this example, there is one narrator called Roger.

Example Interaction:

[0054]

System: "This picture was sent to you by Guillaume. You can talk to Roger to ask for information about it."
User: "Roger, Describe the picture"
System: "This is a picture of the XYZ beach."
User: "What is the location?"
System: "This picture was taken in Martinique, an island located in the French West Indies."
User: "What is it" [and clicks on feature 31]
System: "This is a coconut tree. This kind of trees is very common in the Caribbean."
User: "Any story?"
System: "When I was little, I used to get coconuts from my garden. There is a sweet liquid inside that is very tasty. We use coconut to make ice creams and all sorts of nice desserts."
User: "What is it?" [and clicks on 32]
System: "I guess this is a French tourist"
User: "Any story?"
System: "Tourism is one of the main source of revenue in Martinique. A lot of people come from France when it is winter over there."
User: "Exit"
System: "Thanks for using this digital picture frame."

[0055] The Appendix to the present description includes a detailed script example of the Figure 8 dialog interaction as well as the HTML source of a picture file 45.

Multi-modal picture authoring tool.

[0056] Figure 9 illustrates apparatus for enabling an author 80 to author a multi-modal picture. The apparatus comprises a computing platform 81 providing a graphical user interface and running a tool, such as Microsoft's FrontPage product, for authoring mark-up language pages and for creating image hotspot maps. The apparatus further comprises a speech interface system 82 (here shown as a voice browser though other forms of speech interface system can be used). The speech interface system 82 permits the author 80 to interact with the apparatus by voice and is set up to recognize command words such as "Record".

[0057] Different people, known as narrators, can author different aspects of the same picture. The apparatus keeps a record of narrators known to it.

[0058] The apparatus is arranged to interact with one or more narrators to build up, in memory, the set of files 44 that specify a multi-modal picture, it being assumed that the picture image file 47 around which the multi-modal picture is to be built has already been loaded into memory (for example, from a digital camera) and is displayed via the graphical user interface (GUI) of platform 81. The process of building the required files is controlled by a top-level authoring program 90 that has three main steps 91-93 as will be more fully explained below.

Identifying the narrator - (step 91)

[0059] The first step of the authoring program is to identify the current narrator. The narrator speaks his/her name into the speech interface system 82; if the name is known to the apparatus, the system replies with a recognition greeting. However, if the narrator's name is not already known to the apparatus, the system asks the narrator to create a new profile (basically, input his/her name and any other required information), using appropriate data collection screens displayed on the graphical user interface of the computing platform 81.

[0060] Example: the apparatus knows the following names: "Lawrence" and "Marianne".

Apparatus:	"What is your name?"
Narrator:	"Steve".
Apparatus:	"Sorry, I do not know this name, please write it down."
Narrator:	[inputs "Steve" via a data collection screen of the GUI].

[0061] The authoring program uses the narrator's name to customize a greeting dialog block of a template picture interaction dialog file 46.

Adding general information about the picture - (step 92)

[0062] After identification, the narrator can input general information concerning the picture image such as the date, the location or the description, via a spoken dialogue. In the following example, the command words recognized by the speech interface system 82 are shown in bold whilst the nature of information being recorded (corresponding to the query "action" type of Figure 8) is indicated by underlining. The words indicating the nature of the information are either pre-designated to the system (effectively limiting the classification of information to be input) or else the system can be arranged to analyze narrator "Record" commands to determine the nature of the information to be recorded.

Example:

[0063]

Narrator:	**"Record** description"
Apparatus:	[Plays a beep].
Narrator:	"This is a picture of me and John fishing in the Caribbean sea". [The apparatus records this input, either directly as sound data or as a text data after the input has been subject to speech recognition by the system 82]
Narrator:	**"Write** date".
Apparatus:	[displays date capture screen on GUI].
Narrator:	[inputs date information via GUI].
Narrator:	**"Record** story"
Apparatus:	[Plays a beep.]
Narrator:	"This day, John was attacked by a white shark." [The apparatus records this input]

[0064] The authoring program uses the input from the narrator to create corresponding dialog blocks, similar to those described above with reference to Figure 8, in dialog file 46.

Adding specific information - (step 93)

[0065] The narrator can also input information concerning a specific feature of the picture image. To do this, the narrator indicates the picture feature of interest by using the GUI to draw a "hotspot" boundary around the feature. The apparatus responds by asking the narrator to input a label for the feature via an entry screen displayed on the GUI.. The authoring program uses the input from the narrator to create the multi-media picture file 45 holding an image hotspot map with appropriate links to the control code scripts.

[0066] The narrator can then enter further information using the speech interface system or the GUI. The narrator can record or write multiple descriptions or stories for a single area of the picture, for example, to give different level of details.

Narrator:	**"Record** description".
Apparatus:	[Plays beep.]
Narrator:	"It is a whale" [The apparatus records this input]
Narrator:	**"Record** story"
Apparatus:	[Plays beep.]
Narrator:	"We saw this whale on the way to Dominica." [The apparatus records this input]
Narrator:	**"Record next"** (indicates that further details for the story are to be recorded).
Narrator:	"We were crossing the Guadeloupe channel when we saw it." [The apparatus records this input]

[0067] Again, the authoring program uses the input from the narrator to create corresponding dialog blocks; thus, for the above example, where a "whale" hotspot has been designated by the user, the authoring program generates a set of dialogs blocks: 'whaleDescription', 'whaleStoryl', 'whaleStory2', etc.

[0068] After the first narrator has finished inputting information, other narrators can enter information in the same manner.

User Feedback

[0069] It will be appreciated that the authoring of a multi-modal picture, and in particular the adding of the dialog data, can be quite involved. As a result, it is quite likely that the author will not always include information that a recipient may be interested in.

[0070] It is therefore useful to be able to monitor a user's interaction with a multi modal picture to see if the user tries to access missing information. For example, a user receives the Figure 6 multi modal picture from a friend. Two objects 35,36 (a building and an island) in the picture image intrigues the user (see Figure 9) who therefore clicks on each picture feature concerned and asks for more information ("What is it?"). Unfortunately, there are no hotspots associated with either picture feature and therefore in each case the voice browser comes back with the response "Sorry, there is no information about this item."

[0071] However, the coordinates corresponding to each picture feature the user clicked are known to the browser used to display the picture image and the control script (for example, in file 55) can be used to pass the coordinates as key,value pairs to the voice browser 3. At the same time, a user verbal query is also passed to the voice browser. The voice browser first determines whether the query is a general one and if it is, the voice browser ignores the received coordinate values; however, if the voice browser determines that the query is a specific one, then it determines from the key,value pairs received that the user has indicated a picture feature for which there is no corresponding information available. In this case, the voice browser logs the received coordinate values and the associated "action" type (in the example given above, "what" or "story") in a feedback file 50 that forms part of the set 44 of related files associated with the multimodal picture (see arrow 70 in Figure 7). For example, upon the user clicking on the island feature 36 in Figure 9 and asking "what is this?", the data (action='what'; coordx =400;coordy=300) is logged to file 50. Such logging functionality is, for example, provided by a further dialog block of Figure 8. The logged coordinates provide, together with an indication of the picture concerned, a picture-feature identifier that identifies the picture feature about which information has been requested by the user.

[0072] Alternatively or additionally to logging the "desired-information" feedback data in file 50, the author of the multi-modal picture can be sent a message (for example, an e-mail message) explaining the query from the user such as "John wants a description of this object.". This message includes a picture feature identifier that identifies the picture feature concerned. The picture feature identifier can take the form of explicit data items indicative of the picture concerned and the coordinates of the feature in the picture or may more directly indicate the feature by including either

image data representing the relevant portion of the picture image or image data showing the picture image with a marking indicating the position in the image of the feature concerned (both such forms of picture-feature indication can also be included the feedback file 50 additionally or alternatively to the feature coordinates). The picture-feature indication need not be sent to the file 50 (or included in a message to the author) at the time the system detects that the user has asked for information about a non-hotspot picture feature; instead, the indication and related query can be temporarily stored and output, together with other accumulated similar indications and queries, either at a specified time or event (such as termination of viewing of the picture by the user) or upon request from the picture author.

[0073] The author can then decide whether or not to add in further information by adding an additional hotspot and additional dialogs (for example, using the above-described authoring apparatus).

[0074] Of course, the same general feedback process can be used where although a selected picture feature is associated with an existing hotspot, there is no existing query "action" corresponding to a user's query. Furthermore, a similar feedback process can be used where user queries are input by means other than speech (such as, for example, via a keyboard or by a hand-writing or stroke recognition system) and, indeed, where there are no explicit user queries such as when the selecting of picture feature is taken as a request for information about that feature.

Variants

[0075] Many variants are, of course, possible to the arrangements described above. For example, Figure 11 illustrates a variant form of the multi-modal picture in which the picture image 30 is accompanied by upper and lower information bars 100 and 101 respectively. The upper information bar 100 indicates the narrators associated with the picture whilst the lower information bar 101 indicates what types of general and specific queries are available for use. These information bars assists the user in appreciating what queries can be put and to whom. To further assist the user, speaking (or clicking on) a narrator's name is preferably arranged to indicate what hotspots are associated with that narrator and where these hotspots are located in the image - thus, in Figure 11, narrator "Vivian" has been selected and hotspot 32 is indicated on the picture image by a dashed hotspot boundary line. Query types used by "Vivian" can also be indicated by highlighting these types (in the Figure 11 example, "Vivian" has used general query type 'description' and specific query types 'what' and 'story'). Preferably, once a narrator has been selected, that narrator remains selected until a different (or all) narrators is subsequently selected, whereby with a narrator selected, only the responses of that narrator will be used in responding to the users' queries. However, it is also possible to arrange for selection of a narrator to be effective only for a single query. In this latter case, a convenient way of providing for user selection of a narrator to answer a query about a particular feature is for a list of narrators of responses about that feature to be displayed whenever the user points to that feature.

[0076] Instead of identifying narrators by name as shown in Figure 11, other forms of identifier can be used such as an image of each narrator.

[0077] As regards the generic control code, this can be provided in the form of a Java applet or any other suitable form and is not limited to the use of client-side scripts of the form described above. Furthermore, rather than the frame-set definition file 52 and control code file 55 being generic in form, they can be made specific to each multi-modal picture.

[0078] As already indicated, picture invocation can be initiated in a variety of ways. As a further example, picture invocation can be arranged to be effected by the creator sending the user a reference to the picture interaction dialog file, the user sending this reference to the voice browser to enable the latter to retrieve the dialog file; the dialog file is arranged to cause the return to the user of the frame-set definition file (or a reference to it) with the latter already including the correct source reference to the picture file as well as to the control code file.

[0079] Persons skilled in the art will appreciate that there are very many ways of implementing multi-modal pictures and the supporting functionality ranging from the multiple file approach described above to having just a single data file containing all the necessary data and arranged to be executed by specifically adapted software. It will also be appreciated that whilst in the described embodiments the course of the system-user interaction is controlled by the control logic embedded in the picture interaction dialog file and interpreted by the dialog manager 7 of the voice browser, it is possible to provide this functionality separate from the voice browser and the response scripts (thus, in general terms, the dialog block 62, 67 and 68 would be used by a separate control arrangement for determining, on the basis of the user voice and pointing-arrangement inputs, which of multiple stored responses is the appropriate one to play back to the user). Furthermore, it is not necessary to explicitly identify a selected feature from the coordinates output by the pointing arrangement as a separate step to choosing an appropriate response to a particular user query; thus, a picture feature could simply be specified in the control logic of the dialog interaction file by its coordinate values (of range of values) whereby this control logic tests coordinate values output by the pointing arrangement against coordinate values of particular features in the course of selecting a response to a user query.

[0080] With respect to the selection of a picture feature of interest to a user, in the described embodiments this has been carried out by means of a user-operated pointing arrangement whereby data input about the picture feature of interest is generated through a manual operation. In addition to the described arrangements for manually effecting

feature selection, it is possible to use an arrangement in which the coordinates of the feature of interest are manually input using a keypad (a coordinate system being displayed as part of the image presented to the user, or being presented around the boundary of the display area). Another possible feature-selection arrangement is one based on specifying, via keypad input, a particular area of the display where either the display is divided into labelled areas or there is a direct mapping between keypad keys and display areas. It is also possible to label each feature of interest in the image with a reference and have the user effect feature selection by keypad input of the appropriate reference.

[0081] Further as regards the determination of which picture feature is being selected by a user, it should be noted that determining the picture feature of interest from the image coordinates or image area identified by whatever selection arrangement is being used, can be done in ways other than that described above in which image coordinates generated by the feature-selection arrangement are mapped to picture features using predetermined mapping data as described above. For example, the image can have data encoded into it that labels particular picture features, the pointing arrangement being arranged to read this label data when over the corresponding picture feature. Technology for embedding auxiliary data in picture image data in a way that does not degrade the image for the average human viewer is already known in the art.

[0082] The picture image can be a hard-copy image carrying markings (such as infra-red ink markings) intended to be read by a sensor of a suitable pointing arrangement whereby to determine what particular picture feature is being pointed to; the markings can be a pattern of markings enabling the pointing arrangement to determine the position of its sensor on the image (in which case, an image map can be used to translate the coordinates into picture features) or the markings can be feature labels appropriately located on the image. Even without special markings added to the image, the image can still be a hard-copy image provided the image is located in a reference position relative to which the pointing arrangement can determine the position of a pointing element (so that an image map can be used to translate pointing-element position into picture features). Other manually-operated selection arrangements, such as those based on explicit coordinate input via a keypad, can also be used.

[0083] Where image map data is used to translate image coordinates to picture features, the image map data can be held separately from the picture file and only accessed when needed; this facilitates updating of the image map data. A reference (e.g. URL) to the image map data can be included in the picture file or, where the image is a hard-copy image, in markings carried by the image.

[0084] Preferably, the described embodiments are applied to pictures of scenes and places in the real world such as a tourist might take with a camera. However, it is also possible to apply the embodiments to topographic pictures that are primarily intended to convey map-type information.

APPENDIX

This Appendix forms an integral part of the description.

Example of Multi-Modal Picture file.

The following HTML file was generated using Microsoft FrontPage and is the Multi-Modal Picture file 45 for the picture depicted in Figure 6; the HTML code pulls in image file "beachPicture.jpg" and defines three "hotspots" which when clicked result in a call to a function (method) of the control code file 55 with the passing of a parameter value indicating which hotspot has been clicked on.

File Name: MMPicture1.htm

```
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=windows-1252">
<meta name="GENERATOR" content="Microsoft FrontPage 4.0">
<meta name="ProgId" content="FrontPage.Editor.Document">
<title>Frame Page</title>
</head>
<body>
<p><map name="FPMap0">
<area href="http://localhost/mmpic1/dpfBlank.htm"
onclick="parent.parent.scriptFrame.pushParams('object=coconutTree')"
target="invisible" coords="128, 84, 253, 236" shape="rect">
<area href="http://localhost/mmpic1/dpfBlank.htm"
onclick="parent.parent.scriptFrame.pushParams('object=frenchTourist')"
target="invisible" shape="rect" coords="204, 266, 219, 282">
<area href="http://localhost/mmpic1/dpfBlank.htm"
onclick="parent.parent.scriptFrame.pushParams('object=frenchTourist')"
target="invisible" shape="rect" coords="309, 257, 324, 269"></map>
<img border="0" src="beachPicture.jpg" align="center" usemap="#FPMap0"
width="569" height="375"></p>
</body>
</html>
```

Example of Picture Interaction Dialogue file

[0085] The following is an example implementation of the Figure 8 picture interaction dialog file 46. In this example, there is one narrator called Roger. The user can say things like:"Roger, what is the date?".

```
<talkml>
    <!--variables declaration-->
    <create name="object"          expr="'undefined'"/>
    <create name="action"          expr="'what'"/>
    <create name="type"        expr="'generic'"/>
    <!-- Specify here the url of the display webserver-->
    <display-server url="localhost"/>

    <dialog name="welcome">
        <say> Welcome to the digital picture frame. </say>
        <!-- Display the Multi Modal picture of beach. -->
        <display-show url="MMPicture1.htm"/>
        <say>
            This picture was sent to you by Guillaume. You can talk to Roger to
            ask for information about it.
        </say>
        <goto next="getUserRequest"/>
    </dialog>

    <dialog name="getUserRequest">
        <play src="sound1.wav"/>
        <display-listen wait_after="2000"/>
        <speech wait_after="2000">
            sentence =  narrator question | question | exit {action='exit'};
            question =  genericQuestion {type='generic'} | specificQuestion
                        {type='specific'};
```

```
        narrator = roger {narrator='roger'};
        roger    = "roger";
        genericQuestion = date {action='date'}| location {action='location'}|
                          description {action='description'};
        date     = "what is the date";
        location = "what is the location";
        description = "describe the picture";
        specificQuestion= what {action='what'} | story {action='story'};
        what     = "what is it";
        story    = "any story";
        exit     = "exit";
    </speech>

    <recognised>
        <play src="sound2.wav"/>
        <goto next="filterRequest"/>
    </recognised>

    <unrecognised>
        <play src="sound2.wav"/>
        <say> I am sorry, I have some trouble understanding you.</say>
        <retry/>
    </unrecognised>

</dialog>

<dialog name="filterRequest">
    <if cond="action='exit'">
        <goto next="exit"/>
    </if>
```

```
        <if cond="type='generic'">
            <if cond="action='description'"><goto next="description"/></if>
            <if cond="action='date'"><goto next="date"/></if>
            <if cond="action='location'"><goto next="location"/></if>
        </if>

        <if cond="type='specific'">
            <if cond="action='what'">    <goto next="what"/>  </if>
            <if cond="action='story'">    <goto next="story"/></if>
        </if>

</dialog>


<dialog name="description">
        <say>
            This is a picture of the beach.
        </say>
        <goto next="getUserRequest"/>
</dialog>


<dialog name="date">
        <say>
            Guillaume took this picture during his last trip home to
            Martinique last November
        </say>
        <goto next="getUserRequest"/>
</dialog>


<dialog name="location">
```

```
        <say>
            This picture was taken in Martinique, an island located in the
            French West Indies.
        </say>
        <goto next="getUserRequest"/>
    </dialog>

    <dialog name="what">
        <if cond="object='coconutTree'"><goto next="coconutTreeWhat"/></if>
        <if cond="object='frenchTourist'"><goto next="frenchTouristWhat"/></if>
        <say>
            Apparently, you did not click on any parts of the picture. Try
            again.
        </say>
        <goto next="getUserRequest"/>
    </dialog>


    <dialog name="story">
        <if cond="object='coconutTree'"><goto next="coconutTreeStory"/></if>
        <if cond="object='frenchTourist'"><goto next="frenchTouristStory"/></if>
        <say>
            Apparently, you did not click on any parts of the picture. Try
            again.
        </say>
        <goto next="getUserRequest"/>
    </dialog>

    <dialog name="frenchTouristWhat">
        <say>
            I guess this is a French tourist.
        </say>
```

```
        <goto next="getUserRequest"/>
    </dialog>


    <dialog name="coconutTreeWhat">
        <say>
            This is a coconut tree. This kind of trees is very common in the
            Caribbean.
        </say>
        <goto next="getUserRequest"/>
    </dialog>


    <dialog name="frenchTouristStory">
        <say>
            Tourism is one of the main source of revenue in Martinique. A lot
            of people come from France when it is winter over there.
        </say>
        <goto next="getUserRequest"/>
    </dialog>


    <dialog name="coconutTreeStory">
        <say>
            When I was little,I used to get coconuts from my garden. There is
            a sweet liquid inside that is very tasty. We use coconut to make
            ice creams and all sorts of nice desserts.
        </say>
        <goto next="getUserRequest"/>
    </dialog>
```

```
<dialog name="exit">
    <say> Thanks for using this digital picture frame. </say>
</dialog>

</talkml>
```

Claims

1. A system for presenting information concerning a picture to a user, the system comprising:
   - a data store for holding responses, specific to said picture, in respect of specific user queries concerning particular picture features;
   - a manually-operable feature-selection arrangement for enabling a user to select a feature in a displayed image of the picture, and for providing an output indication regarding what said particular feature, if any, the user has thereby selected;
   - a voice dialog input-output subsystem including a speech recogniser for interpreting queries from a user;
   - a control arrangement responsive to a user selecting a said particular feature and asking a specific query regarding that feature, to output the corresponding stored response.

2. A system according to claim 1, wherein image-map data is associated with the picture image for mapping image coordinates to said particular features, the selection arrangement being arranged to use the image-map data to determine what picture feature is selected by the user.

3. A system according to claim 1, wherein said image includes label data positioned in the region of a said particular picture feature to indicate the identity of that feature, the selection arrangement being arranged to read the label data to determine what picture feature is selected by the user.

4. A system according to any one of claims 1 to 3, further comprising a display subsystem for displaying said image provided to it in the form of digital image data.

5. A system according to any one of claims 1 to 3, wherein the picture image is a hard-copy image.

6. A system according to any one of the preceding claims, wherein the data store is arranged also to hold responses concerning general queries that are not associated with any particular picture feature, the control arrangement being arranged to respond to the user voice input of a general query by returning the appropriate response.

7. A system according to any one of the preceding claims, wherein the voice interface subsystem and control arrangement are arranged to cooperate in recognising multiple different queries in respect of a particular picture feature selected by the user.

8. A system according to claim 1, wherein each of at least some of the responses is associated with a specified narrator, the system being arranged to permit a user to receive only the response of a user-selected narrator in respect of at least one query.

9. A system according to claim 8, wherein user selection of a narrator is arranged to be effected by voice input, the control arrangement being arranged to respond to the selection of a particular specified narrator by user voice input, by using only the said responses associated with that narrator in providing a response to a user query.

10. A system according to claim 9, further comprising means for displaying, along with said picture image, identifiers of narrators associated with the picture.

11. A system according to claim 9, further comprising a display subsystem for displaying said image provided to it in

the form of digital image data and identifiers of narrators associated with the picture; the display subsystem being arranged to respond to selection of a particular specified narrator by user voice input by indicating on the displayed image the said particular features for which responses are available concerning that narrator.

12. A system according to claim 8, further comprising a display subsystem for displaying said image provided to it in the form of digital image data, and identifiers of narrators associated with the picture; user selection of a narrator being arranged to be effected by the user using said selection arrangement to select a displayed narrator identifier, and the control arrangement being arranged to respond to the selection of a particular narrator by using only the said responses associated with that narrator in providing a response to a user query.

13. A system according to claim 12, wherein the display subsystem is arranged to respond to selection of a particular specified narrator to indicate on the displayed image the said particular features for which responses are available concerning the currently-selected narrator.

14. A system according to any one of the preceding claims, wherein said selection arrangement is a pointing arrangement usable by the user to point to a feature of interest in a displayed view of the picture.

15. A system according to any one of the preceding claims, further comprising a feedback arrangement arranged to respond to a user query concerning a picture feature that is other than a said particular picture feature, by outputting at least an identifier of the concerned picture feature for informing an author of the picture or its associated responses regarding the unsatisfied query.

16. A system according to any one of the preceding claims, further comprising a feedback arrangement arranged to respond to a user query that although concerning a said particular picture feature is not a said specific query, by outputting an indication of the query and an identifier of the concerned picture feature for informing an author of the picture or its associated responses regarding the unsatisfied query.

17. A system according to claim 15, wherein the feedback arrangement is further arranged to output an indication of the user query together with said picture feature identifier.

18. A system according to any one of claims 15 to 17, wherein the picture feature identifier arranged to be output by the feedback arrangement comprises an indication of the picture concerned and image coordinates of the picture feature.

19. A system according to any one of claims 15 to 17, further comprising means for converting digital picture data into said displayed image of the picture, the picture feature identifier arranged to be output by the feedback arrangement comprising digital data representing a corresponding portion of the image.

20. A system according to any one of claims 15 to 17, further comprising means for converting digital picture data into said displayed image of the picture, the picture feature identifier arranged to be output by the feedback arrangement comprising digital data representing the image with a marking indicating the position of the feature in the image.

21. A system according to any one of claims 15 to 20, wherein the feedback arrangement is operative to output said picture feature identifier to a log file.

22. A system according to any one of claims 15 to 20, wherein the feedback arrangement is operative to output said picture feature identifier in the form of an electronic message addressed to a person associated with the generation of the picture or its associated responses.

23. A multi-modal picture specified by data held on at least one data carrier, this data comprising:

- picture image data for displaying a picture image;
- response data indicative of voice responses intended to be given to specific user queries concerning particular picture features of the picture;
- first control data for enabling a determination to be made as to which said particular feature in the picture image, if any, a user is selecting when using a selection arrangement to indicate a feature in the displayed image; and
- second control data for determining, on the basis of a spoken user query and on which said particular picture

feature is selected by the user using the selection arrangement, which said response is to be used to reply to the user query.

24. A multi-modal picture according to claim 23, wherein the first control data comprises image-map data mapping image coordinates to said particular features.

25. A multi-modal picture according to claim 23, wherein the first control data comprises label data arranged to be positioned in the displayed image in the region of each said particular picture feature to indicate the identity of that feature.

26. A multi-modal picture according to claim 23, wherein at least some of the said responses are associated with a narrator identified in the response data, the second control data enabling the determination of which said response is to be used to reply to the user query to be restricted to those responses associated with a said narrator that has been selected by the user.

27. A multi-modal picture according to any one of claims 23 to 26, wherein the picture is of a non-topographic real-world scene.

28. A multi-modal picture comprising a hard-copy picture image, and data held on at least one data carrier, this data comprising:

- response data indicative of voice responses intended to be given to specific user queries concerning particular picture features;
- first control data for enabling a determination to be made as to which said particular feature in the picture image, if any, a user is selecting when using a selection arrangement to indicate a feature of the image; and
- second control data for determining, on the basis of a spoken user query and on which said particular picture feature is selected by the user using the selection arrangement, which said response is to be used to reply to the user query.

29. A multi-modal picture according to claim 28, wherein the first control data comprises image-map data mapping image coordinates to said particular features.

30. A multi-modal picture according to claim 28, wherein the first control data comprises label data arranged to be positioned in or on the image in the region of each said particular picture feature to indicate the identity of that feature.

31. A multi-modal picture according to claim 28, wherein at least some of the said responses are associated with a narrator identified in the response data, the second control data enabling the determination of which said response is to be used to reply to the user query to be restricted to those responses associated with a said narrator that has been selected by the user.

32. A multi-modal picture according to any one of claims 28 to 31, wherein the picture is of a non-topographic real-world scene.

33. Apparatus for authoring a multi-modal picture, comprising:

- a first tool for defining image hotspots associated with particular picture-image features;
- a second tool with speech recognition capability, for recording user responses input by voice, to user-specified queries each associated with a particular said picture-image feature; and
- means for automatically generating control data for determining, on the basis of a spoken user query and on which said particular picture feature is selected by a user, which said response is to be used to reply to the user query.

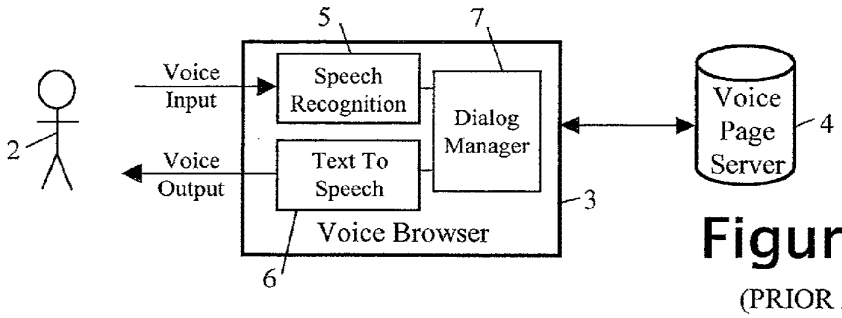


Figure 1

(PRIOR ART)

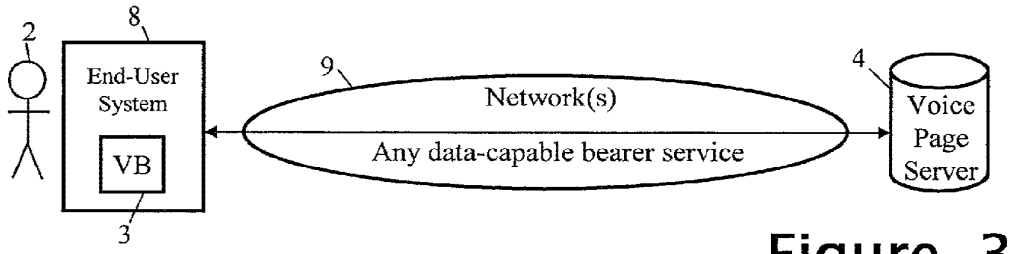


Figure 3

(PRIOR ART)

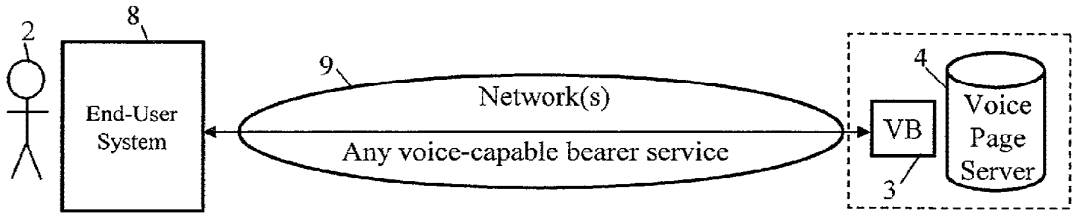


Figure 4

(PRIOR ART)

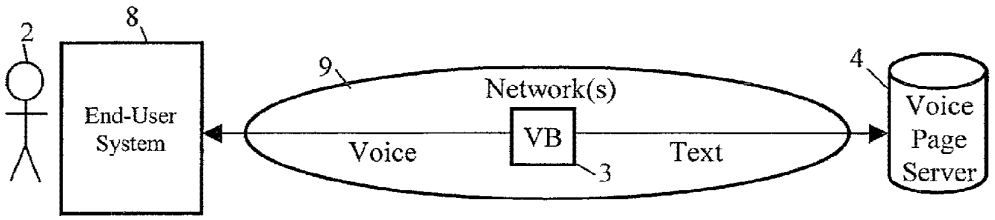


Figure 5

(PRIOR ART)

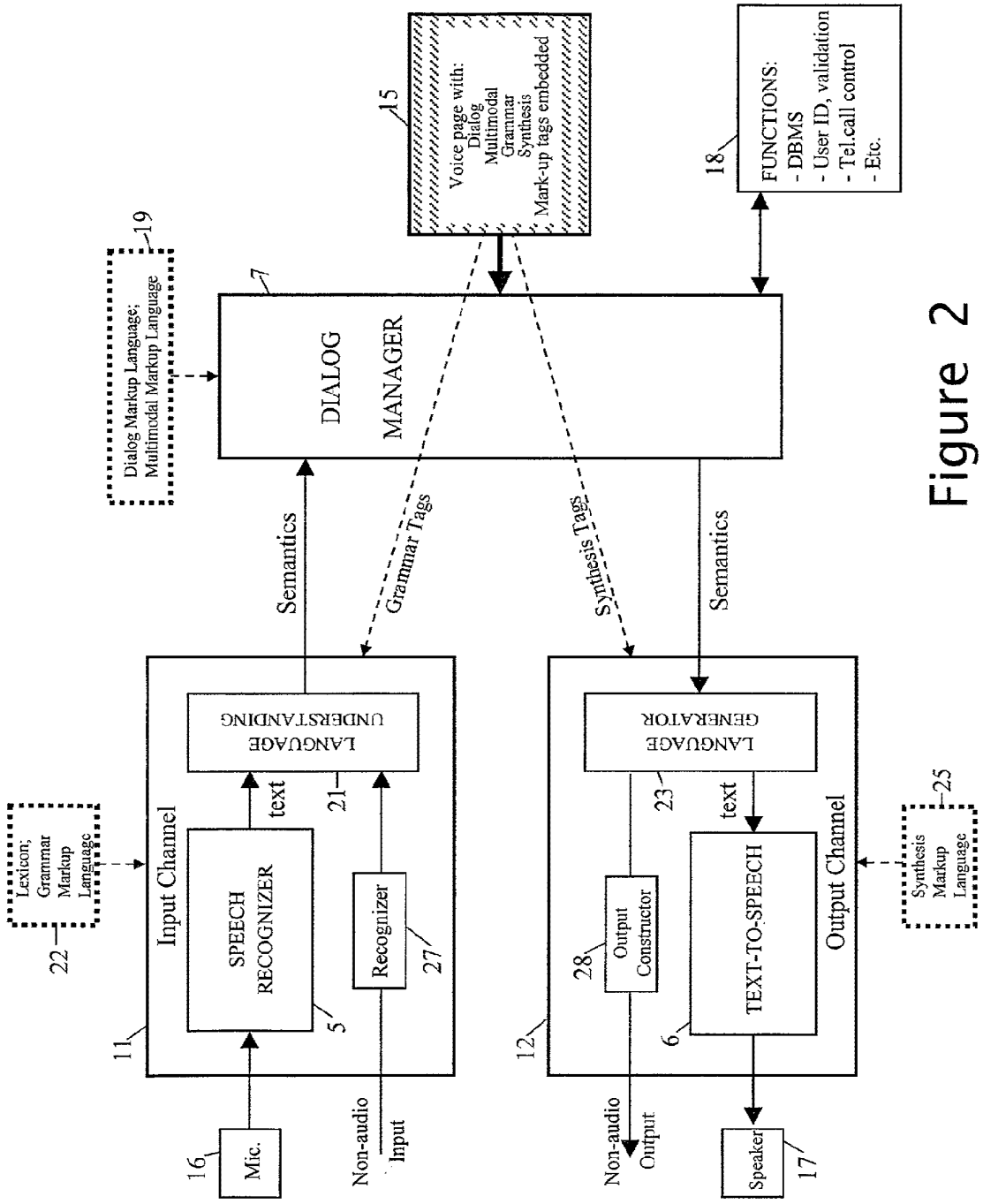


Figure 2
(PRIOR ART)

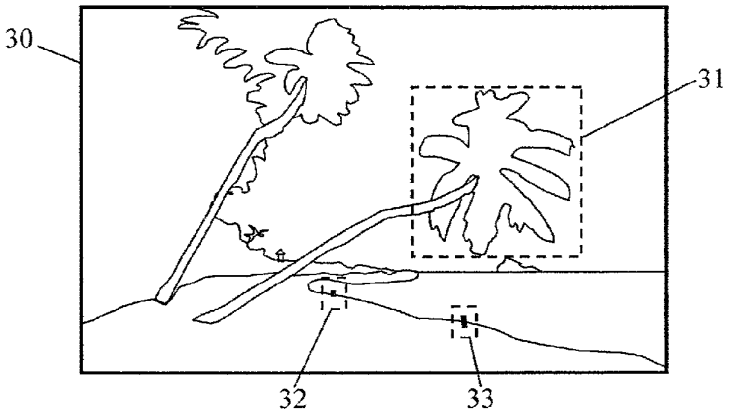


Figure 6

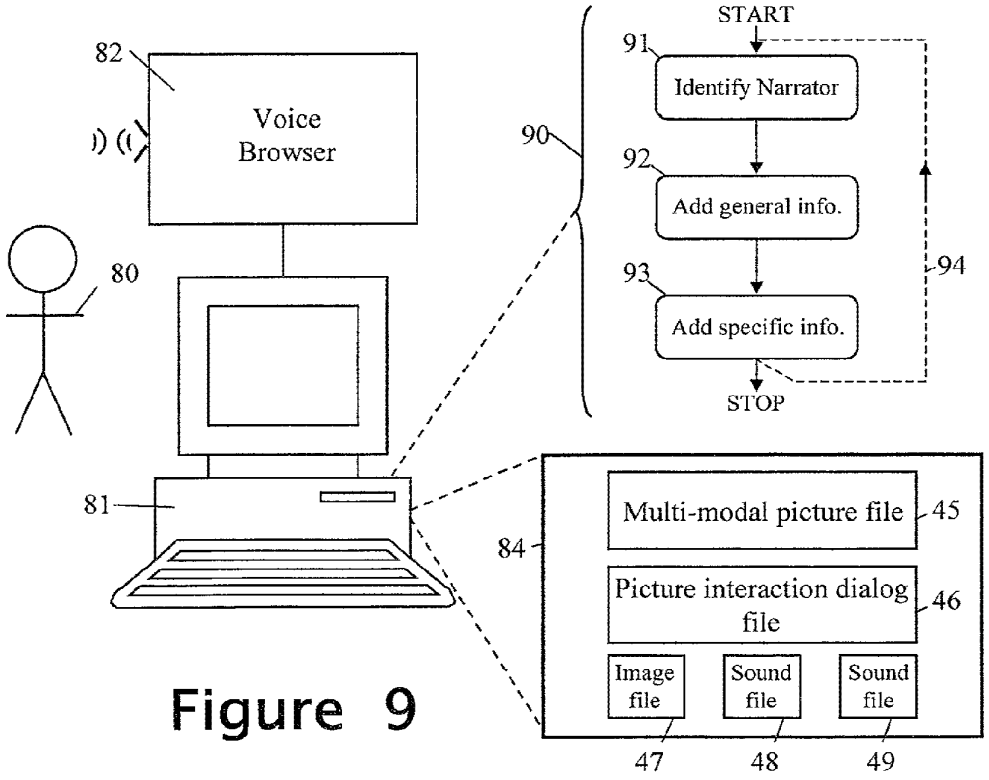


Figure 9

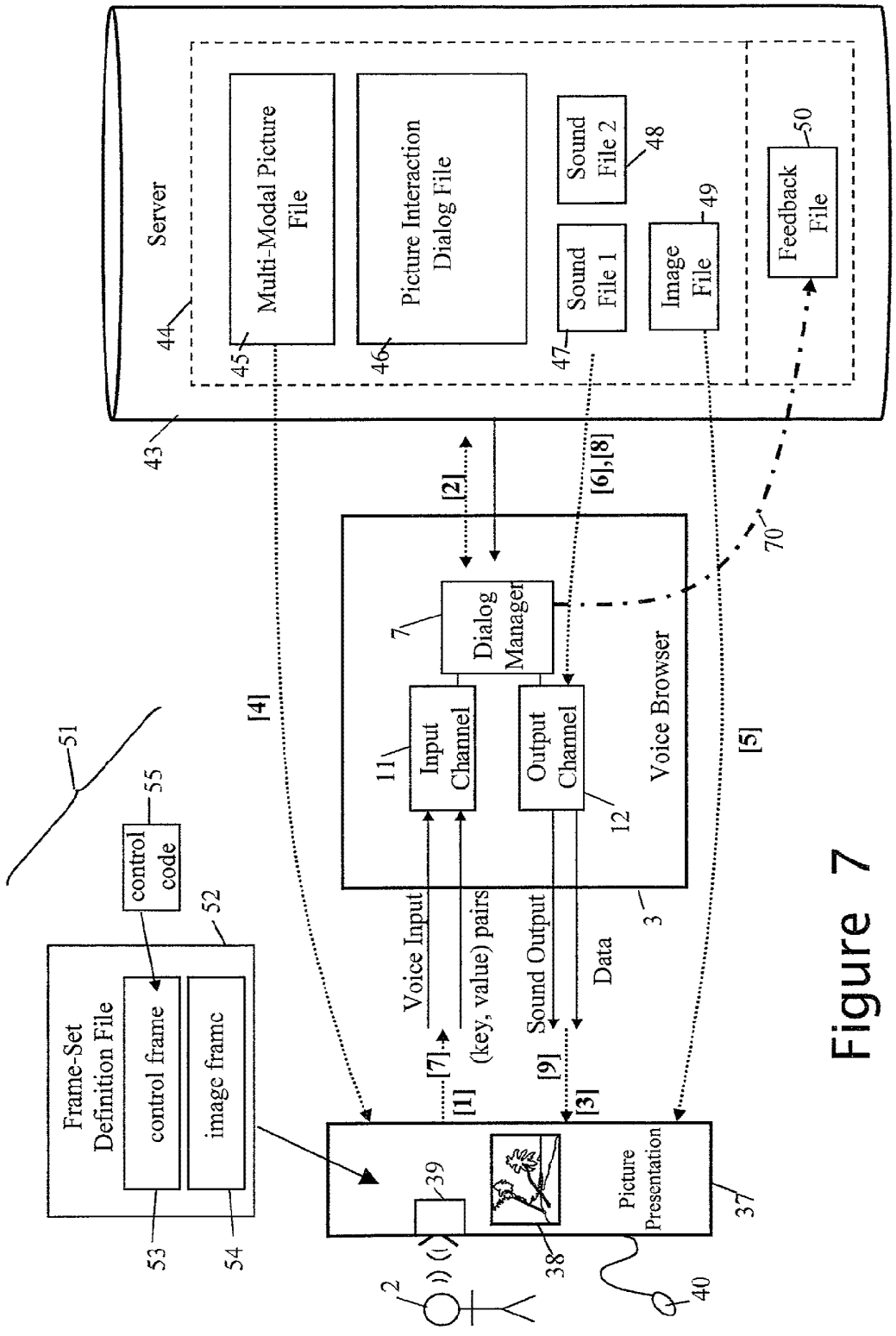
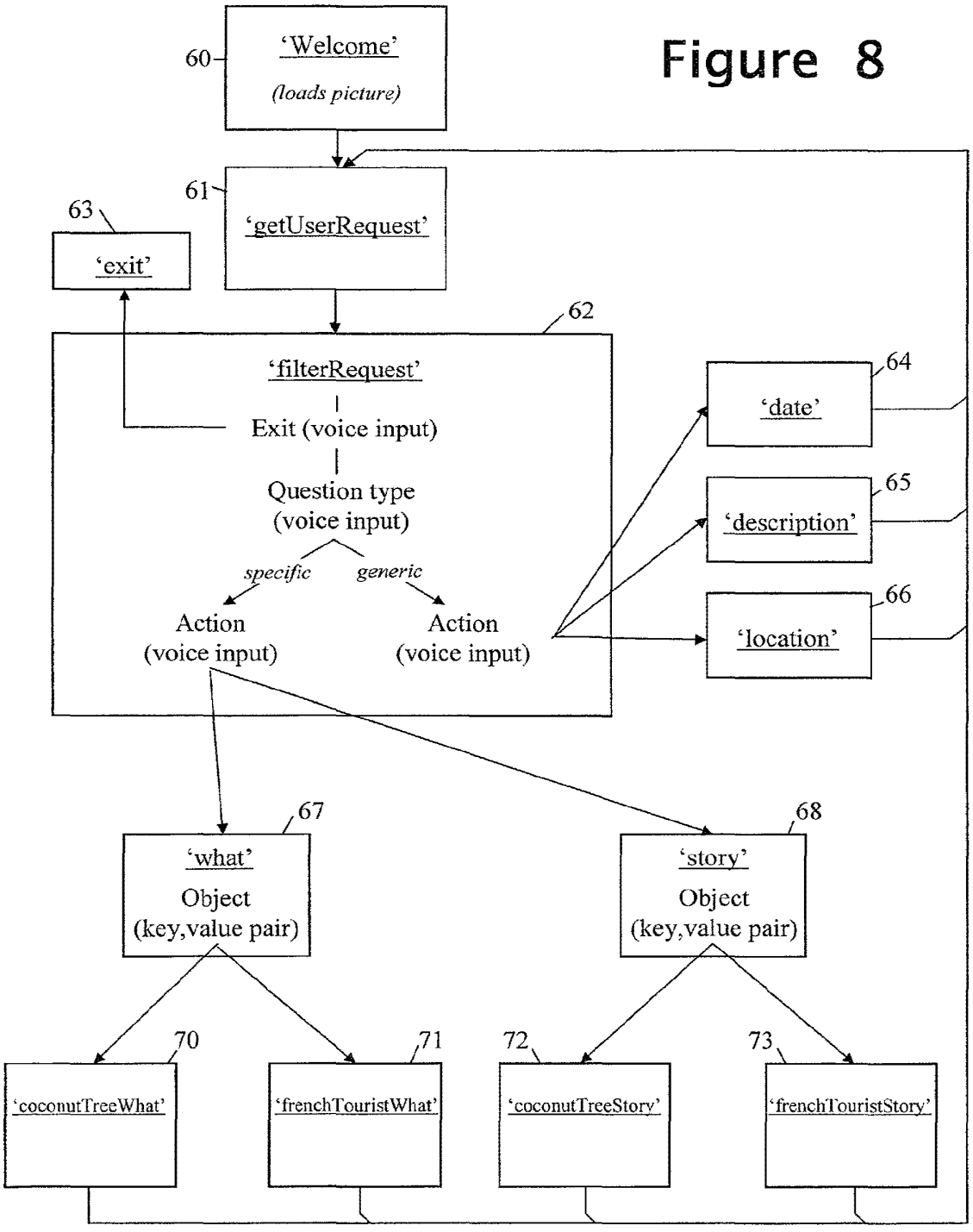

Server
44
Multi-Modal Picture File
45
Picture Interaction Dialog File
46
Sound File 1
47
Sound File 2
48
Image File
49
Feedback File
50
43
[2]
[6],[8]
70
Dialog Manager
7
Input Channel
11
Output Channel
12
Voice Browser
3
[4]
[5]
51
55
control code
52
Frame-Set Definition File
control frame
image frame
53
54
Voice Input
(key, value) pairs
Sound Output
Data
[7]
[1]
[9]
[3]
39
Picture Presentation
37
38
2
40

Figure 7

Figure 8


60
'Welcome'
(loads picture)
61
'getUserRequest'
63
'exit'
62
'filterRequest'
Exit (voice input)
Question type
(voice input)
specific
generic
Action
(voice input)
Action
(voice input)
64
'date'
65
'description'
66
'location'
67
'what'
Object
(key,value pair)
68
'story'
Object
(key,value pair)
70
'coconutTreeWhat'
71
'frenchTouristWhat'
72
'coconutTreeStory'
73
'frenchTouristStory'

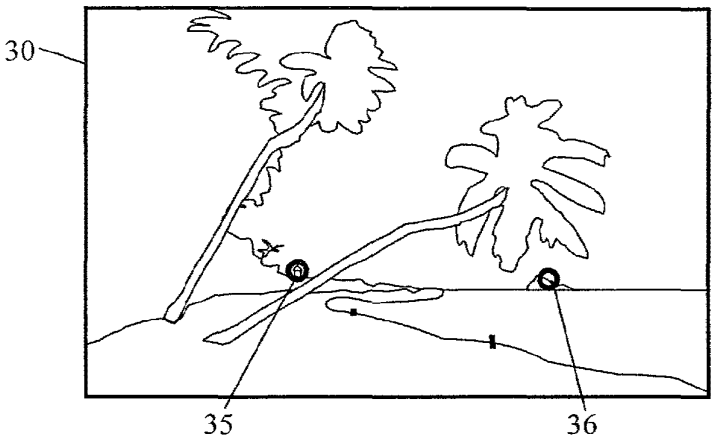


Figure 10

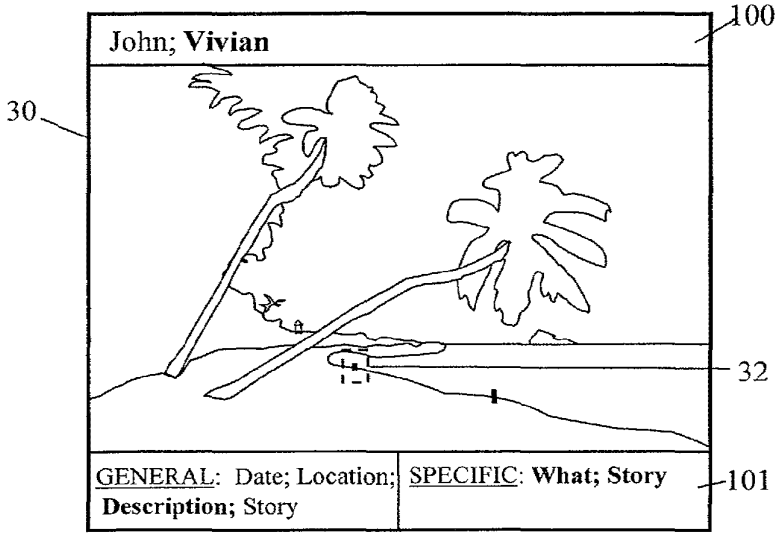


Figure 11

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 646 037 B1

(12) EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
26.03.2008 Bulletin 2008/13

(51) Int Cl.:
G10L 15/26 *(2006.01)*

(21) Application number: **05291989.1**

(22) Date of filing: **23.09.2005**

(54) Method and apparatus for enhancing speech recognition accuracy by using geographic data to filter a set of words

Verfahren und Vorrichtung für erhöhte Spracherkennungspräzision unter Verwendung geografischer Daten zur Filterung einer Wortgruppe

Procédé et appareil pour améliorer la précision de la reconnaissance vocale en utilisant des données géographiques pour filtrer un lot de mots

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

(30) Priority: **29.09.2004 US 953671**

(43) Date of publication of application:
12.04.2006 Bulletin 2006/15

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EP-A- 1 233 407
US-B1- 6 230 132

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EP 1 646 037 B1

Printed by Jouve, 75001 PARIS (FR)

Description

FIELD OF THE INVENTION

[0001] The invention relates generally to speech recognition systems and methods and, more particularly, to systems and methods for enhancing speech recognition accuracy by using geographic data to reduce the size of a set of words that must be checked to effect speech recognition.

BACKGROUND OF THE INVENTION

[0002] While visiting an unfamiliar city, a mobile handset user may wish to locate a business, landmark, street, or other place of interest. It would be quite advantageous if the user could place a voice call to a remote server at a designated telephone number, speaking his or her request for information into the handset. The handset would execute a speech recognition procedure, transforming the spoken request into a server query, and receiving the requested information from the remote server in the form of an electronic signal for producing audible speech. For example, a user in Manhattan may wish to locate the closest Neiman Marcus store. She dials a designated telephone number and speaks a request such as "where is the closest Neiman Marcus?" The handset uses speech recognition to convert the request into an electronic query for receipt by the remote server. Based upon the current location of the handset, the remote server accesses a database to retrieve the address and phone number of the nearest Neiman Marcus. The address and phone number are sent from the server to the user's handset in the form of an electronic signal, whereupon the handset converts the electronic signal into audible speech.

[0003] Unfortunately, there are significant hurdles to overcome if one wishes to use existing speech recognition algorithms to carry out the foregoing procedures. More specifically, it is a challenge to develop speech recognition algorithms, which provide a desired level of accuracy in certain operational environments, such as that of mobile telephonic devices. In general, the processing power and memory capabilities of mobile telephonic devices are limited by size and cost constraints, thereby placing limits on the extent to which the complexity of existing algorithms can be increased. Moreover, the existence of ambient noise severely degrades the performance of many speech recognition algorithms. In view of these shortcomings, prior art techniques have been developed to improve the performance of speech recognition algorithms in applications where processing power may be limited. These prior art techniques are directed toward enhancing a recognition model by utilizing improved acoustic models. The following definitions are presented herein for purposes of understanding and clarity:

[0004] *Lexical Model:* A lexical model breaks down individual words of a syntactic model (defined hereinafter) into a sequence of phonemes (also defined hereinafter).

[0005] *Acoustic Model:* An acoustic model breaks down the sequence of phonemes determined by the lexical model into a Markov model of cepstrum coefficients, also termed vector sequences. Cepstrum coefficients are generated by taking the Fourier Transform of the power spectrum of a speech signal.

[0006] *Recognition Model:* A recognition model is a set of rules and operations that are used by a recognition engine to recognize individual words. The recognition model includes a fully deployed speech recognition system which encompasses the acoustic model, the lexical model and the syntactic model as follows: recognition model = (acoustic model) x (lexical model) x (syntactic model).

[0007] U.S. Patent Application Publication No. US2003236099 discloses a technique for improving the accuracy of a speech recognition algorithm by selecting an appropriate acoustic model in accordance with the location of a mobile telephonic device ("mobile handset", or just "handset" for the sake of convenience). As indicated above, an acoustic model includes a set of cepstrum coefficient statistics for each phoneme in a language. Several different acoustic models can be precompiled, each representing a unique acoustical environment, such that a speech recognition system can select an acoustic model appropriate for a given set of environmental conditions. For example, each acoustic model is prepared by individually recording several hundred speakers in a controlled, model-specific laboratory environment that has known acoustical properties illustratively specified in terms of noise, echo, reverberation, and frequency response. Each model-specific laboratory environment is intended to represent a real-world environment, such as a warehouse, an office, a shopping mall, an airport, or the interior of an automobile. Hence, acoustic models incorporate properties of specific environments as well as characteristics of the human voice. The laboratory environment may include artificially generated sounds to simulate, for example, traffic, conversations, computer keyboard clicks, and forklift trucks.

[0008] Pursuant to this prior art technique, position information is retrieved from a location-based service (LBS), as defined hereinafter, based upon the current location of the mobile handset. The retrieved position information is then employed to select the acoustical properties of the environment surrounding the handset. An acoustic model that approximates the acoustical properties of the type of environment for the current location of the handset is selected from a set of previously prepared acoustic models. The selected acoustic model is then utilized to improve the accuracy of the speech recognition algorithm.

[0009] The technique disclosed in U.S. Patent Application Publication No. US2003236099 presents many practical shortcomings. Existing location-based services, using the Global Positioning System (GPS), will not

determine a user's position to a requisite accuracy of, say, one to two meters, nor will such services determine a user's altitude with sufficient accuracy for many speech recognition applications. The impact of insufficient position accuracy is that, if a user is situated near the entrance of a building, it is not possible to accurately determine whether the user is, in fact, inside the building. The impact of insufficient altitude accuracy is that it is not possible to determine with certainty whether a user is within the building or standing on the roof. An acoustic model that is appropriate for an interior building lobby is unlikely to be totally appropriate for use in an outdoor setting. At the very least, selection of an inappropriate acoustic model based upon an inaccurate determination of a user's actual position will degrade the accuracy of many speech recognition algorithms.

[0010] Another shortcoming of the technique disclosed in U.S. Patent Application Publication No. US2003236099 is the need for creating an acoustic model. First of all, it is not feasible to create a unique acoustic model for every type of location. Secondly, even if an acoustic model is developed for a certain type of location, an actual location may not possess the acoustical characteristics embodied in the model. For example, due to variations in construction materials, furnishings, and room configurations, an acoustic model that attempts to represent a typical conference room, for example, may not adequately represent a specific conference room in a specific office building. Accordingly, what is needed is an improved technique for improving the accuracy of speech recognition algorithms.

[0011] EP1233407 recites a navigation system with speech recognition capacities for a moving vehicle. Whenever the distance between the vehicle and known active locations becomes greater then a given threshold, a pre-existing word list, corresponding to the active location, is acquired by the navigation system for subsequent use with the speech recognition engine.

[0012] US6230132 recites another navigation system with speech recognition functions. A lexicon is generated at periodic intervals with a limited number of words so as to facilitate the speech recognition functions. Furthermore, when a user needs to use the navigation system, he/she has to make a vocal request with the name of a location so that a lexicon can be generated.

[0013] EP0661688 recites a single device navigation apparatus, on board a car, with speed recognition functions. Pre-existing libraries are used and updated at regular intervals to facilitate the speech recognition engine.

SUMMARY OF THE INVENTION

[0014] The present invention is defined by the appended independent claims.

[0015] Other aspects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. It should be further understood that, unless otherwise indicated, the drawings are merely intended to conceptually illustrate the structures and procedures described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] In the drawings:

[0017] FIG. 1 is a diagrammatic representation of a geographic area of interest.

[0018] FIG. 2 is a data structure diagram setting forth a portion of an illustrative element database.

[0019] FIG. 3 is a data structure diagram setting forth an illustrative subset of words selected from the element database of FIG. 2.

[0020] FIG. 4 is a generalized information flow diagram showing a set of fundamental operations for the present invention.

[0021] FIG. 5 is a detailed block diagram setting forth information flow for a speech recognition system constructed in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0022] The following terms used herein are defined as follows:

[0023] *Geographic Area of Interest:* Illustratively defined in terms of a zip code, group of zip codes, cell identification (Cell-ID) information, caller ID (Call-ID) information, the boundaries of a state, county, city, town, place, or other governmental or municipal subdivision, standard USGS (United States Geological Survey) grids, locations within a fixed range of latitude and longitude, or locations within a specified geometric boundary. The geographic area of interest may, but need not, be set automatically based upon the present location of a handset. The geographic area of interest may, but need not, be designated by a user based upon manual, verbal, or user-specified input. The geographic area of interest can be a coarse geographic area of interest or a refined geographic area of interest, with the latter being a portion of the former.

[0024] *E911:* As mandated by the FCC (Federal Communications Commission), a standard for a system by which wireless carriers are able to pinpoint the location of a mobile device in an emergency.

[0025] Element: Name of at least one of a street, a business, a merchant, an individual's name, a place, a point of interest, a transportation facility, an individual household, an activity, and a landmark.

[0026] *GPS*: Global Positioning System -- Enables geographic position determination at a land-based portable device equipped to receive signals from three or more orbiting GPS satellites.

[0027] *LBS:* Location-Based Service -- Any service

that obtains information concerning the current geographical location of a mobile device user. Illustrative examples of location-based services include maps displayed in an automobile that track a motorists' position using GPS, or automatic localization services provided by dialing 911 on an E911-compliant mobile telephone network.

[0028] *Mobile Device:* Any portable device enabled for wireless communication, such as a wireless telephone, a personal digital assistant, or a laptop computer equipped with a wireless modem.

[0029] *Phoneme:* A phoneme represents a unique human uttered sound. Individual words, as pronounced by a human speaker, consist of a sequence of phonemes.

[0030] *Syntactic Model:* A set of rules and operations that specify allowed word sequences (phrases) of one or more words for subsequent use in a speech recognition procedure. Allowed word sequences are set forth in a list of static allowed phrases. In addition, the phrases can be optionally weighted by occurrence probabilities. Otherwise, word sequences can be in the form of stochastic or probabilistic lists, such as a Markov model of word sequences. Syntactic models are usually designed to be specific to a particular speech engine.

[0031] *Word:* A unit of language that native speakers can identify, and which communicates a meaning. Words are the building blocks from which phrases and sentences are constructed. Illustratively, for elements, "The Empire State Building" is the name of an element that contains four words. A street with the name "125th Street" includes the six words "one hundred and twenty fifth street". The street name "K Street" has the words "K" (which is a word for purposes of this invention) and "street".

[0032] The invention presumes that a very large element database is available for some sizeable, designated geographic area, such as a city, state, county, or country. One example of a known element database is TIGER (Topologically Integrated Geographic Encoding and Referencing system), available from the United States Census Bureau. TIGER compounds localized street names, rivers and railroads into a series of large regional databases.

[0033] The element database contains a set of words for elements at locations that are within the designated geographic area. In accordance with an aspect of the invention, enhanced speech recognition accuracy is provided by using geographic data to automatically select a subset of the words in the element database for use with a speech recognition procedure. The subset of words is selected by selecting only those words in the element database that are situated within a geographic area of interest. The geographic area of interest, either coarse or refined (depending on the circumstances, as explained below) is illustratively defined in terms of a zip code, group of zip codes, cell identification (Cell-ID) information, caller ID (Call-ID) information, the boundaries of a state, county, city, town, place, or other governmental or municipal subdivision, standard USGS (United States Geological Survey) grids, locations within a fixed range of latitude and longitude, or locations within a specified geometric boundary.

[0034] By selecting a subset of words, the total number of words used in the speech recognition procedure is substantially reduced. For example, a large element database containing street and business names used throughout all five boroughs of New York City can be reduced to a substantially shorter list of street and business names covering only the Grand Central Station area by specifying zip code 10017. Such a reduction in the total number of potential street names to be recognized, significantly improves speech recognition accuracy.

[0035] Pursuant to a further aspect of the invention, position information is obtained from an LBS based upon the current location of a mobile handset, illustratively using any of GPS coordinates, zip codes, and cellular base station triangulation. The obtained position information can be utilized to automatically define a coarse geographic area of interest. Let us say, as an example, that zip codes are used for this purpose. Thus, once the current location of the handset is determined, the zip code which includes that location automatically becomes the coarse geographic area of interest. Typically, the system can determine which localization method to use based on a knowledge of call configuration. For example, when a call is initiated, the Cell-ID can be used to determine the approximate location of the device. Alternatively, the application itself can choose which methods to employ, or the application can prompt the user to select which method to use. An illustrative prompt might include "*Do you want to use Cell-ID, or GPS to determine you location?*"

[0036] In accordance with a further aspect of the invention, an interface enables a user to refine the coarse geographic area of interest. For example, the user can select a specified geometrical shape within the coarse geographic area centered about the current location of the handset. This can be accomplished using key-based entries. Also, a graphical user interface can be used to draw a geometrical shape within the coarse geographic area. Additionally or alternatively, a Cell-ID can be specified within the geographic area zip code, thus defining a refined geographic area of interest for which the subset of words is to be selected. Combining automatic definition of a coarse geographic area of interest with additional, user-selectable geometric refinement is advantageous because it further reduces the total number of words that must be used in the speech recognition procedure. For example, a user-selectable rectangular region of 300 x 300 feet may contain only a few dozen elements that need to be recognized.

[0037] FIG. 1 is a diagrammatic representation of a geographic region of interest contained within a large area 100, such as a city. The current geographic location of a mobile device is determined to be point 401. In this illustrative example, the coarse geographic area of inter-

est is defined by the zip code. Thus, the coarse geographic area of interest is defined by Zip code region 470 within which point 401 is located. A mobile device user has selected a specific radius 407 around point 401 for defining the refined geographic area of interest. Elements contained (in whole or in part) within this coarse geographic area include Street A 420, Street B 422, and a first building 406. Elements contained within this coarse geographic area of interest but which are not within this refined geographic area include Street C 424, second building 404, and third building 402.

[0038] An element database (FIG. 2, 500) includes a list of element names for at least one of streets, businesses, merchants, places, points of interest, transportation facilities, individual households, activities, or landmarks in large area 100 (FIG. 1). This database can be part of the LBS database. Each element name is associated with one or more corresponding parameters for identifying or associating the element with a refined geographic area of interest, and a parameter for identifying or associating the element with a coarse geographic area of interest. A set of phonemes corresponding to the element name can be computed in real time by recognition model compiler 213, using the outputted element name (501) in conjunction with a phonetizer. A phonetizer is a mechanism that provides phonemic transcriptions for each of a plurality of element names. Phonemic transcriptions comprise a phoneme, or a sequences of two or more phonemes, which indicate the manner in which an element name may be spoken. Illustratively, the element name "Madison" has a corresponding phonemic transcription "mäd è sun".

[0039] Element names are stored in an element name field 501. Each name in element name field 501 is associated with a corresponding parameter field (x,y) for the refined geographic area of interest 503, and a corresponding parameter field for the coarse geographic area of interest 505. These element names may or may not include elements that are within whatever refined geographic area of interest is selected by the user during operation of the invention (in this example, defined by radius 407 around point 401 of FIG. 1).

[0040] Refined geographic parameters are stored in the parameter field for the refined geographic area of interest 503 (FIG. 2). A refined geographic parameter sets forth a characteristic of an element in terms of how the refined geographic area of interest is defined. For example, if the refined geographic area is defined by the user as a shape (e.g., a circle) around the current location of the handset, the refined geographic parameters comprise (x,y) coordinates. In the illustrative example of FIG. 2, the refined geographic parameters are (x,y) coordinates determined with respect to an arbitrarily assigned reference point. When a first set and a second set of (x, y) coordinates are present in the parameter field for the refined geographic area of interest 503, this represents a line segment between the first set of (x,y) coordinates and the second set of (x,y) coordinates. Such a segment is used, for example, to define a street that extends from the first set of (x,y) coordinates to the second set of (x, y) coordinates.

[0041] Coarse geographic parameters are stored in the parameter field for the coarse geographic area of interest 505. A coarse geographic parameter sets forth a characteristic of an element in terms of how the coarse geographic area of interest is defined. For example, if the coarse geographic area of interest is defined in terms of one or more zip codes, the coarse geographic parameters in the parameter field for the coarse geographic area of interest 505 comprise one or more zip codes. For example, if Street A 420 (FIG. 1) crosses into two different zip code regions, then the parameter field for the coarse geographic area of interest 505 includes two zip codes, such as 10017 and 10036. However, other types of coarse geographic parameters could be employed to relate the element to a zip code system, such as standard USGS (United States Geological System) grids, regions within a fixed range of latitude and longitude, state boundaries, county boundaries, city boundaries, and/or boundaries of urbanized areas. For example, a lookup table could be used to determine the foregoing relationship.

[0042] Returning now to FIG. 1, and in accordance with one feature of the invention, only words corresponding to elements within the geographic area of interest are extracted from element database 500 (FIG. 2) to form word subset list 600 (FIG. 3). If the user defines the refined geographic area of interest as shown in FIG. 1, the limited set of words does not include Street C 424, second building 404, and third building 402. Use of this limited set of words enhances the accuracy of a subsequently performed speech recognition procedure because words pertaining to each and every element of large area 100 of FIG. 1 need not be considered.

[0043] FIG. 3 is a data structure diagram setting forth a portion of an illustrative word subset list 600. The names of one or more elements within the geographic area of interest are stored in an element name field 601. Optionally, word subset list 600 may include additional information, such as the probability that a particular element will be incorporated into a user's query based upon the distance of that element from the current position of the mobile device, so as to provide an enhanced level of performance.

[0044] FIG. 4 is a generalized information flow diagram describing a set of fundamental operations for the present invention. Geographic data acquisition mechanism 101 (the details of which are shown in FIG. 5) is equipped to collect geographic data corresponding to a mobile device's current geographic position and, based thereon, to determine and output a geographic area of interest. Geographic data includes, but is not limited to, any of: global positioning system (GPS) coordinates in latitude and longitude, and also altitude if needed, [x,y, z] coordinates, city name, place name, zip code area, geographic area, type of area (urban, suburban or coun-

try), one or more cell identification (Cell-ID) parameters from a cellular network, or a caller identification (Call-ID) parameter from a terrestrial telephone network.

[0045] Word filtering mechanism 102 is equipped to receive a geographic area of interest from geographic data acquisition mechanism 101 and, based thereupon, select a subset of words from element database 500 (FIGs. 2 and 4). If a coarse geographic area of interest is being used, then the subset of words is selected by comparing coarse geographic parameters in the parameter field for the coarse geographic area of interest 505 corresponding to the elements in element name field 501 with coarse geographic parameters used to characterize the geographic area of interest. More specifically, if the coarse geographic area of interest is zip code 10017, then all the element names in element name field 501 will be selected which are associated with zip code 10017 in the parameter field for the coarse geographic area of interest 505. A similar operation is performed if a refined geographic area of interest is used. Of course, the parameter field for the refined geographic area of interest 503 will be used instead of the parameter field for the coarse geographic area of interest 505. The refined geographic parameters are combined with the coarse geographic parameters to enhance the word filtering mechanism 102 by using a two-step filtering process. A first step uses the parameter field for the coarse geographic area of interest 505, and a second step uses the parameter field for the refined geographic area of interest 503.

[0046] Word filtering mechanism 102 places the selected subset of words into a word subset list 600 (FIGs. 3 and 4). Speech recognition mechanism 103 (FIG. 4) is equipped to receive word subset list 600 (FIGS. 3 and 4) from word filtering mechanism 102 (FIG. 4) and, based thereupon, perform a speech recognition procedure. Illustratively, speech recognition mechanism 103 may be equipped to implement a speech recognition procedure by utilizing a (syntactic model) x (lexical model) x (acoustic model) paradigm in conjunction with Markov models. Alternatively or additionally, speech recognition mechanism 103 may utilize a neural network. More generally, the invention is applicable to any speech recognition mechanism that accepts and processes words or groups of words referred to as "grammar". Accordingly, word filtering mechanism 102 includes a grammar formatting mechanism that receives the word subset list 600 and formats the list into a grammar format usable by recognition model compiler 213.

[0047] Recognition model compiler 213 may or may not be required, depending upon the specific design characteristics of speech recognition mechanism 103. Recognition model compiler 213 parses (or analyzes) all of the entries in a formatted grammar, one after the other, and then, in one or more successive stages or "passes", constructs an output code readable by speech recognition mechanism 103. Since the speech recognition procedure is based upon a geographically refined subset of words, the overall accuracy of this procedure is enhanced relative to prior art designs. Speech recognition mechanism 103 can be implemented by a server or by a mobile handset.

[0048] A speech query from a mobile device user is received by an acoustic input mechanism 104 at the mobile device. Acoustic input mechanism 104 may be implemented using a microphone or other transducer equipped to transform acoustical vibrations into electronic signals. Acoustic input mechanism 104 feeds an electronic representation of user speech to speech recognition mechanism 103. Speech recognition mechanism 103 attempts to recognize one or more words in the electronic representation of user speech that are included in word subset list 600 retrieved from element database 500. If one or more words are recognized, speech recognition mechanism 103 sends an electronic message to an output mechanism 105 at the mobile device. The electronic message includes any recognized words in the speech query received from the mobile device user that were also included in word subset list 600. Output mechanism 105 converts the electronic message into audible and/or visual form for perception by the mobile device user. Illustratively, output mechanism 105 may be implemented using a loudspeaker coupled to audio amplifier circuitry and voice synthesizer circuitry for producing an audio message including one or more recognized words. Alternatively or additionally, output mechanism 105 may be implemented using a visual display device for displaying alphanumeric characters including one or more recognized words.

[0049] FIG. 5 is a detailed block diagram setting forth information flow for a speech recognition system constructed in accordance with an embodiment of the present invention. FIG. 5 shows details of geographic data acquisition mechanism 101. The depicted operations are performed either by a remote server 240 or by mobile device 250. Information flow commences upon receipt of a "start" signal at input mechanism 201 of mobile device 250. In practice, this "start" signal can be a request issued from a multimodal web page, an HTML page, or just a phone call. Alternatively, a user may place a call on a mobile handset to a designated telephone number to access a zip code form displayed on the mobile handset. The user fills in the zip code form using DTMF keypresses on the handset and validates the entered zip code by pressing DTMF digit "1" as a "start" signal. Basically, the "start" signal triggers a request for information.

[0050] Next, at mechanism 202, a decision is made as to whether the geographic area of interest will be determined locally (i.e., at mobile device 250), or at a remote location (i.e., at remote server 240). Depending upon the specifics of a given system application, this decision can be made by issuing a query to mobile device 250 in order to ascertain the configuration and capabilities of mobile device 250.

[0051] In cases where the geographic area of interest is determined locally, any one of two approaches may be employed. Pursuant to a first approach, mobile device

250 may include an optional GPS receiver 207, whereupon acquired GPS data are forwarded to a geographic-area-of-interest defining mechanism 204 (server side, see FIG. 5). Mechanism 204 uses the GPS data corresponding to the current location of mobile device 250 to obtain coarse geographic parameters for characterizing the coarse geographic area of interest. According to a second approach, zip code data, for example, can be entered by the user at input mechanism 201 and forwarded to geographic-area-of-interest defining mechanism 204. Illustratively, zip code data are entered into input mechanism 201 by sequentially pressing keys on a DTMF (dual-tone, multifrequency) keypad. Mechanism 204 uses the entered zip code data as a coarse geographic parameter for characterizing the geographic area of interest.

[0052] In cases where the geographic area of interest is determined remotely, mechanism 202 forwards the request received from input mechanism 201 to a location-based service 203 at server 240. Alternatively or additionally, GPS data from GPS receiver 207 are conveyed to location-based service 203, if needed. In response to the received request, location-based service 203 retrieves, for example, zip code information or cell identification (Cell ID) data for mobile device 250. Cell-IDs data can be retrieved in a mobile communications network using the Automatic Number Identification (ANI) retrieved from the mobile device 250. ANI is a service that provides the receiver of a telephone call with the number of the calling phone. The method of providing this information is determined by the service provider. Cell ID data specifies the geographic location of the wireless base station currently in communication with mobile device 250 by identifying at least one of the telephone number and the Internet Protocol (IP) address assigned to mobile device 250. For example, mobile device 250 may send to location-based service 203 Cell ID data in the form of an automated number identification (ANI) parameter. Optionally or alternatively, location-based service 203 determines the geographic location of mobile device 250 by performing a triangulation procedure among a plurality of wireless base stations. The Cell ID data, Caller ID data, and/or triangulation data retrieved by location-based service 203 (ultimately through the telecommunication provider) are forwarded to geographic-area-of-interest defining mechanism 204.

[0053] Optionally, in cases where the geographic area of interest is determined remotely, LBS service 203 utilizes at least one of Caller ID data and Cell ID data to access a zip code database 243. Based upon the Caller ID data or the Cell ID data, a zip code is retrieved from zip code database 243 and then sent to geographic-area-of-interest defining mechanism 204. Although the illustrative embodiment of FIG. 5 shows zip code database 243 and location-based service 203 as separate elements, those skilled in the relevant art will easily recognize that zip code database 243 could, but need not, be incorporated into location-based service 203. Likewise, although element database 500 and location-based service 203 are shown as separate elements, those skilled in the relevant art will easily recognize that element database 500 could, but need not, be incorporated into location-based service 203.

[0054] Geographic-area-of-interest defining mechanism 204 processes incoming geographic data, illustratively comprising at least one of incoming GPS data, zip code data, Caller ID data, or Cell ID data, to generate one or more geographic parameters defining the geographic area of interest for mobile device 250. For example, as discussed above, if the incoming data are based upon zip code data, then the output of mechanism 204 is a zip code. This parameter, e.g., a zip code, is used to specify a geographic area of interest. The defined geographic area of interest may combine a coarse geographic area of interest with a refined geographic area of interest, as is illustrated in the following example. One or more zipcode(s) may be deduced from GPS coordinates, thus defining a coarse geographic area of interest. The GPS coordinates themselves, associated with an area of uncertainty, define a refined geographic area of interest. Such a defined geographic area of interest may be used to implement the two-step filtering process described above.

[0055] Optionally, as indicated by the dotted lines of FIG. 5, a user at mobile device 250 may wish to further refine the geographic area of interest defined by geographic-area-of-interest defining mechanism 204. If so, the geographic area of interest defined by geographic-area-of-interest defining mechanism 204 is referred to as a coarse geographic area of interest, and the area of interest as refined by the user is referred to as a refined geographic area of interest. The refined geographic area of interest comprises a subset of the coarse geographic area of interest. Input mechanism 201 accepts user input setting forth a geometric specification of a refined geographic area of interest. User input is illustratively received over connection line 275 in the form of keypad entries, graphical objects, sketches, textual descriptions, or vocal input. Examples of geometric specifications include squares, rectangles, octagons, triangles, circles, and freehand sketches. Geometry specification refinement mechanism 205 accepts user input from input mechanism 201, and refines the set of geographic parameters generated by geographic-area-of-interest defining mechanism 204.

[0056] The one or more geographic parameters generated by geographic-area-of-interest defining mechanism 204, as optionally refined by geometry specification refinement mechanism 205, are received by word filtering mechanism 102. Word filtering mechanism 102 is enabled to carry out its functions when two conditions are met. Firstly, mobile device 250 should be executing a speech-enabled application where the user has issued a request for information. This requirement is met upon generation of a request from input mechanism 201. Secondly, the geographic area of interest should be defined.

This requirement is met once geographic-area-of-interest defining mechanism 204 generates the above-described geographic parameters.

[0057] When enabled, word filtering mechanism 102 uses the one or more geographic parameters received from mechanism 204 or 205 to determine whether or not each of a plurality of elements in element database 500 is situated within the geographic area of interest. The element names stored in element name field 501 (FIG. 2) may include elements that are within the geographic area of interest, as well as elements that do not lie within the geographic area of interest. Accordingly, word filtering mechanism 102 (FIG. 5) compares the one or more received parameters defining the geographic area of interest against one or more parameters stored in at least one of parameter field for the refined geographic area of interest 503 or parameter field for the coarse geographic area of interest 505 (FIG. 2), to determine whether or not each of a plurality of elements in element database 500 (FIGs. 2 and 5) is situated within the geographic area of interest. For example, Street A is characterized in the parameter field for the refined geographic area of interest 503 by a first and a second set of (x,y) coordinates. Accordingly, Street A is conceptualized as including a straight line segment connecting the first and second sets of (x,y) coordinates. If any portion of this straight line segment intersects the geographic area of interest, then Street A is included in word subset list 600 (FIGs. 3 and 5).

[0058] Word filtering mechanism 102 appends to word subset list 600 only those element names within the geographic area of interest. Optionally, if the user has made any refinements to the coarse geographic area of interest, only elements that are within the refined geographic area of interest are appended to word subset list 600.

[0059] The word subset list 600 of FIGs. 3 and 5 represents an illustrative output format for word filtering mechanism 102. Alternatively or additionally, the output of word filtering mechanism 102 may be conceptualized as a computer-readable stream of words representing one or more elements in a geographic area of interest. This stream, illustratively in text format, is compatible with at least one of a speech recognition engine or a voice browser embedding speech recognition mechanism 103 (FIG. 5). Optionally, word filtering mechanism 102 may reformat at least one of word subset list 600 or the computer-readable stream of words into a format such as an XML document, to provide a subset of words compatible with speech recognition mechanism 103.

[0060] Speech recognition mechanism 103 may be implemented at server 240 or at mobile device 250. In cases where speech recognition is performed at mobile device 250, the output from word filtering mechanism 102 (illustratively in the form of a stream of words corresponding to grammar subset list 600, FIG. 3) is sent from server 240 to mobile device 250. Word subset list 600 is then compiled by the recognition model compiler 213 at mobile device 250 to provide a speech recognition model for use by a speech recognition mechanism 103 responsive to the acoustic input mechanism 104. Speech recognition mechanism 103 then forwards recognized speech to the output mechanism 105 for generating an electronic output signal representing the recognized speech. Such an arrangement is advantageous because it reduces the burden on wireless communication resources. Transmissions between the server and the mobile device are reduced because only word subset list 600 needs to be communicated to the mobile device. The speech recognition steps can be performed at the mobile device with reference to word subset list 600, thereby enhancing the speed and efficiency of the speech recognition process.

[0061] If speech recognition is performed at server 240, then recognition model compiler 213 and speech recognition mechanism 103 are implemented at server 240 instead of at mobile device 250, wherein the output of speech recognition mechanism 103 is sent from server 240 to output mechanism 105 at mobile device 250.

[0062] The operational principles of the configurations shown in FIGs. 4 and 5 are best illustrated with reference to several illustrative scenarios. These scenarios clarify the location resolution process that will govern the filtering process performed by word filtering mechanism 102 in accordance with location data to be resolved. The scenarios consider use of any of several different types of inputs by which a location context will be determined.

[0063] Scenario One: Geographic area of interest to be determined by entered zip code and/or city. Zip code and/or city are entered into mobile device 250 by the user. Possible clients used by mobile device 250 to accept the entered zip code and/or city include a voice browser and/or a multimodal client. In the case of a phone call, the client is not the phone itself, but the voice browser (from the server point of view). Location data are provided in the form of a city and/or a zip code. The geographic area of interest corresponding to this location data is determined in the form of a city or zip code. In this case, location resolution is performed locally. The zip code and/or city are entered into mobile device 250 using DTMF keypresses and/or voice. An HTTP request is issued in response to the entered information after the information is received at input mechanism 201. In this case, word subset list 600 is generated by selecting a set of words and/or grammar pertaining to the entered city and/or zip code. The following steps are performed:

[0064] 1. User connects to geographic data acquisition mechanism 101 using mobile device 250. If mobile device 250 represents a multimodal client, an HTTP request is made by the client to a document server of word filtering mechanism 102 (FIGs. 4 and 5). If mobile device 250 represents a wireless telephone, an http request is made by the voice browser ("speaking" with the telephone) to the document server of word filtering mechanism 102.

[0065] 2. A first page is loaded into mobile device 250 or loaded onto the voice browser. The page is prompting the user to enter a zip code. The zip code by either be entered by DTMF (touch tones) or by voice. The grammar used to recognize the zip code is static.

[0066] 3. The user enters the zip code into input mechanism 201. A second HTTP request is made by the client, with the zip code value as a parameter. As location-based service 203 is not employed in this scenario to resolve the location, location resolution is "local". The geographic area of interest is evaluated at geographic area of interest defining mechanism 204, and no further refinement of the geographical area of interest takes place.

[0067] 4. A second page is loaded into mobile device 250 (the "reduced" page). The document server of word filtering mechanism 102 computes reduced grammars associated with the page in the form of word subset list 600.

[0068] 5. The user can vocally interact with the page over mobile device 250, as the page is optimized for its location

[0069] Note: The geometry specification refinement mechanism 205 is not used in this scenario. If this mechanism were to be used, a "remote" location resolution must be performed so as to enable sending a map (for example) back to the multimodal client of mobile device 250.

[0070] Scenario Two: Geographic area of interest to be determined automatically using Caller ID or Cell ID.

[0071] Possible clients used by mobile device 250 for Caller Id or Cell ID include a voice browser and/or a multimodal client. Location data are provided in the form of a caller ID or cell ID parameter. The geographic area of interest is determined as a zip code or as an area ID that identifies a geographic area. Location resolution is performed remotely, not locally. Input mechanism 201 is not employed for purposes of location resolution. Mobile device 250 is programmed to issue an HTTP request while a first page is retrieved from a document server of word filtering mechanism 102. In this scenario, words and/or grammar from element database 500 are filtered to prepare word subset list 600 based upon ANI or Cell-ID information. Input mechanism 201 is completely transparent, in the sense that the request that trims the word filtering process appears at the first stage of the interaction, and there is no need of a data collecting stage, as in the previous scenario. The HTTP request can be issued by a voice browser (that provides ANI info) or a multimodal client at mobile device 250.

[0072] The following operational sequence is performed:

[0073] 1. User connects to geographic data acquisition mechanism 101 using mobile device 250. If the user is using a multimodal client at mobile device 250, an HTTP request is made by the client to the document server of word filtering mechanism 102. If mobile device 250 is a wireless telephone, an http request is made by the voice browser ("speaking" with the telephone) to the document server of word filtering mechanism 102. The ANI and/or the Cell ID are passed to the document server as part of the HTTP request. Location-based service 203 determines the geographic area of interest, in this case following the remote path indicated in FIG. 5 which commences at mechanism 202. Location-based service also determines geographic position of the user, an area of uncertainty with respect to the user's position, and one or more associated zip codes.

[0074] 2. A page is downloaded to mobile device 250 or loaded onto the voice browser. The geographic context is used by word filtering mechanism 102 to compute a word subset list 600 associated with the page in accordance with the previously determined geographic area of interest.

[0075] 3. The user can vocally interact with the page using mobile device 250. The page is optimized for the user's geographic area of interest.

[0076] Scenario Three: Geographic area of interest to be determined automatically using GPS data. Possible clients used by mobile device 250 for GPS include a multimodal client. Location data are provided in the form of GPS coordinates. The geographic area of interest is determined as a zip code, as (x,y) or (x,y,z) coordinates, optionally incorporating an area of uncertainty. Location resolution is performed locally, not remotely. Input mechanism 201 is not employed to determine geographic area of interest. An HTTP request is issued by mobile device 250 during the first page fetch. In this case, word filtering mechanism 102 is preparing a word subset list 600 by filtering element database 500 using GPS data. Input mechanism 201 is transparent, in the sense that the HTTP request that results in word filtering appears at the first stage of the interaction. Unlike the first scenario, there is no need for a data collecting stage. The following steps are performed:

[0077] 1. User connects to geographic data acquisition mechanism 101 using mobile device 250. If mobile device 250 utilizes a multimodal client, an HTTP request is made by the client to a document server of word filtering mechanism 102. The GPS information is sent as part of the http request. Location-based service 203 determines the geographic area of interest by adding coarse localization to the GPS information, and the coarse localization is sent to geographic area of interest defining mechanism 204.

[0078] 2. A page is downloaded to mobile device 250: The geographic area of interest in the form of the coarse and/or refined localization received at geographic area of interest defining mechanism 204 is used by word filtering mechanism 102 to compute a word subset list 600 and to place the word subset list into a page that is sent to mobile device 250, using the two-step filtering process described above.

[0079] 3. The user can vocally interact with the page, optimized for the geographic area of interest. Note:

[0080] 1. In cases where geometry specification refinement mechanism 205 is employed, an intermediate page is downloaded to mobile device 250, asking to the user to precise its area of interest (before step 2):

[0081] 1.a - An intermediate (i.e., "localization") page is downloaded to mobile device 250.

[0082] 1.b - The user inputs an area of interest into

mobile device 250.

[0083] 1.c - A refined geographic area of interest is sent by mobile device 250 and incorporated into the geographic area of interest defined by geographic area of interest defining mechanism 204.

[0084] In contrast to prior art techniques, the present invention does not employ acoustic models to improve speech recognition accuracy. Instead, the invention reduces the total number of words that need to be considered by a speech recognition algorithm. The number of words is reduced by excluding words that do not relate to a geographic area of interest. In this manner, the reduced processing burden makes it possible to handle speech recognition at the handset. Moreover, the accuracy of the speech recognition algorithm is improved.

[0085] To summarize, the advantages of the invention include more accurate speech recognition due to utilization of a database that has been reduced in size (i.e., word subset list 600). The burden on communication resources is decreased by sending the reduced database to the handset, whereupon the handset performs speech recognition using only the reduced size database instead of a much larger database. The decreased burden on communication resources results in faster, more efficient speech recognition.

[0086] Thus, while there have been shown and described novel features of the invention as applied to embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the scope of the invention, which is solely defined by the appended claims. For example, although an embodiment of the invention was described in terms of a user refining an automatically determined geographic area of interest, it is also possible for a user to augment an automatically determined coarse geographic area of interest.

[0087] In view of the foregoing, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice in as much as they fall within the scope of the claims appended hereto.

Claims

1. A method for use with a mobile handset equipped to communicate with a remote server over a wireless communications network, the remote server equipped to access an element database (500) including words that describe elements at each of a plurality of geographically defined locations, the method comprising the steps of:

   determining (202) geographic data for the mobile handset following a request; and
   using (102) the determined geographic data to automatically select by the remote server a subset (600) of words for use with a speech recognition procedure;

   wherein the subset of words is selected from the element database, thereby reducing the number of words used in the speech recognition procedure.

2. The method of claim 1 wherein the determined geographic data includes at least one of global positioning system (GPS) position data, cell identity (Cell-ID) data, caller identification (Caller ID) data, place name data, or zip code data.

3. The method of claim 1 wherein the geographic data are derived from a signal received from the mobile handset, said signal being related to a current position of said mobile handset or to a manual input entered into said mobile handset.

4. The method of any preceding claim wherein the elements include at least one of street names, businesses, merchants, points of interest, transportation facilities, individual households, activities, or landmarks.

5. The method of any preceding claim wherein the mobile handset receives the subset of words from the remote server and executes the speech recognition procedure based upon the received subset of words, thereby reducing use of the communications network and the remote server.

6. A speech recognition system comprising:

   a mobile handset equipped to communicate with a remote server over a wireless network,
   a data acquisition mechanism (101) for determining geographic data for the mobile handset following a request input; and
   a selection mechanism (102) for using the determined geographic data to automatically select a subset of words (106) for use with a speech recognition procedure;

   wherein the subset of words is selected by the remote server from an element database (500) said remote server has access to, said element database including words that describe elements at each of a plurality of geographically defined locations, thereby reducing the number of words used in the speech recognition procedure.

7. The speech recognition system of claim 6 wherein the geographic data are derived from a signal re-

ceived from the mobile handset, said signal being related to a current position of said mobile handset or to a manual input entered into said mobile handset.

8. The speech recognition system of claim 6 wherein the determined geographic data includes at least one of global positioning system (GPS) position data, cell identity (Cell-ID) data, caller identification (Caller ID) data, place name data, or zip code data.

9. The speech recognition system of any of claims 6 to 8 wherein the elements include at least one of street names, businesses, merchants, points of interest, transportation facilities, individual households, activities, or landmarks.

10. A speech recognition system for associating received speech with words retrieved from an element database, the system comprising:

means for determining a geographic area of interest following a request wherein speech is to be received, said means further comprising:

(i) a portable location determining mechanism associated with a mobile handset for generating an indication signal indicative of current geographic location, and
(ii) a server, in communication with the portable location determining mechanism, programmed to determine a geographic area of interest from the indication signal;

means for selecting a subset of words from the element database based upon the geographic area of interest; said means comprising the server programmed to extract from the element database only words that are associated with the geographic area of interest; and,
means for associating the received speech with words selected from the subset of words, said means being implemented on the mobile handset.

11. The speech recognition system of claim 10 further comprising:

means for accepting a signal from at least one graphical user interface for selecting a portion of the determined geographic area of interest to thereby specify a further limited geographic area of interest; and
means for further reducing the subset of words according to the further limited geographic area of interest to generate a further subset of words, such that the means for associating received speech with words only selects words from the further subset of words.

12. The speech recognition system of claim 11 wherein the means for accepting a signal includes:

an electronic display for displaying a map of the determined geographic area of interest; and
a processing mechanism for combining the accepted signal with the map of the determined geographic area of interest so as to cause a display of the further limited geographic area of interest on the electronic display.

13. A mobile handset (250) comprising speech recognition means for association of received speech with words received from a remote database, the mobile handset comprising:

means for receiving a request;
means for providing a signal representing a geographic area of interest following said request;
means for transmitting said signal to a remote server and for receiving from the remote server a subset of words from the remote database based upon the geographic area of interest; and
means for associating the received speech with words selected from the subset of words.

14. The mobile handset of claim 13 wherein the means for providing a signal comprises means for determining a geographic area of interest wherein speech is to be received.

15. The mobile handset of claim 13 or 14 further comprising:

means (201) for accepting at least one input used to determine a refined geographic area of interest in the geographic area of interest;
means (205) for reducing the subset of words according to the refined geographic area of interest;

and wherein:

the means for associating the received speech is arranged for association of speech only with the reduced subset of words.

Patentansprüche

1. Verfahren zur Verwendung mit einem mobilen Handapparat, der dafür ausgestattet ist, über ein drahtloses Kommunikationsnetz mit einem abgesetzten Server zu kommunizieren, wobei der abgesetzte Server dafür ausgestattet ist, auf eine Elementdatenbank (500) zuzugreifen, die Wörter enthält, die

Elemente an jedem von mehreren geographisch definierten Orten beschreiben, wobei das Verfahren die folgenden Schritte umfaßt:

Bestimmen (202) geographischer Daten für den mobilen Handapparat nach einer Anforderung und Verwenden (102) der bestimmten geographischen Daten zum automatischen Auswählen einer Teilmenge (600) von Wörtern zur Verwendung mit einer Spracherkennungsprozedur durch den abgesetzten Server;

wobei die Teilmenge von Wörtern aus der Elementdatenbank ausgewählt wird, wodurch die Anzahl der in der Spracherkennungsprozedur verwendeten Wörter reduziert wird.

2. Verfahren nach Anspruch 1, wobei die bestimmten geographischen Daten Positionsdaten des globalen Navigationssystems (GPS) und/oder Daten der Zellenidentität (Cell-ID) und/oder Daten der Anruferidentifikation (Caller ID) und/oder Städtenamendaten und/oder Postleitzahldaten umfassen.

3. Verfahren nach Anspruch 1, wobei die geographischen Daten aus einem aus dem mobilen Handapparat empfangenen Signal abgeleitet werden, wobei das Signal eine aktuelle Position des mobilen Handapparats oder eine in den mobilen Handapparat eingegebene manuelle Eingabe betrifft.

4. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Elemente Straßennamen und/oder Unternehmen und/oder Händler und/oder interessierende Punkte und/oder Transporteinrichtungen und/oder individuelle Haushalte und/oder Aktivitäten und/oder Sehenswürdigkeiten umfassen.

5. Verfahren nach einem der vorhergehenden Ansprüche, wobei der mobile Handapparat die Teilmenge von Wörtern von dem abgesetzten Server empfängt und auf der Basis der empfangenen Teilmenge von Wörtern die Spracherkennungsprozedur ausführt und **dadurch** die Benutzung des Kommunikationsnetzes und des abgesetzten Servers reduziert.

6. Spracherkennungssystem, umfassend:

einen mobilen Handapparat, der dafür ausgestattet ist, über ein drahtloses Netz mit einem abgesetzten Server zu kommunizieren,
einen Datenbeschaffungsmechanismus (101) zum Bestimmen von geographischen Daten für den mobilen Handapparat nach einer Anforderungseingabe und
einen Auswahlmechanismus (102) zum Verwenden der bestimmten geographischen Daten zum automatischen Auswählen einer Teilmenge von Wörtern (106) zur Verwendung mit einer Spracherkennungsprozedur;

wobei die Teilmenge von Wörtern durch den abgesetzten Server aus einer Elementdatenbank (500) ausgewählt wird, zu der der abgesetzte Server Zugang hat, wobei die Elementdatenbank Wörter enthält, die Elemente an jedem von mehreren geographisch definierten Orten beschreiben, wodurch die Anzahl der bei der Spracherkennungsprozedur verwendeten Wörter reduziert wird.

7. Spracherkennungssystem nach Anspruch 6, wobei die geographischen Daten aus einem aus dem mobilen Handapparat empfangenen Signal abgeleitet werden, wobei das Signal eine aktuelle Position des mobilen Handapparats oder eine in den mobilen Handapparat eingegebene manuelle Eingabe betrifft.

8. Spracherkennungssystem nach Anspruch 6, wobei die bestimmten geographischen Daten Positionsdaten des globalen Navigationssystems (GPS) und/oder Daten der Zellenidentität (Cell-ID) und/oder Daten der Anruferidentifikation (Caller ID) und/oder Städtenamendaten und/oder Postleitzahldaten umfassen.

9. Spracherkennungssystem nach einem der Ansprüche 6 bis 8, wobei die Elemente Straßennamen und/oder Unternehmen und/oder Händler und/oder interessierende Punkte und/oder Transporteinrichtungen und/oder individuelle Haushalte und/oder Aktivitäten und/oder Sehenswürdigkeiten umfassen.

10. Spracherkennungssystem zum Assoziieren von empfangener Sprache mit aus einer Elementdatenbank abgerufenen Wörtern, wobei das System folgendes umfaßt:

Mittel zum Bestimmen eines interessierenden geographischen Gebiets nach einer Aufforderung, wobei Sprache zu empfangen ist, wobei die Mittel ferner folgendes umfassen:

i) einen mit einem mobilen Handapparat assoziierten tragbaren Ortsbestimmungsmechanismus zum Erzeugen eines Anzeigesignals, das einen aktuellen geographischen Ort anzeigt und
ii) einen mit dem tragbaren Ortsbestimmungsmechanismus kommunizierenden Server, der dafür programmiert ist, aus dem Anzeigesignal ein interessierendes geographisches Gebiet zu bestimmen;

Mittel zum Auswählen einer Teilmenge von Wörtern aus der Elementdatenbank auf der Ba-

sis des interessierenden geographischen Gebiets; wobei die Mittel den Server umfassen, der dafür programmiert ist, aus der Elementdatenbank nur Wörter zu extrahieren, die mit dem interessierenden geographischen Gebiet assoziiert sind und
Mittel zum Assoziieren der empfangenen Sprache mit aus der Teilmenge von Wörtern ausgewählten Wörtern, wobei die Mittel auf dem mobilen Handapparat implementiert sind.

11. Spracherkennungssystem nach Anspruch 10, ferner umfassend:

Mittel zum Annehmen eines Signals von mindestens einer graphischen Benutzeroberfläche zum Auswählen eines Teils des bestimmten interessierenden geographischen Gebiets, um **dadurch** ein weiter eingeschränktes interessierendes geographisches Gebiet zu spezifizieren und
Mittel zum weiteren Reduzieren der Teilmenge von Wörtern gemäß dem weiter eingeschränkten interessierenden geographischen Gebiet, um eine weitere Teilmenge von Wörtern zu erzeugen, dergestalt, daß die Mittel zum Assoziieren empfangener Sprache mit Wörtern nur Wörter aus der weiteren Teilmenge von Wörtern auswählen.

12. Spracherkennungssystem nach Anspruch 11, wobei die Mittel zum Annehmen eines Signals folgendes umfassen:

ein elektronisches Display zum Anzeigen einer Karte des bestimmten interessierenden geographischen Gebiets und
einen Verarbeitungsmechanismus zum Kombinieren des angenommenen Signals mit der Karte des bestimmten interessierenden geographischen Gebiets, um so eine Anzeige des weiter eingeschränkten interessierenden geographischen Gebiets auf dem elektronischen Display zu bewirken.

13. Mobiler Handapparat (150) mit Spracherkennungsmitteln zum Assoziieren empfangener Sprache mit aus einer abgesetzten Datenbank empfangenen Wörtern, wobei der mobile Handapparat folgendes umfaßt:

Mittel zum Empfangen einer Anforderung;
Mittel zum Bereitstellen eines Signals, das ein interessierendes geographisches Gebiet repräsentiert, nach der Anforderung;
Mittel zum Senden des Signals zu einem abgesetzten Server und zum Empfangen einer Teilmenge von Wörtern aus der abgesetzten Datenbank von dem abgesetzten Server auf der Basis des interessierenden geographischen Gebiets und
Mittel zum Assoziieren der empfangenen Sprache mit aus der Teilmenge von Wörtern ausgewählten Wörtern.

14. Mobiler Handapparat nach Anspruch 13, wobei die Mittel zum Bereitstellen eines Signals Mittel zum Bestimmen eines interessierenden geographischen Gebiets umfaßt, worin Sprache empfangen werden soll.

15. Mobiler Handapparat nach Anspruch 13 oder 14, ferner umfassen:

Mittel (210) zum Annehmen mindestens einer Eingabe, mit der ein verfeinertes interessierendes geographisches Gebiet in dem interessierenden geographischen Gebiet bestimmt wird;
Mittel (205) zum Reduzieren der Teilmenge von Wörtern gemäß dem verfeinerten interessierenden geographischen Gebiet und wobei

die Mittel zum Assoziieren der empfangenen Sprache dafür ausgelegt sind, Sprache nur mit der reduzierten Teilmenge von Wörtern zu assoziieren.

Revendications

1. Procédé pour une utilisation avec un combiné mobile équipé pour communiquer avec un serveur distant sur un réseau de communication sans fil, le serveur distant étant équipé pour accéder à une base de données d'éléments (500) comprenant des mots qui décrivent des éléments pour chacun d'une pluralité d'emplacements définis géographiquement, le procédé comprenant les étapes de :

détermination (202) de données géographiques pour le combiné mobile suite à une demande ; et utilisation (102) des données géographiques déterminées pour sélectionner automatiquement par le serveur distant un sous-ensemble (600) de mots pour une utilisation avec une procédure de reconnaissance vocale ;

dans lequel le sous-ensemble de mots est sélectionné parmi la base de données d'éléments, réduisant de ce fait le nombre de mots utilisés dans la procédure de reconnaissance vocale.

2. Procédé selon la revendication 1 dans lequel les données géographiques déterminées comprennent au moins une parmi des données de position du système de positionnement mondial (GPS), des données d'identité de cellule (identifiant de cellule), des

données d'identification d'appelant (identifiant d'appelant), des données de nom de lieu ou des données de code postal.

3. Procédé selon la revendication 1 dans lequel les données géographiques sont déduites d'un signal reçu du combiné mobile, ledit signal étant lié à une position actuelle dudit combiné mobile ou à une entrée manuelle entrée dans ledit combiné mobile.

4. Procédé selon une revendication précédente quelconque dans lequel les éléments comprennent au moins un parmi des noms de rues, des entreprises, des commerçants, des centres d'intérêt, des installations de transport, des maisons individuelles, des activités ou des points de repère.

5. Procédé selon une revendication précédente quelconque dans lequel le combiné mobile reçoit le sous-ensemble de mots du serveur distant et exécute la procédure de reconnaissance vocale sur la base du sous-ensemble reçu de mots, réduisant de ce fait l'utilisation du réseau de communication et du serveur distant.

6. Système de reconnaissance vocale comprenant :

un combiné mobile équipé pour communiquer avec un serveur distant sur un réseau sans fil ;
un mécanisme d'acquisition de données (101) pour déterminer des données géographiques pour le combiné mobile suite à une entrée de demande ; et
un mécanisme de sélection (102) pour utiliser les données géographiques déterminées afin de sélectionner automatiquement un sous-ensemble de mots (106) pour une utilisation avec une procédure de reconnaissance vocale ;

dans lequel le sous-ensemble de mots est sélectionné par le serveur distant à partir d'une base de données d'éléments (500) à laquelle ledit serveur distant a accès, ladite base de données d'éléments comprenant des mots qui décrivent des éléments pour chacun d'une pluralité d'emplacements définis géographiquement, réduisant de ce fait le nombre de mots utilisés dans la procédure de reconnaissance vocale.

7. Système de reconnaissance vocale selon la revendication 6 dans lequel les données géographiques sont déduites d'un signal reçu du combiné mobile, ledit signal étant lié à une position actuelle dudit combiné mobile ou à une entrée manuelle entrée dans ledit combiné mobile.

8. Système de reconnaissance vocale selon la revendication 6 dans lequel les données géographiques déterminées comprennent au moins une parmi des données de position du système de positionnement mondial (GPS), des données d'identité de cellule (identifiant de cellule), des données d'identification d'appelant (identifiant d'appelant), des données de nom de lieu ou des données de code postal.

9. Système de reconnaissance vocale selon l'une quelconque des revendications 6 à 8 dans lequel les éléments comprennent au moins un parmi des noms de rues, des entreprises, des commerçants, des centres d'intérêt, des installations de transport, des maisons individuelles, des activités ou des points de repère.

10. Système de reconnaissance vocale pour associer une voix reçue à des mots récupérés d'une base de données d'éléments, le système comprenant :

des moyens pour déterminer une zone géographique d'intérêt suite à une demande dans laquelle une voix doit être reçue, lesdits moyens comprenant en outre :

(i) un mécanisme de détermination d'emplacement de portable associé à un combiné mobile pour générer un signal d'indication révélateur d'un emplacement géographique actuel, et
(ii) un serveur, en communication avec le mécanisme de détermination d'emplacement de portable, programmé pour déterminer une zone géographique d'intérêt à partir du signal d'indication ;

des moyens pour sélectionner un sous-ensemble de mots parmi la base de données d'éléments sur la base de la zone géographique d'intérêt ; lesdits moyens comprenant le serveur programmé pour extraire de la base de données d'éléments seulement des mots qui sont associés à la zone géographique d'intérêt ; et
des moyens pour associer la voix reçue à des mots sélectionnés parmi le sous-ensemble de mots, lesdits moyens étant mis en oeuvre sur le combiné mobile.

11. Système de reconnaissance vocale selon la revendication 10 comprenant en outre :

des moyens pour accepter un signal d'au moins une interface utilisateur graphique pour sélectionner une partie de la zone géographique d'intérêt déterminée afin de spécifier de ce fait une zone géographique d'intérêt limitée supplémentaire ; et
des moyens pour réduire en outre le sous-ensemble de mots selon la zone géographique

d'intérêt limitée supplémentaire afin de générer un sous-ensemble supplémentaire de mots, de telle sorte que les moyens pour associer une voix reçue à des mots sélectionnent seulement des mots parmi le sous-ensemble supplémentaire de mots.

12. Système de reconnaissance vocale selon la revendication 11 dans lequel les moyens pour accepter un signal comprennent :

un affichage électronique pour afficher une carte de la zone géographique d'intérêt déterminée ; et
un mécanisme de traitement pour combiner le signal accepté avec la carte de la zone géographique d'intérêt déterminée de façon à provoquer un affichage de la zone géographique d'intérêt limitée supplémentaire sur l'affichage électronique.

13. Combiné mobile (250) comprenant des moyens de reconnaissance vocale pour une association d'une voix reçue à des mots reçus d'une base de données distante, le combiné mobile comprenant :

des moyens pour recevoir une demande ;
des moyens pour fournir un signal représentant une zone géographique d'intérêt suite à ladite demande ;
des moyens pour transmettre ledit signal à un serveur distant et recevoir du serveur distant un sous-ensemble de mots provenant de la base de données distante sur la base de la zone géographique d'intérêt ; et
des moyens pour associer la voix reçue à des mots sélectionnés parmi le sous-ensemble de mots.

14. Combiné mobile selon la revendication 13 dans lequel les moyens pour fournir un signal comprennent des moyens pour déterminer une zone géographique d'intérêt dans laquelle une voix doit être reçue.

15. Combiné mobile selon la revendication 13 ou 14 comprenant en outre:

des moyens (201) pour accepter au moins une entrée utilisée pour déterminer une zone géographique affinée d'intérêt dans la zone géographique d'intérêt ;
des moyens (205) pour réduire le sous-ensemble de mots selon la zone géographique affinée d'intérêt;

et dans lequel :

les moyens pour associer la voix reçue sont agencés pour une association d'une voix seulement avec le sous-ensemble réduit de mots.

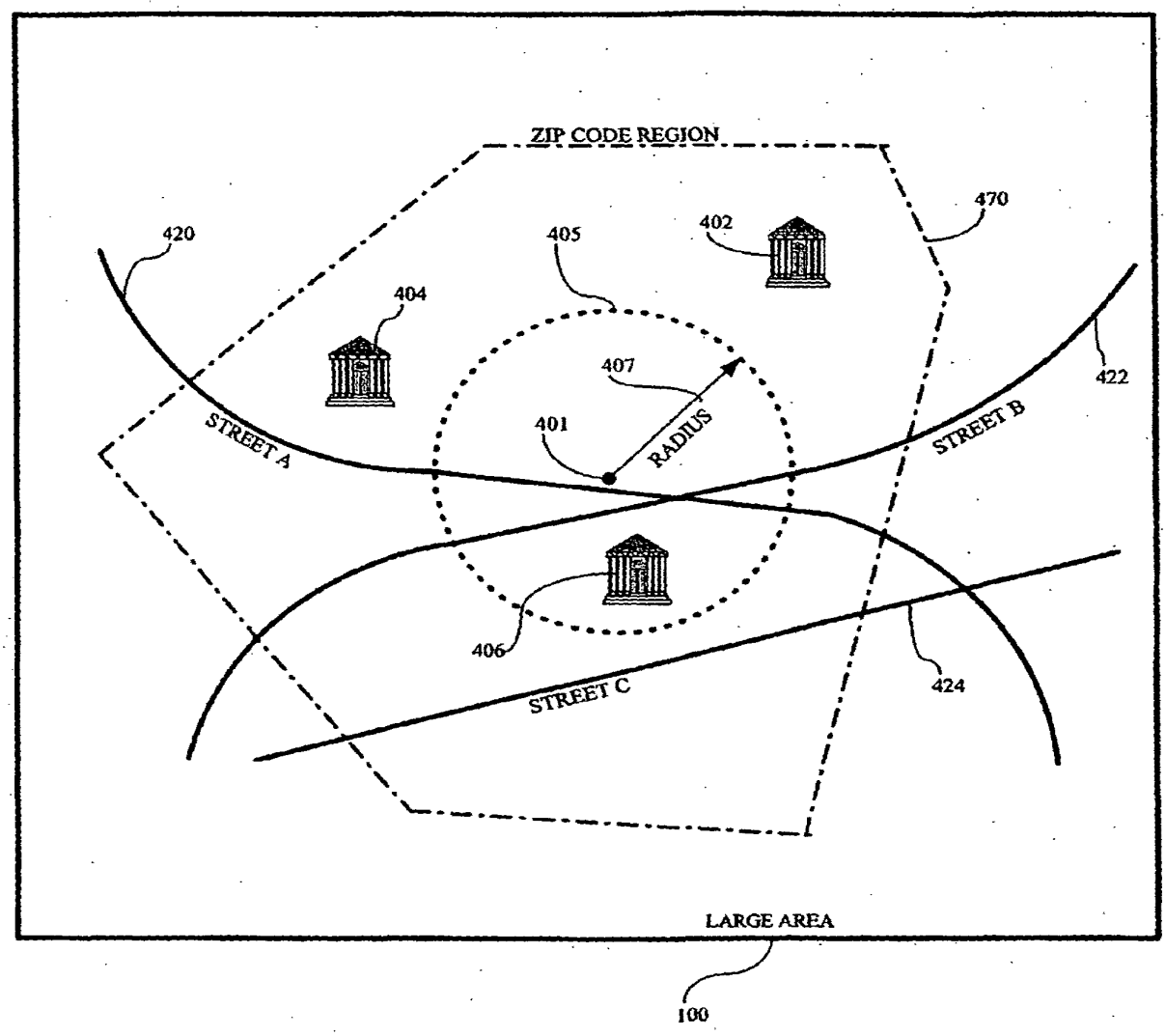

ZIP CODE REGION
470
420
405
402
404
407
422
STREET A
401
RADIUS
STREET B
406
424
STREET C
LARGE AREA
100

FIG. 1

500

ELEMENT DATABASE

ELEMENT NAME FIELD 501	PARAMETER FIELD FOR THE REFINED GEOGRAPHIC AREA OF INTEREST 503	PARAMETER FIELD FOR THE COARSE GEOGRAPHIC AREA OF INTEREST 505
FIRST BUILDING	{[603001, 2428833]}	10017
SECOND BUILDING	{[602298, 2428830]}	10017
THIRD BUILDING	{[603010, 2428836]}	10017
STREET A	{[603012, 2428836],[603013, 24428836]}	10017, 10036
STREET B	{[603014, 2428836],[603015, 24428836]}	10017, 10055
STREET C	{[679010, 2428836],[680000, 24428836]}	10017, 12533
...	...	...
DEVON FARMS ROAD	{[673010, 2428836],[675000, 24428836]}	12582

FIG. 2

600

WORD SUBSET LIST

ELEMENT NAME FIELD 601
FIRST BUILDING
STREET A
STREET B

FIG. 3

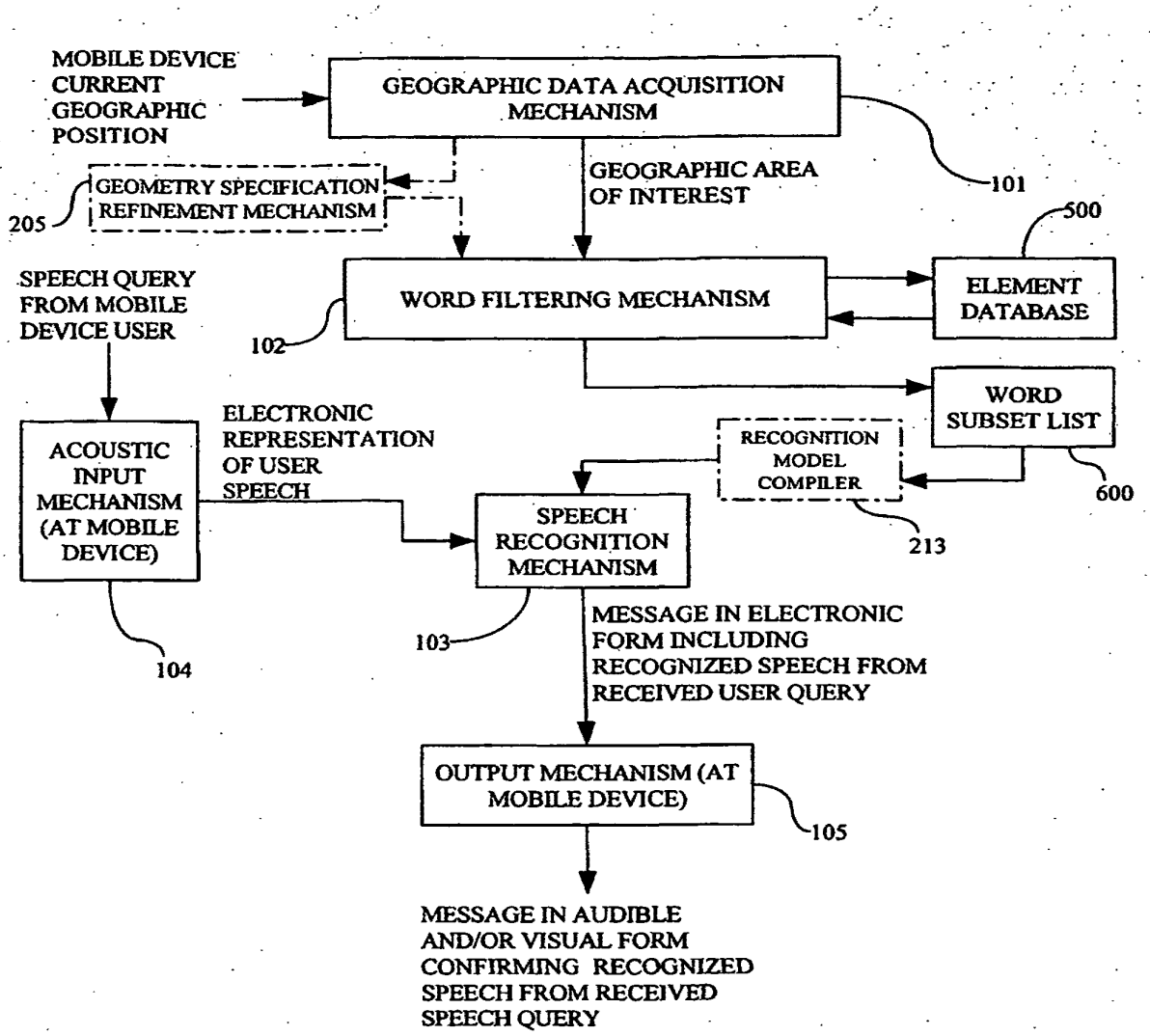

MOBILE DEVICE CURRENT GEOGRAPHIC POSITION
GEOGRAPHIC DATA ACQUISITION MECHANISM
101
GEOGRAPHIC AREA OF INTEREST
GEOMETRY SPECIFICATION REFINEMENT MECHANISM
205
500
SPEECH QUERY FROM MOBILE DEVICE USER
WORD FILTERING MECHANISM
102
ELEMENT DATABASE
WORD SUBSET LIST
600
ELECTRONIC REPRESENTATION OF USER SPEECH
ACOUSTIC INPUT MECHANISM (AT MOBILE DEVICE)
RECOGNITION MODEL COMPILER
213
SPEECH RECOGNITION MECHANISM
103
104
MESSAGE IN ELECTRONIC FORM INCLUDING RECOGNIZED SPEECH FROM RECEIVED USER QUERY
OUTPUT MECHANISM (AT MOBILE DEVICE)
105
MESSAGE IN AUDIBLE AND/OR VISUAL FORM CONFIRMING RECOGNIZED SPEECH FROM RECEIVED SPEECH QUERY

FIG. 4

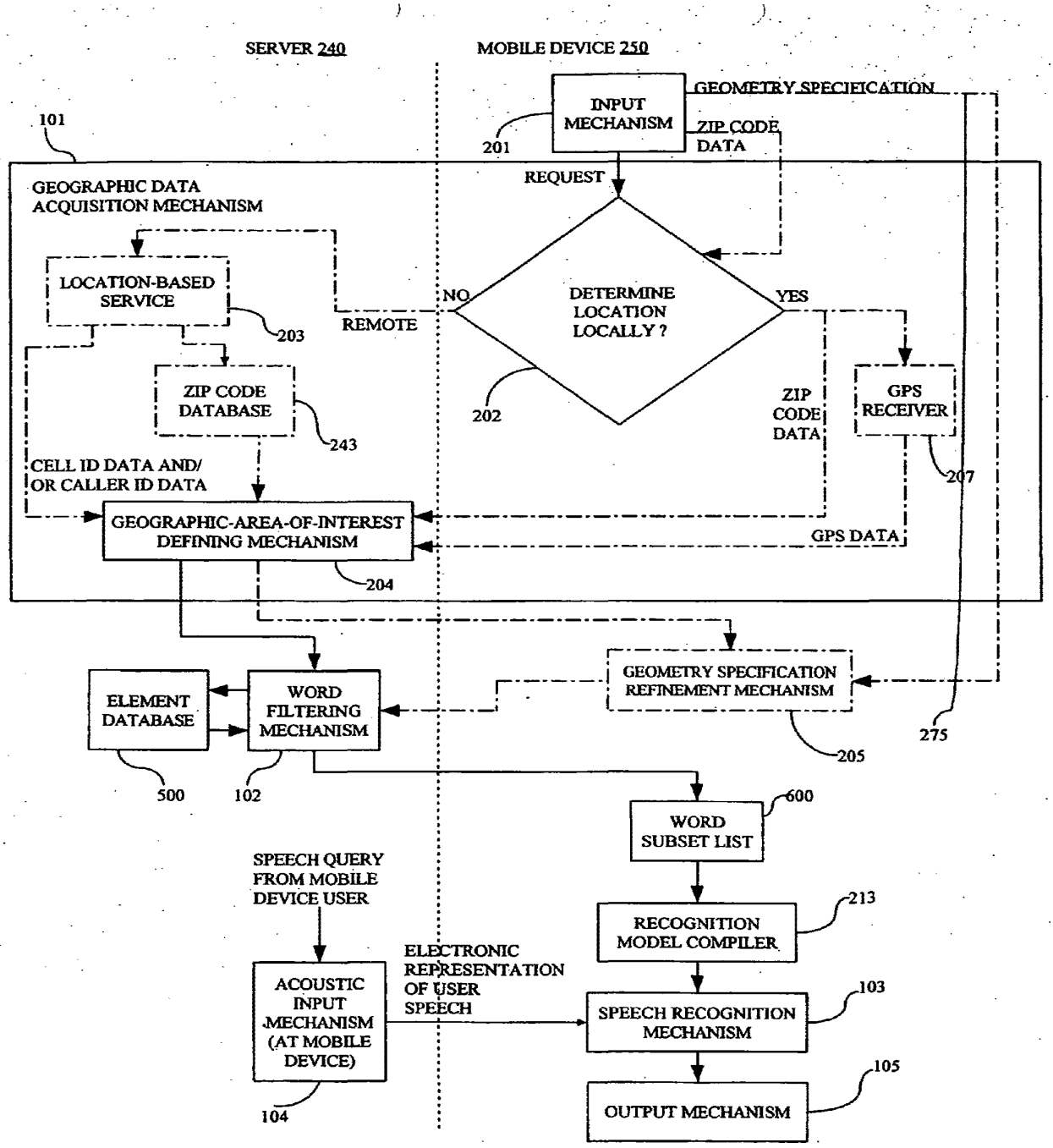

SERVER 240
MOBILE DEVICE 250
INPUT MECHANISM
201
GEOMETRY SPECIFICATION
ZIP CODE DATA
101
REQUEST
GEOGRAPHIC DATA ACQUISITION MECHANISM
LOCATION-BASED SERVICE
203
REMOTE
NO
DETERMINE LOCATION LOCALLY ?
YES
202
ZIP CODE DATABASE
243
ZIP CODE DATA
GPS RECEIVER
207
CELL ID DATA AND/ OR CALLER ID DATA
GEOGRAPHIC-AREA-OF-INTEREST DEFINING MECHANISM
204
GPS DATA
GEOMETRY SPECIFICATION REFINEMENT MECHANISM
205
275
ELEMENT DATABASE
WORD FILTERING MECHANISM
500
102
600
WORD SUBSET LIST
SPEECH QUERY FROM MOBILE DEVICE USER
213
RECOGNITION MODEL COMPILER
ELECTRONIC REPRESENTATION OF USER SPEECH
ACOUSTIC INPUT MECHANISM (AT MOBILE DEVICE)
103
SPEECH RECOGNITION MECHANISM
105
OUTPUT MECHANISM
104

FIG. 5

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 2003236099 A **[0007] [0009] [0010]**
- EP 1233407 A **[0011]**
- US 6230132 B **[0012]**
- EP 0661688 A **[0013]**

Electronic Patent Application Fee Transmittal

Application Number:	13022370
Filing Date:	07-Feb-2011
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Filer:	Chen Li/Jennifer Hake
Attorney Docket Number:	090611-0391838

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	75	75

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**255**

Electronic Acknowledgement Receipt

EFS ID:	14044033
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Customer Number:	909
Filer:	Chen Li/Jennifer Hake
Filer Authorized By:	Chen Li
Attorney Docket Number:	090611-0391838
Receipt Date:	22-OCT-2012
Filing Date:	07-FEB-2011
Time Stamp:	16:08:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$255
RAM confirmation Number	3154
Deposit Account	033975
Authorized User	

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 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

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	Extension of Time	090611_0391838_Extension.pdf	34104 8af6a8728071f0833d8e370aeb0ec5a54430a9aa	no	1
Warnings:					
Information:					
2		090611_0391838_Response.pdf	202152 706d2c42bc414a3169d0bf8675b93227ec272a9b	yes	16
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	11	
	Applicant Arguments/Remarks Made in an Amendment		12	16	
Warnings:					
Information:					
3	Transmittal Letter	0391838_SIDS.pdf	642058 dfc770f6611d6e3a973f57f1d2e9dd6ef5fe9191	no	7
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	0391838_IDSPTO1449.pdf	1264827 b5007738f6a6345b4b4177e7889384cccb7ec82a	no	11
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
5	Foreign Reference	EP1320043A2.pdf	1413297 156a2771d0dc7d59eab0cbd8a3f62e35547c5454	no	28
Warnings:					
Information:					
6	Foreign Reference	EP1646037B1.pdf	216799 5a92988274e0f55ba870b4a71acf929bc16e37ea	no	20

Warnings:					
Information:					
7	Non Patent Literature	Statement.pdf	86801 1f8b8a0aa03870fe5d41adcbb7112436e9730eb3	no	1
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	32145 4144d770101806839e761c9d47ed5c0c2782e1e4	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	3892183	

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.

PTO/SB/22 (09-11)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT OF COMMERCE
Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless if displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 090611-0391838
Application Number 13/022,370	Filed February 7, 2011
For SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH	
Art Unit 2626	Examiner Matthew J. SKED

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
☒ One month (37 CFR 1.17(a)(1))	$150	$75	$ 75.00
☐ Two months (37 CFR 1.17(a)(2))	$560	$280	$
☐ Three months (37 CFR 1.17(a)(3))	$1270	$635	$
☐ Four months (37 CFR 1.17(a)(4))	$1980	$990	$
☐ Five months (37 CFR 1.17(a)(5))	$2690	$1345	$

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 033975.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☒ attorney or agent of record. Registration Number 67448

☐ attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____.

/Chen Li/ — Signature

October 22, 2012 — Date

Chen Li — Typed or printed name

(703) 770-7898 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☒ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). 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 6 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.

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

909 7590 11/28/2012

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER
HE, JIALONG

ART UNIT	PAPER NUMBER
2659	

NOTIFICATION DATE	DELIVERY MODE
11/28/2012	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):

docket_ip@pillsburylaw.com
margaret.drosos@pillsburylaw.com

Office Action Summary	Application No.	Applicant(s)	
	13/022,370	DICRISTO ET AL.	
	Examiner	Art Unit	
	JIALONG HE	2659	

-- 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 *22 October 2012*.

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) *1-19,21-40 and 42-44* 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) *1-19,21-40 and 42-44* 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).

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

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 10/22/2012 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to Amendments and Arguments

3. Regarding obvious type double patenting rejection, the applicant decides to hold filing a terminal disclaimer in abeyance. Obvious type double patenting rejection is maintained.

4. Regarding rejection to claims under 35 U.S.C. 103, applicant amended independent claims 1 and 26 by adding new limitations. Applicant argues (**Remarks, page 13-15**) that Coffman and Kupiec fail to teach newly added limitations. The arguments have been considered but are moot in view of the new ground of rejection necessitated by the amendments. Reference to Geilhufe (US Pat. 6,584,439) was relied upon for teaching the new feature.

Geilhufe discloses a voice controlled device. When the device requests a user to give a response, a timer is setup to detect if a user response is within a predetermined

time. If the device fails to detect user's response within a time limit, the device treated speech recognition as failure (**Geilhufe, Fig. 9A-9B, col. 27, line 51-66**).

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-19, 21-40 and 42-44 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of U.S. Patent No. 7,620,549. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-44 in the instant application are generic to all that is recited in each of claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of the patent. That is, claims 1-44 are anticipated by claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of the patent.

3. Claims 1-19, 21-40 and 42-44 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of copending Application No. 12/571,795. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-44 in the instant application are generic to all that is recited in each of claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of the copending application. That is, claims 1-44 are anticipated by claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-19, 21-40 and 42-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

MPEP (2163.06) states applicant should specifically point out the support for any amendments made to the disclosure. The applicant has not pointed out where the amended claims 1 and 26 are supported. The Examiner carefully read though the specification and could not find fully support for the newly added limitation: "whether a subsequent input is received from the user within a predetermined amount of time after outputting a response to the natural language utterance".

It appears the new limitation is related to specification (**[11]**) which states "*When the system misrecognizes a request, the user typically provides immediate feedback, such as overriding the command in a time shorter than* ***the expected time execution time of the command****, issuing a stop command, or taking other action.*"

However, there is no disclosure to show that **expected command execution time** is "a predetermined amount of time". Normally, command execution time is not pre-determined, but depends on many factors such as user input or hardware speed.

Dependent claims are rejected because dependent claims include all limitations of their corresponding independent claims.

Claim Rejections - 35 USC § 103

6. Claims 1, 2, 5, 8-19, 21-22, 25-27, 30, 33-40 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman et al. (U.S. Pat. 7,137,126) in view of Kupiec (U.S. Pat. 5,500,920), both cited by the Applicant and further in view of Geilhufe et al. (US Pat. 6,584,439, hereinafter referred to as Geilhufe).

As per claims 1 and 26, Coffman teaches a system and method for processing natural language utterances, comprising:

a multimodal device configured to receive a natural language utterance (multi-modal input with speech and keyboard input, Fig. 6, elements 600 and 601);

a speech recognition engine configured to recognize one or more words from-the natural language utterance (speech recognizer, Fig. 6, element 604);

a parser configured to generate an interpretation of the natural language utterance from the one or more recognized words, and further configured to generate a

request based on the interpretation of the natural language utterance (NLU processing, col. 27, line 65 to col. 28, line 38 and Fig. 6, element 605); and

a domain agent configured to process the generated request (conversational virtual machine (CVM) , col. 27, line 65 to col. 28, line 38 and Fig. 6, element 401).

Coffman teaches monitoring backend accesses and determining if the query is complete, incomplete, incorrect or ambiguous (col. 27, line 65 to col. 28, line 38) but does not teach an adaptive misrecognition engine configured to: monitor one or more actions associated with the domain agent processing the request; and determine whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions.

Kupiec teaches a speech recognition system which monitors one or more actions associated with an agent processing the request; and determines whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions (the correct hypothesis is judged to be correct based upon the returned results from the query constructor and information retrieval, col. 11, line 10, to col. 12, line 33).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman wherein the adaptive misrecognition engine monitors one or more actions associated with an agent processing the request; and determines whether the interpretation of the natural language utterance is correct or incorrect based on the one or more monitored actions as taught by Kupiec because it is more efficient to

use the results of the agent processing then to calculate further statistics of the recognizer.

Coffman in view of Kupiec does not disclose determining whether the interpretation of the natural language utterance is correct or incorrect based on whether a subsequent input is received from the user within a predetermined amount of time after outputting a response to the natural language utterance.

Geilhufe discloses a voice controlled device. When the device requests a user response, a timer is setup to detect a user response. If the device fails to detect user's response within a time limit, the device treated speech recognition as failure (**Geilhufe, Fig. 9A-9B, col. 27, lines 51-66**).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include timing user input as taught by Geilhufe in Coffman's system. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods, and in the combination each element merely would have performed the same function as it did separately. "A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." KSR, 550 U.S. ___, 82 USPQ2d at 1395 (2007). One of ordinary skill in the art would have recognized that the results of the combination were predictable.

7. As per claims 2 and 27, Coffman teaches wherein the adaptive misrecognition engine is further configured to generate an unrecognized event if the interpretation of the natural language utterance is determined to be incorrect (determines if the query is complete, incomplete, incorrect or ambiguous, col. 27, line 65 to col. 28, line 38).

8. As per claims 5 and 30, Coffman teaches the analyzer is configured to track interaction patterns with the system over time for a plurality of users (different user preferences for each user, col. 36, lines 4-26).

9. As per claims 8 and 33, Coffman further discloses that the environmental model includes information associated with user environmental conditions or surroundings (context stack comprises information of current application, col. 16, lines 18-33).

10. As per claims 9 and 34, Coffman further discloses that the user environmental conditions include (i) a user global position (position, col. 42, lines 33-39).

11. As per claims 10 and 35, Coffman further discloses that the environmental model provides (i) context (col. 16, lines 18-33).

12. As per claims 11 and 36, Coffman teaches a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:

identify, one or more contexts a search module that completely, or partially, match one or more searches the query, for text combinations, wherein identifying the one or more contexts includes comparing a comparison module that compares the text combinations against one or more grammar expression entries in a context description grammar (complete queries are compared to a context stack 405 at the level of the natural language processing (NLU, i.e. grammar), column 31, lines 23-30);

provide a relevance score for each of identified matching contexts (queries are compared to the context stack and assigned a likelihood score, column 30, lines 10-35); and

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the generated request is associated with the selected context (task dispatcher 402 directs input streams to the appropriate application or device, column 30, lines 36-50 and column 41, lines 35-40); and

a response generating module configured to:

communicate that communicates with the request to the domain agent associated with the selected context; and generate a response to the natural language utterance using domain agents to content gathered as a result of by the domain agent processing agents and that generates a response from the request, wherein the response arranges the content in an order based on the relevance scores results from for the identified matching contexts (output streams of multiple tasks at multiple

applications and devices are prioritized based on the priorities assigned by the task dispatcher 402, column 29, lines 14-23 and lines 34-39).

13. As per claims 12 and 37, Coffman further discloses that the response generating module generates an aggregate response (output is aggregated by priorities assigned by task dispatcher, col. 29, lines 34-39).

14. As per claims 13 and 38, Coffman teaches a personality module configured to format the response (conversational facilities with multiple personalities, column 13, lines 58-67).

15. As per claims 14 and 39, Coffman teaches wherein the knowledge-enhanced speech recognition engine identifying one or more contexts further includes comparing the text combinations against a context stack that stores one or more expected contexts (queries are compared to the context stack and assigned a likelihood score, column 30, lines 10-35).

16. As per claims 15 and 40, Coffman teaches wherein the knowledge-enhanced speech recognition identifying the one or more contexts further includes applying prior probabilities (likelihoods, column 30, lines 10-35) or fuzzy possibilities to at least one of keyword matching, user profiles, a dialog history (the context stack includes a past history of discourses, column 22, lines 20-28).

17. As per claim 16, Coffman teaches wherein the domain agent is further configured to direct a query to a local information source to process the request (backend application, Fig. 6, element 608).

18. As per claim 17, Kupiec teaches wherein the domain agent is further configured to evaluate a plurality of responses to the query to process the request (retrieved documents, col. 12, lines 1-14).

19. As per claim 18, Coffman teaches wherein the domain agent is further configured to direct a command to a local device to process the request (backend application, Fig. 6, element 608).

20. As per claim 19, Coffman teaches the terminal device includes at least one of a personal digital assistant (Fig. 7, PDA 709), a cellular telephone (phone 711), a portable computer (laptop 708), a desktop computer (workstation 708), (i.e. all devices of Fig. 7, column 41, lines 14-17).

22. As per claim 21, Coffman discloses wherein the speech recognition engine is further configured to recognize one or more words from a natural language utterance provided in the follow-up multimodal input and wherein the parser is further configured to generate an interpretation of the follow-up multimodal input from the one or more words recognized from the natural language utterance provided in the follow-up multimodal input (mixed initiative allows a user to complete, modify or correct via a dialog with the system, col. 8, lines 21-63).

23. As per claim 22, Coffman discloses the follow-up multimodal input includes a follow-up request associated with a same context as the request being processed by the domain agent (during completion or correction of the original query, the previous context stack status is restored, column 31, lines 50-67).

24. As per claims 25 and 49, Coffman teaches wherein the multimodal device is further configured to receive a non-speech input relating to the natural language utterance (multi-modal input with keyboard input, Fig. 6, element 601); and wherein the system further comprises:

a transcription module that transcribes the non-speech communications to create a non-speech-based transcription (both speech and non-speech are converted to ASCII text, col. 27, line 65 to col. 28, line 57); and

a merging module that merges the recognized words and the non-speech-based transcription to generate a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance from the merged transcription (transcripts are merged, col. 28, lines 39-57).

25. Claims 3 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec, Geilhufe and taken in further view of Anderson et al. (U.S. Pat. 7,203,644), cited by the Applicant.

Coffman and Kupiec do not teach an analyzer configured to analyze the unrecognized event to determine how the natural language utterance was incorrectly interpreted; and determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

Anderson teaches a speech recognition system for interacting with a speech application that uses feedback of the recognition results in order to adapt the grammar filed used by the recognition engine (col. 2, line 61 to col. 4, line 12).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Coffman and Kupiec to include an analyzer configured to analyze the unrecognized event to determine how the natural language utterance was incorrectly interpreted; and determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request as taught by Anderson because it would improve subsequent recognition results.

26. Claims 4, 6, 7, 29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec, Geilhufe and taken in further view of Ramaswamy et al. (U.S. Pat. 6,622,119).

As per claims 4 and 29, Coffman teaches an analyzer configured to track an interaction pattern with the system over time for a user that provided the natural language utterance and generate a personalized cognitive model for the user based on the interaction pattern tracked for the user (user history is logged and used to tailor the prompts to the user, col. 15, line 50 to col. 16, line 17).

Coffman and Kupiec do not specifically teach using the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

Ramaswamy teaches a multi-modal dialog system using both speech recognition and natural language processing which includes a command predictor that uses a cognitive model to predict a user's next command (abstract, col. 4, lines 1-58, Fig. 1 and Fig. 2, element 204).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman and Kupiec to use the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request because, as taught by Ramaswamy, it would improve the accuracy of the natural language processing (col. 1, lines 23-33).

27. As per claims 6 and 31, Coffman teaches wherein the analyzer is further configured to generate a generalized cognitive model for the plurality of users based on the interaction patterns tracked for the plurality of users (history is logged and used to tailor the prompts wherein user information is optional, col. 15, line 50 to col. 16, line 17).

Coffman and Kupiec do not teach the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns.

Ramaswamy teaches the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns (prediction model calculated from conditional probabilities, col. 5, line 13 to col. 6, line 47).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman so teaches the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns as taught by Ramaswamy because basing the model in statistics would create a more robust model that can better handle changes in behavior.

28. As per claims 7 and 32, Coffman and Kupiec do not specifically teach using the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

Ramaswamy teaches a multi-modal dialog system using both speech recognition and natural language processing which includes a command predictor that uses a cognitive model to predict a user's next command (abstract, col. 4, lines 1-58, Fig. 1 and Fig. 2, element 204).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman and Kupiec to use the generalized cognitive model to predict the one or more actions associated with the domain agent processing the request because, as taught by Ramaswamy, it would improve the accuracy of the natural language processing (col. 1, lines 23-33).

29. Claims 23, 24, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec, Geilhufe and taken in further view of Houser et al. (U.S. Pat. 5,774,859).

Coffman and Kupiec do not teach the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect if a user provides a subsequent request to stop the request being processed (repeat the utterance) by the domain agent.

Houser teaches a speech recognition system wherein the system assumes a misrecognition of a first utterance when the user repeats the utterance twice (col. 19, lines 27-60).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Coffman and Kupiec to determine an utterance is incorrect if the user provides a subsequent request to stop the request being processed as taught by Houser because it would allow the system to react to the user who can better judge the correctness of the recognition.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Waibel et al. (US 5,855,000) disclosed various method of correcting speech recognition errors.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JIALONG HE whose telephone number is (571) 270-5359. The examiner can normally be reached on Monday-Thursday, 7:00 - 4:30, Alt Friday, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pierre Desir can be reached on (571) 272-7799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. 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.

/JIALONG HE/
Primary Examiner, Art Unit 2659

Notice of References Cited	Application/Control No. 13/022,370	Applicant(s)/Patent Under Reexamination DICRISTO ET AL.	
	Examiner JIALONG HE	Art Unit 2659	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,584,439	06-2003	Geilhufe et al.	704/270
*	B	US-5,855,000	12-1998	Waibel et al.	704/235
	C	US-			
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*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	1	(Dicristo near4 philippe).inv.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/19 11:57
S2	18	(Weider near5 chris).inv.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/19 11:59
S3	44	(kennewick near4 robert).inv.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/19 11:59
S4	84	(voicebox).as.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/19 11:59
S5	38	(S2 | S3 | S4) and misrecognition	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/19 12:00
S6	33	(S2 | S3 | S4) and misrecognition near4 adaptive	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/19 12:00
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S11	8	("20020035501" | "6681206" | "6751612" | "6954755").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/20 18:57
S12	4	("20080140385" | "20090216540").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2012/11/20 18:57
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S14	30	("20030120493" | "20090271194" | "20110112827" | "20110112921" | "5027406" | "5960447" | "5995928" | "6018708" | "6108631" | "6167377" | "6173266" | "6208964" | "6269336" | "6366882" | "6377913" | "6405170" | "6606598" | "6701294" | "6704708" |	US-PGPUB; USPAT	ADJ	ON	2012/11/20 18:58

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S16	44	("20030065427" | "20030212562" | "20070198267" | "20080147410" | "20090052635" | "20090106029" | "20090273563" | "20090313026" | "20100029261" | "20100312566" | "20120150636" | "6199043" | "6236968" | "6246990" | "6301560" | "6393403" | "6434529" | "6456974" | "6560590" | "6571279" | "6578022" | "6601026" | "6631351" | "6745161" | "7107218" | "7143039" | "7190770" | "7283951" | "7299186" | "7321850" | "7542894"	US-PGPUB; USPAT	ADJ	ON	2012/11/20 18:59

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S17	479	(S7 | S8 | S9 | S10 | S11 | S12 | S13 | S14 | S15 | S16)	US-PGPUB; USPAT	ADJ	ON	2012/11/20 18:59
S18	30	("20010041980" | "20020035501" | "20020049805" | "20020065568" | "20020069059" | "20020082911" | "20020087525" | "20020120609" | "20020124050" | "20020138248" | "20020143535" | "20020188602" | "20020198714" | "20030014261" | "20030046346" | "20030064709" | "20030088421" | "20030097249" | "20030112267" | "20030135488" | "20030182132" | "20030236664" | "20040006475" | "20040025115" | "20040044516" | "20040166832" | "20040193408" | "20040193420" | "20040199375" | "20040243417").PN.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:02
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S22	529	(S17 | S18 | S19 | S20 | S21)	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:04
S23	164	S22 and (incorrect$5 near4 recogntion | misrecogni$6 | recognition near4 error | unrecogniz$5)	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:08
S24	20	S22 and (incorrect$5 near4 recogntion | misrecogni$6 | recognition near4 error | unrecogniz$5) and feedback same (time)	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:09
S26	9	S22 and (incorrect$5 near4 recogntion | misrecogni$6 | recognition near4 error | unrecogniz$5) and feedback near10 (time)	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:11
S27	4	user near20 feedback near20 (timer | time out) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:12
S28	1	"7,137,126".pn.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:18
S30	1	"5,500,920".pn.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:18
S31	30	("20070213979" | "20040085162" | "5712937" | "5960447" | "6321196" | "20030033146" | "7162422" | "6347296" | "20020138265" | "5864805" | "5842163" | "6418410" | "20030105634" | "20030189603" | "20050149319" | "5799273" | "6513005" | "20050033574" | "6044347" | "6922669" | "20030233230" | "5855000" | "6327566" | "6912498" | "5909667" | "6314397" | "6581033" | "20020133340" | "20030083876" | "20030110035").PN.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:21
S32	28	S31 and time	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:22
S33	4	S31 and time near10 (response | feedback)	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:22
S34	474	(error near4 correction) and (timer | time out | feedback) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:26

S35	66	(error near4 correction) same (timer | time out | feedback) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:26
S36	13	(error near4 correction) same (timer | short (period | time)) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:27
S37	16	(error near4 correction) and (immediat$5 feedback) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:29
S39	1	"20060235687".pn.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:31
S40	1541	(detect$5 | identif$5) near10 (error | misrecogni$6) near10 (timer | short period | user feedback)	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:38
S42	6	(detect$5 | identif$5) near10 (error | misrecogni$6) near10 (timer | short period | user feedback) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:39
S43	624	(detect$5 | identif$5) near10 (error | misrecogni$6) near20 (response | feedback | correction) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:40
S44	79	(detect$5 | identif$5) near10 (error | misrecogni$6) near20 user near4 (response | feedback | correction) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:40
S45	28	(detect$5 | identif$5) near10 (error | misrecogni$6 | incorrec$5) near20 (response | feedback | correction) near5 (timer | time | period | immediat$6) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:44
S46	222	(detect$5 | identif$5 | correc$5) near10 (error | misrecogni$6 | incorrec$5) near20 (response | feedback | correction) near20 (timer | time | period | short time) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:49
S47	1	(detect$5 | identif$5 | correc$5) near10 (error | misrecogni$6 | incorrec$5) near20 (response | feedback | correction) near20 (timer | short (time | period)) and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:49
S48	348	(detect$5 | identif$5 | correc$5) near10 (error | misrecogni$6 | incorrec$5) near20 (response | feedback | correction) near4 user and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:50
S49	18	(detect$5 | identif$5 | correc$5) near10 (error | misrecogni$6 | incorrec$5) near20 (response | feedback | correction) near4 user near20 time and 704/200-278.ccls.	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:50
S50	3	09/316,334	US-PGPUB; USPAT	ADJ	ON	2012/11/20 19:54
S51	8	S22 and Waibel	US-PGPUB; USPAT	ADJ	ON	2012/11/20 20:09
S52	26	(11/200,164 | "12,571,795")	US-PGPUB; USPAT	ADJ	ON	2012/11/20 20:12

11/20/2012 9:12:51 PM
C:\Users\jhe\Documents\EAST\Workspaces\13022370_Sked.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	Art Unit
	MATTHEW SKED	2626

SEARCHED			
Class	Subclass	Date	Examiner
704	200-278	11/20/2012	JH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search	06/13/12	/MS/
EAST: update search (see search history)	11/20/2012	JH
Google Patent	11/20/2012	JH

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	Art Unit
	JIALONG HE	2659

✓	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	11/20/2012								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
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	33	✓								
	34	✓								
	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	**Art Unit**
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/20/2012								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	-								
	42	✓								
	43	✓								
	44	✓								

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	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1A	5,027,406	06/25/1991	Roberts *et al.*	381	43	
	1B	5,208,748	05/04/1993	Flores *et al.*	364	419	
	1C	5,357,596	10/18/1994	Takebayashi *et al.*	395	2.84	
	1D	5,577,165	11/19/1996	Takebayashi et al.	395	2.84	
	1E	5,608,635	03/04/1997	Tamai	364	449.3	
	1F	5,740,256	04/14/1998	Castello Da Costa *et al.*	361	94.7	
	1G	5,748,974	05/05/1998	Johnson	395	759	
	1H	5,839,107	11/17/1998	Gupta *et al.*	704	270	
	1I	5,848,396	12/08/1998	Gerace	705	10	
	1J	5,892,900	04/06/1999	Ginter *et al.*	395	186	
	1K	5,897,613	04/27/1999	Chan	704	210	
	1L	5,960,397	09/28/1999	Rahim	704	244	
	1M	5,960,399	09/28/1999	Barclay *et al.*	704	270	
	1N	5,960,447	09/28/1999	Holt *et al.*	707	500	
	1O	5,995,928	11/30/1999	Nguyen *et al.*	704	251	
	1P	6,018,708	01/25/2000	Dahan *et al.*	704	244	
	1Q	6,035,267	03/07/2000	Watanabe *et al.*	704	1	
	1R	6,049,607	04/11/2000	Marash *et al.*	379	410	
	1S	6,067,513	05/23/2000	Ishimitsu	704	233	
	1T	6,076,059	06/13/2000	Glickman *et al.*	704	260	
	1U	6,085,186	07/04/2000	Christianson *et al.*	707	3	
	1V	6,108,631	08/22/2000	Ruhl	704	270	
	1W	6,167,377	12/26/2000	Gillick *et al.*	704	240	

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	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO
	1X	1 320 043 A2	06/18/2003	Europe				
	1Y	1 646 037	04/12/2006	Europe				

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

	1Z	"Statement in Accordance with the Notice from the European Patent Office dated 1 October 2007 Concerning Business Methods (OJ EPO 11/2007, 592-593), XP002456252.

EXAMINER	DATE CONSIDERED

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

403709660v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.H./

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
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U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2A	6,173,266	01/09/2001	Marx *et al.*	704	270	
	2B	6,188,982	02/13/2001	Chiang	704	256	
	2C	6,199,043	03/06/2001	Happ	704	272	
	2D	6,208,964	03/27/2001	Sabourin	704	244	
	2E	6,233,561	05/15/2001	Junqua *et al.*	704	277	
	2F	6,236,968	05/22/2001	Kanevsky *et al.*	704	275	
	2G	6,246,990	06/12/2001	Happ	704	275	
	2H	6,266,636	07/24/2001	Kosaka *et al.*	704	244	
	2I	6,269,336	07/31/2001	Ladd *et al.*	704	270	
	2J	6,275,231	08/14/2001	Obradovich	345	349	
	2K	6,278,968	08/21/2001	Franz *et al.*	704	3	
	2L	6,301,560	10/09/2001	Masters	704	251	
	2M	6,362,748	03/26/2002	Huang	340	901	
	2N	6,366,882	04/02/2002	Bijl *et al.*	704	235	
	2O	6,377,913	04/23/2002	Coffman *et al.*	704	8	
	2P	6,393,403	05/21/2002	Majaniemi	704	275	
	2Q	6,397,181	05/28/2002	Li *et al.*	704	256	
	2R	6,405,170	06/11/2002	Phillips *et al.*	704	270	
	2S	6,429,813	08/06/2002	Feigen	342	357.13	
	2T	6,434,529	08/13/2002	Walker *et al.*	704	275	
	2U	6,456,974	09/24/2002	Baker *et al.*	704	270.1	
	2V	6,510,417	01/21/2003	Woods *et al.*	704	275	
	2W	6,522,746	02/18/2003	Marchok *et al.*	379	406.03	

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OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

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U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	3A	6,549,629	04/15/2003	Finn *et al.*	381	92	
	3B	6,560,590	05/06/2003	Shwe *et al.*	706	55	
	3C	6,571,279	05/27/2003	Herz *et al.*	709	217	
	3D	6,578,022	06/10/2003	Foulger *et al.*	706	45	
	3E	6,587,858	07/01/2003	Strazza	707	102	
	3F	6,591,239	07/08/2003	McCall *et al.*	704	275	
	3G	6,594,367	07/15/2003	Marash *et al.*	381	92	
	3H	6,601,026	07/29/2003	Appelt *et al.*	704	9	
	3I	6,606,598	08/12/2003	Holthouse *et al.*	704	275	
	3J	6,631,351	10/07/2003	Ramachandran *et al.*	704	270	
	3K	6,633,846	10/14/2003	Bennett *et al.*	704	257	
	3L	6,701,294	03/02/2004	Ball *et al.*	704	257	
	3M	6,704,396	03/09/2004	Parolkar *et al.*	379	88.17	
	3N	6,704,708	03/09/2004	Pickering	704	235	
	3O	6,745,161	06/01/2004	Arnold *et al.*	704	7	
	3P	6,754,485	06/22/2004	Obradovich *et al.*	455	414.1	
	3Q	6,757,544	06/29/2004	Rangarajan *et al.*	455	456.1	
	3R	6,832,230	12/14/2004	Zilliacus *et al.*	707	203	
	3S	6,850,603	02/01/2005	Eberle *et al.*	379	88.16	
	3T	6,868,380	03/15/2005	Kroeker	704	240	
	3U	6,877,001	04/05/2005	Wolf *et al.*	707	3	
	3V	6,910,003	06/21/2005	Arnold *et al.*	704	4	
	3W	6,912,498	06/28/2005	Stevens *et al.*	704	235	

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U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	4A	6,934,756	08/23/2005	Maes	709	227	
	4B	6,959,276	10/25/2005	Droppo *et al.*	704	226	
	4C	6,968,311	11/22/2005	Knockeart *et al.*	704	270	
	4D	6,975,993	12/13/2005	Keiller	704	275	
	4E	6,983,055	01/03/2006	Luo	381	313	
	4F	7,003,463	02/21/2006	Maes *et al.*	704	270.1	
	4G	7,024,364	04/04/2006	Guerra *et al.*	704	270	
	4H	7,027,586	04/11/2006	Bushey *et al.*	379	265.09	
	4I	7,035,415	04/25/2006	Belt *et al.*	381	92	
	4J	7,043,425	05/09/2006	Pao	704	211	
	4K	7,054,817	05/30/2006	Shao	704	270	
	4L	7,058,890	06/06/2006	George *et al.*	715	728	
	4M	7,069,220	06/27/2006	Coffman *et al.*	704	275	
	4N	7,072,834	07/04/2006	Zhou	704	244	
	4O	7,107,210	09/12/2006	Deng *et al.*	704	226	
	4P	7,107,218	09/12/2006	Preston	704	270	
	4Q	7,110,951	09/19/2006	Lemelson *et al.*	704	270	
	4R	7,130,390	10/31/2006	Abburi	379	88.17	
	4S	7,143,037	11/28/2006	Chestnut	704	251	
	4T	7,143,039	11/28/2006	Stifelman *et al.*	704	270	
	4U	7,165,028	01/16/2007	Gong	704	233	
	4V	7,184,957	02/27/2007	Brookes *et al.*	704	246	
	4W	7,190,770	03/13/2007	Ando *et al.*	379	88.01	

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	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

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	Philippe DI CRISTO *et al.*	
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U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5A	7,197,069	03/27/2007	Agazzi *et al.*	375	233	
	5B	7,206,418	04/17/2007	Yang *et al.*	381	92	
	5C	7,207,011	04/17/2007	Mulvey *et al.*	715	812	
	5D	7,236,923	06/26/2007	Gupta	704	9	
	5E	7,272,212	09/18/2007	Eberle *et al.*	379	88.17	
	5F	7,277,854	10/02/2007	Bennett *et al.*	704	257	
	5G	7,283,829	10/16/2007	Christenson *et al.*	455	461	
	5H	7,283,951	10/16/2007	Marchisio *et al.*	704	9	
	5I	7,299,186	11/20/2007	Kuzunuki *et al.*	704	270.1	
	5J	7,305,381	12/04/2007	Poppink *et al.*	1	1	
	5K	7,321,850	01/22/2008	Wakita	704	10	
	5L	7,328,155	02/05/2008	Endo *et al.*	704	251	
	5M	7,337,116	02/26/2008	Charlesworth *et al.*	704	254	
	5N	7,366,285	04/29/2008	Parolkar *et al.*	379	88.17	
	5O	7,366,669	04/29/2008	Nishitani *et al.*	704	256	
	5P	7,406,421	07/29/2008	Odinak *et al.*	704	275	
	5Q	7,447,635	11/04/2008	Konopka *et al.*	704	275	
	5R	7,454,608	11/18/2008	Gopalakrishnan *et al.*	713	100	
	5S	7,472,020	12/30/2008	Brulle-Drews	701	211	
	5T	7,472,060	12/30/2008	Gorin *et al.*	704	240	
	5U	7,478,036	01/13/2009	Shen *et al.*	704	9	
	5V	7,493,259	02/17/2009	Jones *et al.*	704	257	
	5W	7,516,076	04/07/2009	Walker *et al.*	704	275	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

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U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	6A	7,529,675	05/05/2009	Maes	704	270.1	
	6B	7,536,297	05/19/2009	Byrd *et al.*	704	10	
	6C	7,536,374	05/19/2009	Au	706	55	
	6D	7,542,894	06/02/2009	Murata	704	9	
	6E	7,546,382	06/09/2009	Healey *et al.*	709	246	
	6F	7,558,730	07/07/2009	Davis *et al.*	704	235	
	6G	7,574,362	08/11/2009	Walker *et al.*	704	275	
	6H	7,577,244	08/18/2009	Taschereau	379	218.01	
	6I	7,606,708	10/20/2009	Hwang	704	257	
	6J	7,640,006	12/29/2009	Portman *et al.*	455	412.1	
	6K	7,640,272	12/29/2009	Mahajan *et al.*	707	104.1	
	6L	7,676,365	03/09/2010	Hwang *et al.*	704	240	
	6M	7,676,369	03/09/2010	Fujimoto *et al.*	704	270	
	6N	7,684,977	03/23/2010	Morikawa	704	211	
	6O	7,729,916	06/01/2010	Coffman *et al.*	704	270	
	6P	7,729,918	06/01/2010	Walker *et al.*	704	275	
	6Q	7,748,021	06/29/2010	Obradovich	725	105	
	6R	7,788,084	08/31/2010	Brun *et al.*	704	7	
	6S	7,801,731	09/21/2010	Odinak *et al.*	704	275	
	6T	7,831,426	11/09/2010	Bennett	704	252	
	6U	7,831,433	11/09/2010	Belvin *et al.*	704	275	
	6V	7,873,519	01/18/2011	Bennett	704	257	
	6W	7,873,523	01/18/2011	Potter *et al.*	704	275	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

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*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	7A	7,881,936	02/01/2011	Longe *et al.*	704	257	
	7B	7,894,849	02/22/2011	Kass *et al.*	455	550.1	
	7C	7,902,969	03/08/2011	Obradovich	340	439	
	7D	7,917,367	03/29/2011	Di Cristo *et al.*	704	270.1	
	7E	7,949,529	05/24/2011	Weider *et al.*	704	270	
	7F	7,949,537	05/24/2011	Walker *et al.*	704	275	
	7G	7,953,732	05/31/2011	Frank *et al.*	707	724	
	7H	7,974,875	07/05/2011	Quilici *et al.*	705	14.4	
	7I	7,983,917	07/19/2011	Kennewick *et al.*	704	257	
	7J	7,984,287	07/19/2011	Gopalakrishnan *et al.*	713	100	
	7K	8,005,683	08/23/2011	Tessel *et al.*	704	275	
	7L	8,015,006	09/06/2011	Kennewick *et al.*	704	236	
	7M	8,060,367	11/15/2011	Keaveney	704	247	
	7N	8,069,046	11/29/2011	Kennewick *et al.*	704	257	
	7O	8,073,681	12/06/2011	Baldwin *et al.*	704	9	
	7P	8,077,975	12/13/2011	Ma *et al.*	382	187	
	7Q	8,082,153	12/20/2011	Coffman *et al.*	704	270	
	7R	8,086,463	12/27/2011	Ativanichayaphong *et al.*	704	275	
	7S	8,112,275	02/07/2012	Kennewick *et al.*	704	240	
	7T	8,140,327	03/20/2012	Kennewick *et al.*	704	226	
	7U	8,140,335	03/20/2012	Kennewick *et al.*	704	257	
	7V	8,145,489	03/27/2012	Freeman *et al.*	704	257	
	7W	8,150,694	04/03/2012	Kennewick *et al.*	704	257	

FOREIGN PATENT DOCUMENTS

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OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

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403709660v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.H./

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	8A	8,155,962	04/10/2012	Kennewick *et al.*	704	257	
	8B	8,170,867	05/01/2012	Germain	704	9	
	8C	8,195,468	06/05/2012	Weider *et al.*	704	275	
	8D	8,219,599	07/10/2012	Tunstall-Pedoe	707	955	
	8E	8,224,652	07/17/2012	Wang *et al.*	704	275	
	8F	2001/0049601	12/06/2001	Kroeker *et al.*	704	254	
	8G	2001/0054087	12/20/2001	Flom *et al.*	709	218	
	8H	2002/0015500	02/07/2002	Belt *et al.*	381	66	
	8I	2002/0022927	02/21/2002	Lemelson *et al.*	701	301	
	8J	2002/0029261	03/07/2002	Shibata	709	219	
	8K	2002/0032752	03/14/2002	Gold *et al.*	709	218	
	8L	2002/0069071	06/06/2002	Knockeart et al.	704	275	
	8M	2002/0133402	09/19/2002	Faber *et al.*	705	14	
	8N	2002/0161646	10/31/2002	Gailey *et al.*	705	14	
	8O	2002/0173961	11/21/2002	Guerra	704	258	
	8P	2002/0184373	12/05/2002	Maes	709	228	
	8Q	2003/0016835	01/23/2003	Elko *et al.*	381	92	
	8R	2003/0065427	04/03/2003	Funk *et al.*	701	1	
	8S	2003/0110037	06/12/2003	Walker *et al.*	704	257	
	8T	2003/0115062	06/19/2003	Walker *et al.*	704	258	
	8U	2003/0120493	06/26/2003	Gupta	704	270.1	
	8V	2003/0144846	07/31/2003	Denenberg *et al.*	704	277	
	8W	2003/0158731	08/21/2003	Falcon *et al.*	704	231	

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U.S. PATENT DOCUMENTS

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	9A	2003/0161448	08/28/2003	Parolkar *et al.*	379	88.17	
	9B	2003/0204492	10/30/2003	Wolf *et al.*	707	3	
	9C	2003/0206640	11/06/2003	Malvar *et al.*	381	93	
	9D	2003/0212550	11/13/2003	Ubale	704	215	
	9E	2003/0212558	11/13/2003	Matula	704	260	
	9F	2003/0212562	11/13/2003	Patel *et al.*	704	275	
	9G	2003/0225825	12/04/2003	Healey *et al.*	709	203	
	9H	2004/0098245	05/20/2004	Walker *et al.*	704	1	
	9I	2004/0117804	06/17/2004	Scahill *et al.*	719	320	
	9J	2004/0140989	07/22/2004	Papageorge	345	700	
	9K	2004/0158555	08/12/2004	Seedman *et al.*	707	3	
	9L	2004/0167771	08/26/2004	Duan *et al.*	704	10	
	9M	2004/0205671	10/14/2004	Sukehiro *et al.*	715	532	
	9N	2005/0125232	06/09/2005	Gadd	704	270.1	
	9O	2005/0137877	06/23/2005	Oesterling *et al.*	704	275	
	9P	2005/0143994	06/30/2005	Mori *et al.*	704	235	
	9Q	2005/0216254	09/29/2005	Gupta *et al.*	704	9	
	9R	2005/0234727	10/20/2005	Chiu	704	270.1	
	9S	2005/0283752	12/22/2005	Fruchter *et al.*	717	100	
	9T	2006/0041431	02/23/2006	Maes	704	270.1	
	9U	2006/0047509	03/02/2006	Ding *et al.*	704	231	
	9V	2006/0217133	09/28/2006	Christenson *et al.*	455	461	
	9W	2006/0285662	12/21/2006	Yin *et al.*	379	88.16	

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U.S. PATENT DOCUMENTS

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	10A	2007/0033020	02/08/2007	(Kelleher) Francois *et al.*	704	226	
	10B	2007/0043868	02/22/2007	Kumar *et al.*	709	226	
	10C	2007/0073544	03/29/2007	Millett *et al.*	704	277	
	10D	2007/0078708	04/05/2007	Yu *et al.*	705	14	
	10E	2007/0078709	04/05/2007	Rajaram	705	14	
	10F	2007/0118357	05/24/2007	Kasravi *et al.*	704	10	
	10G	2007/0135101	06/14/2007	Ramati *et al.*	455	414.1	
	10H	2007/0146833	06/28/2007	Satomi *et al.*	358	537	
	10I	2007/0162296	07/12/2007	Altberg *et al.*	705	1	
	10J	2007/0198267	08/23/2007	Jones *et al.*	704	257	
	10K	2008/0034032	02/07/2008	Healey *et al.*	709	203	
	10L	2008/0065386	03/13/2008	Cross *et al.*	704	270	
	10M	2008/0109285	05/08/2008	Reuther *et al.*	705	7	
	10N	2008/0147410	06/19/2008	Odinak	704	270.1	
	10O	2009/0052635	02/26/2009	Jones *et al.*	379	88.02	
	10P	2009/0067599	03/12/2009	Agarwal *et al.*	379	114.21	
	10Q	2009/0106029	04/23/2009	DeLine *et al.*	704	275	
	10R	2009/0271194	10/29/2009	Davis *et al.*	704	235	
	10S	2009/0273563	11/05/2009	Pryor	345	157	
	10T	2009/0313026	12/17/2009	Coffman *et al.*	704	275	
	10U	2010/0029261	02/04/2010	Mikkelsen *et al.*	455	419	
	10V	2010/0036967	02/11/2010	Caine *et al.*	709	236	
	10W	2010/0185512	07/22/2010	Borger *et al.*	705	14.49	

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Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

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	11A	2010/0312566	12/09/2010	Odinak *et al.*	704	275	
	11B	2011/0112827	05/12/2011	Kennewick *et al.*	704	9	
	11C	2011/0112921	05/12/2011	Kennewick *et al.*	705	26.1	
	11D	2011/0131045	06/02/2011	Cristo *et al.*	704	249	
	11E	2011/0231182	09/22/2011	Weider *et al.*	704	9	
	11F	2011/0231188	09/22/2011	Kennewick *et al.*	704	236	
	11G	2012/0022857	01/26/2012	Baldwin *et al.*	704	9	
	11H	2012/0101809	04/26/2012	Kennewick *et al.*	704	9	
	11I	2012/0101810	04/26/2012	Kennewick *et al.*	704	9	
	11J	2012/0109753	05/03/2012	Kennewick *et al.*	705	14.58	
	11K	2012/0150636	06/14/2012	Freeman *et al.*	705	14.49	

FOREIGN PATENT DOCUMENTS

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EXAMINER	DATE CONSIDERED
/Jialong He/	11/20/2012

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UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

909 7590 02/11/2013

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER	
HE, JIALONG	

ART UNIT	PAPER NUMBER
2659	

NOTIFICATION DATE	DELIVERY MODE
02/11/2013	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):

docket_ip@pillsburylaw.com
margaret.drosos@pillsburylaw.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/022,370	DICRISTO ET AL.	
	Examiner	Art Unit	
	JIALONG HE	2659	

All participants (applicant, applicant's representative, PTO personnel):

(1) *JIALONG HE*. (3)_____.

(2) *Rachel Lee (Reg. 70,049)*. (4)_____.

Date of Interview: _____.

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*.

Identification of prior art discussed: _____.

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...)

Ms Lee inteneded to amend claim 1 according to spec. ([11]). The Examiner agreed that the proposed amendment would overcome previous 112 1st rejection. To detemrine allowability, further search is necessary .

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

/JIALONG HE/ Primary Examiner, Art Unit 2659	

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.

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	Philippe DI CRISTO *et al.*	
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	A	7,036,128	04/25/2006	Julia *et al.*	719	317	
	B	7,920,682	04/05/2011	Byrne *et al.*	379	88.18	
	C	8,326,627	12/04/2012	Kennewick *et al.*	704	257	
	D	8,326,634	12/04/2012	Di Cristo *et al.*	704	270.1	
	E	8,326,637	12/04/2012	Baldwin *et al.*	704	275	
	F	8,332,224	12/11/2012	Di Cristo *et al.*	704	257	
	G	8,370,147	02/05/2013	Kennewick et al.	704	257	
	H	2002/0087326	07/04/2002	Lee *et al.*	704	270.1	
	I	2005/0021470	01/27/2005	Martin *et al.*	705	51	
	J	2012/0278073	11/01/2012	Weider et al.	704	235	

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE PATENT APPLICATION OF:	Philippe DI CRISTO *et al.*
SERIAL NO.:	13/022,370
FILING DATE:	February 7, 2011
ATTORNEY DOCKET NO.:	090611-0391838
CONFIRMATION NO.:	6569
EXAMINER:	Jialong HE
ART UNIT:	2659
FOR:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

RESPONSE TO FINAL OFFICE ACTION mailed 28 NOVEMBER 2012

MAIL STOP RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Dear Madam:

In response to the Final Office Action mailed November 28, 2012, and in conjunction with the Request for Continued Examination (RCE) filed concurrently herewith, please amend the above-identified application as follows:

Amendments to the Claims begin on page **2** of this paper.

Remarks begin on page **13** of this paper.

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned for under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 033975 (**Ref. No. 090611-0391838**).

LISTING OF CLAIMS:

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

1. (**Currently Amended**) A system for processing natural language utterances, comprising:

a device configured to receive a first input comprising a natural language utterance from a user;

a speech recognition engine configured to recognize one or more words from the natural language utterance;

a parser configured to generate an interpretation of the natural language utterance from the one or more recognized words, and further configured to generate a request based on the interpretation of the natural language utterance;

a domain agent configured to process the ~~generated~~ request; and

an adaptive misrecognition engine configured to determine whether the interpretation of the natural language utterance is correct or incorrect based on whether a ~~subsequent~~ second input is received from the user within ~~a predetermined~~ an amount of time shorter than an expected execution time associated with the request after outputting a response to the ~~natural language utterance~~ request.

2. (**Previously Presented**) The system of claim 1, wherein the adaptive misrecognition engine is further configured to generate an event indicative of misrecognition in response to determining that the interpretation of the natural language utterance is incorrect.

3. (**Previously Presented**) The system of claim 2, further comprising an analyzer configured to:

analyze the event to determine how the natural language utterance was incorrectly interpreted; and

determine one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

4. (**Currently Amended**) The system of claim 1, further comprising an analyzer configured to:

track an interaction pattern with the system over time for the user that provided the natural language utterance;

generate a personalized cognitive model ~~for~~ associated with the user based on the interaction pattern tracked for the user; and

~~use the personalized cognitive model to~~ predict ~~the~~ one or more actions associated with the user ~~the domain agent processing the request~~ based on the personalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

5. (**Currently Amended**) The system of claim 1, further comprising an analyzer configured to track interaction patterns with the system over time for a plurality of users.

6. (**Currently Amended**) The system of claim 5, wherein the analyzer is further configured to generate a generalized cognitive model ~~for~~ associated with the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the ~~tracked~~ interaction patterns.

7. (**Currently Amended**) The system of claim 6, wherein the analyzer is further configured to ~~use the generalized cognitive model to~~ predict ~~the~~ one or more actions associated with the user ~~the domain agent processing the request~~ based on the generalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

8. (**Previously Presented**) The system of claim 1, further comprising an analyzer configured to generate an environmental model that includes information associated with at least one of an environmental condition or surrounding associated with the user that provided the natural language utterance.

9. (**Previously Presented**) The system of claim 8, wherein the environmental condition or surrounding identifies a level of noise associated with an environment or the surrounding of the user.

10. (**Original**) The system of claim 8, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

11. (**Currently Amended**) The system of claim 1, further comprising:

a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:

compare one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

provide a relevance score for each of the identified matching contexts; and

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the ~~generated~~ request is associated with the selected context; and

a response generating module configured to:

communicate the request to the domain agent associated with the selected context; and

generate the response to the ~~natural language utterance~~ request using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

12. (**Original**) The system of claim 11, wherein the response generated by the response generating module includes an aggregation of the content gathered as a result of the domain agent processing the request.

13. (**Currently Amended**) The system of claim 11, further comprising a personality module configured to determine a personality based on the identified matching contexts, the domain agent processing the request, or a user profile associated with the user and format the response based on the personality.

14. (**Original**) The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to compare the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

15. (**Original**) The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to apply prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

16. (**Original**) The system of claim 11, wherein the domain agent is further configured to direct a query to at least one of a local information source or a network information source to process the request.

17. (**Original**) The system of claim 16, wherein the domain agent is further configured to evaluate a plurality of responses to the query to process the request.

18. (**Original**) The system of claim 11, wherein the domain agent is further configured to direct a command to at least one of a local device or a remote device to process the request.

19. (**Previously Presented**) The system of claim 1, wherein the device includes at least one of a personal digital assistant, a cellular telephone, a portable computer, or a desktop computer.

20. (**Cancelled**)

21. (**Currently Amended**) The system of claim 1, wherein the speech recognition engine is further configured to recognize one or more words from a natural language utterance provided in the ~~subsequent~~ second input, and wherein the parser is further configured to generate an interpretation of the ~~subsequent~~ second input from the one or more words recognized from the natural language utterance provided in the ~~subsequent~~ second input.

22. (**Currently Amended**) The system of claim 1, wherein the ~~subsequent~~ second input includes a follow-up request associated with a same context as the request being processed by the domain agent.

23. (**Currently Amended**) The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to determining that the ~~subsequent~~ second input includes a request to stop the request being processed by the domain agent.

24. (**Previously Presented**) The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to the user repeating the natural language utterance.

25. (**Currently Amended**) The system of claim 1, wherein the device is further configured to receive a non-speech input relating to the natural language utterance, and wherein the system further comprises:

a transcription module configured to transcribe the non-speech input to create a non-speech-based transcription; and

a merging module configured to merge the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance ~~from~~ based on the merged transcription.

26. (**Currently Amended**) A method for processing natural language utterances, comprising:

receiving a first input comprising a natural language utterance at a device from a user;

recognizing one or more words from the natural language utterance using a speech recognition engine of the device;

generating an interpretation of the natural language utterance from the one or more recognized words using a parser of the device, wherein the parser generates a request based on the interpretation of the natural language utterance;

invoking a domain agent configured to process the ~~generated~~ request;

monitoring one or more actions associated with the domain agent processing the request using an adaptive misrecognition engine; and

determining, at the adaptive misrecognition engine, whether the interpretation of the natural language utterance is correct or incorrect based on whether a ~~subsequent~~ second input is received from the user within ~~a predetermined~~ an amount of time shorter than an expected execution time associated with the request after outputting a response to the ~~natural language utterance~~ request.

27. (**Previously Presented**) The method of claim 26, wherein the adaptive misrecognition engine generates an event indicative of misrecognition in response to determining that the interpretation of the natural language utterance is incorrect.

28. (**Previously Presented**) The method of claim 27, further comprising:

analyzing the event to determine how the natural language utterance was incorrectly interpreted; and

determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

29. (**Currently Amended**) The method of claim 26, further comprising:

tracking an interaction pattern over time for the user that provided the natural language utterance;

generating a personalized cognitive model ~~for~~ associated with the user based on the interaction pattern tracked for the user; and

~~using the personalized cognitive model to~~ predicting ~~the~~ one or more actions associated with the user ~~the domain agent processing the request~~ based on the personalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

30. (**Original**) The method of claim 26, further comprising tracking interaction patterns over time for a plurality of users.

31. (**Currently Amended**) The method of claim 30, further comprising generating a generalized cognitive model ~~for~~ associated with the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the ~~tracked~~ interaction patterns.

32. (**Currently Amended**) The method of claim 31, further comprising ~~using the generalized cognitive model to~~ predicting ~~the~~ one or more actions associated with the user ~~the domain agent processing the request~~ based on the generalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

33. (**Previously Presented**) The method of claim 26, further comprising generating an environmental model that includes information associated with at least one of an

environmental condition or surrounding associated with the user that provided the natural language utterance.

34. (**Previously Presented**) The method of claim 33, wherein the environmental condition or surrounding identifies a level of noise associated with an environment or the surrounding of the user.

35. (**Original**) The method of claim 33, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

36. (**Currently Amended**) The method of claim 26, further comprising determining a most likely context for the natural language utterance using a knowledge-enhanced speech recognition engine, wherein determining the most likely context further includes:

comparing one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

providing a relevance score for each of identified matching contexts;

selecting the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the ~~generated~~ request is associated with the selected context;

communicating the request to the domain agent associated with the selected context; and

generating the response to the ~~natural language utterance~~ request using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

37. (**Original**) The method of claim 36, wherein the response includes an aggregation of the content gathered as a result of the domain agent processing the request.

38. (**Currently Amended**) The method of claim 36, further comprising determining a personality based on the identified matching contexts, the domain agent processing the request, or a user profile associated with the user and formatting the response based on the personality using a personality module.

39. (**Original**) The method of claim 36, wherein the knowledge-enhanced speech recognition engine further compares the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

40. (**Original**) The method of claim 36, wherein the knowledge-enhanced speech recognition engine further applies prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

41. (**Cancelled**)

42. (**Currently Amended**) The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to determining that the ~~subsequent~~ second input includes a request to stop the request being processed by the domain agent.

43. (**Previously Presented**) The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to the user repeating the natural language utterance.

44. (**Currently Amended**) The method of claim 26, further comprising:

receiving a non-speech input relating to the natural language utterance at the device;

transcribing the non-speech input to create a non-speech-based transcription; and

merging the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance ~~from~~ based on the merged transcription.

REMARKS

In response to the Final Office Action mailed November 28, 2012 (hereinafter "Office Action"), claims 1, 4-7, 11, 13, 21-23, 25, 26, 29, 31, 32, 36, 38, 42, and 44 have been amended. No claims have been cancelled or newly added. Therefore, claims 1-19, 21-40, and 42-44 remain pending, of which claims 1 and 26 are independent. Support for the instant amendments is provided throughout the as-filed Specification. Thus, no new matter has been added. In view of the foregoing amendments and following comments, allowance of all the claims pending in the application is requested.

EXAMINER INTERVIEW

Applicants thank the Examiner for the courtesies extended to the Applicants' representative (the undersigned) during a Telephonic Examiner Interview (hereinafter, "Examiner Interview") conducted on February 5, 2013. During the Examiner Interview, a proposed amendment to independent claim 1 and 26 was discussed and the Examiner agreed that the proposed amendment would overcome the rejection of claims 1-19, 21-40, and 42-44 under 35 U.S.C. 112, first paragraph.

DOUBLE PATENTING REJECTIONS

Claims 1-19, 21-40, and 42-44 stand rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-6, 9-11, 13-24, 26-31, 34-36, 38-45 and 47-49 of U.S. Patent No. 7,620,549. Claims 1-19, 21-40, and 42-44 further stand *provisionally* rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 4, 6-8, 10-28, 32, 34-36, 38-40 and 42-50 of U.S. Patent Application Serial No. 12/571,795.

Although Applicants disagree with the propriety of the alleged rejections, Applicants will consider filing a terminal disclaimer once the remaining claim rejections have been withdrawn.

REJECTIONS UNDER 35 U.S.C. § 112

Claims 1-19, 21-40 and 42-44 stand rejected under 35 U.S.C. 112, first paragraph as allegedly failing to comply with the written description requirement.

Applicants disagree with the propriety of the alleged rejection. However, *solely* in an effort to advance prosecution, and in no way acquiescing in the propriety of the alleged rejection, independent claims 1 and 26 have each been amended to recite ". . . whether a second input is received from the user within an amount of time shorter than an expected execution time associated with request after outputting a response to the request." During the Examiner Interview, the Examiner agreed that the foregoing amendment would overcome the rejection of claims 1-19, 21-40, and 42-44 under 35 U.S.C. 112, first paragraph.

Accordingly, withdrawal of the rejection of claims 1-19, 21-40, and 42-44 under 35 U.S.C. 112, first paragraph is earnestly sought.

REJECTIONS UNDER 35 U.S.C. § 103

Claims 1, 2, 5, 8-19, 21-22, 25-27, 30, 33-40, and 44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 7,137,126 to Coffman *et al.* (hereinafter "Coffman") in view of U.S. Patent No. 5,500,920 to Kupiec *et al.* (hereinafter "Kupiec"), and further in view of U.S. Patent 6,584,439 to Geilhufe et al (hereinafter "Geilhufe"). Claims 3 and 28 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Coffman in view of Kupiec and Geilhufe, and further in view of U.S. Patent No. 7,203,644 to Anderson *et al.* (hereinafter "Anderson"). Claims 4, 6, 7, 29, 31 and 32 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Coffman in view of Kupiec and Geilhufe, and further in view of U.S. Patent No. 6,622,119 to Ramaswamy *et al.* (hereinafter "Ramaswamy"). Claims 23, 24, 42, and 43 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Coffman in view of Kupiec and Geilhufe, and further in view of U.S. Patent No. 5,774,859 to Houser *et al.* (hereinafter "Houser").

Applicants disagree with the propriety of the alleged rejections. However, *solely* in an effort to advance prosecution, and in no way acquiescing in the propriety of the alleged

rejection, independent claims 1 and 26 have each been amended to clarify aspects of the invention.

For example, independent claim 1 recites, *inter alia*, the features of:

> determining, at the adaptive misrecognition engine, whether the interpretation of the natural language utterance is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request.

Independent claim 26 includes similar recitations.

Even assuming *arguendo* that it were deemed legally proper to modify Coffman to include the alleged teachings of Kupiec and Geilhufe in the manner alleged by the Examiner (which Applicants do not concede), the three references, either alone or in combination, still fail to teach or suggest *at least* the foregoing claim recitations, for the reasons set forth below.

In the Office Action, the Examiner concedes that the alleged combination of Coffman and Kupiec fails to teach the foregoing claim features. The Examiner relies on Fig. 9A-9B and column 27, lines 51-66 of Geilhufe, however, as allegedly teaching this aspect. The cited portions of Geilhufe discuss a timeout period that indicates "the number of seconds to wait for a response before flagging that a response was not detected" (Geilhufe, column 27, lines 59-60) in response to "a voice prompt to [a] user which asks a question that can be answered positively or negatively such as 'yes' or 'no'" (Geilhufe, column 27, lines 56-58). The cited portions of Geilhufe do not, however, teach determining whether the interpretation of the natural language utterance in the user's first input is correct or incorrect based on whether a second input is received from the same user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request, as recited in claims 1 and 26.

Even assuming *arguendo* that the timeout period of Geilhufe can be equated to "an amount of time shorter than an expected execution time associated with the request [generated from an interpretation of the natural language utterance of the first input by the user]" (which Applicants do not concede), the cited portions of Geilhufe fail to teach

that the timeout period starts from outputting a response to the request related to the first input by the user and that the system determines whether the interpretation of the first input is correct or incorrect based on whether a second input is received from the user during the timeout period. For example, there is no indication in the cited portions of Geilhufe that the voice prompt (which the Examiner appears to allege is the claimed 'response') outputted to a user is a response to a request related to a previous input (e.g., first input) by the same user, nor that whether the user's answer (e.g., 'yes' or 'no') to the voice prompt arrives within the timeout period determines whether the interpretation of the first input was correct or incorrect, as recited in claims 1 and 26. Thus, Coffman, Kupiec, and Geilhufe, either alone or in combination, fail to teach or suggest each and every feature of at least independent claims 1 and 26.

For *at least* the foregoing reasons, the rejection of independent claims 1 and 26 is legally improper, and should be withdrawn. Claims 2-19, 21-25, 27-40, and 42-44 are allowable at least by virtue of their dependency, as well as for the features they recite individually. Particularly, none of Anderson, Ramaswamy, or Houser cure the deficiencies of Coffman, Kupiec, and Geilhufe.

CONCLUSION

Having addressed each of the foregoing rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, the application is in condition for allowance. Notice to that effect is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is believed that no extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned for under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 033975 (**Ref. No. 090611-0391838**).

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

Dated: **February 26, 2013** By: _____

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Electronic Patent Application Fee Transmittal

Application Number:	13022370
Filing Date:	07-Feb-2011
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Filer:	Rachel Jeong-Eun Lee/Jennifer Hake
Attorney Docket Number:	090611-0391838

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($)
Miscellaneous:				
Request for continued examination	2801	1	465	465
		Total in USD ($)		**465**

Electronic Acknowledgement Receipt

EFS ID:	15057435
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Customer Number:	909
Filer:	Rachel Jeong-Eun Lee/Jennifer Hake
Filer Authorized By:	Rachel Jeong-Eun Lee
Attorney Docket Number:	090611-0391838
Receipt Date:	26-FEB-2013
Filing Date:	07-FEB-2011
Time Stamp:	17:41:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$465
RAM confirmation Number	5543
Deposit Account	033975
Authorized User	

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 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

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	Request for Continued Examination (RCE)	090611_0391838_RCE.pdf	84942 67cfee16da3ba59cc69eab5da48423e8c5aa4ecf	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2		090611_0391838_IDS.pdf	109511 59f4ade0b942892c5e0d9df7925f561a3d0c7022	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

Warnings:					
Information:					
3		090611_0391838_Response.pdf	611956 b568a6b580e17addb7ed0cecaa5d16f0ecf13545	yes	17

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	12
	Applicant Arguments/Remarks Made in an Amendment	13	17

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30737 3a42d7c5da61a27871aa8c5abea2b62bb7a4878e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	837146		

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.

PTO/SB/30 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	13/022,370
Filing Date	February 7, 2011
First Named Inventor	Philippe DI CRISTO
Art Unit	2659
Examiner Name	Jialong HE
Attorney Docket Number	090611-0391838

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. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. 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).

   a. ☐ 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.

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

      ii. ☐ Other _____

   b. ☒ Enclosed

      i. ☒ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☒ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a

   a. ☐ period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. 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 the following fees any underpayment of fees or credit any overpayments to

   a. ☒ Deposit Account No. 033975 .

      i. ☒ RCE fee required under 37 CFR 1.17(e)

      ii ☐ Extension of time fee (37 CFR 1.136 and 1.17)

      iii ☐ Other _____

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature		Date	February 26, 2013
Name (Print/Type)	Rachel J. Lee	Registration No.	70049

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

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. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, 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.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS :	Philippe DI CRISTO *et al.*	CONFIRMATION NO.:	6569
SERIAL NUMBER :	13/022,370	EXAMINER:	Jialong He
FILING DATE :	February 7, 2011	ART UNIT:	2659
FOR :	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicants hereby make of record in the above-identified application the documents listed on the attached Form PTO-1449.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This Supplemental Information Disclosure Statement is being filed within three months of the filing date of a national application other than a continued prosecution application under 37 C.F.R. § 1.53(d), or within three months of the date of entry of the national stage as set forth

in 37 C.F.R. § 1.491 in an international application, or before the mailing date of a first Office Action on the merits, or before the mailing date of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No certification or fee is required. 37 C.F.R. § 1.97(b).

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP

By _____
Rachel J. Lee
Registration No.: 70,049

Customer No.
00909

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Dated: February 26, 2013

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
13/022,370	02/07/2011	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	02/26/2013	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 42	Minus	** 44	= 0	X $31 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $125 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	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))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	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.

Legal Instrument Examiner:
/MARQUITA JONES/

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.

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/022,370	DICRISTO ET AL.	
	Examiner	Art Unit	
	JIALONG HE	2659	

All participants (applicant, applicant's representative, PTO personnel):

(1) *JIALONG HE*.

(2) *Rachel Lee (Reg. 70,049)*.

(3) *Ngai Zhang (Reg. 65,473)*.

(4) _____.

Date of Interview: *13 April 2013*.

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*.

Identification of prior art discussed: *Woodward (US Pat. 6,754,627)*.

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...)

Regarding amended claims in a RCE filed on 04/23/2013, the Examiner did an update search and found a relevant reference to Woodward. To advance prosecution, the Examiner contacted applicant's representive and suggested including some features recited in dependent claims and also features as disclosed in specification (e.g., Spec. [62-63]). Mr. Zhang presented a proposed amendment on 04/24/2013 by including a few limitations from a dependent claim 4. The Examiner believed the proposed amendment would still be obvious over prior art in record and suggested to include more features. The applicant representive did not intend to further amend the claims and requested the Examiner to send an office action .

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of 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

/JIALONG HE/ Primary Examiner, Art Unit 2659	

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

909 7590 05/01/2013

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER	
HE, JIALONG	

ART UNIT	PAPER NUMBER
2659	

NOTIFICATION DATE	DELIVERY MODE
05/01/2013	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):

docket_ip@pillsburylaw.com
margaret.drosos@pillsburylaw.com

Office Action Summary	Application No. 13/022,370	Applicant(s) DICRISTO ET AL.	
	Examiner JIALONG HE	Art Unit 2659	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 *26 February 2013*.

☐ 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) *1-19,21-40 and 42-44* 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) *1-19,21-40 and 42-44* 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.

Interim copies:

a)☐ All b)☐ Some c)☐ None of the: Interim copies of the priority documents have been 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

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Request for Continued Examination

2. 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 02/26/2013 has been entered.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 02/26/2013 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to Amendments and Arguments

4. Regarding obviousness-type double patenting rejections, applicant decided to delay filing a terminal disclaimer (Remark, page 13). The double patenting rejection is maintained.

5. Regarding rejection to claims under 35 USC 112, first paragraph, applicant amended claims 1 and 26. The rejection under 35 USC 112, first paragraph, is withdrawn.

6. Applicant's arguments regarding the amended claims have been considered but are moot in view of the new grounds of rejection necessitated by the amendments. Reference to Woodward (US Pat. 6,754,627) was relied upon for teaching the amended claims. Woodward discloses an embedded speech recognition system (Fig. 1, fig. 3A, 3B). When a user notices a recognition error, the user notifies the speech recognition system using a voice command (Fig. 3A and 3B, Col. 5, line 1 - 20). The system will train the speech recognition engine and update a language model when a recognition error is detected.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140

F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-19, 21-40 and 42-44 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of U.S. Patent No. **7,620,549**. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims in the instant application are broader. That is, claims 1-19, 21-40 and 42-44 are anticipated by claims in the parent patent.

Claims 1-19, 21-40 and 42-44 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of US Pat. **8,332,224**. Although the conflicting claims are not identical, they are not patentably

distinct from each other because claims in the instant application are generic to all that is recited in each of claims of the parent patent.

Claim Rejections - 35 USC § 103

8. Claims 1-3, 19, 21-23, 26-28 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodward (US Pat. 6,754,627, hereinafter referred to as Woodward, hereinafter referred to as Woodward).

Regarding claim 1, Woodward discloses a system for processing natural language utterances (**Fig. 1 and 2, embedded speech recognition system**), comprising:

a device configured to receive a first input comprising a natural language utterance from a user (**Fig. 3A-3B, col. 4, line 57 – col. 5, line 20, user issuing a voice command to play a song**);

a speech recognition engine configured to recognize one or more words from the natural language utterance (**fig. 3A-3B, col. 4, line 57 – col. 5, recognizing a voice command "Play CD, disk 12"**);

a parser configured to generate an interpretation of the natural language utterance from the one or more recognized words, and further configured to generate a request based on the interpretation of the natural language utterance (**fig. 3A-3B, col. 4, line 57 – col. 5, the system interprets the natural language voice command and sends a request to play CD player**);

a domain agent configured to process the request (**fig. 3A-3B, col. 4, line 57 – col. 5, a software component in CD player processing the voice command to play a song**); and

an adaptive misrecognition engine configured to determine whether the interpretation of the natural language utterance is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request (**fig. 3A-3B, col. 4, line 57 – col. 5, during playing song, the user notices a recognition error, playing 14 instead of 12, the user issues a second voice command "recognition error" to stop current playing, the system determines recognition error from "recognition error" voice command**).

Regarding claim 2, Woodward further discloses the adaptive misrecognition engine is further configured to generate an event indicative of misrecognition in response to determining that the interpretation of the natural language utterance is incorrect (**fig. 3B, col. 4, line 57 – col. 5, fig. 4, #410, the system stops playing song 14 when detecting a user issuing a voice command "recognition error" or "misrecognition"**).

Regarding claim 3, Woodward further discloses comprising an analyzer configured to:

analyze the event to determine how the natural language utterance was incorrectly interpreted (**col. 4, line 45-55, col. 5, line 36-45, in case misrecognizing notification received, checking the language model in speech recognition engine**); and

determine one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request (**col. 4, line 45-55, col. 5, line 36-45, training speech recognition engine and updating a language model if recognition errors being detected**).

Regarding claim 19, Woodward further discloses the device includes at least one of a personal digital assistant, a cellular telephone, a portable computer, or a desktop computer (**Fig. 1, a portable computer**).

Regarding claim 21, Woodward further discloses the speech recognition engine is further configured to recognize one or more words from a natural language utterance provided in the second input, and wherein the parser is further configured to generate an interpretation of the second input from the one or more words recognized from the natural language utterance provided in the second input (**Fig. 3B, Col. 5, line 4-20, user issuing a voice command "Recognition error". The system stops playing song 14**).

Regarding claims 22, 23 and 42, Woodward further discloses wherein the second input includes a follow-up request associated with a same context as the request being processed by the domain agent (**Fig. 3B, CD player with embedded speech recognition stops playing a song when receiving a voice command "misrecognition"**).

Claims 26-28 are directed to a method and including features similar to system claims 1-3, respectively. Claims 26-28 are rejected based on the same rationale as explained for claims 1-3.

9. Claims 4-7 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodward in views of Ramaswamy et al. (U.S. Pat. 6,622,119).

As per claims 4 and 29, Woodward discloses an embedded speech recognition system (**Fig. 2**). A user could issue a voice command to play a song and could interrupt playing if detecting a recognition error (**Fig. 3A and Fig. 3B**).

Woodward does not specifically teach using the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request.

Ramaswamy teaches a multi-modal dialog system using both speech recognition and natural language processing which includes a command predictor that uses a

cognitive model to predict a user's next command (abstract, col. 4, lines 1-58, Fig. 1 and Fig. 2, element 204).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Woodward to use the personalized cognitive model to predict the one or more actions associated with the domain agent processing the request because, as taught by Ramaswamy, it would improve the accuracy of the natural language processing (col. 1, lines 23-33).

Regarding claims 5 and 30, Ramaswamy further discloses tracking interaction patterns for a plurality of users (**fig. 3, construction user prediction model. col. 6, line 56, a large number of users**).

Regarding claims 6 and 31, Ramaswamy teaches the generalized cognitive model includes a statistical abstract that corresponds to the tracked interaction patterns (prediction model calculated from conditional probabilities, col. 5, line 13 to col. 6, line 47).

Regarding claims 7 and 32, Ramaswamy teaches a multi-modal dialog system using both speech recognition and natural language processing which includes a command predictor that uses a cognitive model to predict a user's next command (abstract, col. 4, lines 1-58, Fig. 1 and Fig. 2, element 204).

10. Claims 8-18, 25, 33-40, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodward in view of Coffman et al. (U.S. Pat. 7,137,126).

Woodward discloses an embedded speech recognition system with a user-initiated misrecognition error notification (**Abstract, Fig. 3B**). Woodward does not explicitly disclose considering environment condition, noise level, context, domain knowledge, preferences, or cognitive qualities.

As per claims 8 and 33, Coffman discloses that the environmental model includes information associated with user environmental conditions or surroundings (context stack comprises information of current application, col. 16, lines 18-33).

As per claims 9 and 34, Coffman discloses that the user environmental conditions include (i) a user global position (position, col. 42, lines 33-39).

As per claims 10 and 35, Coffman discloses that the environmental model provides (i) context (col. 16, lines 18-33).

As per claims 11 and 36, Coffman teaches a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:

identify, one or more contexts a search module that completely, or partially, match one or more searches the query, for text combinations, wherein identifying the one or more contexts includes comparing a comparison module that compares the

text combinations against one or more grammar expression entries in a context description grammar (complete queries are compared to a context stack 405 at the level of the natural language processing (NLU, i.e. grammar), column 31, lines 23-30);

provide a relevance score for each of identified matching contexts (queries are compared to the context stack and assigned a likelihood score, column 30, lines 10-35); and

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the generated request is associated with the selected context (task dispatcher 402 directs input streams to the appropriate application or device, column 30, lines 36-50 and column 41, lines 35-40); and

a response generating module configured to:

communicate that communicates with the request to the domain agent associated with the selected context; and generate a response to the natural language utterance using domain agents to content gathered as a result of by the domain agent processing agents and that generates a response from the request, wherein the response arranges the content in an order based on the relevance scores results from for the identified matching contexts (output streams of multiple tasks at multiple applications and devices are prioritized based on the priorities assigned by the task dispatcher 402, column 29, lines 14-23 and lines 34-39).

As per claims 12 and 37, Coffman further discloses that the response generating module generates an aggregate response (output is aggregated by priorities assigned by task dispatcher, col. 29, lines 34-39).

As per claims 13 and 38, Coffman teaches a personality module configured to format the response (conversational facilities with multiple personalities, column 13, lines 58-67).

As per claims 14 and 39, Coffman teaches wherein the knowledge-enhanced speech recognition engine identifying one or more contexts further includes comparing the text combinations against a context stack that stores one or more expected contexts (queries are compared to the context stack and assigned a likelihood score, column 30, lines 10-35).

As per claims 15 and 40, Coffman teaches wherein the knowledge-enhanced speech recognition identifying the one or more contexts further includes applying prior probabilities (likelihoods, column 30, lines 10-35) or fuzzy possibilities to at least one of keyword matching, user profiles, a dialog history (the context stack includes a past history of discourses, column 22, lines 20-28).

As per claim 16, Coffman teaches wherein the domain agent is further configured to direct a query to a local information source to process the request (backend application, Fig. 6, element 608).

As per claim 17, Coffman teaches wherein the domain agent is further configured to evaluate a plurality of responses to the query to process the request (retrieved documents, col. 12, lines 1-14).

As per claim 18, Coffman teaches wherein the domain agent is further configured to direct a command to a local device to process the request (backend application, Fig. 6, element 608).

As per claims 25 and 44, Coffman teaches wherein the multimodal device is further configured to receive a non-speech input relating to the natural language utterance (multi-modal input with keyboard input, Fig. 6, element 601); and wherein the system further comprises:

a transcription module that transcribes the non-speech communications to create a non-speech-based transcription (both speech and non-speech are converted to ASCII text, col. 27, line 65 to col. 28, line 57); and

a merging module that merges the recognized words and the non-speech-based transcription to generate a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance from the merged transcription (transcripts are merged, col. 28, lines 39-57).

11. Claims 24 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodward view of Houser et al. (U.S. Pat. 5,774,859).

Woodward discloses an embedded speech recognition system with a user-initiated misrecognition error notification (**Abstract, Fig. 3B**). Woodward does not disclose detecting a user repeating a voice command.

Houser teaches a speech recognition system wherein the system assumes a misrecognition of a first utterance when the user repeats the utterance twice (col. 19, lines 27-60).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Woodward to determine an utterance is incorrect if the user provides a subsequent request to stop the request being processed as taught by Houser because it would allow the system to react to the user who can better judge the correctness of the recognition.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Cohen; Michael H. et al (US 6219643 B1) : Method of analyzing dialogs in a natural language speech recognition system.

- Chapados; Nicolas et al (US 6356869 B1) : Method and apparatus for discourse management.

- Vanbuskirk; Ronald et al (US 6505155 B1) : Method and system for automatically adjusting prompt feedback based on predicted recognition accuracy.

- Gupta; Narendra K. et al (US 7197460 B1) : System for handling frequently asked questions in a natural language dialog service.

- Di Fabbrizio; Giuseppe et al (US 7421393 B1) : System for developing a dialog manager using modular spoken-dialog components.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JIALONG HE whose telephone number is (571) 270-5359. The examiner can normally be reached on Monday-Thursday, 7:00AM-4:30PM, ALT. Fridays, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pierre Desir can be reached on (571) 272-7799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. 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.

/JIALONG HE/
Primary Examiner, Art Unit 2659

Notice of References Cited	Application/Control No. 13/022,370	Applicant(s)/Patent Under Reexamination DICRISTO ET AL.	
	Examiner JIALONG HE	Art Unit 2659	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,219,643 B1	04-2001	Cohen et al.	704/257
*	B	US-6,356,869 B1	03-2002	Chapados et al.	704/275
*	C	US-6,505,155 B1	01-2003	Vanbuskirk et al.	704/246
*	D	US-6,754,627 B2	06-2004	Woodward, Steven G.	704/235
*	E	US-7,197,460 B1	03-2007	Gupta et al.	704/270.1
*	F	US-7,421,393 B1	09-2008	Di Fabbrizio et al.	704/275
	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.

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	A	7,036,128	04/25/2006	Julia *et al.*	719	317	
	B	7,920,682	04/05/2011	Byrne *et al.*	379	88.18	
	C	8,326,627	12/04/2012	Kennewick *et al.*	704	257	
	D	8,326,634	12/04/2012	Di Cristo *et al.*	704	270.1	
	E	8,326,637	12/04/2012	Baldwin *et al.*	704	275	
	F	8,332,224	12/11/2012	Di Cristo *et al.*	704	257	
	G	8,370,147	02/05/2013	Kennewick et al.	704	257	
	H	2002/0087326	07/04/2002	Lee *et al.*	704	270.1	
	I	2005/0021470	01/27/2005	Martin *et al.*	705	51	
	J	2012/0278073	11/01/2012	Weider et al.	704	235	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	/Jialong He/	DATE CONSIDERED	04/25/2013

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

403872335v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.H./

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S53	3	12/571,795	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/23 09:43
S55	2	"7,620,549".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/23 09:44
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L5	103	(L1 | L2 | L3 | L4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/25 10:19
L4	91	(voicebox).as.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/25 10:19
L3	46	(kennewick near4 robert).inv.	US-	ADJ	ON	2013/04/25

			PGPUB; USPAT; EPO; JPO; DERWENT			10:19
L2	21	(Weider near5 chris).inv.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/25 10:19
L1	1	(Dicristo near4 philippe).inv.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/25 10:19
L6	15	L5 and (cognitive model) and environmental model	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/25 10:21
L7	9	L5 and (personalized near4 model) and (generalized near4 model)	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/25 10:22
L8	7	(personalized near4 model) and (generalized near4 model) and 704/200-278.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/04/25 10:25
L9	4	("7421393" | "7197460" | "6219643" | "6356869").pn.	US-PGPUB; USPAT	ADJ	ON	2013/04/25 10:30
L10	52	(voicebox).as.	US-PGPUB; USPAT	ADJ	ON	2013/04/25 10:31

EAST Search History (Interference)

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4/25/2013 10:36:11 AM
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	Art Unit
	MATTHEW SKED	2626

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
704	200-278	11/20/2012	JH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search	06/13/12	/MS/
EAST: update search (see search history)	11/20/2012	JH
Google Patent	11/20/2012	JH
EAST and Google Patent update search	4/25/2013	JH

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	Art Unit
	JIALONG HE	2659

✓	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

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	**Art Unit**
	JIALONG HE	2659

✓	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

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	44	✓	✓							

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE PATENT APPLICATION OF:	Philippe DI CRISTO, *et al.*
SERIAL NO.:	13/022,370
FILING DATE:	February 7, 2011
ATTORNEY DOCKET NO.:	090611-0391838
CONFIRMATION NO.:	6569
EXAMINER:	Jialong HE
ART UNIT:	2659
FOR:	System and Method of Supporting Adaptive Misrecognition in Conversational Speech

RESPONSE TO NON-FINAL OFFICE ACTION mailed 1 MAY 2013

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Non-Final Office Action mailed **May 1, 2013**, please amend the above-identified application as follows:

Amendments to the Claims begin on page **2** of this paper.

Remarks begin on page **13** of this paper.

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned for under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 033975 (**Ref. No. 090611-0391838**).

This listing of claims will replace all prior versions and listings of claims in the Application.

LISTING OF CLAIMS:

1. (**Currently Amended**) A system for processing natural language utterances, comprising:

~~a device configured to receive a first input comprising a natural language utterance from a user;~~

~~a speech recognition engine configured to recognize one or more words from the natural language utterance;~~

one or more processors configured to receive a first input of a user that comprises a natural language utterance;

a parser configured to: (i) generate an interpretation of the natural language utterance ~~from the~~ based on one or more recognized words of the natural language utterance; and (ii)~~, and further configured to~~ generate a request based on the interpretation of the natural language utterance;

a domain agent configured to process the request; and

an adaptive misrecognition engine configured to determine whether the interpretation of the natural language utterance is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request.

2. (**Previously Presented**) The system of claim 1, wherein the adaptive misrecognition engine is further configured to generate an event indicative of misrecognition in response to determining that the interpretation of the natural language utterance is incorrect.

3. (**Currently Amended**) The system of claim 2, further comprising: a speech recognition engine configured to recognize the one or more recognized words based on the natural language utterance; and an analyzer configured to:

analyze the event to determine how the natural language utterance was incorrectly interpreted; and

determine one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

4. (**Previously Amended**) The system of claim 1, further comprising an analyzer configured to:

track an interaction pattern with the system over time for the user that provided the natural language utterance;

generate a personalized cognitive model associated with the user based on the interaction pattern tracked for the user; and

predict one or more actions associated with the user based on the personalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

5. (**Previously Presented**) The system of claim 1, further comprising an analyzer configured to track interaction patterns with the system over time for a plurality of users.

6. (**Previously Presented**) The system of claim 5, wherein the analyzer is further configured to generate a generalized cognitive model associated with the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the interaction patterns.

7. (**Previously Presented**) The system of claim 6, wherein the analyzer is further configured to predict one or more actions associated with the user based on the generalized

cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

8. (**Previously Presented**) The system of claim 1, further comprising an analyzer configured to generate an environmental model that includes information associated with at least one of an environmental condition or surrounding associated with the user that provided the natural language utterance.

9. (**Previously Presented**) The system of claim 8, wherein the environmental condition or surrounding identifies a level of noise associated with an environment or the surrounding of the user.

10. (**Original**) The system of claim 8, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

11. (**Previously Presented**) The system of claim 1, further comprising:

a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:

compare one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

provide a relevance score for each of the identified matching contexts; and

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the request is associated with the selected context; and

a response generating module configured to:

communicate the request to the domain agent associated with the selected context; and

generate the response to the request using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

12. (**Original**) The system of claim 11, wherein the response generated by the response generating module includes an aggregation of the content gathered as a result of the domain agent processing the request.

13. (**Previously Presented**) The system of claim 11, further comprising a personality module configured to determine a personality based on the identified matching contexts, the domain agent processing the request, or a user profile associated with the user and format the response based on the personality.

14. (**Original**) The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to compare the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

15. (**Original**) The system of claim 11, wherein the knowledge-enhanced speech recognition engine is further configured to apply prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

16. (**Original**) The system of claim 11, wherein the domain agent is further configured to direct a query to at least one of a local information source or a network information source to process the request.

17. (**Original**) The system of claim 16, wherein the domain agent is further configured to evaluate a plurality of responses to the query to process the request.

18. (**Original**) The system of claim 11, wherein the domain agent is further configured to direct a command to at least one of a local device or a remote device to process the request.

19-21. (**Cancelled**)

22. (**Previously Presented**) The system of claim 1, wherein the second input includes a follow-up request associated with a same context as the request being processed by the domain agent.

23. (**Previously Presented**) The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to determining that the second input includes a request to stop the request being processed by the domain agent.

24. (**Previously Presented**) The system of claim 1, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to the user repeating the natural language utterance.

25. (**Previously Presented**) The system of claim 1, wherein the device is further configured to receive a non-speech input relating to the natural language utterance, and wherein the system further comprises:

a transcription module configured to transcribe the non-speech input to create a non-speech-based transcription; and

a merging module configured to merge the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance based on the merged transcription.

26. (**Currently Amended**) A method [[for]] of processing natural language utterances, the method being implemented on a computer system that includes one or more processors, the method comprising:

receiving a first input of a user that comprises a natural language utterance ~~comprising a natural language utterance at a device from a user~~;

~~recognizing one or more words from the natural language utterance using a speech recognition engine of the device;~~

generating an interpretation of the natural language utterance ~~from the~~ based on one or more recognized words of the natural language utterance using a parser ~~of the device~~, wherein the parser generates a request based on the interpretation of the natural language utterance;

invoking a domain agent configured to process the request;

monitoring one or more actions associated with the domain agent processing the request using an adaptive misrecognition engine; and

determining, at the adaptive misrecognition engine, whether the interpretation of the natural language utterance is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request.

27. (**Previously Presented**) The method of claim 26, wherein the adaptive misrecognition engine generates an event indicative of misrecognition in response to determining that the interpretation of the natural language utterance is incorrect.

28. (**Currently Amended**) The method of claim 27, wherein a speech recognition engine is used to recognize the one or more recognized words based on the natural language utterance, the method further comprising:

analyzing the event to determine how the natural language utterance was incorrectly interpreted; and

determining one or more tuning parameters for at least one of the speech recognition engine or the parser based on how the natural language utterance was

incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

29. (**Previously Presented**) The method of claim 26, further comprising:

tracking an interaction pattern over time for the user that provided the natural language utterance;

generating a personalized cognitive model associated with the user based on the interaction pattern tracked for the user; and

predicting one or more actions associated with the user based on the personalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

30. (**Original**) The method of claim 26, further comprising tracking interaction patterns over time for a plurality of users.

31. (**Previously Presented**) The method of claim 30, further comprising generating a generalized cognitive model associated with the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the interaction patterns.

32. (**Previously Presented**) The method of claim 31, further comprising predicting one or more actions associated with the user based on the generalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

33. (**Previously Presented**) The method of claim 26, further comprising generating an environmental model that includes information associated with at least one of an environmental condition or surrounding associated with the user that provided the natural language utterance.

34. (**Previously Presented**) The method of claim 33, wherein the environmental condition or surrounding identifies a level of noise associated with an environment or the surrounding of the user.

35. (**Original**) The method of claim 33, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

36. (**Previously Presented**) The method of claim 26, further comprising determining a most likely context for the natural language utterance using a knowledge-enhanced speech recognition engine, wherein determining the most likely context further includes:

comparing one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

providing a relevance score for each of identified matching contexts;

selecting the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent configured to process the request is associated with the selected context;

communicating the request to the domain agent associated with the selected context; and

generating the response to the request using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

37. (**Original**) The method of claim 36, wherein the response includes an aggregation of the content gathered as a result of the domain agent processing the request.

38. (**Previously Presented**) The method of claim 36, further comprising determining a personality based on the identified matching contexts, the domain agent processing the

request, or a user profile associated with the user and formatting the response based on the personality using a personality module.

39. (**Original**) The method of claim 36, wherein the knowledge-enhanced speech recognition engine further compares the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

40. (**Original**) The method of claim 36, wherein the knowledge-enhanced speech recognition engine further applies prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

41. (**Cancelled**)

42. (**Previously Presented**) The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to determining that the second input includes a request to stop the request being processed by the domain agent.

43. (**Previously Presented**) The method of claim 26, wherein the adaptive misrecognition engine determines that the interpretation of the natural language utterance was incorrect in response to the user repeating the natural language utterance.

44. (**Previously Presented**) The method of claim 26, further comprising:

receiving a non-speech input relating to the natural language utterance at the device;

transcribing the non-speech input to create a non-speech-based transcription; and

merging the recognized words and the non-speech-based transcription to create a merged transcription, wherein the parser is further configured to generate the interpretation of the natural language utterance based on the merged transcription.

45. (**New**) A method of processing natural language utterances, the method being implemented by a computer system that includes one or more processors executing one or more computer program modules which, when executed, perform the method, the method comprising:

receiving a first input of a user that comprises a natural language utterance;

generating an interpretation of the natural language utterance based on one or more recognized words of the natural language utterance;

generating a request based on the interpretation;

transmitting the request to a domain agent for processing;

determining whether the interpretation is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request;

updating a personalized cognitive model associated with the user based on the determination of whether the interpretation is correct or incorrect, wherein the personalized cognitive model is based on a tracking of a pattern of interactions between the user and the system; and

predicting one or more actions associated with the user based on the updated personalized cognitive model.

46. (**New**) A method of processing natural language utterances, the method being implemented by a computer system that includes one or more processors executing one or more computer program modules which, when executed, perform the method, the method comprising:

receiving a first input of a user that comprises a natural language utterance;

generating an interpretation of the natural language utterance based on one or more recognized words of the natural language utterance;

generating a request based on the interpretation;

transmitting the request to a domain agent for processing;

determining that a personalized cognitive model associated with the user does not include sufficient information for predicting one or more subsequent actions associated with the user, wherein the personalized cognitive model is generated based on a tracking of a pattern of interactions between the user and the system, and wherein the one or more subsequent actions include one or more actions predicted to occur after receiving the first input; and

predicting the one or more subsequent actions based on a generalized cognitive model in response to the determination that the personalized cognitive model does not include sufficient information, wherein the generalized cognitive model is generated based on a tracking of patterns of interactions between a plurality of users and the system.

47. (**New**) The method of claim 46, further comprising:

determining whether the interpretation is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request; and

updating the personalized cognitive model based on the determination of whether the interpretation is correct or incorrect.

REMARKS

In response to the Non-Final Office Action mailed **May 1, 2013** (hereinafter "Office Action"), claims 1, 3, 26, and 28 have been amended, claims 19 and 21 have been cancelled without prejudice or disclaimer, and claims 45-47 have been newly added. Therefore, claims 1-18, 22-40, and 42-47 are now pending. Support for the instant amendments is provided throughout the as-filed Specification. Thus, no new matter has been added. In view of the foregoing amendments and following comments, allowance of all the claims pending in the application is earnestly sought.

INFORMATION DISCLOSURE STATEMENT

Applicants are submitting herewith a Supplemental Information Disclosure Statement and request that the Examiner considers the cited references and provides a signed copy of the Form PTO-1449 for this submission with the next Office Action.

EXAMINER INTERVIEW

Examiner Jialong He is thanked for the courtesies extended to Applicants' representative (the undersigned) during a telephonic interview conducted on April 24, 2013 (hereinafter the "Interview"). Although Examiner He stated in the Interview Summary mailed May 1, 2013 that Applicants' representative "presented a proposed amendment," it is noted that amendments were discussed during the Interview solely in an effort to expedite prosecution.

In particular, during the Interview, Applicants' representative indicated that U.S. Patent No. 6,754,627 to Woodward did not teach or suggest each and every feature of the claims (as previously pending) and, thus, did not believe that any amendments to the claims were necessary for allowance. No formal agreement was reached.

DOUBLE PATENTING

Claims 1-19, 21-40, and 42-44 stand rejected on the ground of nonstatutory obviousness-type double patenting as being allegedly unpatentable over U.S. Patent No. 7,620,549. [Office Action, pg. 4]. Claims 1-19, 21-40, and 42-44 stand rejected on the ground of nonstatutory obviousness-type double patenting as being allegedly unpatentable over U.S. Patent No. 8,332,224. [Office Action, pg. 4].

Solely in an effort to expedite prosecution of this application, and without acknowledging the propriety of the alleged basis for the alleged rejections, Applicants will consider filing Terminal Disclaimers once the remaining claim rejections have been withdrawn. Applicants further note that filing a Terminal Disclaimer to obviate a rejection based on non-statutory double patenting does not constitute an admission of the propriety of the rejection. *See Quad Environmental Technologies Corp. v. Union Sanitary District*, 946 F.2d 870 (Fed. Cir. 1991) (indicating that "filing of a terminal disclaimer simply serves the statutory function of removing the rejection of double patenting, and raises neither a presumption nor estoppel on the merits of the rejection.").

REJECTIONS UNDER 35 U.S.C. § 103

Claims 1-3, 19, 21-23, 26-28 and 42 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over U.S. Patent No. 6,754,627 to Woodward (hereinafter "Woodward"). [Office Action, pg. 5]. Claims 4-7 and 29-32 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Woodward in view of U.S. Patent No. 6,622,119 to Ramaswamy *et al.* (hereinafter "Ramaswamy"). [Office Action, pg. 8]. Claims 8-18, 25, 33-40 and 44 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Woodward in view of U.S. Patent No. 7,137,126 to Coffman *et al.* (hereinafter "Coffman"). [Office Action, pg. 10]. Claims 24 and 43 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Woodward in view of U.S. Patent No. 5,774,859 to Houser *et al.* (hereinafter "Houser). [Office Action, pg. 13].

Applicants traverse the alleged rejections for at least the reason that Woodward neither teaches nor suggests each and every feature of at least independent claims 1 and 26. For example, independent claim 1 recites, *inter alia*, the feature of:

> determine whether the interpretation of the natural language utterance is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request after outputting a response to the request. [Emphasis added].

Independent claim 26 includes similar recitations.

In the Office Action, the Examiner alleges that Woodward (i.e., FIGS 3A and 3B, and col. 4, lines 57 - col. 5, lines 19) teaches a system that determines a recognition error in response receiving the specific voice command "recognition error" from a user. [Office Action, pg. 6]. Even assuming *arguendo* that Woodward teaches a determination of a recognition error based on receipt of the specific voice command "recognition error," the determination of the recognition error in Woodward is not a determination of a recognition error based on a determination of whether a user input is received within an amount of time shorter than an expected execution time, much less a teaching of at least the foregoing claim recitations.

Thus, Woodward fails to teach or suggest at least the foregoing claim recitations. The foregoing deficiencies are not cured by Ramaswamy, Coffman, or Houser. The Examiner has failed to establish otherwise.

For *at least* the foregoing reason, the alleged rejection of independent claims 1 and 26 is legally improper, and withdrawal of the alleged rejection is earnestly sought. Further, with respect to the alleged rejections of dependent claims 2-18, 22-25, 27-40, and 42-44, the dependent claims are allowable because they each ultimately depend from an allowable independent claim, as well as for the further features they each recite.

CONCLUSION

Having addressed each of the foregoing rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, the application is in condition for allowance. Notice to that effect is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Respectfully submitted,

Date: July 3, 2013

PILLSBURY WINTHROP SHAW PITTMAN LLP

/Ngai B. Zhang/

By: _____

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS :	Philippe DI CRISTO *et al.*	CONFIRMATION No.:	6569
SERIAL NUMBER :	13/022,370	EXAMINER:	Jialong He
FILING DATE :	February 7, 2011	ART UNIT:	2659
FOR :	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicants hereby make of record in the above-identified application the documents listed on the attached Form PTO-1449.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This Supplemental Information Disclosure Statement is being filed more than three months after the filing date of a national application other than a continued prosecution application under 37 C.F.R. § 1.53(d), or more than three months after the date of entry of the

national stage as set forth in 37 C.F.R. § 1.491 in an international application, and after the mailing date of the first Office Action on the merits, but before the mailing date of any of a Final Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution in the application. 37 C.F.R. § 1.97(c).

Please charge the $90.00 fee [37 C.F.R. § 1.17(p)] to Deposit Account No. 03-3975. In addition, please charge any fee deficiencies, or credit any overpayment, to Deposit Account No. 03-3975 as needed to ensure consideration of the Supplemental Information Disclosure Statement.

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP

By /Ngai B. Zhang/
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Dated: July 3, 2013

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	A	6,122,613	09/19/2000	Baker	704	235	
	B	6,704,576	03/09/2004	Brachman *et al.*	455	503	
	C	7,890,324	02/15/2011	Bangalore *et al.*	704	231	
	D	8,219,399	07/10/2012	Lutz *et al.*	704	270	
	E	8,255,224	08/28/2012	Singleton *et al.*	704	275	
	F	8,447,607	05/21/2013	Weider *et al.*	704	250	
	G	8,452,598	05/28/2013	Kennewick *et al.*	704	257	
	H	2002/0143532	10/03/2002	McLean *et al.*	704	235	
	I	2009/0076827	03/19/2009	Bulitta *et al.*	704	275	
	J	2009/0276700	11/05/2009	Anderson *et al.*	715	700	
	K	2013/0054228	02/28/2013	Baldwin et al.	704	9	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	DATE CONSIDERED

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

Electronic Patent Application Fee Transmittal

Application Number:	13022370
Filing Date:	07-Feb-2011
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Filer:	Ngai Bing Zhang/Miriam Nelsen Awan
Attorney Docket Number:	090611-0391838

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:				
Independent Claims in Excess of 3	2201	1	210	210
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	2806	1	90	90
		Total in USD ($)		**300**

Electronic Acknowledgement Receipt

EFS ID:	16234937
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Customer Number:	909
Filer:	Ngai Bing Zhang/Miriam Nelsen Awan
Filer Authorized By:	Ngai Bing Zhang
Attorney Docket Number:	090611-0391838
Receipt Date:	03-JUL-2013
Filing Date:	07-FEB-2011
Time Stamp:	17:03:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$300
RAM confirmation Number	6083
Deposit Account	033975
Authorized User	

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 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

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		090611-0391838_Response.pdf	588176 7d392056b7f2e632d8e2202874f020df1e316c01	yes	16

Multipart Description/PDF files in .zip description			
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	12
	Applicant Arguments/Remarks Made in an Amendment	13	16

Warnings:

Information:

2	Transmittal Letter	090611-0391838_IDSTransmittalLetter.pdf	518092 7f628fb284ada99ae1cc423349a334d36ff59c2b	no	2

Warnings:

Information:

3	Information Disclosure Statement (IDS) Form (SB08)	090611-0391838_PTO1449.pdf	457539 f4c6a2c503a8e86dc544dd520f27c2463805d2f7	no	1

Warnings:

Information:

This is not an USPTO supplied IDS fillable form

4	Fee Worksheet (SB06)	fee-info.pdf	32150 e9ca2737c0838617e0e675b554ff8ca4e185fe94	no	2

Warnings:

Information:

Total Files Size (in bytes):	1595957

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/022,370	Filing Date 02/07/2011	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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

AMENDMENT **07/03/2013**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 43	Minus	** 44	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 4	Minus	***3	= 1	X $210 =	210
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**210**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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
/DANTE SMITH/

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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

909 7590 08/05/2013

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER
HE, JIALONG

ART UNIT	PAPER NUMBER
2659	

NOTIFICATION DATE	DELIVERY MODE
08/05/2013	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):

docket_ip@pillsburylaw.com
heather.marthers@pillsburylaw.com

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/022,370	DICRISTO ET AL.	
	Examiner	Art Unit	
	JIALONG HE	2659	

All participants (applicant, applicant's representative, PTO personnel):

(1) *JIALONG HE*. (3)_____.

(2) *Ngai Zhang (Reg. 65,473)*. (4)_____.

Date of Interview: *30 July 2013*.

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 and 26*.

Identification of prior art discussed: *Woodward et al. (Reg. 6,754,627)*.

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...)

See Continuation Sheet.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of 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

/JIALONG HE/ Primary Examiner, Art Unit 2659	

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Mr. Zhang filed a response on 07/03/2013 by amending independent claims 1 and 26. Mr. Zhang also added new claims 45-47. In the Remark, Mr. Zhang argued that Woodward does not teach "a determination of a recognition error based on a determination of whether a user input is received within an amount of time shorter than an expected execution time". The Examiner respectively disagrees and noted that Woodward discloses (Fig. 3A, 3B, fig. 4) when a user noticed that a CD player misrecognized a previous voice command, the user immediately issues a correction voice command (i.e., "within an amount of time shorter than an expected execution time"). The CD player determines that there is a recognition error based on a correction voice command "recognition error" (i.e., a second input).

The newly presented claim 45 includes features of updating and predicting actions using a personalized model. The Examiner believes that when considering the claim as a whole, the new claim 45 would be unobvious over the prior art in record.

To advance prosecution, the Examiner contacted Mr. Zhang and suggested amending independent claims 1 and 26 by adding the features of updating a personalized cognitive model and predicting actions using the updated model as recited in claim 45. Mr. Zhang would consult with his client and let the Examiner know if his client is willing to amend claims.

PTO/SB/26 (08-11)
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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 090611-0391838

In re Application of: PHILIPPE DI CRISTO, et al.

Application No.: 13/022,370

Filed: February 7, 2011

For: SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

The owner*, VoiceBox Technologies, Inc., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 7,620,549 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

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2. ☒ The undersigned is an attorney or agent of record. Reg. No. 65,473

/Ngai B. Zhang/ August 14, 2013
Signature Date

Ngai B. Zhang
Typed or printed name

(703) 770-7532
Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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/Ngai B. Zhang/ August 14, 2013
Signature Date

Ngai B. Zhang
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Electronic Patent Application Fee Transmittal

Application Number:	13022370
Filing Date:	07-Feb-2011
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Filer:	Ngai Bing Zhang/Miriam Nelsen Awan
Attorney Docket Number:	090611-0391838

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($)
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	2	160	320
		Total in USD ($)		**320**

Electronic Acknowledgement Receipt

EFS ID:	16591195
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Customer Number:	909
Filer:	Ngai Bing Zhang/Miriam Nelsen Awan
Filer Authorized By:	Ngai Bing Zhang
Attorney Docket Number:	090611-0391838
Receipt Date:	14-AUG-2013
Filing Date:	07-FEB-2011
Time Stamp:	16:39:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$320
RAM confirmation Number	3900
Deposit Account	033975
Authorized User	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		090611-0391838_TerminalDisclaimers.pdf	41990 2a03a1013df4e49fba2230ca4319f1e0d67eec5c	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Terminal Disclaimer Filed	1	1
	Terminal Disclaimer Filed	2	2

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30537 c67aae8d02eb5795750e9234bde927588699bfb9	no	2

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Total Files Size (in bytes):	72527

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Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/022,370	DICRISTO ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☐ APPROVED	☒ DISAPPROVED
Date Filed : 8/14/13	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

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[ ] has failed to state his/her capacity to sign for the business entity. (See FP 14.28)
[ ] is not recognized as an officer of the assignee. (See FP 14.29)
[x] does not have power of attorney. (FP 14.29.01)
Jean Proctor

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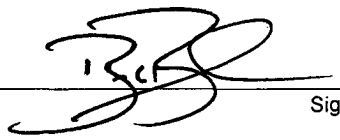
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2. ☒ The undersigned is an attorney or agent of record. Reg. No. 47,429



Signature — August 20, 2013 (Date)

Bradford C. Blaise
Typed or printed name

(703) 770-7741
Telephone Number

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EFS ID:	16638219
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Customer Number:	909
Filer:	Bradford C. Blaise/Miriam Nelsen Awan
Filer Authorized By:	Bradford C. Blaise
Attorney Docket Number:	090611-0391838
Receipt Date:	20-AUG-2013
Filing Date:	07-FEB-2011
Time Stamp:	16:57:29
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		090611-0391838_TerminalDisclaimers.pdf	42602 bd43b93f308b0755fbeaf70d882102a1274a8541	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Terminal Disclaimer Filed	1	1
	Terminal Disclaimer Filed	2	2
Warnings:			
Information:			
	Total Files Size (in bytes):	42602	

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New Applications Under 35 U.S.C. 111
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Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/022,370	DICRISTO ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : August 20 2013	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Henry D. Jefferson

2 td's are approved

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909 7590 08/22/2013

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER
HE, JIALONG

ART UNIT	PAPER NUMBER
2659	

DATE MAILED: 08/22/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

TITLE OF INVENTION: SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$890	$300	$0	$1190	11/22/2013

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.

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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)

909 7590 08/22/2013
Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

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.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

TITLE OF INVENTION: SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$890	$300	$0	$1190	11/22/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
HE, JIALONG	2659	704-257000

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 _____
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 credit 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	NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27	NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.	NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information 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.

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.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

909 7590 08/22/2013

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER	
HE, JIALONG	

ART UNIT	PAPER NUMBER
2659	

DATE MAILED: 08/22/2013

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

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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. 13/022,370	Applicant(s) DICRISTO ET AL.	
	Examiner JIALONG HE	Art Unit 2659	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 *07/03/2013*.
   ☐ 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 *1-18,22-40 and 42-47*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

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

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

Attachment(s)

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

/JIALONG HE/
Primary Examiner, Art Unit 2659

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/022,370	DICRISTO ET AL.	
	Examiner	Art Unit	
	JIALONG HE	2659	

All participants (applicant, applicant's representative, PTO personnel):

(1) *JIALONG HE*. (3)_____.

(2) *Ngai Zhang (Reg. 65,473)*. (4)_____.

Date of Interview: *09 August 2013*.

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 and 26*.

Identification of prior art discussed: _____.

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...)

The Examiner reviewed amendments filed on 07/03/2013 and suggested clarifying the claimed invention. Mr. Zhang consulted with his client and authorized Examiner's amendments presented in this office action. The Examiner also reminded the obviousness double patenting (ODP) issue indicated in a previous office action. Mr. Zhang would file terminal disclaimers to obviate the ODP issue .

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of 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

/JIALONG HE/ Primary Examiner, Art Unit 2659	

DETAILED ACTION

Examiner's Amendment

1. 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.

2. Authorization for this examiner's amendment was given in a telephone interview with Mr. Zhang (65,473) on 08/09/2013.

3. The application has been amended as follows with insertions indicated by underlining and deletions indicated by ~~strikethrough~~ and/or double brackets. This listing of claims will **replace all prior versions of claims** in the application.

1. (**Currently Amended**) A system for processing natural language utterances, comprising:

one or more processors configured to:

receive a first input of a user that comprises a natural language utterance;

~~a parser configured to: (i)~~ generate an interpretation of the natural language utterance based on one or more recognized words of the natural language utterance; ~~and (ii)~~

generate a request based on the interpretation of the natural language utterance;

invoke a domain agent ~~configured~~ to process the request; ~~and~~

~~an adaptive misrecognition engine configured to~~ determine whether the interpretation of the natural language utterance is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request;

update a personalized cognitive model associated with the user based on the determination of whether the interpretation is correct or incorrect, wherein the personalized cognitive model is based on a tracking of a pattern of interactions between the user and the system; and

predict one or more actions associated with the user based on the updated personalized cognitive model ~~after outputting a response to the request~~.

2. (**Currently Amended**) The system of claim 1, wherein the one or more processors are configured to ~~adaptive misrecognition engine is further configured to~~ generate an event indicative of misrecognition in response to ~~determining~~ a determination that the interpretation of the natural language utterance is incorrect.

3. (**Currently Amended**) The system of claim 2, ~~further comprising: a speech recognition engine configured to recognize the one or more recognized words based on the natural language utterance; and an analyzer~~ wherein the one or more processors are configured to:

analyze the event to determine how the natural language utterance was incorrectly interpreted; and

determine one or more tuning parameters ~~for at least one of the speech recognition engine or the parser~~ based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

4. (**Currently Amended**) The system of claim 1, ~~further comprising an analyzer configured to:~~

~~track an interaction pattern with the system over time for the user that provided the natural language utterance;~~

~~generate a personalized cognitive model associated with the user based on the interaction pattern tracked for the user; and~~

~~predict one or more actions associated with the user based on the personalized cognitive model in response to receiving one or more subsequent natural language utterances from the user,~~ wherein the predicted actions associated with the user are used to improve interpretations of [[the]] one or more subsequent natural language utterances.

5. (**Currently Amended**) The system of claim 1, ~~further comprising an analyzer~~ wherein the one or more processors are configured to track interaction patterns with the system over time for a plurality of users.

6. (**Currently Amended**) The system of claim 5, wherein ~~the analyzer is further~~ the one or more processors are configured to generate a generalized cognitive model associated with the plurality of users based on the interaction patterns tracked for the plurality of users, and wherein the generalized cognitive model includes a statistical abstract that corresponds to the interaction patterns.

7. (**Currently Amended**) The system of claim 6, wherein ~~the analyzer is further~~ one or more processors are configured to predict one or more other actions associated with the user based on the generalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted other actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

8. (**Currently Amended**) The system of claim 1, ~~further comprising an analyzer~~ wherein the one or more processors are configured to generate an environmental model that includes information associated with at least one of an environmental condition or surrounding associated with the user that provided the natural language utterance.

9. (**Previously Presented**) The system of claim 8, wherein the environmental condition or surrounding identifies a level of noise associated with an environment or the surrounding of the user.

10. (**Original**) The system of claim 8, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

11. (**Currently Amended**) The system of claim 1, ~~further comprising:~~ wherein the one or more processors are configured to:

~~a knowledge-enhanced speech recognition engine configured to determine a most likely context for the natural language utterance, wherein the knowledge-enhanced speech recognition engine is further configured to:~~

determine a most likely context for the natural language utterance;

compare one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

provide a relevance score for each of the identified matching contexts; ~~and~~

select the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent ~~configured to process the request~~ is associated with the selected context; ~~and~~

~~a response generating module configured to:~~

communicate the request to the domain agent associated with the selected context; and

generate a response to the request using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

12. (**Currently Amended**) The system of claim 11, wherein the response ~~generated by the response generating module~~ includes an aggregation of the content gathered as a result of the domain agent processing the request.

13. (**Currently Amended**) The system of claim 11, ~~further comprising a personality module configured to~~ wherein the one or more processors are configured to:

determine a personality based on the identified matching contexts, the domain agent processing the request, or a user profile associated with the user; and

format the response based on the personality.

14. (**Currently Amended**) The system of claim 11, ~~wherein the knowledge-enhanced speech recognition engine is further configured to~~ wherein the one or more processors are configured to compare the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

15. (**Currently Amended**) The system of claim 11, ~~wherein the knowledge-enhanced speech recognition engine is further configured to~~ wherein the one or more processors are configured to apply prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

16. (**Currently Amended**) The system of claim 11, wherein the domain agent is ~~further~~ configured to direct a query to at least one of a local information source or a network information source to process the request.

17. (**Currently Amended**) The system of claim 16, wherein the domain agent is ~~further~~ configured to evaluate a plurality of responses to the query to process the request.

18. (**Currently Amended**) The system of claim 11, wherein the domain agent is ~~further~~ configured to direct a command to at least one of a local device or a remote device to process the request.

19-21. (**Canceled**)

22. (**Previously Presented**) The system of claim 1, wherein the second input includes a follow-up request associated with a same context as the request being processed by the domain agent.

23. (**Currently Amended**) The system of claim 1, ~~wherein the adaptive misrecognition engine determines~~ wherein the one or more processors are configured to determine that the interpretation of the natural language utterance was incorrect in response to ~~determining~~ a determination that the second input includes a request to stop the request being processed by the domain agent.

24. (**Currently Amended**) The system of claim 1, ~~wherein the adaptive misrecognition engine determines~~ wherein the one or more processors are configured to determine that the interpretation of the natural language utterance was incorrect in response to the user repeating the natural language utterance.

25. (**Currently Amended**) The system of claim 1, ~~wherein the device is further configured to receive a non-speech input relating to the natural language utterance, and wherein the system further comprises:~~ wherein the one or more processors are configured to:

receive a non-speech input relating to the natural language utterance;

~~a transcription module configured to~~ transcribe the non-speech input to create a non-speech-based transcription; and

~~a merging module configured to~~ merge the recognized words and the non-speech-based transcription to create a merged transcription, wherein ~~the parser is further configured to~~

~~generate the interpretation of the natural language utterance~~ the interpretation is generated further based on the merged transcription.

26. (**Currently Amended**) A method of processing natural language utterances, the method being implemented on a computer system that includes one or more processors, the method comprising:

receiving a first input of a user that comprises a natural language utterance;

generating an interpretation of the natural language utterance based on one or more recognized words of the natural language utterance; ~~using a parser, wherein the parser generates~~

generating a request based on the interpretation of the natural language utterance;

invoking a domain agent ~~configured~~ to process the request;

monitoring one or more actions associated with the domain agent processing the request ~~using an adaptive misrecognition engine~~; and

determining~~, at the adaptive misrecognition engine,~~ whether the interpretation of the natural language utterance is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request;

updating a personalized cognitive model associated with the user based on the determination of whether the interpretation is correct or incorrect, wherein the personalized cognitive model is based on a tracking of a pattern of interactions between the user and the system; and

predicting one or more actions associated with the user based on the updated personalized cognitive model ~~after outputting a response to the request~~.

27. (**Currently Amended**) The method of claim 26, further comprising:

~~wherein the adaptive misrecognition engine generates~~ generating an event indicative of misrecognition in response to ~~determining~~ a determination that the interpretation of the natural language utterance is incorrect.

28. (**Currently Amended**) The method of claim 27, ~~wherein a speech recognition engine is used to recognize the one or more recognized words based on the natural language utterance, the method~~ further comprising:

analyzing the event to determine how the natural language utterance was incorrectly interpreted; and

determining one or more tuning parameters ~~for at least one of the speech recognition engine or the parser~~ based on how the natural language utterance was incorrectly interpreted, wherein the one or more tuning parameters are used to improve interpretations of subsequent natural language utterances relating to the request.

29. (**Currently Amended**) The method of claim 26, ~~further comprising:~~

~~tracking an interaction pattern over time for the user that provided the natural language utterance;~~

~~generating a personalized cognitive model associated with the user based on the interaction pattern tracked for the user; and~~

~~predicting one or more actions associated with the user based on the personalized cognitive model in response to receiving one or more subsequent natural language utterances from the user,~~ wherein the predicted actions associated with the user are used to improve interpretations of [[the]] one or more subsequent natural language utterances.

30. (**Original**) The method of claim 26, further comprising tracking interaction patterns over time for a plurality of users.

31. (**Previously Presented**) The method of claim 30, further comprising generating a generalized cognitive model associated with the plurality of users based on the interaction patterns tracked for the plurality of users, wherein the generalized cognitive model includes a statistical abstract that corresponds to the interaction patterns.

32. (**Currently Amended**) The method of claim 31, further comprising predicting one or more other actions associated with the user based on the generalized cognitive model in response to receiving one or more subsequent natural language utterances from the user, wherein the predicted other actions associated with the user are used to improve interpretations of the one or more subsequent natural language utterances.

33. (**Previously Presented**) The method of claim 26, further comprising generating an environmental model that includes information associated with at least one of an environmental condition or surrounding associated with the user that provided the natural language utterance.

34. (**Previously Presented**) The method of claim 33, wherein the environmental condition or surrounding identifies a level of noise associated with an environment or the surrounding of the user.

35. (**Original**) The method of claim 33, wherein the environmental model provides one or more of context, domain knowledge, preferences, or cognitive qualities to enhance the interpretation of the natural language utterance.

36. (**Currently Amended**) The method of claim 26, further comprising:

determining a most likely context for the natural language utterance; ~~using a knowledge-enhanced speech recognition engine, wherein determining the most likely context further includes:~~

comparing one or more text combinations against one or more grammar expression entries in a context description grammar to identify one or more contexts that completely or partially match the one or more text combinations;

providing a relevance score for each of identified matching contexts;

selecting the matching context having a highest score as the most likely context for the natural language utterance, wherein the domain agent ~~configured to process the request~~ is associated with the selected context;

communicating the request to the domain agent associated with the selected context; and

generating the response to the request using content gathered as a result of the domain agent processing the request, wherein the response arranges the content in an order based on the relevance scores for the identified matching contexts.

37. (**Original**) The method of claim 36, wherein the response includes an aggregation of the content gathered as a result of the domain agent processing the request.

38. (**Currently Amended**) The method of claim 36, further comprising:

determining a personality based on the identified matching contexts, the domain agent processing the request, or a user profile associated with the user; and

formatting the response based on the personality using a personality module.

39. (**Currently Amended**) The method of claim 36, further comprising: ~~wherein the knowledge-enhanced speech recognition engine further compares~~

comparing the text combinations against a context stack that stores one or more expected contexts to identify the one or more contexts.

40. (**Currently Amended**) The method of claim 36, further comprising: ~~wherein the knowledge-enhanced speech recognition engine further applies~~

applying prior probabilities or fuzzy possibilities to at least one of keyword matching, user profiles, or a dialog history to identify the one or more contexts.

41. (**Canceled**)

42. (**Currently Amended**) The method of claim 26, further comprising: ~~wherein the adaptive misrecognition engine determines~~

determining that the interpretation of the natural language utterance was incorrect in response to ~~determining~~ a determination that the second input includes a request to stop the request being processed by the domain agent.

43. (**Currently Amended**) The method of claim 26, further comprising: ~~wherein the adaptive misrecognition engine determines~~

determining that the interpretation of the natural language utterance was incorrect in response to the user repeating the natural language utterance.

44. (**Currently Amended**) The method of claim 26, further comprising:

receiving a non-speech input relating to the natural language utterance at the device;

transcribing the non-speech input to create a non-speech-based transcription; and

merging the recognized words and the non-speech-based transcription to create a merged transcription, wherein ~~the parser is further configured to generate the interpretation of the natural language utterance~~ the interpretation is generated further based on the merged transcription.

45. (**Currently Amended**) A method of processing natural language utterances, the method being implemented by a computer system that includes one or more processors executing one or more computer program instructions ~~modules~~ which, when executed, perform the method, the method comprising:

receiving a first input of a user that comprises a natural language utterance;

generating an interpretation of the natural language utterance based on one or more recognized words of the natural language utterance;

generating a request based on the interpretation;

transmitting the request to a domain agent for processing;

determining whether the interpretation is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request ~~after outputting a response to the request~~;

updating a personalized cognitive model associated with the user based on the determination of whether the interpretation is correct or incorrect, wherein the personalized cognitive model is based on a tracking of a pattern of interactions between the user and the system; and

predicting one or more actions associated with the user based on the updated personalized cognitive model.

46. (**Currently Amended**) A method of processing natural language utterances, the method being implemented by a computer system that includes one or more processors executing one or more computer program instructions ~~modules~~ which, when executed, perform the method, the method comprising:

receiving a first input of a user that comprises a natural language utterance;

generating an interpretation of the natural language utterance based on one or more recognized words of the natural language utterance;

generating a request based on the interpretation;

transmitting the request to a domain agent for processing;

determining ~~that~~ whether a personalized cognitive model associated with the user includes ~~does not include~~ sufficient information for predicting one or more subsequent actions associated with the user, wherein the personalized cognitive model is generated based on a tracking of a pattern of interactions between the user and the system, and wherein the one or more subsequent actions include one or more actions predicted to occur after receiving the first input; and

predicting the one or more subsequent actions based on a generalized cognitive model in response to [[the]] a determination that the personalized cognitive model does not include the sufficient information, wherein the generalized cognitive model is generated based on a tracking of patterns of interactions between a plurality of users and the system.

47. (**Currently Amended**) The method of claim 46, further comprising:

determining whether the interpretation is correct or incorrect based on whether a second input is received from the user within an amount of time shorter than an expected execution time associated with the request ~~after outputting a response to the request~~; and

updating the personalized cognitive model based on the determination of whether the interpretation is correct or incorrect.

End of amendment.

Allowable Subject Matter

4. Claims **1-18, 22-40 and 42-47** are allowed.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JIALONG HE whose telephone number is (571) 270-5359. The examiner can normally be reached on Monday-Thursday, 7:00 - 4:30, Alt Friday, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pierre Desir can be reached on (571) 272-7799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. 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.

/JIALONG HE/
Primary Examiner, Art Unit 2659

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S75	3	12/571,795	US-PGPUB; USPAT; EPO; JPO; DERWENT	ADJ	ON	2013/08/12 15:46
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EAST Search History (Interference)

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INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
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	B	6,704,576	03/09/2004	Brachman *et al.*	455	503	
	C	7,890,324	02/15/2011	Bangalore *et al.*	704	231	
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	E	8,255,224	08/28/2012	Singleton *et al.*	704	275	
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	I	2009/0076827	03/19/2009	Bulitta *et al.*	704	275	
	J	2009/0276700	11/05/2009	Anderson *et al.*	715	700	
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	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	DATE CONSIDERED
/Jialong He/	08/13/2013

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

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	**Art Unit**
	JIALONG HE	2659

CPC		
Symbol	**Type**	**Version**

CPC Combination Sets				
Symbol	**Type**	**Set**	**Ranking**	**Version**

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	43	
/JIALONG HE/ Primary Examiner.Art Unit 2659	08/13/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	Fig. 8

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	**Art Unit**
	JIALONG HE	2659

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
704	257

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
704	251	270	275		

INTERNATIONAL CLASSIFICATION														
CLAIMED					**NON-CLAIMED**									
G	1	0	L	15 / 18 (2013.01.01)					
G	1	0	L	15 / 00 (2013.01.01)					
G	1	0	L	21 / 00 (2013.01.01)					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	43	
/JIALONG HE/ Primary Examiner.Art Unit 2659	08/13/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	Fig. 8

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	**Art Unit**
	JIALONG HE	2659

☒ 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

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	43	
/JIALONG HE/ Primary Examiner.Art Unit 2659	08/13/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	Fig. 8

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	Art Unit
	MATTHEW SKED	2626

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
704	200-278	11/20/2012	JH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search	06/13/12	/MS/
EAST: update search (see search history)	11/20/2012	JH
Google Patent	11/20/2012	JH
EAST and Google Patent update search	4/25/2013	JH
EAST and Google Patent update search	8/13/2013	JH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	US Pat. US PG Pub and Upad text search	8/13/2013	JH

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	JIALONG HE	2659

✓	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								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13022370	DICRISTO ET AL.
	Examiner	**Art Unit**
	JIALONG HE	2659

✓	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								
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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
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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)

909 7590 08/22/2013
Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
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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.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

TITLE OF INVENTION: SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$890	$300	$0	$1190	11/22/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
HE, JIALONG	2659	704-257000

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 Pillsbury Winthrop Shaw Pittman 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: VoiceBox Technologies, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Bellevue, Washington

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 credit any overpayment, to Deposit Account Number 03-3975 (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	NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27	NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.	NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Ngai B. Zhang/ Date November 22, 2013

Typed or printed name Ngai B. Zhang Registration No. 65,473

This collection of information 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.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS :	Philippe DI CRISTO *et al.*	CONFIRMATION No.:	6569
SERIAL NUMBER :	13/022,370	EXAMINER:	Jialong He
FILING DATE :	February 7, 2011	ART UNIT:	2659
FOR :	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicants hereby make of record in the above-identified application the documents listed on the attached Form PTO-1449.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This Supplemental Information Disclosure Statement is being filed more than three months after the filing date of a national application other than a continued prosecution application under 37 C.F.R. § 1.53(d), or more than three months after the date of entry of the

national stage as set forth in 37 C.F.R. § 1.491 in an international application, and after the mailing date of any of a Final Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution in the application, but on or before payment of the Issue Fee. 37 C.F.R. § 1.97(d).

Documents 1T and 1U were cited by the U.S. Patent Office in co-pending Application Serial No. 13/692,451, filed December 3, 2012, in an Office Action dated August 29, 2013. Document 2B was cited by the U.S. Patent Office in co-pending Application Serial No. 12/703,032, filed February 9, 2010, in an Office Action dated September 5, 2013. Documents 1B, 1H, and 1O were cited by the U.S. Patent Office in co-pending Application Serial No. 12/365,516, filed February 4, 2009, in an Office Action dated September 5, 2013. Document 1N was cited by the U.S. Patent Office in co-pending Application Serial No. 13/758,170, filed February 4, 2013, in an Office Action dated September 10, 2013. Documents 1A, 1C-1G, 1I-1M, 1P-1S, and 2A were cited by the U.S. Patent Office in co-pending Application Serial No. 12/705,311, filed February 12, 2010, in an Office Action dated October 8, 2013. I hereby certify that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to my knowledge after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).

Please charge the $90.00 fee [37 C.F.R. § 1.17(p)] to Deposit Account No. 03-3975. In addition, please charge any fee deficiencies, or credit any overpayment, to Deposit Account No. 03-3975 as needed to ensure consideration of the Supplemental Information Disclosure Statement.

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP

By /Ngai B. Zhang/
Ngai B. Zhang
Registration No.: 65,473

Customer No.
00909

P. O. Box 10500
McLean, Virginia 22102
Telephone: (703) 770-7900
Telefax: (703) 770-7901

Dated: November 22, 2013

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1A	4,821,027	04/11/1989	Mallory *et al.*	340	521	
	1B	4,910,784	03/20/1990	Doddington *et al.*	381	43	
	1C	5,164,904	11/17/1992	Sumner	364	436	
	1D	5,559,864	09/24/1996	Kennedy, Jr.	379	59	
	1E	5,652,570	07/29/1997	Lepkofker	340	573	
	1F	5,774,841	06/30/1998	Salazar *et al.*	704	225	
	1G	6,028,514	02/22/2000	Lemelson *et al.*	340	539	
	1H	6,321,196	11/20/2001	Franceschi	704	243	
	1I	6,487,495	11/26/2005	Gale *et al.*	701	209	
	1J	6,739,556	05/25/2004	Langston	244	189	
	1K	6,813,341	11/02/2004	Mahoney	379	88.01	
	1L	6,868,385	03/15/2005	Gerson	704	275	
	1M	6,873,837	03/29/2005	Yoshioka *et al.*	455	321	
	1N	6,937,982	08/30/2005	Kitaoka *et al.*	704	252	
	1O	6,961,700	11/01/2005	Mitchell *et al.*	704	235	
	1P	7,085,708	08/01/2006	Manson	704	9	
	1Q	7,149,696	12/12/2006	Shimizu *et al.*	705	1	
	1R	7,215,941	05/08/2007	Beckmann *et al.*	455	404.1	
	1S	7,254,482	08/07/2007	Kawasaki *et al.*	701	211	
	1T	7,451,088	11/11/2008	Ehlen *et al.*	704	270.1	
	1U	7,873,654	01/18/2011	Bernard	707	769	
	1V	8,527,274	09/03/2013	Freeman *et al.*	704	257	
	1W	8,589,161	11/19/2013	Kennewick *et al.*	704	252	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	DATE CONSIDERED

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

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2A	2002/0107694	08/08/2002	Lerg	704	273	
	2B	2004/0117179	06/17/2004	Balasuriya	704	231	
	2C	2013/0253929	09/26/2013	Weider *et al.*	704	235	
	2D	2013/0297293	11/07/2013	Di Cristo *et al.*	704	9	
	2E	2013/0304473	11/14/2013	Baldwin *et al.*	704	257	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	DATE CONSIDERED

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

Electronic Patent Application Fee Transmittal

Application Number:	13022370
Filing Date:	07-Feb-2011
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Filer:	Ngai Bing Zhang/Susan Trader
Attorney Docket Number:	090611-0391838

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	890	890
Publ. Fee- Early, Voluntary, or Normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
Submission- Information Disclosure Stmt	2806	1	90	90
		Total in USD ($)		**1280**

Electronic Acknowledgement Receipt

EFS ID:	17474273
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Customer Number:	909
Filer:	Ngai Bing Zhang/Susan Trader
Filer Authorized By:	Ngai Bing Zhang
Attorney Docket Number:	090611-0391838
Receipt Date:	22-NOV-2013
Filing Date:	07-FEB-2011
Time Stamp:	08:38:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1280
RAM confirmation Number	8379
Deposit Account	033975
Authorized User	
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 1.20 (Post Issuance fees)	

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)	0391838_IssueFee.pdf	108316 cd146a9b24067d579543fdd1558f3bac8f195f91	no	2
Warnings:					
Information:					
2	Transmittal Letter	0391838_SIDS.pdf	525540 22c5b1044ca26e7ca0d036ea41992b04460dd713	no	3
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	0391838_PTO1449.pdf	662912 d37727196b42da25a3613179f92ba72ef78d026d	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Fee Worksheet (SB06)	fee-info.pdf	33851 49a3bf6bbbec80d779d66c2727f4a0facaa5f185	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1330619		

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.

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1A	4,821,027	04/11/1989	Mallory *et al.*	340	521	
	1B	4,910,784	03/20/1990	Doddington *et al.*	381	43	
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	1E	5,652,570	07/29/1997	Lepkofker	340	573	
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	1G	6,028,514	02/22/2000	Lemelson *et al.*	340	539	
	1H	6,321,196	11/20/2001	Franceschi	704	243	
	1I	6,487,495	11/26/2005	Gale *et al.*	701	209	
	1J	6,739,556	05/25/2004	Langston	244	189	
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	1Q	7,149,696	12/12/2006	Shimizu *et al.*	705	1	
	1R	7,215,941	05/08/2007	Beckmann *et al.*	455	404.1	
	1S	7,254,482	08/07/2007	Kawasaki *et al.*	701	211	
	1T	7,451,088	11/11/2008	Ehlen *et al.*	704	270.1	
	1U	7,873,654	01/18/2011	Bernard	707	769	
	1V	8,527,274	09/03/2013	Freeman *et al.*	704	257	
	1W	8,589,161	11/19/2013	Kennewick *et al.*	704	252	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	DATE CONSIDERED

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

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Docket Number	Application Number
	090611-0391838	13/022,370
	Applicant(s)	
	Philippe DI CRISTO *et al.*	
	Filing Date	Group Art Unit
Form PTO-1449	February 7, 2011	2659

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
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	2B	2004/0117179	06/17/2004	Balasuriya	704	231	
	2C	2013/0253929	09/26/2013	Weider *et al.*	704	235	
	2D	2013/0297293	11/07/2013	Di Cristo *et al.*	704	9	
	2E	2013/0304473	11/14/2013	Baldwin *et al.*	704	257	

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	Translations YES	Translations NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	DATE CONSIDERED
/Jialong He/	11/27/2013

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

404257958v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.H./

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838	6569

909 7590 12/04/2013

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

EXAMINER	
HE, JIALONG	

ART UNIT	PAPER NUMBER
2659	

NOTIFICATION DATE	DELIVERY MODE
12/04/2013	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):

docket_ip@pillsburylaw.com
heather.marthers@pillsburylaw.com

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address : COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/022,370	07 February, 2011	DICRISTO ET AL.	090611-0391838

		EXAMINER	
Pillsbury Winthrop Shaw Pittman, LLP (NV) PO Box 10500 McLean, VA 22102		JIALONG HE	
		ART UNIT	PAPER
		2659	20131127

DATE MAILED:

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

Commissioner for Patents

IDS submitted on 11/22/2013 has been considered.

/JIALONG HE/
Primary Examiner, Art Unit 2659

PTO-90C (Rev.04-03)

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.
13/022,370	12/31/2013	8620659	090611-0391838	6569

909 7590 12/11/2013

Pillsbury Winthrop Shaw Pittman, LLP (NV)
PO Box 10500
McLean, VA 22102

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):

Philippe DiCristo, Bellevue, WA;
Chris Weider, Everett, WA;
Robert A. Kennewick, Seattle, WA;

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.

PATENT
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Current Date: June 30th, 2017

Application No.: 13/022370
Filed: 07.02.2011

Patent No.: 8620659
Issued: 31.12.2013

CHANGE OF ENTITY STATUS PURSUANT TO 37 C. F. R. § 1.27 (g)(2)

Commissioner for Patents
Mail Stop M Correspondence
P.O. Box 1450
Alexandria, VA 22313-1450

By Fax: 001-571-273-6500

Sir:

This communication hereby notifies the United States Patent and Trademark Office that **small entity status is no longer applicable** for the above-identified patent.

Respectfully submitted,

Signature
Printed Name: Scott A. Ouellette
TITLE: Senior Director - IP

PAGE 2/2 * RCVD AT 6/30/2017 10:40:44 AM [Eastern Daylight Time] * SVR:W-PTOFAX-002/25 * DNIS:2736500 * CSID:+49 89 943850411 * DURATION (mm-ss):00-55

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Fax Message

To : **USPTO** **From : IPAN GmbH**

Maintenance Fee Branch

Office of Finance

001-571-273-6500 **Pages : 1 + 2**

Date : 06/30/2017

Attached: Petition pursuant § 1.27

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT6700444

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
NUANCE COMMUNICATIONS, INC.	01/01/2021

RECEIVING PARTY DATA

Name:	VOICE INVENTIONS, LLC
Street Address:	2 EXECUTIVE DRIVE
Internal Address:	STE. 270
City:	FORT LEE
State/Country:	NEW JERSEY
Postal Code:	07024

PROPERTY NUMBERS Total: 29

Property Type	Number
Patent Number:	7398209
Patent Number:	7502738
Patent Number:	7809570
Patent Number:	8015006
Patent Number:	8112275
Patent Number:	8140327
Patent Number:	8155962
Patent Number:	8731929
Patent Number:	9734825
Patent Number:	7693720
Patent Number:	9031845
Patent Number:	7640160
Patent Number:	7917367
Patent Number:	8326634
Patent Number:	8849670
Patent Number:	9263039
Patent Number:	7620549
Patent Number:	8332224
Patent Number:	8620659

Property Type	Number
Patent Number:	9626959
Patent Number:	7949529
Patent Number:	8195468
Patent Number:	8447607
Patent Number:	8849652
Patent Number:	9495957
Patent Number:	7634409
Patent Number:	7983917
Patent Number:	8069046
Patent Number:	8150694

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Email: eddie.weiss@voiceinventions.com
Correspondent Name: EDWARD WEISS
Address Line 1: 2 EXECUTIVE DRIVE
Address Line 2: STE. 270
Address Line 4: FORT LEE, NEW JERSEY 07024

NAME OF SUBMITTER:	EDWARD WEISS
SIGNATURE:	/Edward Weiss/
DATE SIGNED:	05/10/2021
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 4
source=2020-12-24 - Assignment Nuance to Voice Inventions#page1.tif
source=2020-12-24 - Assignment Nuance to Voice Inventions#page2.tif
source=2020-12-24 - Assignment Nuance to Voice Inventions#page3.tif
source=2020-12-24 - Assignment Nuance to Voice Inventions#page4.tif

PATENT ASSIGNMENT AGREEMENT

This PATENT ASSIGNMENT AGREEMENT (the "Assignment Agreement") between Nuance Communications, Inc., a Delaware corporation, with an address at One Wayside Road, Burlington, MA 01803 ("Assignor"), and Voice Inventions, LLC, a Texas Limited Liability Company, with an address at 2 Executive Drive, Suite 270, Fort Lee, NJ 07024 ("Assignee").

RECITALS

WHEREAS the parties have entered into a certain Patent Purchase and Licensing Agreement (the "Purchase Agreement"), with an effective date of January 1, 2021;

WHEREAS Assignor possesses all legal rights, title, and interests in and to the patents listed in Exhibit A (the "Assigned Patent Portfolio") to this Assignment Agreement;

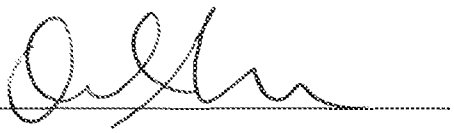
WHEREAS the parties desire to effectuate the assignment and transfer of the Assigned Patent Portfolio to Assignee such that Assignee shall acquire, and thus hereby acquires, all of Assignor's worldwide rights, title, and interests in and to the Assigned Patent Portfolio; and

WHEREAS the parties further desire that the assignment of the Assigned Patent Portfolio be undertaken in a such a manner as to allow Assignee to make such assignment a matter of record in the appropriate domestic and international patent offices;

NOW THEREFORE, for good and valuable consideration, the receipt of which by Assignor is hereby acknowledged, Assignor hereby sells, assigns, and transfers to Assignee, and Assignee hereby purchases and accepts from Assignor, all of Assignor's worldwide rights, title and interest, in and to the Assigned Patent Portfolio, including any and all of Assignor's rights to sue for past damages, subject to the terms and conditions of the Purchase Agreement.

IN WITNESS WHEREOF, intending to be legally bound, Assignor has caused this Assignment Agreement to by executed by its duly authorized representative and made effective, as of January 1, 2021.

Nuance Communications, Inc.
Assignor

By 

Name: David Greenbaum
Title: VP, Litigation & IP

Exhibit A

Assigned Patent Portfolio

	COUNTRY	TITLE	APPLICATION NUMBER	DATE FILED	PATENT NUMBER
1	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	10/452,147	Jun 3, 2003	7,398,209
2	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	11/747,547	May 11, 2007	7,502,738
3	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	12/168,554	Jul 7, 2008	7,809,570
4	US	SYSTEMS AND METHODS FOR PROCESSING NATURAL LANGUAGE SPEECH UTTERANCES WITH CONTEXT-SPECIFIC DOMAIN AGENTS	12/130,397	May 30, 2008	8,015,006
5	US	SYSTEM AND METHOD FOR USER-SPECIFIC SPEECH RECOGNITION	12/765,733	Apr 22, 2010	8,112,275
6	US	SYSTEM AND METHOD FOR FILTERING AND ELIMINATING NOISE FROM NATURAL LANGUAGE UTTERANCES TO IMPROVE SPEECH RECOGNITION AND PARSING	12/765,753	Apr 22, 2010	8,140,327
7	US	METHOD AND SYSTEM FOR ASYNCHRONOUSLY PROCESSING NATURAL LANGUAGE UTTERANCES	12/838,982	Jul 19, 2010	8,155,962
8	US	AGENT ARCHITECTURE FOR DETERMINING MEANINGS OF NATURAL LANGUAGE UTTERANCES	12/365,516	Feb 4, 2009	8,731,929
9	US	SYSTEM AND METHOD FOR PROCESSING NATURAL LANGUAGE UTTERANCES	14/278,627	May 15, 2014	9,734,825
10	US	MOBILE SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCES	10/618,633	Jul 15, 2003	7,693,720
11	US	MOBILE SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	12/705,311	Feb 12, 2010	9,031,845

12	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	11/197,504	Aug 5, 2005	7,640,160
13	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	12/617,506	Nov 12, 2009	7,917,367
14	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	13/019,834	Feb 2, 2011	8,326,634
15	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	13/690,895	Nov 30, 2012	8,849,670
16	US	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	14/500,723	Sep 29, 2014	9,263,039

17	US	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH	11/200,164	Aug 10, 2005	7,620,549
18	US	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH	12/571,795	Oct 1, 2009	8,332,224
19	US	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH	13/022,370	Feb 7, 2011	8,620,659
20	US	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH	14/143,903	Dec 30, 2013	9,626,959

21	US	MOBILE SYSTEMS AND METHODS OF SUPPORTING NATURAL LANGUAGE HUMAN-MACHINE INTERACTIONS	11/212,693	Aug 29, 2005	7,949,529
22	US	MOBILE SYSTEMS AND METHODS OF SUPPORTING NATURAL LANGUAGE HUMAN-MACHINE INTERACTIONS	13/084,197	Apr 11, 2011	8,195,468
23	US	MOBILE SYSTEMS AND METHODS OF SUPPORTING NATURAL LANGUAGE HUMAN-MACHINE INTERACTIONS	13/488,299	Jun 4, 2012	8,447,607
24	US	MOBILE SYSTEMS AND METHODS OF SUPPORTING NATURAL LANGUAGE HUMAN-MACHINE INTERACTIONS	13/898,045	May 20, 2013	8,849,652

25	US	MOBILE SYSTEMS AND METHODS OF SUPPORTING NATURAL LANGUAGE HUMAN-MACHINE INTERACTIONS	14/467,641	Aug 25, 2014	9,495,957

26	US	DYNAMIC SPEECH SHARPENING	11/513,269	Aug 31, 2006	7,634,409
27	US	DYNAMIC SPEECH SHARPENING	12/608,544	Oct 29, 2009	7,983,917
28	US	DYNAMIC SPEECH SHARPENING	12/608,572	Oct 29, 2009	8,069,046
29	US	SYSTEM AND METHOD FOR PROVIDING AN ACOUSTIC GRAMMAR TO DYNAMICALLY SHARPEN SPEECH INTERPRETATION	13/150,977	Jun 1, 2011	8,150,694

30	CN	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	2006800362006	Aug 4, 2006	ZL200680036200.6
31	CN	SYSTEMS AND METHODS FOR RESPONDING TO NATURAL LANGUAGE SPEECH UTTERANCE	2015102059396	Aug 4, 2006	ZL201510205939.6
32	CN	MOBILE SYSTEMS AND METHODS OF SUPPORTING NATURAL LANGUAGE HUMAN-MACHINE INTERACTIONS	200680038560	Aug 29, 2006	200680038560

PTO/AIA/81A (02-15)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Patent Number	8620659
Issue Date	12/31/13
First Named Inventor	Di Cristo, Philippe
Title	System and method of supporting adaptive misrecognition in
Attorney Docket No.	9032-0022

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the Customer Number identified in the box at right as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 174889

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent to:

☒ The address associated with the above-identified Customer Number.

OR

☐ The address associated with the Customer Number identified in the box at right:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the:

☐ Applicant.

OR

☒ Patent owner.

Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) submitted herewith or filed on _____.

SIGNATURE of Applicant or Patent Owner

Signature	/Jeff Ronaldi/	Date	02/27/2023
Name	Jeff Ronaldi	Telephone	(571) 334-1112
Title and Company	Manager, Dialect, LLC		

NOTE: Signatures of all the applicants or patent owners of the entire interest or their representative(s) are required. If more than one signature is required, submit multiple forms, check the box below, and identify the total number of forms submitted in the blank below.

☐ A total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 3 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.

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.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Dialect, LLC

Application No./Patent No.: 8620659 Filed/Issue Date: 12/31/13

Titled: System and method of supporting adaptive misrecognition in conversational speech

Dialect, LLC, a limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Di Cristo, Philippe et al. To: VoiceBox Technologies, Inc.

   The document was recorded in the United States Patent and Trademark Office at Reel 026437, Frame 0420, or for which a copy thereof is attached.

2. From: VoiceBox Technologies, Inc. To: VoiceBox Technologies Corporation

   The document was recorded in the United States Patent and Trademark Office at Reel 032620, Frame 0956, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). 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. 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.

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.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: VoiceBox Technologies Corporation To: Nuance Communications, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 034703, Frame 0429, or for which a copy thereof is attached.

4. From: Nuance Communications, Inc. To: Voice Inventions, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 056185, Frame 0742, or for which a copy thereof is attached.

5. From: Voice Inventions, LLC To: Dialect, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 060820, Frame 0857, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Jeff Ronaldi/	02/27/2023
Signature	Date
Jeff Ronaldi	Manager, Dialect, LLC
Printed or Typed Name	Title or Registration 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.

Electronic Acknowledgement Receipt

EFS ID:	47603805
Application Number:	13022370
International Application Number:	
Confirmation Number:	6569
Title of Invention:	SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH
First Named Inventor/Applicant Name:	Philippe DiCristo
Customer Number:	909
Filer:	David Alexander Gerasimow
Filer Authorized By:	
Attorney Docket Number:	090611-0391838
Receipt Date:	28-FEB-2023
Filing Date:	07-FEB-2011
Time Stamp:	13:28:37
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	Power of Attorney	8620659.pdf	206857 c388c12df724d7698a31f591d8b766e751b9964d	no	2

Warnings:

Information:					
2	Assignee showing of ownership per 37 CFR 3.73	8620659-aia0096.pdf	201073 ab363c0ed1a98509b01df8dd9b1988d40ced2704	no	3
Warnings:					
Information:					
		Total Files Size (in bytes):	407930		

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	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838

CONFIRMATION NO. 6569

IMPROPER CPOA LETTER

909
Pillsbury Winthrop Shaw Pittman, LLP
PO Box 10500
McLean, VA 22102

OC000000137522918

Date Mailed: 03/07/2023

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 02/28/2023. The power of attorney in this application is not accepted for the reason(s) listed below:

- The person(s) appointed in the power of attorney is/are not registered to practice before the U.S. Patent and Trademark Office.

/sltorres/

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

174889
Carbon Research, Inc (aka Research Carbon, Inc)
43 Luke St
Prospect, CT 06712
UNITED STATES

PTO/AIA/81A (02-15)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Patent Number	8620659
Issue Date	12/31/13
First Named Inventor	Di Cristo, Philippe
Title	System and method of supporting adaptive misrecognition in
Attorney Docket No.	9032-0022

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the Customer Number identified in the box at right as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 174899

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent to:

☒ The address associated with the above-identified Customer Number.

OR

☐ The address associated with the Customer Number identified in the box at right:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the:

☐ Applicant.

OR

☒ Patent owner.

Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) submitted herewith or filed on 02/28/2023.

SIGNATURE of Applicant or Patent Owner

Signature	/Jeff Ronaldi/	Date	11/06/2023
Name	Jeff Ronaldi	Telephone	(571) 334-1112
Title and Company	Manager, Dialect, LLC		

NOTE: Signatures of all the applicants or patent owners of the entire interest or their representative(s) are required. If more than one signature is required, submit multiple forms, check the box below, and identify the total number of forms submitted in the blank below.

☐ A total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 3 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.

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.

UNITED STATES
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P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
13/022,370	**11/27/2023 03:23:27 PM Z ET**	**090611-0391838**

Title of Invention

SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	8620659
CONFIRMATION #	6569	FILED BY	David Gerasimow
PATENT CENTER #	63384915	FILING DATE	02/07/2011
CUSTOMER #	909	FIRST NAMED INVENTOR	Philippe DiCristo
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
8620659.pdf	2	Power of Attorney	208 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
8620659.pdf	2A9425000974D06F839DEF55DCDA2602C770584DD9933A351 A00ECE00EE5D1D73EB6E6F4C6848FC44641C7428BDBAD319 BB9370C0796242F1FF812138F7B3B68

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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 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
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/022,370	02/07/2011	Philippe DiCristo	090611-0391838

CONFIRMATION NO. 6569

909
Pillsbury Winthrop Shaw Pittman, LLP
PO Box 10500
McLean, VA 22102

POWER OF ATTORNEY NOTICE

OC000000065479475

Date Mailed: 12/07/2023

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/27/2023.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/cnguyen/

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/022,370	02/07/2011	Philippe DiCristo	9032-0022

CONFIRMATION NO. 6569

174899
The Law Offices of David A. Gerasimow, P.C.
211 W. Wacker Dr.
Ste. 1717
Chicago, IL 60606

POA ACCEPTANCE LETTER

OC000000065479556

Date Mailed: 12/07/2023

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/27/2023.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/cnguyen/

Doc Code: MFEE.C.AD
Document Description: Maintenance Fee Address Change

PTO/SB/47 (11-21)
Approved for use through 11/30/2024. OMB 0651-0016
U.S. Patent and Trademark Office; U.S. Department of Commerce
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"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop Maintenance Fee
Director of the United States
Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

-OR-

Fax to: 571-273-6500

INSTRUCTIONS: The issue fee must have been paid for application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application.
When to check the first box below: If you have a Customer Number to represent the fee address.
When to check the second box below: If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see section 403 of the Manual of Patent Examining Procedure (MPEP).

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:

☑ Customer Number 174899

OR

☐ The attached Request for Customer Number (PTO/SB/125) form.

PATENT NUMBER (if known)	APPLICATION NUMBER
8620659	13/022,370

Completed by (check one):

☐ Applicant/Inventor

/David A. Gerasimow/
Signature

☑ Attorney or agent of record 57,512 (Reg. No.)

David A. Gerasimow
Typed or printed name

☐ Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) (Form PTO/SB/96) is enclosed or was filed on _____ (Date)

(312) 919-4254
Requester's telephone number

12/11/2023
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. If the assignee is a juristic entity, this form must be signed by a patent practitioner (attorney or agent) of record. Submit multiple forms if more than one signature is required (see below*).

☐ *Total of _____ PTO/SB/47 forms are submitted

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0016. Public burden for this form is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. 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 this form, please call 1-800-PTO-9199 and then 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. The United States Patent and Trademark Office (USPTO) collects this information under authority of 5 CFR 1.290. The information in this system of records is used to manage all records of applicant including name, citizenship, residence, post office address and other information with respect to inventors and their legal representatives pertaining to the applicant's activities in connection with the invention for which a patent is sought. This information is protected from disclosure to third parties in accordance with the Privacy Act.

However, routine uses of this information may include disclosure to the following: to law enforcement and investigation in the event that the system of records indicates a violation or potential violation of law; to a Federal, state, local, or international agency, in response to its request; to an agency, organization, or individual for the purpose of performing audit or oversight operations as authorized by law; to non-federal personnel under contract to the agency; to a court for adjudication and litigation; to the Department of Justice for Freedom of Information Act (FOIA) assistance; to members of congress working on behalf of an individual; to the Office of Personnel Management (OPM) for personnel research purposes; to National Archives and Records Administration for inspection of records; and to the Office of Management and Budget (OMB)for legislative coordination and clearance. Failure to provide any part of the requested information may result in an inability to process requests for access and information. The applicable Privacy Act System of Records Notice for this information is COMMERCE/PAT-TM-7 Patent Application Files, available at Federal Register / Vol. 78, No. 61 / Friday, March 29, 2013 /Notices 19243. https://www.govinfo.gov/content/pkg/FR-2013-03-29pdf/2013-07341.pdf

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
13/022,370	**12/14/2023 03:25:36 PM Z ET**	**9032-0022**

Title of Invention

SYSTEM AND METHOD OF SUPPORTING ADAPTIVE MISRECOGNITION IN CONVERSATIONAL SPEECH

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	8620659
CONFIRMATION #	6569	FILED BY	David Gerasimow
PATENT CENTER #	63618979	FILING DATE	02/07/2011
CUSTOMER #	174899	FIRST NAMED INVENTOR	Philippe DiCristo
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
sb0047 - 8620659.pdf	2	Maintenance Fee Address Change	293 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
sb0047 - 8620659.pdf	9C5A2A714ED419AFD0E5AD94613B47DF58399F465AB2D6B3C C68F042F0455EFFB0F2AB5EF05AED697B513F8144C5B0BE4D F530A714A3A353864B6D5E59FC99E6

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

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

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New International Application Filed with the USPTO as a Receiving Office

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