UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/156,009	12/06/2016	9514748	340577.01	1056

69316 7590 11/16/2016

MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

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 130 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):

Microsoft Corporation, Redmond, WA;
Mouni Reddy, Bellevue, WA;
Robert J. Howard III, Bellevue, WA;
Deborah B. Harrison, Seattle, WA;
Sogol Malekzadeh, Sammamish, 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.

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)

69316 7590 08/02/2016
MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

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.

Gina Borri	(Depositor's name)
/Gina Borri/	(Signature)
November 2, 2016	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/156,009	01/15/2014	Mouni Reddy	340577.01	1056

TITLE OF INVENTION: DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	11/02/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
HANG, VU B	2672	704-249000

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 Miia Sula
2 Micky Minhas
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: Microsoft Technology Licensing, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Redmond, WA

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

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 50-5182 (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 forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature /Thomas C. Fiala, #43,610/ Date November 2, 2016

Typed or printed name Thomas C. Fiala Registration No. 43,610

Patent Owner Ex. 2104

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Mouni Reddy *et al.*	Examiner:	Hang, Vu B.
Serial No.:	14/156,009	Group Art Unit:	2154
Filed:	January 15, 2014	Docket No.:	340577.01
		Confirmation No.:	1056
Title:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA RESPONSES		

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

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

Applicants thank the Examiner for indicating the allowability of claims 1-7 and 9-20 in the Notice of Allowance dated August 2, 2016.

Applicants agree with the Examiner's Statement of Reasons for Allowance to the extent that the claims of the present invention are patentable over the references in the record. Applicants expressly traverse the Examiner's Statement of Reasons for Allowance to the extent that any comment is intended or has the effect of limiting a claim scope, explicitly or implicitly, by not reciting verbatim the respective claim language, or is intended or has the effect of limiting a claim scope by stating or implying that all the reasons for patentability are in any way fully enumerated.

By virtue of the Examiner's allowance of the claims over the cited references and the associated arguments, it is believed that the previous arguments made by the Examiner have been overcome. Additionally, Applicants specifically do not acquiesce or agree in any manner as to the comments made by the Examiner regarding what the prior does or does not teach. Indeed, Applicants have pointed out the errors in the comments/arguments in Applicants' Response to the Office Action(s).

Applicants further point out that the reasons for allowance set forth by the Examiner are not the only reasons that the claims are allowable. Further reasons for allowance of the claims beyond those enumerated by the Examiner are described and set forth in Applicants' specification. In addition, structures and methods that perform substantially the same function in substantially the same way to achieve substantially the same results are included within the scope of the claims.

Finally, as the Examiner's reasons for allowance are not exhaustive, such reasons for allowance do not establish an estoppel against Applicants seeking and obtaining allowance of additional, broader claims in a continuation application, which Applicants reserve the right to file.

Respectfully submitted,

Date November 2, 2016

By /Thomas C. Fiala, #43,610/
Thomas C. Fiala
Attorney for Applicants
Reg. No. 43,610
Direct telephone (301) 718-2259

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Electronic Patent Application Fee Transmittal

Application Number:	14156009
Filing Date:	15-Jan-2014
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Filer:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt

EFS ID:	27395326
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Gina Borri
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	02-NOV-2016
Filing Date:	15-JAN-2014
Time Stamp:	14:36:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$960
RAM confirmation Number	110316INTEFSW14394200
Deposit Account	505182
Authorized User	Gina Borri

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	340577_01-FeeTransmittal.pdf	95768 5cbb23fc2d94afea680da8e7f9db2370978e8a47	no	1
Warnings:					
Information:					
2	Post Allowance Communication - Incoming	340577_01_Comments_on_Statement_of_Reasons_for_Allowance.pdf	82465 7d8d350fc44eb17bb12d874654e83459fd576411	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30573 8488800d1a0a5c8091d5f866429ce13fb20e32b0	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	208806		

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.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

69316 7590 08/02/2016
MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

EXAMINER
HANG, VU B

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 08/02/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/156,009	01/15/2014	Mouni Reddy	340577.01	1056

TITLE OF INVENTION: DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	11/02/2016

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

69316 7590 08/02/2016
MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

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.
14/156,009	01/15/2014	Mouni Reddy	340577.01	1056

TITLE OF INVENTION: DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	11/02/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
HANG, VU B	2672	704-249000

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 credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29
  NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27
  NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status.
  NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Patent Owner Ex. 2104
Page 10 of 431

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/156,009	01/15/2014	Mouni Reddy	340577.01	1056

69316 7590 08/02/2016
MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

EXAMINER	
HANG, VU B	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 08/02/2016

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 14/156,009	Applicant(s) REDDY ET AL.	
	Examiner Vu B. Hang	Art Unit 2672	AIA (First Inventor to File) Status Yes

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

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

1. ☒ This communication is responsive to *04/22/2016*.
   ☐ 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 *1-7 and 9-20 (renumbered 1-19, respectively)*. 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 _____.

/Vu B Hang/
Primary Examiner, Art Unit 2672

- The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.
- This office action is responsive to the Request for Continued Examination filed on 04/22/2016.
- Claims 1-7 and 9-20 (renumbered 1-19, respectively) are allowed.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/22/2016 has been entered.

Response to Arguments

Applicant's arguments filed on 04/22/2016, with respect to the amended independent claims and the previously cited prior art, have been fully considered and are persuasive. Therefore, the previous rejections of Claims 1-7 and 9-20 have been withdrawn.

Allowable Subject Matter

Claims 1-7 and 9-20 (renumbered 1-19, respectively) are **allowed**.

The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose, teach or suggest the claimed limitation of (in combination with all other limitations in the claim), "identifying a plurality of eligible responses to the utterance, the plurality of eligible responses including at least one multimedia object that is associated with a popular culture reference and speech comprising an impersonation of a voice of a person associated with the popular culture reference", as found in **Claim 1**. Similar features are claimed in **Claims 2-7 and 9-20**.

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

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu B. Hang whose telephone number is (571)272-0582. The examiner can normally be reached on Monday-Friday, 9:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. 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.

/Vu B Hang/
Primary Examiner, Art Unit 2672

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	**Art Unit**
	VU B HANG	2672

CPC								
Symbol							**Type**	**Version**
G10L		15	/	22			F	2013-01-01
G10L		25	/	30			I	2013-01-01
G10L		13	/	08			A	2013-01-01
G10L		13	/	02			A	2013-01-01
G10L		15	/	16			A	2013-01-01
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CPC Combination Sets									
Symbol							**Type**	**Set**	**Ranking**	**Version**
			/							
			/							

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	19	
/VU B HANG/ Primary Examiner.Art Unit 2672	07/26/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	**Art Unit**
	VU B HANG	2672

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
704	259	G	1	0	L	13 / 00 (2006.01.01)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
704	249	270			

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	19	
/VU B HANG/ Primary Examiner.Art Unit 2672	07/26/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	**Art Unit**
	VU B HANG	2672

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	18												
2	2	18	19												
3	3	19	20												
4	4														
5	5														
6	6														
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8	9														
9	10														
10	11														
11	12														
12	13														
13	14														
14	15														
15	16														
16	17														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 19	
/VU B HANG/ Primary Examiner.Art Unit 2672 (Primary Examiner)	07/26/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	Art Unit
	BARBARA REINIER	2672

CPC- SEARCHED		
Symbol	Date	Examiner
G10L 15/22, 15/30, 15/265, 15/16, 25/30, 15/10, 15/12, 15/00, 17/005, 17/02, 13/08, 13/02, 13/033	07/26/2016	VH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
704	231	07/26/2016	VH
704	232	07/26/2016	VH
704	235	07/26/2016	VH
704	237	07/26/2016	VH
704	238	07/26/2016	VH
704	239	07/26/2016	VH
704	246	07/26/2016	VH
704	249	07/26/2016	VH
704	259	07/26/2016	VH
704	270	07/26/2016	VH

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	7/24/2015	br
Search via EAST limited by text	7/24/2015	br
Consulted with Mike Opsasnik [Primary 704] for search/art application assistance	7/24/2015	br
Updated inventor search	1/14/2016	br
Consulted with Mohammad Ghayour [SPE 358] regarding withdrawing 101 rejection and maintaining art rejection - specifically the application of NPL Dr. Theopolis prior art	1/14/2016	br
EAST Search	07/26/2016	VH
Inventor Search	07/26/2016	VH

	/Vu B Hang/ Primary Examiner, Art Unit 2672

Patent Owner Ex. 2104
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INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
G10L	25/30	07/26/2016	VH
704	259	07/26/2016	VH

	/Vu B Hang/ Primary Examiner, Art Unit 2672

Patent Owner Ex. 2104
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BIB DATA SHEET

CONFIRMATION NO. 1056

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/156,009	01/15/2014	704	2672	340577.01

APPLICANTS

Microsoft Corporation, Redmond, WA;

INVENTORS

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Robert J. Howard III, Bellevue, WA;
Deborah B. Harrison, Seattle, WA;
Sogol Malekzadeh, Sammamish, WA;

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

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

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

01/29/2014

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /Barbara Reinier/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		WA	11	20	3

ADDRESS

MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052
UNITED STATES

TITLE

DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

FILING FEE RECEIVED		
1740	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

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	71189	704/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 20:22
L2	0	l1 and ((utterance or speech) same persona same voice same impersonation same ((pop or popular) near3 culture) same playback)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 20:24
L3	0	l1 and ((utterance or speech) same persona same voice same impersonation same ((pop or popular) near3 culture) same (play near3 back))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 20:24
L4	0	l1 and ((utterance or speech) same persona same voice same impersonation same (person or actor or actress or artist or singer) same (play near3 back))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 20:25
L5	0	l1 and ((utterance or speech) same voice same impersonation same ((pop or popular) near3 culture) same playback)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 20:25
L6	1	l1 and ((utterance or speech) same voice same impersonation same (person or actor or actress or artist or singer) same (play near3 back))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 20:25
L7	3	l1 and ((utterance or speech or dialog) same voice same impersonation same (person or actor or actress or artist or singer) same ((play$3 near3 back) or display$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 20:29
L8	2	l1 and ((utterance or speech or dialog)	US-PGPUB;	OR	ON	2016/07/26

		same (multimedia or video image or picture or reference) same ((pop or popular) near3 culture) same display$3)	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			20:37
L9	1	("8903716").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/07/26 20:51
L10	1	("20090083143").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/07/26 21:02
L11	3256	704/231.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:12
L12	502	704/232.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:12
L13	3897	704/235.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:12
L14	156	704/237.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:12
L15	359	704/238.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:12
L16	520	704/239.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:13
L17	2837	704/246.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:13

L18	527	704/249.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:13
L19	89	704/259.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:13
L20	5641	704/270.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:13
L21	14664	l11 or l12 or l13 or l14 or l15 or l16 or l17 or l18 or l19 or l20	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:14
L22	231108	G10L 15/22	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:15
L23	231241	G10L 15/30	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:15
L24	230374	G10L 15/265	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:15
L25	239088	G10L 15/16	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:15
L26	231411	G10L 25/30	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2016/07/26 21:15

			DERWENT; IBM_TDB			
L27	232260	G10L 15/10	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:15
L28	231231	G10L 15/12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:15
L29	236718	G10L 15/00	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:15
L30	230835	G10L 17/005	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:16
L31	233657	G10L 17/02	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:16
L32	232490	G10L 13/08	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:16
L33	234207	G10L 13/02	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:16
L34	230314	G10L 13/033	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:16
L35	1294288	H05K 999/99	US-PGPUB; USPAT; USOCR;	OR	ON	2016/07/26 21:17

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
L36	235160	l21 or l34	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:17
L37	24910	l36 and ((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:33
L38	15596	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:34
L39	4441	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command) same (server or backend or database))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:35
L40	442	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command) same (server or backend or database) same reference)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:35
L41	47	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command) same (server or backend or database) same reference same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or show or sport or athlete))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:37
L42	1	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same reference same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or show or sport or athlete) same (response or respond$3) same (multimedia or animation or video or text or image))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:38

L43	19	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or show or sport or athlete) same (response or respond$3) same (multimedia or animation or video or text or image))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:39
L44	5	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or show or sport or athlete) same (response or respond$3) same (multimedia or animation or video or text or image) same (playback or (play$3 near3 back) or display$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:40
L45	0	l35 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or show or sport or athlete) same (response or respond$3) same (multimedia or animation or video or text or image) same (playback or (play$3 near3 back) or display$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:41
L46	1	l36 and ((utterance or speech) same voice same impersonation same (person or actor or actress or artist or singer) same (play near3 back))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:44
L47	0	l35 and ((utterance or speech) same voice same impersonation same (person or actor or actress or artist or singer) same (play near3 back))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:44
L48	3	l36 and ((utterance or speech or dialog) same voice same impersonation same (person or actor or actress or artist or singer) same ((play$3 near3 back) or display$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:44
L49	0	l35 and ((utterance or speech or dialog) same voice same impersonation same (person or actor or actress or artist or	US-PGPUB; USPAT; USOCR;	OR	ON	2016/07/26 21:44

		singer) same ((play$3 near3 back) or display$3))	FPRS; EPO; JPO; DERWENT; IBM_TDB			
L50	3	l36 and ((utterance or speech or dialog) same (multimedia or video image or picture or reference) same ((pop or popular) near3 culture) same display$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:44
L51	6	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or (("tv" or television) near3 show) or sport or athlete) same (response or respond$3) same (multimedia or animation or video or text or image))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 21:45
L52	6	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or (("tv" or television) near3 show) or sport or athlete) same (response or respond$3 or impersonation) same (multimedia or animation or video or text or image))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:00
L53	0	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or (("tv" or television) near3 show) or sport or athlete) same voice same impersonation same (multimedia or animation or video or text or image))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:01
L54	0	l36 and (((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or (("tv" or television) near3 show) or sport or athlete) same voice same impersonation same playback)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:01

L55	9	(((digital adj personal adj assistant) or (personal adj assistant) or "PDA" or (palm adj device) or phone) same (utterance or speech or voice or dialong or request or command or audio) same (server or backend or database) same (((pop or popular) adj2 culture) or movie or artist or song or actor or actress or (("tv" or television) near3 show) or sport or athlete) same (response or respond$3 or impersonation) same (multimedia or animation or video or text or image)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:06
L56	1	((utterance or speech or dialog) same voice same impersonation same (person or actor or actress or artist or singer) same ((play$3 near3 back) or display$3)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:06
L57	0	((utterance or speech) same voice same impersonation same (person or actor or actress or artist or singer) same (play near3 back)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:07
L58	0	l19 and (l55 or l56)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:15
L59	1	l18 and (l55 or l56)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:15
L60	1	l32 and (l55 or l56)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:15
L61	27426	reddy.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:16
L62	178338	howard.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2016/07/26 22:16

			IBM_TDB			
L63	44388	harrison.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:16
L64	0	malekzadheh.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:17
L65	155	malekzadeh.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:17
L66	249794	l61 or l62 or l63 or l65	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:17
L67	3	l66 and (l43 or l44 or l45 or l46 or l48 or l50 or l51 or l52)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 22:19

7/26/2016 10:20:53 PM
C:\Users\vhang\Documents\EAST\Workspaces\14-156009.wsp

PTO/SB/08a (03-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14156009
Filing Date	2014-01-15
First Named Inventor	Mouni Reddy
Art Unit	2672
Examiner Name	Barbara Diane Reinier
Attorney Docket Number	340577.01

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
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	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

/V.H./	1	"International Preliminary Report on Patentability Issued in PCT Application No. PCT/US2015/010711", Mailed Date: March 11, 2016, 09 Pages. (MS# 340577.02)

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

EXAMINER SIGNATURE

Examiner Signature	/Vu Hang/	Date Considered	07/26/2016

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

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

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	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

CERTIFICATION STATEMENT

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

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

OR

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

See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2016-04-29
Name/Print	Thomas C. Fiala	Registration Number	43610

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	Art Unit
	VU B HANG	2672

✓	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	07/26/2015	01/14/2016	07/26/2016						
1	1	✓	✓	=						
2	2	✓	✓	=						
3	3	✓	✓	=						
4	4	✓	✓	=						
5	5	✓	✓	=						
6	6	✓	✓	=						
7	7	✓	✓	=						
	8	✓	✓	-						
8	9	✓	✓	=						
9	10	✓	✓	=						
10	11	✓	✓	=						
11	12	✓	✓	=						
12	13	✓	✓	=						
13	14	✓	✓	=						
14	15	✓	✓	=						
15	16	✓	✓	=						
16	17	✓	✓	=						
17	18	✓	✓	=						
18	19	✓	✓	=						
19	20	✓	✓	=						

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Filing Date	2014-01-15
First Named Inventor	Mouni Reddy
Art Unit	2672
Examiner Name	Barbara Diane Reinier
Attorney Docket Number	340577.01

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2016-04-29
Name/Print	Thomas C. Fiala	Registration Number	43610

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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

GODDAR, Heinz
Boehmert & Boehmert
Anwaltspartnerschaft mbB
Hollerallee 32
28209 Bremen
ALLEMAGNE

BOEHMERT & BOEHMERT
Bremen

Eing.: 18. März 2016

gesehen: Sekr.: Anw.:
Verfügung:
Frist:

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(PCT Rule 71.1)

Date of mailing *(day/month/year)* 11.03.2016

Applicant's or agent's file reference
M33083WO

IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2015/010711	09.01.2015	15.01.2014

Applicant
Microsoft Technology Licensing, LLC

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465

Authorized Officer

Zeiselmair, Sabine

Tel. +49 89 2399-2151

Form PCT/IPEA/416 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
M33083WO		

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2015/010711	09.01.2015	15.01.2014

International Patent Classification (IPC) or national classification and IPC

INV. G10L15/22

Applicant

Microsoft Technology Licensing, LLC

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 9 sheets, as follows:
      - ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions).
      - ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2).
      - ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)).

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3*ter* of Annex C of the Administrative Instructions).

4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☒ Box No. VII Certain defects in the international application
   - ☒ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
10.11.2015	11.03.2016

Name and mailing address of the international preliminary examining authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465

Authorized officer

Del Chiaro, Silvia

Telephone No. +49 89 2399-7390

Box No. I Basis of the report

1. With regard to the **language**, this report is based on

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3(a) and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4(a))
   - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-35	as originally filed	

Claims, Numbers

1-9	filed with the letter of	09-11-2015

Drawings, Sheets

1-11	as originally filed	

☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☒ the claims, Nos. 6
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-*bis*)):
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:

5. ☐ This report has been established:
   - ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-*bis*) and 70.2(e)).
   - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4*bis* and 70.2(e)).

6. ☒ With regard to top-up searches (Rules 66.1*ter* and 70.2(f)):
   - ☒ A top-up search was carried out by this Authority on 01.03.2016 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
     - ☐ Additional relevant documents have been discovered during the top-up search.
   - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.

7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* *If item 4 applies, some or all of those sheets may be marked "superseded".*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-9
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 **Documents**

1.1 Reference is made to the following documents:

D1 WO 2013/155619 A1 (PASUPALAK SAM [CA]; PANTONY JOSHUA R [CA]; HSU WILSON [CA]; WU ZHIYUAN) 24 October 2013 (2013-10-24)

D2 US 6 721 706 B1 (STRUBBE HUGO J [US] ET AL) 13 April 2004 (2004-04-13)

D3 US 2006/155765 A1 (TAKEUCHI JOHANE [JP] ET AL) 13 July 2006 (2006-07-13)

D4 US 2009/210217 A1 (OKADA KAZUO [JP]) 20 August 2009 (2009-08-20)

2 **Inventiveness of claims 1 and 8, Article 33(3) PCT**

2.1 Document D1 is regarded as being the closest prior art to the subject-matter of claim 1. It discloses already, in correspondence with claim 1 (the references between brackets relate to D1; the original wording of the claim is set in *italic fonts*; features not disclosed in D1 are set as ~~strikethrough~~; features which differ from the wording of the claim are set underlined):

A method for implementing a digital personal assistant, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant

(paragraph 5, page 2, lines 14-20, paragraph 69);

based on at least an analysis of the digital representation of the utterance

(paragraph 59),

determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant

(paragraph 42 , in the case of chat query, page 7, lines 7-10, paragraph 60); *and*

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant

(paragraph 44, in the case of chat query, see paragraph 42, paragraphs 224-229) *that includes at least one of:*

a multimedia object that is displayed within or played back by a user interface of the digital personal assistant **(paragraph 44)**,

the ~~multimedia object being associated with a popular culture reference~~; and

speech that is generated or played back by the digital personal assistant

(paragraph 44),

~~the speech comprising an impersonation of a voice of a person associated with the popular culture reference.~~

wherein causing the response to the utterance to be generated comprises:
matching the utterance to a particular utterance type within database **(paragraph 226)** ~~a hierarchical tree~~ of utterance types, each utterance type in the database ~~in the hierarchical tree~~ of utterance types having one or more responses associated therewith **(paragraph 226 "the chat service may then look at the candidate responses")**; and
selecting the response to the utterance from among the response(s) associated with the particular utterance type **(see passage of paragraph 226 cited above)**.

2.2 The method defined in independent claim 1 differs from that disclosed in D1 in that:

a) The played multimedia object is associated with a popular culture reference

b) A voice of a person associated with the popular culture reference is used to reproduce the speech.

c)The utterance types are organized as a hierarchical tree.

2.3 The differences a) and b) have no technical character and do not provide any technical effect. A played media associated with the popular culture or the kind of voice used to reproduce the speech is not a technical feature of the system but more an aesthetical or social characterisation.

The said features being not technical do not made any contribution over the prior art and to the inventive activity of the claims,

2.4 Coming to difference c) the said difference has the effect of facilitating the search of the appropriate responses because of the data being organised in a hierarchical tree.

2.5 The objective technical problem to be solved may therefore be as to improve a user device conversation capabilities.

Document D1 discloses already that there is a database of utterance types with multiple responses associated to the different types of utterances. The database is used to find an appropriate response in the case of "chat" conversation and improve the conversational interaction of the user with the device (paragraphs 225-227). A database can be organised in many different known ways, one of which is as a hierarchical structure or a hierarchical tree. The person skilled in the art, confronted with the above objective technical problem and starting from the database of D1, knowing advantages and disadvantages of the different database implementations and the constrains of the system, would choose freely form the many possible implementations applying the one of a hierarchical tree, if necessary, without the help of any inventive activity. Therefore, claim 1 does not meet the requirements of inventiveness of Article 33(3) PCT.

2.6 Therefore the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

2.7 The same considerations apply to claims 8 mutatis mutandis.

3 Inventiveness of dependent claims 2-7 and 9, Article 33(3) PCT

3.1 The dependent claims 2-7 do not appear to contain any additional feature which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to inventive step, the reason being as following:

A general statement the Applicant should note that the features "a quotation associated with the popular culture reference", "that evoked the popular culture reference", "associated with the popular culture reference" as in claims 2-4 and 9, have no technical character and do not provide any technical effect, see also paragraph 2.3 above.

The said features being not technical do not made any contribution over the prior art and to the inventive activity of the claims.

The remaining features of claims 2-7 are disclosed in D2 (claim 2-5: paragraph 44, claims 7: paragraph 99, paragraphs 224-229, claim 6: paragraph 227) and D1(claims 2-5: column 15, lines 3-67, column 25, line 55 to column 28, line 51);

Therefore, for what said above the subject matter of claims 2-8 does not involve any inventive activity.

The same considerations apply to claim 9 mutatis mutandis.

Re Item VII

Certain defects in the international application

4 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.

4.1 All independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate.

4.2 The features of the claims 1 and 8 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

4.3 The general statement in the description on page 35 , line 2 refers to the "spirit of the invention". When used to interpret the claims, it indicates that subject-matter for which protection is sought could differ from the subject-matter of the claims, thereby rendering the scope of the claims unclear (Article 6 PCT). The statement should therefore be deleted.

Re Item VIII

Certain observations on the international application

5 Clarity of claims 1 and 8, Article 6 PCT

5.1 The expression "a virtual persona of the digital personal assistant" used in claims 1 and 8 is ambiguous and has not well recognized technical meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of the said claims unclear (Article 6 PCT).

5.2 Claim 1 does not meet the requirements of Article 6 PCT because the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result (see Guidelines C II, 5.35), in particular it is not explained how the response among the responses associate to an utterance type is selected.

5.3 The same considerations as above apply to claim 8 mutatis mutandis.

Electronic Acknowledgement Receipt

EFS ID:	25623255
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Charlene Ramler
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	29-APR-2016
Filing Date:	15-JAN-2014
Time Stamp:	15:32:47
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	Transmittal Letter	340577-01-IDS-Cover-Sheet_4-29-16.pdf	70090 895d584ea053139607dbe8c114c8bb919e3221c4	no	3

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	340577-01-IDS-no_fee.pdf	1042650 bc85dd434966da7093f36a2cb02c9a0437deeb9b	no	4

Warnings:

Information:

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

3	Non Patent Literature	340577-01-NPL1.pdf	1521758 9d1c1194234a14d9d26921ba3c1613c0dd0ef7fc	no	9

Warnings:

Information:

Total Files Size (in bytes):	2634498

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Mouni Reddy
Application No.: 14/156,009
Filed: 2014-01-15
Customer No.: 69316

Attorney Docket No.: 340577.01
Group Art Unit: 2672
Confirmation Number: 1056
Examiner: Barbara Diane Reinier

Title: DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

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

STATEMENT FILED PURSUANT TO THE DUTY OF DISCLOSURE UNDER 37 C.F.R. §§ 1.56, 1.97 AND 1.98

Commissioner:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, the Applicant requests consideration of this Information Disclosure Statement.

PART I: Compliance with 37 C.F.R. § 1.97

This Information Disclosure Statement is being filed before the issuance of a Non-Final office action and after Request for Continued Examination (RCE).

No fee or certification is required.

PART II: Additional Information

The Applicant hereby makes the following additional information of record in the above-identified application.

Serial No.	Filing Date	Inventor(s)
N/A	N/A	N/A

Patent Owner Ex. 2104
Page 52 of 431

PART III: Remarks

The Applicant hereby makes of record in the above-identified application the information listed on the attached form PTO/SB/08A. The order of presentation of the references should not be construed as an indication of the importance of the references. Documents cited on the attached form PTO/SB/08A are enclosed unless otherwise indicated. It is respectfully requested that:

1. The Examiner consider completely the cited information, along with any other information, in reaching a determination concerning the patentability of the present claims;

2. The enclosed form PTO/SB/08A be signed by the Examiner to evidence that the cited information has been fully considered by the Patent and Trademark Office during the examination of this application;

3. The citations for the information be printed on any patent which issues from this application.

By submitting this Information Disclosure Statement, the Applicant makes no representation that a search has been performed, of the extent of any search performed, or that more relevant information does not exist.

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, in fact, prior art as defined by 35 U.S.C. § 102.

Patent Owner Ex. 2104
Page 53 of 431

Notwithstanding any statement by the Applicant, the Applicant urges the Examiner to form his or her own conclusion regarding the relevance of the cited information. An early and favorable action is hereby requested.

Respectfully submitted,

Date April 29, 2016

By: /Thomas C. Fiala, #43,610/

Thomas C. Fiala

Reg. No. 43,610

Microsoft Technology Licensing, LLC

One Microsoft Way

Redmond WA 98052-6399

Direct telephone (425) 707-9382

CERTIFICATE OF MAILING OR TRANSMISSION
(Under 37 CFR § 1.8(a)) or ELECTRONIC FILING

I hereby certify that this correspondence is being electronically deposited with the USPTO via EFS-Web on the date shown below:

April 29, 2016
Date

/Charlene M. Ramler/
Signature

Charlene M. Ramler
Printed Name

Patent Owner Ex. 2104
Page 54 of 431

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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

Application Number	14156009	Filing Date	2014-01-15	Docket Number (if applicable)	340577.01	Art Unit	2672
First Named Inventor	Mouni Reddy			Examiner Name	REINIER, BARBARA DIANE		

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

SUBMISSION REQUIRED UNDER 37 CFR 1.114

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

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

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

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

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

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 505182

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2016-04-21
Name	Thomas C. Fiala	Registration Number	43610

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14156009
Filing Date:	15-Jan-2014
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Filer:	Thomas Christopher Fiala/Shanti Pfenning
Attorney Docket Number:	340577.01

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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($)
Miscellaneous:				
Request for Continued Examination	1801	1	1200	1200
		Total in USD ($)		**1200**

Electronic Acknowledgement Receipt

EFS ID:	25559302
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Shanti Pfenning
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	22-APR-2016
Filing Date:	15-JAN-2014
Time Stamp:	15:08:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1200
RAM confirmation Number	1547
Deposit Account	505182
Authorized User	FIALA, THOMAS C

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 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 CFR 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		340577_01_Reply_After_Advisory_Mailed_041516.pdf	171887 0080c4ae2af3b1613d7149f466bd1872eec96197	yes	19
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Response After Final Action		1	1	
	Claims		2	7	
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Warnings:					
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2	Request for Continued Examination (RCE)	340577_01_RCE.pdf	697652 6fc12eca56c39620799cd480ce6d2638a3450a11	no	3
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30749 d3289b18ac19e6ab62732ea8751a5072b0869b7e	no	2
Warnings:					
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		Total Files Size (in bytes):	900288		

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Reddy, *et al.*	Examiner: Reinier, Barbara D.
Serial No.:	14/156,009	Group Art Unit: 2672
Filed:	January 15, 2014	Docket No.: 340577.01
		Confirmation No.: 1056
Title:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

AMENDMENT AND REPLY UNDER 37 C.F.R. § 1.114

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the final Office Action issued on January 22, 2016, and the Advisory Action issued on April 15, 2016, Applicants submit the following Amendments and Remarks, along with a Request for Continued Examination (RCE).

Amendments to the Claims start on page 2.

Remarks start on page 8.

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 under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims, other petitions, etc.) are hereby authorized to be charged to our Deposit Account No. 50-5182.

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently amended) A method for implementing a digital personal assistant, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant;

based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant; [[and]]

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, ~~causing a response to the utterance to be generated by the digital personal assistant that includes at least one of~~ identifying a plurality of eligible responses to the utterance, the plurality of eligible responses including:

[[a]] at least one multimedia object ~~that is displayed within or played back by a user interface of the digital personal assistant, the multimedia object being~~ associated with a popular culture reference; and

~~speech that is generated or played back by the digital personal assistant, the~~ speech comprising an impersonation of a voice of a person associated with the popular culture reference; and

selecting one of the plurality of eligible responses and causing the selected response to be displayed when the selected response includes the at least one multimedia object or played back when the selected response includes the speech by the digital personal assistant.

2. (Currently amended) The method of claim 1, wherein the selected response to the utterance ~~further~~ includes text ~~that is displayed within the user interface of the digital personal assistant, the text~~ comprising a quotation associated with the popular culture reference.

3. (Original) The method of claim 1, wherein the speech comprises a quotation associated with the popular culture reference.

4. (Currently amended) The method of claim 1, wherein the selected response ~~to the utterance further~~ includes a visual representation of the digital personal assistant ~~that is displayed within the user interface thereof and~~ that evokes the popular culture reference.

5. (Original) The method of claim 4, wherein the visual representation of the digital personal assistant comprises an animation of the digital personal assistant.

6. (Currently amended) The method of claim 1, wherein the multimedia object comprises:

image or video content that is ~~displayed~~ suitable for display within ~~the~~ a user interface of the digital personal assistant or audio content that is ~~played back~~ suitable for playback by the user interface of the digital personal assistant.

7. (Currently amended) The method of claim 1, wherein the selected response ~~to the utterance further~~ includes:

a link that is ~~displayed~~ suitable for display within ~~the~~ a user interface of the digital personal assistant and that can be activated by the user to access content associated with the popular culture reference.

8. (Canceled)

9. (Currently amended) The method of claim 1, wherein ~~causing the response to the utterance to be generated~~ identifying the plurality of eligible responses to the utterance comprises:

matching the utterance to a particular utterance type within a hierarchical tree of utterance types, each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith~~; and~~

~~selecting the response to the utterance from among the response(s) associated with the particular utterance type~~.

10. (Currently amended) The method of claim 1, wherein ~~causing the response to the utterance to be generated~~ identifying the plurality of eligible response to the utterance comprises:

determining that the utterance is associated with a trending topic; and

in response to determining that the utterance is associated with the trending topic, ~~selecting the response to the utterance from among~~ identifying one or more responses associated with the trending topic.

11. (Currently amended) The method of claim 1, ~~wherein causing the response to the utterance to be generated~~ identifying the plurality of eligible responses to the utterance comprises:

determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant~~; and~~

~~in response to determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant, selecting the response to the utterance from among the one or more predefined responses~~.

12. (Currently amended) The method of claim 1, wherein causing the selected response to ~~the utterance to~~ be ~~generated~~ displayed or played back by the digital personal assistant comprises:

sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant.

13. (Currently amended) The method of claim 1, wherein causing the selected response to ~~the utterance to~~ be ~~generated~~ displayed or played back by the digital personal assistant comprises:

providing text to a computing device executing the digital personal assistant, the text to be processed by a text-to-speech component of the digital personal assistant to generate the speech.

14. (Original) A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference.

15. (Original) The computing device of claim 14, wherein the digital personal assistant is configured to play back an audio file that includes the speech.

16. (Original) The computing device of claim 14, wherein the digital personal assistant is configured to apply text-to-speech conversion to text to generate the speech.

17. (Original) The computing device of claim 14, wherein providing the response further includes at least one of:

displaying or playing back a multimedia object by a user interface of the digital personal assistant, the multimedia object being associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

18. (Currently amended) A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to:

based at least on information received from the digital personal assistant backend, provide a response to the utterance that is selected from among a plurality of eligible responses that includes at least one of text or audio and a multimedia object associated with a popular culture reference, ~~based at least on information received from the digital personal assistant backend,~~ providing the response including displaying the response for the text or the multimedia object or playing back the response for the audio ~~a multimedia object associated with a popular culture reference~~ by a user interface of the digital personal assistant.

19. (Original) The computing device of claim 18, wherein the multimedia object comprises an image, video content, or audio content.

20. (Original) The computing device of claim 18, wherein providing the response further includes at least one of:

generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

REMARKS

Reconsideration of this Application is respectfully requested.

Claims 1-7 and 9-20 are pending in the application, with claims 1, 14, and 18 being the independent claims. Claims 1, 2, 4, 6-7, 9-13, and 18 have been amended without adding new matter. Claim 8 is cancelled without prejudice to, or disclaimer of, the subject matter therein.

Applicants have carefully reviewed and considered the final Office Action issued on January 22, 2016 ("Office Action"), the Advisory Action issued on April 15, 2016 ("Advisory Action"), and the references cited therein. Based on the foregoing Amendments and the following Remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Rejection of Claims 1-20 under 35 U.S.C. § 101

On page 2 of the Office Action, the prior rejection of claims 1-20 under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter is indicated as being withdrawn. Applicants acknowledge and appreciate the withdrawal of this rejection.

Rejection of Claims 1-3 and 6-20 under 35 U.S.C. § 103

On page 5 of the Office Action, claims 1-3 and 6-20 are rejected under 35 U.S.C. § 103 as allegedly being obvious over U.S. Patent No. 8,903,716 to Chen et al. (hereinafter "Chen") in view of the television series "Buck Rogers," 1979-1981 (hereinafter "Buck Rogers") and further in view of U.S. Patent Appl. Publ. No. 2009/0083143 by Steven Tischer (hereinafter "Tischer"). Applicants respectfully traverse this rejection, and request that it be withdrawn.

Claims 14-17

On page 15, the Examiner argues that claim 14 "include[s] features similar to claims 1, 12 and 13 respectively, and therefore, are rejected for the same reasons as claims 1, 12 and 13 respectively." Applicants respectfully disagree.

Applicants respectfully maintain that the Office Action is deficient for failing to address limitations of independent claim 14, as set forth below.

Notwithstanding, patentable distinctions exist between independent claim 14 and the combination of Chen, Buck Rogers, and Tischer. For example, claim 14, shown below for illustration, is directed to a computing device that includes:

> at least one processor; and
>
> a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:
>
> a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;
>
> the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference.

Applicants respectfully assert that independent claim 14 *explicitly and positively* recites "providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference." As admitted by the Examiner on page 4 of the Office Action in the Response to Arguments, "with regard to applicant's remarks on page 17 under 'Impersonations,' the Examiner made no citation regarding this limitation." Because the Examiner has not provided any basis for the rejection of this limitation of claim 14, the Office Action is defective, and further, a *prima facie* case of obviousness has not been made for claim 14.

In the Advisory Action on the Continuation Sheet, the Examiner argues the following points. Applicants response to each of these points is also included below:

1. "Claim 14 was rejected on the same grounds as claim 1." As noted above, the "impersonation" feature of claim 1 was not addressed in the Office Action, and therefore the "impersonation" feature of claim 14 was also not addressed. Accordingly, the

Examiner did not make a *prima facie* case of obviousness in the Office Action. Additionally, as Applicants showed in the prior Reply noted by the Examiner on page 4 of the Office Action, the cited references fail to teach or suggest such a feature. Applicants respectfully maintain the referenced Remarks in the noted Reply.

2. "The common definition [as would be known by one of ordinary skill in the art] of a "multimedia object" is elements of multimedia data, such as video, audio, animation, images, text etc., that are used as objects in OOP [See Multimedia Objects, Hamakawa et al., 1996]" (hereinafter "Hamakawa"). Applicants respectfully disagree and assert that this portion of Hamakawa is mischaracterized and taken out of context. Hamakawa states that video, audio, animation, images, text, etc., may be **elements** of multimedia data, **not** that they are themselves multimedia data. Indeed, Applicants respectfully assert that taken alone, video, audio, animation, images, and text are *singular*-media data, **not** *multi*-media data. There must be some combination of these singular elements in order to form "*multi*media" data. Under the position set forth by the Examiner, any object with any type of data, e.g., text only, would be a multimedia object. This is incorrect. Applicants respectfully assert that such a position is untenable at least because this position obviates the term "*multi*" in multimedia, and actually contradicts the definition relied on in Hamakawa (i.e., that video, audio, animation, images, and text are only singular media elements which in some combination may form multimedia elements). For instance, the next paragraph on page 1 of Hamakawa states (with emphasis added) that "[o]bject-oriented approaches in multimedia design applications have, until fairly recently, been limited to use with **static media, such as text and images**," and given such a description of text as being "static," it is clear that text alone does not constitute multimedia.

Accordingly, Applicants respectfully assert that the Examiner's reliance on and characterization of the definition in Hamakawa is untenable.

3. "Tischer was relied upon to teach 'the multimedia object being associated with a popular culture reference,'" and "discloses [as cited] where by utilizing business rules as well as personal information to create [i.e. generate] output strings designed to resonate and persist with the intended recipient [para. 17]." As noted in the Examiner's

statement, Tischer discloses creating output *strings* which, as is known in the art(s), are text (see also, Tischer, each and every FIG.). As noted above, however, text is **not** multimedia data.

4. "The words and phrases that are created a [sic] those commonly recognized across a populace [para. 7]," and "Tischer additionally discloses [though not explicitly cited], where the business rules [which is explicitly cited] can included phonetics (e.g. speech sounds) [para. 28 and 35]." Applicants' careful review of paragraphs [0028] and [0035] of Tischer reveals that these portions of Tischer disclose that business rules may include different ways to express text strings for a given populace. In the context of Tischer, phonetics or "speech sounds" means creating words or combinations of words for a text string that, *if* spoken or read, would be appropriate for a given dialect, region, population, etc., not that actual sound is generated or played back for a text string message.

5. "Given the broadest reasonable interpretation, Tischer does in fact disclose "generating" speech," and "[t]his speech, when used to repeat the output string that was "generated," can be easily considered as an "impersonation" since the speech sounds are present." Applicants respectfully disagree. Tischer is completely silent regarding generating speech or any sounds for that matter. As previously noted, Tischer discloses that phonetics can be represented in text strings. Therefore, the statement in the Advisory Action that "speech, when used to repeat the output string that was "generated," has no substantive basis whatsoever in Tischer. That is, Applicants assert that Tischer is completely silent regarding producing sound outputs based on any text strings—output strings are not taught or suggested as being "repeated" in Tischer.

Furthermore, the assertion that the alleged speech "can be easily considered as an "impersonation" since the speech sounds are present" is incorrect for a number of reasons. First, as shown above, Tischer fails to disclose outputs involving actively producing audio. That is, no output sounds are present in the disclosure of Tischer. Additionally, there is no basis for "considering" text strings to be impersonations in Tischer. Impersonations are neither expressed nor implied in this reference. Still further, any position that an audio output is an impersonation *per se* is untenable on its face. An

impersonation is an intentional attempt to copy the speech or characteristics of a person, and Tischer has nothing whatsoever to with this.

Accordingly, while broad, Applicants respectfully submit that the Examiner's interpretation is not reasonable or in any way substantiated in view of Tischer.

6. "An impersonation does NOT inherently imply or mean that the created sounds [i.e. string word(s) when phonetics are concatenated] that the voice has any particular "match" to an expected sound," and the claim limitations "impose no "impersonation" accuracy limits or degree." Applicants respectfully disagree. As noted above, Tischer does not disclose "creating sounds" or outputting audio in any way. Furthermore, Applicants assert that while claim 14 does not specify a "good" impersonation or allow for a "poor" impersonation, any "impersonation," as positively recited and explicitly claimed, is an intentional attempt to copy speech of a person, which is wholly absent from Tischer (or any other cited reference). Thus, the statement in the Advisory Action regarding a lack of "degree" is not relevant to claim 14, and Tischer still fails to teach or suggest an "impersonation." That is, not only does Tischer fail to teach or suggest impersonations with zero correlation to a person being impersonated, but Tischer completely fails to even contemplate any form of impersonation.

7. "The primary reference, Chen, explicitly discloses where a multimedia object's speech that is generated can be output via a speaker." However, Applicants note that neither Chen nor Tischer disclose impersonations, as recited in claim 14.

8. "Thus, when considered as a whole, Tischer clearly discloses the multimedia object, which includes speech, being "generated" and includes "an impersonation of a voice of a person associated with the popular culture reference" because when the string is output [via the disclosed business rules that include speech sounds] and the words/phrase used is commonly recognized [as further elaborated in para. 28 and 35], can be considered, given the broadest reasonable interpretation, as an impersonation." Applicants respectfully assert that in view of the Remarks above regarding the points argued in the Advisory Action by the Examiner, the Examiner's conclusion in this point is untenable and incorrect. Tischer does not generate audio nor does Tischer teach or suggest impersonations, and even assuming *arguendo* that Chen and Tischer may be

properly combined with respect to their outputs, and Applicants do not so acquiesce, Chen also fails to teach or suggest at least the "impersonation" limitation of claim 14.

9. "Claim 14 DOES NOT require any more response than that of "generating" the speech sounds [claim 14 line 12]. See MPEP 1207.03(a)(II)."

Initially here, Applicants respectfully request clarification regarding the cited portion of the MPEP which refers to Examiner's answers on appeal to the Board. The posture of the instant Application is after-final, but a Notice of Appeal has not been filed. Correction or explanation of the cite to MPEP 1207.03(a)(II): SITUATIONS THAT ARE NOT CONSIDERED NEW GROUNDS OF REJECTION is respectfully solicited for the record. To the extent the Examiner implies that this appeal provision is applicable to the instant application given its after-final status, to which Applicants would not acquiesce, Applicants respectfully assert that the basic thrust of the rejection for claim 14 does **not** remain the same such that Applicant has been given a fair opportunity to react to the rejection. Indeed, the entirety of the position noted above in the Advisory Action that text disclosed by Tischer leads to a teaching or suggestion of impersonations was not included in the rejection of claim 14 (i.e., not included in the rejection of claim 1) in any prior Actions issued by the Office. In fact, as previously noted, the Examiner admits in the Office Action on page 4 with respect to impersonations that "the Examiner made no citation regarding this limitation."

Moreover, the position set forth in the Advisory Action, regarding claim 14, is untenable and is unsupported by the cited references. In other words, the assertion that Applicants had unchanged evidence supporting a new rationale for the rejection (as alleged by the Examiner in view of MPEP 1207.03(a)(II)) is incorrect. The new rationale applied in the Advisory Action is substantiated by the cited references at all.

Finally, the Examiner improperly mischaracterizes the positively recited language of claim 14 by stating: "Claim 14 DOES NOT require any more response than that of "generating" the speech sounds…." Claim 14 is reproduced above for the Examiner's reference and convenience. The limitation at issue for claim 14 recites "providing the response including generating or playing back **speech that comprises an impersonation of a voice of a person associated with a popular culture reference**." Applicants

respectfully assert that any attempt to impute a limitation, characterization, or generalization that differs from the explicitly recited claim feature is improper. The entirety of the claim limitation must be shown as taught or suggested by the cited references to establish a *prima facie* case of obviousness. If this feature of claim 14 required no more of a response than "generating speech sounds," the inclusion of Tischer in the arguments set forth in the Advisory Action would have been completely unnecessary. As it is, the arguments in the Office Action and in the Advisory Action fail to that the cited references teach or suggest this limitation of claim 14.

Therefore, Applicants respectfully maintain that (1) the current Office Action is defective, and (2) the cited references fail to teach or suggest each and every feature of claim 14.

In view of the foregoing, Applicants respectfully assert that independent claim 14 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Applicants also respectfully assert that claims 15-17, which depend from independent claim 14, are also patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, for at least similar reasons as their base independent claim, and further in view of their own respective features. Accordingly, Applicants respectfully request that the rejection of claims 14-17 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Claims 1-3 and 6-13

Applicants respectfully assert that patentable distinctions exist between independent claim 1 and the combination of Chen, Buck Rogers, and Tischer. For example, amended claim 1, shown below for illustration, is directed to a method for implementing a digital personal assistant that includes:

> receiving a digital representation of an utterance of a user of the digital personal assistant;
>
> based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant;
>
> in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the

> digital personal assistant, identifying a plurality of eligible responses to the utterance, the plurality of eligible responses including:
>
> at least one multimedia object associated with a popular culture reference; and
>
> speech comprising an impersonation of a voice of a person associated with the popular culture reference; and
>
> selecting one of the plurality of eligible responses and causing the selected response to be displayed or played back by the digital personal assistant.

Exemplary, non-limiting support for the amendments to claim 1 are found in the as-filed Specification of the instant application at least at paragraphs [0003], [0020], [0036]-[0037], [0059]-[0060], and, [0069]-[0075], and in FIG. 3.

Applicants respectfully submit that Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, do not teach or suggest each and every one of these features of amended independent claim 1. For example, Chen, Buck Rogers, and Tischer do not teach or suggest "identifying a plurality of eligible responses to the utterance, the plurality of eligible responses including at least one multimedia object associated with a popular culture reference **and** speech comprising an impersonation of a voice of a person associated with the popular culture reference," as recited in amended claim 1.

Applicants respectfully assert that the cited references are completely silent regarding such a feature. That is, the cited references do not teach or suggest identifying eligible responses that include both a multimedia object and speech comprising an impersonation of a voice, as recited in amended claim 1, for at least similar reasons as noted above for claim 14. Therefore, claim 1 is patentable over the cited references.

Regarding the Examiner's reliance on Buck Rogers in the obviousness rejection, Applicants respectfully maintain the arguments from the prior Reply that Buck Rogers may not properly be used in the rejection of the claims.

Additionally, Applicants respectfully assert that the combination of Chen and Tischer with Buck Rogers would not have enabled Applicants or the public to arrive at the instant claims. *Rockwell Int'l Corp. v. United States*, 147 F.3d 1358, 1365 (Fed. Cir. 1998) ("That prior art

patents may have described failed attempts or attempts that used different elements is not enough [to establish obviousness]. The prior art must be enabling."); *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1471 (Fed. Cir. 1997); *Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989) ("In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method."); *Minn. Mining & Mfg. Co. v. Blume*, 684 F.2d 1166, 1173 n.10 (6th Cir. 1982) ("the requirement is simply that the means which would enable the inventor to arrive at the product be obvious"); *In re Payne*, 606 F.2d 303, 314 (C.C.P.A. 1979) ("References relied upon to support a rejection under [35 U.S.C. § 103] must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public.").

In other words, the *mere idea* of a sentient computer in a science fiction television program, without any real-world enabling details as to how such a sentient computer could be realized, when combined with the disclosures of Chen and Tischer would not have placed the instant claims in the public domain nor would this combination have enabled an inventor(s) to arrive at the instant claims without undue experimentation.

For at least this additional reason, Applicants respectfully assert that the combination of Chen, Buck Rogers, and Tischer do not teach or suggest this feature of claim 1.

In view of the foregoing, Applicants respectfully assert that independent claim 1 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Furthermore, Applicants respectfully submit that claims 2-3, 6-7, and 9-13, which depend from independent claim 1, are also patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, for at least similar reasons as their base independent claims, and further in view of their own respective features.

Claim 8 has been cancelled, therefore Applicants respectfully assert that the rejection of claim 8 is moot.

Accordingly, Applicants respectfully request that the rejection of claims 1-3, 6-7 and 9-13 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Claims 18-20

Applicants also respectfully assert that independent claim 18 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. For example, amended claim 18, shown below for illustration, is directed to a computing device that includes…program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including…a digital personal assistant configured to:

> based at least on information received from the digital personal assistant backend, provide a response to the utterance that is selected from among a plurality of eligible responses that includes at least one of text or audio and a multimedia object associated with a popular culture reference, providing the response including displaying or playing back the response by a user interface of the digital personal assistant.

Applicants respectfully submit that Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, do not teach or suggest each and every one of these features of amended independent claim 1. For example, Chen, Buck Rogers, and Tischer do not teach or suggest the claim 18 limitation noted above.

Applicants respectfully assert that the cited references are completely silent regarding such a feature. That is, the cited references do not teach or suggest providing a response from a plurality of eligible responses that include both a multimedia object and one of text or audio, as recited in amended claim 18.

Therefore, independent claim 18, as well as claims 19-20 which depend therefrom, are patentable over the cited references for at least these reasons.

Rejection of Claims 4-5 under 35 U.S.C. § 103(a)

On page 15 of the Office Action, claims 4-5 are rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Chen, in view of Buck Rogers, further in view of Tischer, and still further in view of "Getting Results with Microsoft Office 97," 1995-1997, from Microsoft Corporation (hereinafter, "Getting Results"). Applicants respectfully traverse this rejection and request that it be withdrawn.

As noted above, independent claim 1 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Applicants respectfully assert that Getting Results fails to remedy the deficiencies of Chen, Buck Rogers, and Tischer. Therefore, claim 1 is also patentable over Chen, Buck Rogers, Tischer, and Getting Results, taken alone or in any rational combination. Accordingly, Applicants respectfully assert that claims 4-5, which depend from claim 1, are patentable over Chen, Buck Rogers, Tischer, and Getting Results, taken alone or in any rational combination, for at least similar reasons as their base independent claim, and further in view of their own features.

Accordingly, Applicants respectfully request that the rejection of claims 4-5 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Information Disclosure Statement

Applicants acknowledge and appreciate the indication in the Office Action that the document listed on the Form PTO/SB/08a that accompanied the Information Disclosure Statement (IDS) filed in the instant application on March 8, 2016, has been accepted and considered by the Office.

Conclusion

Amendments made herein or previously made, are without abandonment of subject matter. Applicants expressly reserve the right to, in the pending application or any application related thereto, reintroduce any subject matter removed from the scope of claims by any amendment and introduce any subject matter not present in current or previous claims.

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly 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 April 21, 2016

By / Thomas C. Fiala, #43,610 /
Thomas C. Fiala
Reg. No. 43,610
Attorney for Applicants

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UNITED STATES PATENT AND TRADEMARK OFFICE

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/156,009	01/15/2014	Mouni Reddy	340577.01	1056

69316 7590 04/15/2016

MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

EXAMINER
REINIER, BARBARA DIANE

ART UNIT	PAPER NUMBER
2672	

NOTIFICATION DATE	DELIVERY MODE
04/15/2016	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):

stevensp@microsoft.com
chriochs@microsoft.com
usdocket@microsoft.com

Notice of References Cited	Application/Control No. 14/156,009	Applicant(s)/Patent Under Reexamination REDDY ET AL.	
	Examiner Barbara Reinier	Art Unit 2672	Page 1 of 1

U.S. PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Hamakawa et al., Multimedia Objects, Multimedia Systems and Techniques, Kluwer Academic Publishers 1996, pages 1 and 9
	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.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 14/156,009	**Applicant(s)** REDDY ET AL.	
	Examiner Barbara Reinier	**Art Unit** 2672	**AIA (First Inventor to File) Status** Yes

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

THE REPLY FILED 22 March 2016 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires _____months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

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

NOTICE OF APPEAL

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

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
13. ☒ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☒ Other: PTO-2323 & PTO-892.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
    Claim(s) allowed: .
    Claim(s) objected to: .
    Claim(s) rejected: 1-20.
    Claim(s) withdrawn from consideration: .

/Barbara Reinier/
Primary Examiner, Art Unit 2672

Continuation of 12. does NOT place the application in condition for allowance because: The applicant's remarks with regard to claims 1-7, 9-13 and 18-20 are directed at the proposed amendments which are not entered. Although Tischer is considered to meet a substantial degree of the proposed amendments [as discussed below with regard to claim 14], the AF amendment cannot be reviewed and a search conducted within the time guidelines of the AFCP program.

The applicant argues that the Final OA is deficient for failing to address limitations of independent claim 14. The Examiner respectfully disagrees. Specifically, the applicant asserts that the limitation "providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference." Claim 14 was rejected on the same grounds as claim 1. Tischer was relied upon to teach "the multimedia object being associated with a popular culture reference." The common definition [as would be known by one of ordinary skill in the art] of a "multimedia object" is elements of multimedia data, such as video, audio, animation, images, text etc., that are used as objects in OOP [See Multimedia Objects, Hamakawa et al., 1996] Tischer discloses [as cited] where by utilizing business rules as well as personal information to create [i.e. generate] output strings designed to resonate and persist with the intended recipient [para. 17] The words and phrases that are created a those commonly recognized across a populace [para. 7]. To further elaborate, Tischer additionally discloses [though not explicitly cited], where the business rules [which is explicitly cited] can included phonetics (e.g. speech sounds) [para. 28 and 35]. Given the broadest reasonable interpretation, Tischer does in fact disclose "generating" speech. This speech, when used to repeat the output string that was "generated," can be easily considered as an "impersonation" since the speech sounds are present. An impersonation does NOT inherently imply or mean that the created sounds [i.e. string word(s) when phonetics are concatenated] that the voice has any particular "match" to an expected sound. The claim limitations impose no "impersonation" accuracy limits or degree. The primary reference, Chen, explicitly discloses where a multimedia object's speech that is generated can be output via a speaker. Thus, when considered as a whole, Tischer clearly discloses the multimedia object, which includes speech, being "generated" and includes "an impersonation of a voice of a person associated with the popular culture reference" because when the string is output [via the disclosed business rules that include speech sounds] and the words/phrase used is commonly recognized [as further elaborated in para. 28 and 35], can be considered, given the broadest reasonable interpretation, as an impersonation. Claim 14 DOES NOT require any more response than that of "generating" the speech sounds [claim 14 line 12]. See MPEP 1207.03(a)(II).

The applicant argues that the application of the Buck Rogers reference may not properly be used. The Examiner respectfully disagrees and therefore maintains the position as detailed in the Final OA dated 1/22/2016.

Notice of References Cited	Application/Control No. 14/156,009	Applicant(s)/Patent Under Reexamination REDDY ET AL.	
	Examiner Barbara Reinier	Art Unit 2672	Page 1 of 1

U.S. PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Hamakawa et al., Multimedia Objects, Multimedia Systems and Techniques, Kluwer Academic Publishers 1996, pages 1 and 9
	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.

AFCP 2.0 Decision	Application No.	Applicant(s)
	14/156,009	REDDY ET AL.
	Examiner	Art Unit
	Barbara Reinier	2672

This is in response to the After Final Consideration Pilot request filed 22 March 2016.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.

   ☐ Other:

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☒ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action. See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other:

   Examiner Note: Please attach an interview summary when necessary as described above.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14156009
Filing Date	2014-01-15
First Named Inventor	Mouni Reddy
Art Unit	2672
Examiner Name	Barbara Diane Reinier
Attorney Docket Number	340577.01

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

	1	Second Written Opinion Issued in PCT Application No. PCT/US2015/010711, Mail Date December 15, 2015, 8 Pages. (MS# 340577.02)	

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

EXAMINER SIGNATURE

Examiner Signature	/BARBARA D REINIER/	Date Considered	04/10/2016

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

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

A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2016-03-08
Name/Print	Thomas C. Fiala	Registration Number	43610

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Reddy, *et al.*	Examiner: Reinier, Barbara D.
Serial No.:	14/156,009	Group Art Unit: 2672
Filed:	January 15, 2014	Docket No.: 340577.01
		Confirmation No.: 1056
Title:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

AMENDMENT AND REPLY UNDER 37 C.F.R. § 1.116

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the final Office Action issued on January 22, 2016, Applicants submit the following Amendments and Remarks, along with a Request for Consideration under the After Final Consideration Pilot Program 2.0.

Amendments to the Claims start on page 2.

Remarks start on page 8.

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 under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims, other petitions, etc.) are hereby authorized to be charged to our Deposit Account No. 50-5182.

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
340577.01	14/156,009	January 15, 2014
First Named Inventor:	**Title:**	
Mouni Reddy	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
    - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
    - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
        - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
        - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
            - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
            - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Thomas C. Fiala/	March 22, 2016
Name (Print/Typed)	**Practitioner Registration No.**
Thomas C. Fiala	43610

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☑ * Total of 1 forms are submitted.

Privacy Act Statement

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Reddy, *et al.*	Examiner: Reinier, Barbara D.
Serial No.:	14/156,009	Group Art Unit: 2672
Filed:	January 15, 2014	Docket No.: 340577.01
		Confirmation No.: 1056
Title:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

AMENDMENT AND REPLY UNDER 37 C.F.R. § 1.116

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the final Office Action issued on January 22, 2016, Applicants submit the following Amendments and Remarks, along with a Request for Consideration under the After Final Consideration Pilot Program 2.0.

Amendments to the Claims start on page 2.

Remarks start on page 8.

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 under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims, other petitions, etc.) are hereby authorized to be charged to our Deposit Account No. 50-5182.

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently amended) A method for implementing a digital personal assistant, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant;

based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant; [[and]]

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, ~~causing a response to the utterance to be generated by the digital personal assistant that includes at least one of~~ identifying a plurality of eligible responses to the utterance, the plurality of eligible responses including:

[[a]] at least one multimedia object ~~that is displayed within or played back by a user interface of the digital personal assistant, the multimedia object being~~ associated with a popular culture reference; and

~~speech that is generated or played back by the digital personal assistant, the~~ speech comprising an impersonation of a voice of a person associated with the popular culture reference; and

selecting one of the plurality of eligible responses and causing the selected response to be displayed or played back by the digital personal assistant.

2. (Currently amended) The method of claim 1, wherein the selected response to the utterance ~~further~~ includes text ~~that is displayed within the user interface of the digital personal assistant, the text~~ comprising a quotation associated with the popular culture reference.

3. (Original) The method of claim 1, wherein the speech comprises a quotation associated with the popular culture reference.

4. (Currently amended) The method of claim 1, wherein the selected response ~~to the utterance further~~ includes a visual representation of the digital personal assistant ~~that is displayed within the user interface thereof and~~ that evokes the popular culture reference.

5. (Original) The method of claim 4, wherein the visual representation of the digital personal assistant comprises an animation of the digital personal assistant.

6. (Currently amended) The method of claim 1, wherein the multimedia object comprises:

image or video content that is ~~displayed~~ suitable for display within ~~the~~ a user interface of the digital personal assistant or audio content that is ~~played back~~ suitable for playback by the user interface of the digital personal assistant.

7. (Currently amended) The method of claim 1, wherein the selected response ~~to the utterance further~~ includes:

a link that is ~~displayed~~ suitable for display within ~~the~~ a user interface of the digital personal assistant and that can be activated by the user to access content associated with the popular culture reference.

8. (Canceled)

9. (Currently amended) The method of claim 1, wherein ~~causing the response to the utterance to be generated~~ identifying the plurality of eligible responses to the utterance comprises:

matching the utterance to a particular utterance type within a hierarchical tree of utterance types, each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith~~; and~~

~~selecting the response to the utterance from among the response(s) associated with the particular utterance type~~.

10. (Currently amended) The method of claim 1, wherein ~~causing the response to the utterance to be generated~~ identifying the plurality of eligible response to the utterance comprises:

determining that the utterance is associated with a trending topic; and

in response to determining that the utterance is associated with the trending topic, ~~selecting the response to the utterance from among~~ identifying one or more responses associated with the trending topic.

11. (Currently amended) The method of claim 1, ~~wherein causing the response to the utterance to be generated~~ identifying the plurality of eligible responses to the utterance comprises:

determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant~~; and~~

~~in response to determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant, selecting the response to the utterance from among the one or more predefined responses~~.

12. (Currently amended) The method of claim 1, wherein causing the selected response to ~~the utterance to~~ be ~~generated~~ displayed or played back by the digital personal assistant comprises:

sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant.

13. (Currently amended) The method of claim 1, wherein causing the selected response to ~~the utterance to~~ be ~~generated~~ displayed or played back by the digital personal assistant comprises:

providing text to a computing device executing the digital personal assistant, the text to be processed by a text-to-speech component of the digital personal assistant to generate the speech.

14. (Original) A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference.

15. (Original) The computing device of claim 14, wherein the digital personal assistant is configured to play back an audio file that includes the speech.

16. (Original) The computing device of claim 14, wherein the digital personal assistant is configured to apply text-to-speech conversion to text to generate the speech.

17. (Original) The computing device of claim 14, wherein providing the response further includes at least one of:

displaying or playing back a multimedia object by a user interface of the digital personal assistant, the multimedia object being associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

18. (Currently amended) A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to:

based at least on information received from the digital personal assistant backend, provide a response to the utterance that is selected from among a plurality of eligible responses that includes at least one of text or audio and a multimedia object associated with a popular culture reference, ~~based at least on information received from the digital personal assistant backend,~~ providing the response including displaying or playing back ~~a multimedia object associated with a popular culture reference~~ the response by a user interface of the digital personal assistant.

19. (Original) The computing device of claim 18, wherein the multimedia object comprises an image, video content, or audio content.

20. (Original) The computing device of claim 18, wherein providing the response further includes at least one of:

generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

REMARKS

Reconsideration of this Application is respectfully requested.

Claims 1-7 and 9-20 are pending in the application, with claims 1, 14, and 18 being the independent claims. Claims 1, 2, 4, 6-7, 9-13, and 18 have been amended without adding new matter. Claim 8 is cancelled without prejudice to, or disclaimer of, the subject matter therein.

Entry of the amendments to the claims is respectfully requested.

Applicants have carefully reviewed and considered the final Office Action issued on January 22, 2016 ("Office Action"), and the references cited therein. Based on the following Remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Rejection of Claims 1-20 under 35 U.S.C. § 101

On page 2 of the Office Action, the prior rejection of claims 1-20 under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter is indicated as being withdrawn. Applicants acknowledge and appreciate the withdrawal of this rejection.

Rejection of Claims 1-3 and 6-20 under 35 U.S.C. § 103

On page 5 of the Office Action, claims 1-3 and 6-20 are rejected under 35 U.S.C. § 103 as allegedly being obvious over U.S. Patent No. 8,903,716 to Chen et al. (hereinafter "Chen") in view of the television series "Buck Rogers," 1979-1981 (hereinafter "Buck Rogers") and further in view of U.S. Patent Appl. Publ. No. 2009/0083143 by Steven Tischer (hereinafter "Tischer"). Applicants respectfully traverse this rejection, and request that it be withdrawn.

Claims 14-17

On page 15, the Examiner argues that claim 14 "include[s] features similar to claims 1, 12 and 13 respectively, and therefore, are rejected for the same reasons as claims 1, 12 and 13 respectively." Applicants respectfully disagree.

Applicants respectfully assert that the Office Action is deficient for failing to address limitations of independent claim 14, as set forth below, and respectfully assert that

a new Office Action be issued that fully considers and addresses each and every positively recited feature of each claim.

Patentable distinctions exist between independent claim 14 and the combination of Chen, Buck Rogers, and Tischer. For example, claim 14, shown below for illustration, is directed to a computing device that includes:

> at least one processor; and
>
> a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:
>
> a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;
>
> the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference.

Applicants respectfully assert that independent claim 14 explicitly and positively recites "providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference." As admitted by the Examiner on page 4 of the Office Action in the Response to Arguments, "with regard to applicant's remarks on page 17 under 'Impersonations,' the Examiner made no citation regarding this limitation." Because the Examiner has not provided any basis for the rejection of this limitation of claim 14, the Office Action is defective, and further, a *prima facie* case of obviousness has not been made for claim 14.

Additionally, as Applicants showed in the prior Reply noted by the Examiner on page 4 of the Office Action, the cited references fail to teach or suggest such a feature.

Therefore, Applicants respectfully assert that (1) the current Office Action is defective and must be withdrawn, and a new Office Action must be issued, and (2) the cited references fail to teach or suggest each and every feature of claim 14.

In view of the foregoing, Applicants respectfully assert that independent claim 14 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Applicants also respectfully assert that claims 15-17, which depend from independent claim 14, are also patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, for at least similar reasons as their base independent claim, and further in view of their own respective features. Accordingly, Applicants respectfully request that the rejection of claims 14-17 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Claims 1-3 and 6-13

Applicants respectfully assert that patentable distinctions exist between independent claim 1 and the combination of Chen, Buck Rogers, and Tischer. For example, amended claim 1, shown below for illustration, is directed to a method for implementing a digital personal assistant that includes:

> receiving a digital representation of an utterance of a user of the digital personal assistant;
>
> based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant;
>
> in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, identifying a plurality of eligible responses to the utterance, the plurality of eligible responses including:
>
> at least one multimedia object associated with a popular culture reference; and
>
> speech comprising an impersonation of a voice of a person associated with the popular culture reference; and

> selecting one of the plurality of eligible responses and causing the selected response to be displayed or played back by the digital personal assistant.

Exemplary, non-limiting support for the amendments to claim 1 are found in the as-filed Specification of the instant application at least at paragraphs [0003], [0020], [0036]-[0037], [0059]-[0060], and, [0069]-[0075], and in FIG. 3.

Applicants respectfully submit that Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, do not teach or suggest each and every one of these features of amended independent claim 1. For example, Chen, Buck Rogers, and Tischer do not teach or suggest "identifying a plurality of eligible responses to the utterance, the plurality of eligible responses including at least one multimedia object associated with a popular culture reference and speech comprising an impersonation of a voice of a person associated with the popular culture reference," as recited in amended claim 1.

Applicants respectfully assert that the cited references are completely silent regarding such a feature. That is, the cited references do not teach or suggest identifying eligible responses that include both a multimedia object and speech comprising an impersonation of a voice, as recited in amended claim 1. Therefore, claim 1 is patentable over the cited references.

Regarding the Examiner's reliance on Buck Rogers in the obviousness rejection, Applicants respectfully maintain the arguments from the prior Reply that Buck Rogers may not properly be used in the rejection of the claims.

Additionally, Applicants respectfully assert that the combination of Chen and Tischer with Buck Rogers would not have enabled Applicants or the public to arrive at the instant claims. *Rockwell Int'l Corp. v. United States*, 147 F.3d 1358, 1365 (Fed. Cir. 1998) ("That prior art patents may have described failed attempts or attempts that used different elements is not enough [to establish obviousness]. The prior art must be enabling."); *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1471 (Fed. Cir. 1997); *Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989) ("In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method."); *Minn. Mining & Mfg. Co. v. Blume*, 684 F.2d 1166, 1173 n.10 (6th Cir. 1982) ("the requirement is simply that the means which would enable the inventor to arrive at the product be

obvious"); *In re Payne*, 606 F.2d 303, 314 (C.C.P.A. 1979) ("References relied upon to support a rejection under [35 U.S.C. § 103] must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public.").

In other words, the *mere idea* of sentient computer in a science fiction television program, without any real-world enabling details as to how such a sentient computer could be realized, when combined with the disclosures of Chen and Tischer would not have placed the instant claims in the public domain nor would this combination have enabled an inventor(s) to arrive at the instant claims without undue experimentation.

For at least this additional reason, Applicants respectfully assert that the combination of Chen, Buck Rogers, and Tischer do not teach or suggest this feature of claim 1.

In view of the foregoing, Applicants respectfully assert that independent claim 1 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Furthermore, Applicants respectfully submit that claims 2-3, 6-7, and 9-13, which depend from independent claim 1, are also patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, for at least similar reasons as their base independent claims, and further in view of their own respective features.

Claim 8 has been cancelled, therefore Applicants respectfully assert that the rejection of claim 8 is moot.

Accordingly, Applicants respectfully request that the rejection of claims 1-3, 6-7 and 9-13 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Claims 18-20

Applicants also respectfully assert that independent claim 18 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. For example, amended claim 18, shown below for illustration, is directed to a computing device that includes…program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including…a digital personal assistant configured to:

> based at least on information received from the digital personal assistant backend, provide a response to the utterance that is selected from among a plurality of eligible responses that includes at least one of text or audio and a multimedia object associated with a popular culture reference, providing the response including displaying or playing back the response by a user interface of the digital personal assistant.

Applicants respectfully submit that Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, do not teach or suggest each and every one of these features of amended independent claim 1. For example, Chen, Buck Rogers, and Tischer do not teach the claim 18 limitation noted above.

Applicants respectfully assert that the cited references are completely silent regarding such a feature. That is, the cited references do not teach or suggest providing a response from a plurality of eligible responses that include both a multimedia object and one of text or audio, as recited in amended claim 18.

Therefore, independent claim 18, as well as claims 19-20 which depend therefrom, are patentable over the cited references for at least these reasons.

Rejection of Claims 4-5 under 35 U.S.C. § 103(a)

On page 15 of the Office Action, claims 4-5 are rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Chen, in view of Buck Rogers, further in view of Tischer, and still further in view of "Getting Results with Microsoft Office 97," 1995-1997, from Microsoft Corporation (hereinafter, "Getting Results"). Applicants respectfully traverse this rejection and request that it be withdrawn.

As noted above, independent claim 1 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Applicants respectfully assert that Getting Results fails to remedy the deficiencies of Chen, Buck Rogers, and Tischer. Therefore, claim 1 is also patentable over Chen, Buck Rogers, Tischer, and Getting Results, taken alone or in any rational combination. Accordingly, Applicants respectfully assert that claims 4-5, which depend from claim 1, are patentable over Chen, Buck Rogers, Tischer, and Getting Results, taken alone or in

any rational combination, for at least similar reasons as their base independent claim, and further in view of their own features.

Accordingly, Applicants respectfully request that the rejection of claims 4-5 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Information Disclosure Statement

Applicants acknowledge and appreciate the indication in the Office Action that the documents listed on the Form PTO/SB/08a that accompanied the Information Disclosure Statement (IDS) filed in the instant application on October 20, 2015, have been accepted and considered by the Office.

Conclusion

Amendments made herein or previously made, are without abandonment of subject matter. Applicants expressly reserve the right to, in the pending application or any application related thereto, reintroduce any subject matter removed from the scope of claims by any amendment and introduce any subject matter not present in current or previous claims.

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly 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 March 22, 2016

By /Thomas C. Fiala /
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Electronic Acknowledgement Receipt

EFS ID:	25271657
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Gina Borri
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	22-MAR-2016
Filing Date:	15-JAN-2014
Time Stamp:	16:30:12
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	After Final Consideration Program Request	340577_01-ReqforReconsideration.pdf	226546 71af5433cd2fd250303f103167dc28f6b2b2d829	no	2

Warnings:	
Information:	

2		340577_01_ReplyToFOA_Mailed_012216.pdf	159520 caaa4f86bf98442bd688b7ae7392ab04e360d9e7	yes	15

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Applicant Arguments/Remarks Made in an Amendment	1	1
Claims	2	7
Applicant Arguments/Remarks Made in an Amendment	8	15

Warnings:	
Information:	
Total Files Size (in bytes):	386066

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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)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/156,009	Filing Date 01/15/2014	☐ 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 **03/22/2016**

	(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))	* 19	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

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
/KAREN VESTAL/

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.**
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PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14156009
Filing Date	2014-01-15
First Named Inventor	Mouni Reddy
Art Unit	2672
Examiner Name	Barbara Diane Reinier
Attorney Docket Number	340577.01

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

	1	Second Written Opinion Issued in PCT Application No. PCT/US2015/010711, Mail Date December 15, 2015, 8 Pages. (MS# 340577.02)

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

CERTIFICATION STATEMENT

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

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

OR

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

☒ See attached certification statement.

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

A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2016-03-08
Name/Print	Thomas C. Fiala	Registration Number	43610

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14156009
Filing Date:	15-Jan-2014
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Filer:	Thomas Christopher Fiala/Christine Hartness
Attorney Docket Number:	340577.01

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	25094577
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Christine Hartness
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	08-MAR-2016
Filing Date:	15-JAN-2014
Time Stamp:	18:53:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	5476
Deposit Account	505182
Authorized User	FIALA, THOMAS C

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Charge any Additional Fees required under 37 CFR 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	Non Patent Literature	340577_01NPL1.pdf	799295 710f7cd0b856b2e112de874fb9569f47452bae3a	no	8
Warnings:					
Information:					
2	Transmittal Letter	340577_01IDSCover.pdf	37473 eb14d6851ceaa010dc0c5fe32fa263041ae43d60	no	3
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	340577_01IDS.pdf	1035075 bf4faf345738981c43e88d064828e8a3bc86bb4a	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
4	Fee Worksheet (SB06)	fee-info.pdf	30807 87ae1590abaeda1eac5e62c3a96bca33a15f5428	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1902650		

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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.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

Boehmert & Boehmert
Anwaltspartnerschaft mbB
Holleralllee 32
28209 Bremen
ALLEMAGNE

BOEHMERT & BOEHMERT
Bremen

Eing.: 21. Dez. 2015

gesehen: Sekr.: Anw.:

Verfügung:

Frist: 15.02.2016

PCT

WRITTEN OPINION OF THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rule 66)

Date of mailing (day/month/year) 15.12.2015

Applicant's or agent's file reference
M33083WO

REPLY DUE
within 2 month(s) from the above date of mailing

International application No.	International filing date (day/month/year)	Priority date (day/month/year)
PCT/US2015/010711	09.01.2015	15.01.2014

International Patent Classification (IPC) or both national classification and IPC
INV. G10L15/22

Applicant
Microsoft Technology Licensing, LLC

1. ☒ The written opinion established by the International Searching Authority:
   ☒ is ☐ is not
   considered to be a written opinion of the International Preliminary Examining Authority.

2. This second opinion contains indications relating to the following items:
   - ☒ Box No. I Basis of the opinion
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☒ Box No. VII Certain defects in the international application
   - ☒ Box No. VIII Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.
   When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(e).
   How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 55.3 and 66.8.
   Also: For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4*bis*. For an informal communication with the examiner, see Rule 66.6. For an additional opportunity to submit amendments, see Rule 66.4.

   If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary report on patentability (Chapter II of the PCT) must be established according to Rule 69.2 is: 15.06.2016

Name and mailing address of the international preliminary examining authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465

Authorized Officer

Del Chiaro, Silvia

Telephone No. +49 89 2399-7390

Patent Owner Ex. 2104

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☑ the international application in the language in which it was filed

☐ a translation of the international application into ,
which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3(a) and 23.1(b)).
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))

2. With regard to the elements of the international application, this opinion has been established on the basis of *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed")*:

Description, Pages

1-35 as originally filed

Claims, Numbers

1-9 filed with the letter of 09-11-2015

Drawings, Sheets

1-11 as originally filed

☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.

3. ☑ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☒ the claims, Nos. 6
- ☐ the drawings, sheets/figs
- ☐ the sequence listing *(specify)*:

4. ☐ This opinion has been established as if (some of) the amendments listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-*bis*)):
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing *(specify)*:

5. ☐ This opinion has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 66.1(d-*bis*)).
- ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 66.4*bis*).

6. ☐ Supplementary international search report(s) from Authority(ies) have been received and taken into account in drawing up this opinion (Rule 45*bis*.6(b) and (c)).

Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	No:	Claims 1-9
Inventive step (IS)	No:	Claims 1-9
Industrial applicability (IA)	No:	Claims

2. Citations and explanations:

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 **Documents**

1.1 Reference is made to the following documents:

D1 WO 2013/155619 A1 (PASUPALAK SAM [CA]; PANTONY JOSHUA R [CA]; HSU WILSON [CA]; WU ZHIYUAN) 24 October 2013 (2013-10-24)

D2 US 6 721 706 B1 (STRUBBE HUGO J [US] ET AL) 13 April 2004 (2004-04-13)

D3 US 2006/155765 A1 (TAKEUCHI JOHANE [JP] ET AL) 13 July 2006 (2006-07-13)

D4 US 2009/210217 A1 (OKADA KAZUO [JP]) 20 August 2009 (2009-08-20)

2 **Inventiveness of claims 1 and 9, Article 33(3) PCT**

2.1 Document D1 is regarded as being the closest prior art to the subject-matter of claim 1. It discloses already, in correspondence with claim 1 (the references between brackets relate to D1; the original wording of the claim is set in *italic fonts*; features not disclosed in D1 are set as ~~strikethrough~~; features which differ from the wording of the claim are set underlined):

A method for implementing a digital personal assistant, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant

(paragraph 5, page 2, lines 14-20, paragraph 69);

based on at least an analysis of the digital representation of the utterance

(paragraph 59),

determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant

(paragraph 42 , in the case of chat query, page 7, lines 7-10, paragraph 60); *and*

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant

(paragraph 44, in the case of chat query, see paragraph 42, paragraphs 224-229) *that includes at least one of:*

a multimedia object that is displayed within or played back by a user interface of the digital personal assistant **(paragraph 44)**,

the ~~multimedia object being associated with a popular culture reference~~; and

speech that is generated or played back by the digital personal assistant

(paragraph 44),

~~the speech comprising an impersonation of a voice of a person associated with the popular culture reference.~~

wherein causing the response to the utterance to be generated comprises:
matching the utterance to a particular utterance type within database **(paragraph 226)** ~~a hierarchical tree of~~ utterance types, each utterance type in the database ~~in the hierarchical tree~~ of utterance types having one or more responses associated therewith **(paragraph 226 "the chat service may then look at the candidate responses")**; and
selecting the response to the utterance from among the response(s) associated with the particular utterance type **(see passage of paragraph 226 cited above)**.

2.2 The method defined in independent claim 1 differs from that disclosed in D1 in that:

a) The played multimedia object is associated with a popular culture reference

b) A voice of a person associated with the popular culture reference is used to reproduce the speech.

c)The utterance types are organized as a hierarchical tree.

2.3 The differences a) and b) have no technical character and do not provide any technical effect. A played media associated with the popular culture or the kind of voice used to reproduce the speech is not a technical feature of the system but more an aesthetical or social characterisation.

The said features being not technical do not made any contribution over the prior art and to the inventive activity of the claims,

2.4 Coming to difference c) the said difference has the effect of facilitating the search of the appropriate responses because of the data being organised in a hierarchical tree.

2.5 The objective technical problem to be solved may therefore be as to improve a user device conversation capabilities.

Document D1 discloses already that there is a database of utterance types with multiple responses associated to the different types of utterances. The database is used to find an appropriate response in the case of "chat" conversation and improve the conversational interaction of the user with the device (paragraphs 225-227). A database can be organised in many different known ways, one of which is as a hierarchical structure or a hierarchical tree. The person skilled in the art, confronted with the above objective technical problem and starting from the database of D1, knowing advantages and disadvantages of the different database implementations and the constrains of the system, would choose freely form the many possible implementations applying the one of a hierarchical tree, if necessary, without the help of any inventive activity. Therefore, claim 1 does not meet the requirements of inventiveness of Article 33(3) PCT.

2.6 Therefore the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

2.7 The same considerations apply to claims 9 mutatis mutandis.

3 **Inventiveness of dependent claims 2-7 and 9, Article 33(3) PCT**

3.1 The dependent claims 2-7 do not appear to contain any additional feature which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to inventive step, the reason being as following:

A general statement the Applicant should note that the features "a quotation associated with the popular culture reference", "that evoked the popular culture reference", "associated with the popular culture reference" as in claims 2-4 and 9, have no technical character and do not provide any technical effect, see also paragraph 2.3 above.

The said features being not technical do not made any contribution over the prior art and to the inventive activity of the claims.

The remaining features of claims 2-7 are disclosed in D2 (claim 2-5: paragraph 44, claims 7: paragraph 99, paragraphs 224-229, claim 6: paragraph 227) and D1(claims 2-5: column 15, lines 3-67, column 25, line 55 to column 28, line 51);

Therefore, for what said above the subject matter of claims 2-8 does not involve any inventive activity.

The same considerations apply to claim 9 mutatis mutandis.

Re Item VII

Certain defects in the international application

4 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.

4.1 All independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate.

4.2 The features of the claims 1 and 9 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

4.3 The general statement in the description on page 35 , line 2 refers to the "spirit of the invention". When used to interpret the claims, it indicates that subject-matter for which protection is sought could differ from the subject-matter of the claims, thereby rendering the scope of the claims unclear (Article 6 PCT). The statement should therefore be deleted.

Re Item VIII

Certain observations on the international application

5 **Clarity of claims 1 and 8, Article 6 PCT**

5.1 The expression "a virtual persona of the digital personal assistant" used in claims 1 and 8 is ambiguous and has not well recognized technical meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of the said claims unclear (Article 6 PCT).

5.2 Claim 1 does not meet the requirements of Article 6 PCT because the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result (see Guidelines C II, 5.35), in particular it is not explained how the response among the responses associate to an utterance type is selected.

The same considerations as above apply to claim 8 mutatis mutandis.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Mouni Reddy
Application No.: 14/156,009
Filed: 2014-01-15
Customer No.: 69316
Attorney Docket No.: 340577.01
Group Art Unit: 2672
Confirmation Number: 1056
Examiner: Barbara Diane Reinier
Title: DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

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

STATEMENT FILED PURSUANT TO THE DUTY OF DISCLOSURE UNDER 37 C.F.R. §§ 1.56, 1.97 AND 1.98

Commissioner:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, the Applicant requests consideration of this Information Disclosure Statement.

PART I: Compliance with 37 C.F.R. § 1.97

This Information Disclosure Statement is being filed after issuance of Final office action.

Both Fee and certification are required.

PART II: Additional Information

The Applicant hereby makes the following additional information of record in the above-identified application.

Serial No.	Filing Date	Inventor(s)
N/A	N/A	N/A

PART III: Remarks

The Applicant hereby makes of record in the above-identified application the information listed on the attached form PTO/SB/08A. The order of presentation of the references should not be construed as an indication of the importance of the references. Documents cited on the attached form PTO/SB/08A are enclosed unless otherwise indicated. It is respectfully requested that:

1. The Examiner consider completely the cited information, along with any other information, in reaching a determination concerning the patentability of the present claims;

2. The enclosed form PTO/SB/08A be signed by the Examiner to evidence that the cited information has been fully considered by the Patent and Trademark Office during the examination of this application;

3. The citations for the information be printed on any patent which issues from this application.

By submitting this Information Disclosure Statement, the Applicant makes no representation that a search has been performed, of the extent of any search performed, or that more relevant information does not exist.

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, in fact, prior art as defined by 35 U.S.C. § 102.

Notwithstanding any statement by the Applicant, the Applicant urges the Examiner to form his or her own conclusion regarding the relevance of the cited information. An early and favorable action is hereby requested.

Patent Owner Ex. 2104
Page 131 of 431

Respectfully submitted,

Date March 8, 2016

By: /Thomas C. Fiala, #43,610/

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Reg. No. 43,610

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CERTIFICATE OF MAILING OR TRANSMISSION
(Under 37 CFR § 1.8(a)) or ELECTRONIC FILING

I hereby certify that this correspondence is being electronically deposited with the USPTO via EFS-Web on the date shown below:

March 8, 2016
Date

/Christine Hartness/
Signature

Christine Hartness
Printed Name

Patent Owner Ex. 2104
Page 132 of 431

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/156,009	01/15/2014	Mouni Reddy	340577.01	1056

69316 7590 01/22/2016

MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

EXAMINER
REINIER, BARBARA DIANE

ART UNIT	PAPER NUMBER
2672	

NOTIFICATION DATE	DELIVERY MODE
01/22/2016	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):

stevensp@microsoft.com
chriochs@microsoft.com
usdocket@microsoft.com

Office Action Summary	Application No. 14/156,009	Applicant(s) REDDY ET AL.	
	Examiner Barbara Reinier	Art Unit 2672	AIA (First Inventor to File) Status Yes

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *10/30/2015*.

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

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

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

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

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

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

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-20* is/are rejected.

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

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

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

Application Papers

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

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Response to Arguments

2. Applicant's arguments filed 10/30/2015 have been considered and the 35 USC 101 rejection withdrawn.

3. Applicant's arguments filed 10/30/2015 have been fully considered but they are not persuasive. The 35 USC 103 rejection is maintained.

4. Beginning on page 15, the applicant argues that "*Chen, Buck Rogers, and Tischer do not teach or suggest "determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant," "speech comprising an impersonation of a voice of a person associated with the popular culture reference," and "the multimedia object being associated with a popular culture reference," as cited in claim 1*."

5. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Specifically, the applicant argues at length with regards to the Buck Rogers reference and Tischer references as though they were applied in a vacuum.

6. In summary of arguments on page 16, the sentient computer reference of Dr. Theopolis would "*under no reasonable and/or broad interpretation" qualify as a digital personal assistant with a persona*." The applicant further argues that "*Buck Rogers does not teach or suggest and actual digital personal assistant with a persona … nor is Buck Rogers enabling … i.e. the actual "sentient computer" did not exist nor was it disclosed in Buck Rogers exactly how a "sentient computer" could be achieved*." The sentient computer, Dr. Theopolis, as portrayed in Buck Rogers of the 24th Century, provided into the public domain as early as 1979 the concept of a digital system that was fully capable to converse with a human counterpart [i.e. Buck Rogers] and include its own personality [i.e. persona]. As disclosed in the history, Dr. Theopolis was a scientist that had his consciousness "uploaded" into the digital computer so that his knowledge would not be lost [TV show back-story]. Thus, the intellectual property concept of a sentient computer system with a persona with whom a human could converse with has been in the public domain for over 30 years. The Office does not find that the TV show had to explicit state "this is a personal assistant and it has a persona" as it appears the applicant is suggesting would have had occur. The fact remains that the TV show does explicitly disclose that Dr. Theopolis is a sentient computer and that Dr. Theopolis is presented as a digital computer with a personality that converses freely with Buck Rogers. Thus, the Office finds that there is sufficient disclosure for the grounds in which the Buck Rogers reference was applied. Further, Tischer was not relied upon to disclose a persona.

7. On page 17, the applicant argues that Tischer does not teach or suggest multimedia objects. In the previous OA, Tischer is relied upon to disclose where it is well-known that programming responses in a device can include personalized responses which included words or phrases that are commonly recognized across a populace. Tischer was not relied upon to disclose multimedia objects as this had already been taught by the primary reference of Chen. Chen, having already taught the presentation of multimedia objects but lacking the explicit disclosure of such personalization is thereby improved with such teaching as presented by Tischer.

8. Thus, the piecemeal analysis of both Buck Rogers and Tischer fails to take the teaching of the references in the perspective in which it has been presented.

9. Further, with regard to applicant's remarks on page 17 under "Impersonations," the Examiner made no citation regarding this limitation. The Examiner draws the applicant's attention to line 8 of claim 1 where the claim language recites "… *that includes at least one of*:" The Examiner met this requirement via the multimedia object limitation. The Examiner further did include a citation in that included the output modes of speech as known in Chen [the applied primary reference] for the applicant's convenience. However, given the above specific claim language, the applicant did not require both limitation groups to be met. Therefore, this particular argument is moot.

10. With regards the applicant's arguments on pages 18-19 directed to claims 2-20; these arguments are based on arguments of claim 1. Since the Office views the arguments directed to claim 1 are not persuasive, these arguments are moot.

Claim Rejections - 35 USC § 103

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

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

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-3 and 6-20 are rejected under 35 U.S.C. 103 as being unpatentable over Chen et al. (US 8903716) in view of Buck Rogers (TV series 1979-1981) and in further view of Tischer (20090083143).

Regarding claim 1: Chen discloses a method for implementing a digital personal assistant **[Abstract & col. 10 lines 6-52]**, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant **[a user is speaking to intelligent automated assistant 1002 using input device 1206, col. 18 lines 12-15]**;

based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant **[assistant 1002 includes intelligence beyond simple database applications … Operationalizing semantic intent into a**

strategy for using online services and executing that strategy on behalf of the user, col. 18 lines 47-57]; and

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant that includes at least one of **[assistant responds, col. 18 lines 19-20]**:

a multimedia object that is displayed within or played back by a user interface of the digital personal assistant **[101D of Figure 2, col. 18 lines 20-26]**, the multimedia object being associated with a popular culture reference; and speech that is generated or played back by the digital personal assistant **[Output device 1207 can be a screen, speaker, printer, and/or any combination thereof, col. 10 lines 64-66]**, the speech comprising an impersonation of a voice of a person associated with the popular culture reference.

Chen does not appear to explicitly disclose a persona or that the multimedia object being associated with a popular culture reference.

Buck Rogers discloses, in the well-known TV show which aired publicly from 1979-1981, Dr. Theopolis, a sentient computer with artificial intelligence [i.e. digital personal assistant] featuring its own personality as well as the means for intelligent dialog [i.e. spoken] exchange with a user [e.g. Buck Rogers] that also included a visual indication of interaction [facial illumination] **[Concept and broadcast history]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the invention of Chen to apply personality [i.e. persona]

features as disclosed by the personality of Dr. Theopolis in Buck Rogers because it would provide a more natural conversational interface for the user.

Neither Chen nor Buck Rogers appear to disclose the multimedia object being associated with a popular culture reference.

Tischer discloses in a related system for a personalized user interface **[Abstract & p17]**, where the response to a user include the usage of popular culture reference information **[The information strings include words and phrases that are commonly recognized across a populace … constructing a contextually relevant output string that is relevant to the subject. The output string includes portions of the selected information string, data elements, and personal information elements. The method further includes conveying the output string to the subject, p7]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 2: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein the response to the utterance further includes text that is displayed within the user interface of the digital personal assistant **[Figure 2]**.

Neither Chen nor Buck Rogers appears to disclose where the text is a quotation associated with the popular culture reference.

Tischer discloses where the text is a quotation associated with the popular culture reference **[Information strings may be derived from best selling or classic novels or books, and may include titles, passages, and quotes, p26]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers to apply the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 3: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses where the output can be an audio **[for the intelligent automated assistant 1002, the Output device 1207 can be a screen, speaker, printer, and/or any combination thereof, col. 10 lines 60-66]**.

Buck Rogers discloses where Dr. Theopolis [potentially interpreted as a popular culture reference] has its own persona **[Concept and broadcast history]**.

Neither Chen nor Buck Rogers appear to explicitly disclose wherein the speech comprises a quotation associated with the popular culture reference.

Tischer discloses where the text is a quotation associated with the popular culture reference **[Information strings may be derived from best selling or classic novels or books, and may include titles, passages, and quotes, p26]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified in the invention of Chen in view of Buck Rogers to apply the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 6: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein the multimedia object comprises: image or video content that is displayed within the user interface of the digital personal assistant or audio content that is played back by the user interface of the digital personal assistant **[shown in Figure 2]**.

Regarding claim 7: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein the response to the utterance further includes: a link that is displayed within the user interface of the digital personal assistant and that can be activated by the user to access content *associated with the popular culture reference* **[shown in Figure 2]**.

Chen and Buck Rogers appear to fail to disclose accessing displayed content that is *associated with the popular culture reference.*

Tischer discloses where the response to a user includes the usage of popular culture reference information **[The information strings include words and phrases that are commonly recognized across a populace … constructing a contextually relevant output string that is relevant to the subject. The output string includes portions of the selected information string, data elements, and personal information elements. The method further includes conveying the output string to the subject, p7]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the display and subsequent selective activation access of

Chen in view of Buck Rogers the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 8: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses identifying a plurality of eligible responses to the utterance **[col. 16 lines 35-49 & col. 31 lines 29-54]**; and selecting the response to the utterance from among the plurality of eligible responses to the utterance **[col. 31 lines 29-54]**.

Tischer also discloses identifying a plurality of eligible responses to the utterance and selecting the response to the utterance from among the plurality of eligible responses to the utterance **[Information strings may be derived from best selling or classic novels or books, and may include titles, passages, and quotes, p26]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers to apply the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended

recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 9: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses matching the utterance to a particular utterance type within a hierarchical tree of utterance types, each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith **[e.g. a tree of ontology nodes bound to their matching input tokens, col. 37 line 61 - col. 38 line 26 & col. 76 line 8 – col. 77 line 40]**; and selecting the response to the utterance from among the response(s) associated with the particular utterance type **[col. 38 lines 22-26 & Tables 1-4].**

Regarding claim 10: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein causing the response to the utterance to be generated comprises: determining that the utterance is associated with a trending topic **[intelligent automated assistant 1002 may also enable the combined use of several sources of data and services at once … automate the use of data and services available over the Internet to discover, investigate, select among, reserve, and otherwise**

learn about things to do (including but not limited to movies, events, performances, exhibits, shows and attractions); places to go (including but not limited to travel destinations, hotels and other places to stay, landmarks and other sites of interest, and the like); places to eat or drink (such as restaurants and bars), times and places to meet others, and any other source of entertainment or social interaction, col. 14 lines 12-39]; and in response to determining that the utterance is associated with the trending topic, selecting the response to the utterance from among one or more responses associated with the trending topic **[personal recommendations for activities, products, services, source of entertainment, time management, or any other kind of recommendation service that benefits from an interactive dialog in natural language and automated access to data and services, col. 14 lines 40-62]**.

Regarding claim 11: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen appears to fail to disclose determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant; and in response to determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistance, selecting the response to the utterance from among the one or more predefined responses.

Buck Rogers discloses, Dr. Theopolis, a sentient computer with artificial intelligence [i.e. digital personal assistant] featuring its own personality as well as the means for intelligent dialog [i.e. spoken] exchange with a user [e.g. Buck Rogers] **[Concept and broadcast history]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the invention of Chen to apply personality [i.e. persona] features defined by Dr. Theopolis' plurality of responses [i.e. intelligent dialog] as disclosed by the personality of Dr. Theopolis in Buck Rogers because it would provide a more natural conversational interface for the user.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 12: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein causing the response to the utterance to be generated comprises: sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant **[col. 16 lines 35-61]**.

Regarding claim 13: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein causing the response to the utterance to be generated comprises: providing text to a computing device executing the digital personal assistance, the text to be processed by a text-to-speech component of the digital personal assistant to generate the speech **[col. 16 lines 35-67 & col. 17 lines 47-51]**.

Regarding claims 14-16: they include features similar to claims 1, 12 and 13 respectively, and therefore, are rejected for the same reasons as claims 1, 12 and 13 respectively.

Regarding claim 17: includes at least features similar to claims 3 and 7, and therefore, are rejected for the same reasons as claims 3 and 7.

Regarding claims 18 and 19: they include features similar to claims 1 and 6 and therefore, are rejected for the same reasons as claims 1 and 6.

Regarding claim 20: includes at least features similar to claim 2, and therefore, are rejected for the same reasons as claim 2.

14. Claims 4 and 5 are rejected under 35 U.S.C. 103 as being unpatentable over Chen et al. (US 8903716) in view of Buck Rogers (TV series 1979-1981) and in further view of Tischer (20090083143) and Microsoft (Getting Results with Microsoft Office 97).

Regarding claim 4: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Neither Chen, Buck Rogers nor Tischer appear to disclose wherein the response to the utterance further includes a visual representation of the digital personal assistant that is displayed within the user interface thereof and that evokes the popular culture reference.

Microsoft discloses in a well-known digital system **[Microsoft Office 97]**, a visual representation of *the* digital personal assistant that is displayed within the user interface thereof and that evokes the popular culture reference **[Office Assistant (commonly known as Clippy in popular culture), page 38]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers and Tischer a visual representation of the digital personal assistant as disclosed by Microsoft because it offers the user a visually entertaining avatar as well as a means by which the user knows the assistant is engaged.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 5: Chen in view of Buck Rogers and Tischer discloses the method of claim 4.

Neither Chen, Buck Rogers nor Tischer appear to disclose wherein the digital personal assistant comprises an animation of the digital personal assistant.

Microsoft discloses wherein the digital personal assistant comprises an animation of the digital personal assistant **[Office Assistant (commonly known as Clippy in popular culture), page 38]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers and Tischer a visual representation of the digital personal assistant as disclosed by Microsoft because it offers the user a visually entertaining avatar as well as a means by which the user knows the assistant is engaged.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Conclusion

15. THIS ACTION IS MADE FINAL. 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.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Reinier whose telephone number is (571)270-5082. The examiner can normally be reached on M-Th, 10am - 6pm Eastern.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. 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.

/Barbara Reinier/
Primary Examiner, Art Unit 2672

PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14156009
Filing Date	2014-01-15
First Named Inventor	Mouni Reddy
Art Unit	2672
Examiner Name	Barbara Diane Reinier
Attorney Docket Number	340577.01

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6721706	B1	2004-04-13	Strubbe, et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060155765	A1	2006-07-13	Takeuchi, et al.	
	2	20090210217	A1	2009-08-20	Okada, Kazuo	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2013155619	WO	A1	2013-10-24	Pasupalak Sam		☐

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	International Search Report & Written Opinion Received for PCT Patent Application Number PCT/US2015/010711, Mail Date: March 18, 2015, 11 Pages. (MS# 340577.02)	☐

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EXAMINER SIGNATURE

Examiner Signature	/BARBARA D REINIER/	Date Considered	01/14/2016

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☐ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2015-10-20
Name/Print	Thomas C. Fiala	Registration Number	43610

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

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

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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.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.D.R/

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	Art Unit
	BARBARA REINIER	2672

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	7/24/2015	br
Search via EAST limited by text	7/24/2015	br
Consulted with Mike Opsasnik [Primary 704] for search/art application assistance	7/24/2015	br
Updated inventor search	1/14/2016	br
Consulted with Mohammad Ghayour [SPE 358] regarding withdrawing 101 rejection and maintaining art rejection - specifically the application of NPL Dr. Theopolis prior art	1/14/2016	br

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

Patent Owner Ex. 2104
Page 156 of 431

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	16	(burgener near2 robin).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 16:43
S1	9	("20120124456" | "5918222" | "6144938" | "7225125" | "8073681" | "8140335" | "8346563" | "8447607" | "8498873").PN.	US-PGPUB; USPAT	OR	ON	2015/07/14 13:26
S2	0	14/156009	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 13:26
S3	0	(Reddy near3 Mouni).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 14:09
S4	2673	(Howard near3 Robert).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 14:09
S5	307	("6144938").URPN.	USPAT	OR	ON	2015/07/14 15:40
S6	7	(Malekzadeh near3 Sogol).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 15:43
S7	53	(Harrison near3 Deborah).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 15:43
S8	16	(Howard near3 Robert).inv. and (persona personality)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 15:46
S9	2	("6377919").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/07/14 16:10
S10	1	(interactive near3 (computer digital adj assistant pda! device) near5	US-PGPUB; USPAT; USOCR;	OR	ON	2015/07/14 16:37

		intelligence near6 (audio voice speech))	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S12	1234	(interactive near5 (computer digital adj assistant pda!) near5 (audio voice speech) near6 (reply respon$4))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 16:41
S14	8	(interactive near5 (computer digital adj assistant pda!) near5 (audio voice speech) same (quot$3 quotation impersonation famous))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 16:44
S15	4	((computer digital adj assistant pda!) near5 (audio voice speech) same (quot$3 quotation) with (impersonation famous))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 16:47
S17	1	((computer digital adj assistant pda!) near5 (audio voice speech) same chit$1chat)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 13:43
S19	14	((computer robot) near4 chit$1chat)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 13:47
S27	277	(virtual with (avatar friend girl$1friend boy$1friend) with (talk chat visit) same (tablet computer mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:45
S28	277	(virtual with (avatar friend) with (talk chat visit) same (tablet computer mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:45
S29	102	(virtual with (avatar friend) with (talk chat visit) same (tablet mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:46
S30	3	(virtual near5 (avatar friend) near5 (talk chat visit) near6 (tablet mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:48
S31	0	(virtual with (girl$1friend boy$1friend) near6 (talk chat visit) near6 (tablet computer mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:49
S32	233	((speech speak$3 talk$3) near6 synthe$3 near6 (actor avatar robot))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:51
S33	30	((speech speak$3 talk$3) near6 synthe$3 near6 (actor))	US-PGPUB; USPAT; USOCR;	OR	ON	2015/07/15 14:52

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S34	3	"20050169453"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/25 14:43
S35	6	"20090083143"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/25 14:43
S36	2	(Reddy near3 Mouni).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 09:16
S37	2719	(Howard near3 Robert).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 09:16
S38	16	(Malekzadeh near3 Sogol).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 09:16
S39	58	(Harrison near3 Deborah).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 09:16
S40	3	"20090318777"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 09:22
S41	2	"20130302766"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 09:22
S42	2	"20050163379"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/14 09:24
S43	3	("20060155765" | "20090210217" | "6721706").PN.	US-PGPUB; USPAT	OR	ON	2016/01/14 14:46

1/14/2016 4:47:24 PM
C:\Users\breinier\Documents\EAST\Workspaces\14156009.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	Art Unit
	BARBARA REINIER	2672

✓	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	07/26/2015	01/14/2016							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
	20	✓	✓							

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Reddy, *et al.*	Examiner: Reinier, Barbara D.
Serial No.:	14/156,009	Group Art Unit: 2672
Filed:	January 15, 2014	Docket No.: 340577.01
		Confirmation No.: 1056
Title:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

REPLY UNDER 37 C.F.R. § 1.111

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the non-final Office Action issued on July 30, 2015, Applicants submit the following Remarks.

A Listing of the Claims starts on page 2.

Remarks start on page 7.

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 under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims, other petitions, etc.) are hereby authorized to be charged to our Deposit Account No. 50-5182.

LISTING OF THE CLAIMS

1. (Original) A method for implementing a digital personal assistant, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant;

based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant; and

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant that includes at least one of:

a multimedia object that is displayed within or played back by a user interface of the digital personal assistant, the multimedia object being associated with a popular culture reference; and

speech that is generated or played back by the digital personal assistant, the speech comprising an impersonation of a voice of a person associated with the popular culture reference.

2. (Original) The method of claim 1, wherein the response to the utterance further includes text that is displayed within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference.

3. (Original) The method of claim 1, wherein the speech comprises a quotation associated with the popular culture reference.

4. (Original) The method of claim 1, wherein the response to the utterance further includes a visual representation of the digital personal assistant that is displayed within the user interface thereof and that evokes the popular culture reference.

5. (Original) The method of claim 4, wherein the visual representation of the digital personal assistant comprises an animation of the digital personal assistant.

6. (Original) The method of claim 1, wherein the multimedia object comprises:

image or video content that is displayed within the user interface of the digital personal assistant or audio content that is played back by the user interface of the digital personal assistant.

7. (Original) The method of claim 1, wherein the response to the utterance further includes:

a link that is displayed within the user interface of the digital personal assistant and that can be activated by the user to access content associated with the popular culture reference.

8. (Original) The method of claim 1, wherein causing the response to the utterance to be generated comprises:

identifying a plurality of eligible responses to the utterance; and

selecting the response to the utterance from among the plurality of eligible responses to the utterance.

9. (Original) The method of claim 1, wherein causing the response to the utterance to be generated comprises:

matching the utterance to a particular utterance type within a hierarchical tree of utterance types, each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith; and

selecting the response to the utterance from among the response(s) associated with the particular utterance type.

10. (Original) The method of claim 1, wherein causing the response to the utterance to be generated comprises:

determining that the utterance is associated with a trending topic; and

in response to determining that the utterance is associated with the trending topic, selecting the response to the utterance from among one or more responses associated with the trending topic.

11. (Original) The method of claim 1, wherein causing the response to the utterance to be generated comprises:

determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant; and

in response to determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant, selecting the response to the utterance from among the one or more predefined responses.

12. (Original) The method of claim 1, wherein causing the response to the utterance to be generated comprises:

sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant.

13. (Original) The method of claim 1, wherein causing the response to the utterance to be generated comprises:

providing text to a computing device executing the digital personal assistant, the text to be processed by a text-to-speech component of the digital personal assistant to generate the speech.

14. (Original) A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference.

15. (Original) The computing device of claim 14, wherein the digital personal assistant is configured to play back an audio file that includes the speech.

16. (Original) The computing device of claim 14, wherein the digital personal assistant is configured to apply text-to-speech conversion to text to generate the speech.

17. (Original) The computing device of claim 14, wherein providing the response further includes at least one of:

displaying or playing back a multimedia object by a user interface of the digital personal assistant, the multimedia object being associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

18. (Original) A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including displaying or playing back a multimedia object associated with a popular culture reference by a user interface of the digital personal assistant.

19. (Original) The computing device of claim 18, wherein the multimedia object comprises an image, video content, or audio content.

20. (Original) The computing device of claim 18, wherein providing the response further includes at least one of:

generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

REMARKS

Reconsideration of this Application is respectfully requested.

Claims 1-20 are pending in the application, with claims 1, 14, and 18 being the independent claims.

Applicants have carefully reviewed and considered the non-final Office Action issued on July 30, 2015 ("Office Action"), and the references cited therein. Based on the following Remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

In the Drawings

On the Summary page of the Office Action, the Examiner indicates that the Drawings filed in the instant application on January 5, 2014, have been accepted. Applicants acknowledge and appreciate this indication of acceptance for the Drawings.

Oath/Declaration

Applicants note that there is no indication in the Office Action that the Oaths/ Declarations filed in the instant application on January 5, 2014, have been objected to. Thus, Applicants infer that the filed Oaths/Declarations have been accepted as compliant by the Office, and Applicants acknowledge and appreciate this acceptance of the Oaths/Declarations.

Rejection of Claims 1-20 under 35 U.S.C. § 101

On page 2 of the Office Action, claims 1-20 are rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. Specifically, the Examiner alleges that claims 1-20 are directed to patent ineligible subject matter for claiming abstract ideas without "significantly more." Applicants respectfully traverse this rejection and request that it be withdrawn.

Applicants respectfully assert that claims 1-20 are not directed to an abstract idea, but rather are directed to statutory subject matter, i.e., devices and methods for implementing a digital personal assistant.

I. Legal Standards

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. "USPTO personnel should review the totality of the evidence (e.g., the specification, claims, relevant prior art) before reaching a conclusion with regard to whether the claimed invention sets forth patent eligible subject matter" and "USPTO personnel must weigh the determinations made above to reach a conclusion as to whether it is more likely than not that the claimed invention as a whole either falls outside of one of the enumerated statutory classes or within one of the exceptions to statutory subject matter." MPEP 2106. "'The examiner bears the initial burden … of presenting a prima facie case of unpatentability.' In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992)." *Id.* "If the record as a whole suggests that it is more likely than not that the claimed invention would be considered a practical application of an abstract idea, physical phenomenon, or law of nature, then USPTO personnel should not reject the claim." *Id.* The Examiner must "identify and explain in the record the reasons why a claim is for an abstract idea, physical phenomenon, or law of nature with no practical application." *Id.*

In the Office Action, claims 1-20 are rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter in view of the U.S. Supreme Court holding in *Alice Corporation Pty. Ltd. v. CLS Bank International, et al.*, 573 U.S. ___ (2014) (hereinafter "*Alice*"). In *Alice*, the Court followed the framework for patent eligibility under 35 U.S.C. § 101 set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. ___ (2012) (hereinafter "*Mayo*"). This framework was used by the Court for "distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, *7. The framework used by the Court requires a two-step process of first determining whether the claims at issue are directed to a patent-ineligible concept (i.e., an exception), and if so, a second step for determining if the claim provides "significantly more" than the exception is performed. *See id.* The elements of each claim must be considered both individually and "as an ordered combination" to determine whether the additional elements "transform the nature of the claim" into a patent-eligible application. *Id.* It is not enough to

merely conclude that a claim is patent-ineligible "simply because it involves an abstract concept." *Id.* at *6 (citing *Diamond v. Diehr*, 450 U.S. 175, 187 (1981).

Under the first step of the *Alice* framework, a determination is made as to whether the claim is directed to an exception, such as an abstract idea. See *Alice*, at *7-8. An abstract idea may be an "idea of itself," a fundamental law of nature, natural phenomena, a mathematical formula, a method of organizing human activity, or a "fundamental practice" that is "long prevalent" in the field. *See id.* If not directed to an exception, such as an abstract idea, the claimed subject matter is patent-eligible under the framework. *See id.* at *7. If directed to an exception, such as an abstract idea, the claim is then analyzed under the second step of the framework: a determination of whether the claim recites "significantly more" than the exception. *See id.* The Court in *Alice* stated that the implementation of an abstract idea using a generic computer was not sufficient to add "significantly more" to the claim (*see id.* at *10-14), but the Court also noted that "a process designed to solve a technological problem in 'conventional industry practice'" or a process to perform "something 'the industry ha[d] not been able to obtain'" is patent-eligible subject matter even though the claim may recite the use of an equation on a computer to accomplish the process. *Id.* at *12-13 (citing *Diamond v. Diehr*, 450 U.S. 175, 177-79 and n.3 (1981). Similarly, claim limitations to something other than "well-understood, routine, conventional activit[ies]" previously known to the industry provide for "significantly more." *Alice*, at *15 (citing *Mayo*, 566 U. S., at ___ (slip op., at *4)).

The Federal Register provides additional guidance, including examples from case law, on the determination of whether the claim recites a patent-eligible application of a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea). *See* 2014 Interim Guidance of Patent Subject Matter Eligibility, 79 Fed. Reg. 74,622 (December 16, 2014). For example, the Interim Guidance of Patent Subject Matter Eligibility notes that the Supreme Court in *Alice* has "identified a number of considerations for determining whether a claim with additional elements amounts to significantly more than the judicial exception itself." *Id.* at 74,624. Such considerations include:

1. Improvements to another technology or technical field;
2. Improvements to the functioning of the computer itself;

3. Applying the judicial exception with, or by use of, a particular machine;
4. Effecting a transformation or reduction of a particular article to a different state or thing;
5. Adding a specific limitation other than what is well-understood, routine and conventional in the field, or adding unconventional steps that confine the claim to a particular useful application;
6. Other meaningful limitations beyond generally linking the use of the judicial exception to a particular technological environment.

Id. The Examiner's attention is also respectfully directed to the additional examples of patent eligible claims and subject matter set forth in the Abstract Ideas memo published by the USPTO at http://www.uspto.gov/patents/law/exam/abstract_idea_examples.pdf (hereinafter "Abstract Ideas").

Applicants respectfully submit that in view of the standards set forth above, and for at least the reasons provided below, the rejection of claims 1-20 under 35 U.S.C. § 101 is improper and should be withdrawn.

II. Initial Burden Establishing Patent Eligibility

Applicants respectfully submit that the Examiner has not met the initial burden of establishing that the pending claims are patent-ineligible under 35 U.S.C. § 101. That is, with respect to the pending claims, the Examiner has failed to "identify and explain in the record the reasons why a claim is for an abstract idea, physical phenomenon, or law of nature with no practical application" as set forth in MPEP 2106.

For example, Applicants respectfully submit that the Examiner has mischaracterized the claims as merely being directed to an abstract idea without explaining reasons why the claims are directed to abstract ideas and why the claims amount to no more than abstract ideas. On page 2 of the Office Action, the Examiner argues: "The claim(s) does/do not fall within at least one of the four categories of patent eligible subject matter because claims are directed at abstract conceptual steps; the input information [i.e. utterance of a user] is used to compare with already present information [i.e. analysis determined to engage the digital personal assistant], and then using some set of rules to generate a response." However, no explanation or reasoning is provided on page 2 as to why each claim element is alleged to be no more than an abstract idea.

Applicants respectfully assert that the argument provided on page 2 of the Office Action amounts to no more than an unsubstantiated, conclusory statement that the pending claims, essentially in their entirety, are directed to abstract ideas. For instance, also no page 2 of the Office Action, the Examiner asserts: "Following the flowchart on page 74621 as provided in the Federal Register dated 12/16/2014, claims 1-20 appear to fail at step 2B." However, the Examiner offers no analysis or reasoning whatsoever as to how the flowchart is applied or why the claims allegedly fail to comply according to the Federal Register guidance. The Examiner further asserts: "As discussed in the FR on page 74622, the above claims appear to fall under several of the explicitly detailed conceptual categories that have been found to be ineligible [see columns 2 and 3]." Again, no explanation or analysis is provided to support this allegation by the Examiner, e.g., Applicants are not informed as to which categories are considered relevant by the Examiner and why, and as noted above, the initial burden to show patent eligibility lies with the Examiner. In other words, Applicants have not been afforded a fair opportunity to respond to this rejection at least because the reasons for the rejection have not been clearly set forth in the Office Action.

Accordingly, Applicants respectfully request that a new, non-final Office Action be issued that remedies the legal deficiencies of the current Office Action noted above.

Moreover, Applicants respectfully assert that the Examiner's over-generalized characterization of the claims is also incorrect. For example, claims 1, 14, and 18 recite *inter alia* receiving a digital representation of an utterance of a user, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant based on at least an analysis of the digital representation of the utterance, and generating a multimedia object that is displayed within or played back by a user interface of the digital personal assistant or speech that is generated or played back by the digital personal assistant comprising an impersonation, where the object and speech are related to a popular culture reference. Applicants respectfully assert that characterizing the claims in such an overly-broad manner so as to neglect the positively recited language therein in order to argue abstractness is improper.

Applicants respectfully request that the Examiner properly consider the positively recited claim language for determinations of patentability, both as individual elements and as a whole, and that the Examiner "identify and explain" why specific parts of the pending claims are alleged

to be an abstract idea. The Examiner offers no analysis, explanation or evidence that the recited claim language is directed to an abstract idea—only conclusory statements are provided in the rejection.

Still further, even assuming that the claims are directed to an abstract idea, and Applicants do not so acquiesce, there is little explanation or analysis provided in the Office Action as to why the remaining features of the claims do not amount to "significantly more" than an abstract idea. That is, with the exception of generally citing generic computer implementations (i.e., processor and memory), the Examiner fails to provide reasons why any of the claim elements do not amount to "significantly more."

Applicants respectfully assert that the positively recited claim language, as whole, must be considered in an analysis under 35 U.S.C. § 101, as noted in the legal standards above, and that the Examiner must provide an explanation as to which identified claim elements constitute the alleged abstract idea and why the additional claim elements are alleged as lacking "significantly more." The Examiner fails to even allude to consideration of the claims as a whole, and no additional claim features are addressed in the Office Action with respect to why the additional elements do not provide "significantly more."

Therefore, the current rejection under 35 U.S.C. § 101 has failed to provide any reasons or explanations why the claims are alleged to be no more than abstract ideas, and has failed to provide any reasons why many of the claim elements do not amount to "significantly more."

Because the Examiner has not specifically pointed out why the language of the claims allegedly fail to be mere abstract ideas and fail to show "significantly more" than an abstract idea, Applicants respectfully assert that the Examiner has failed to meet the requisite burden of proof for establishing *prima facie* patent ineligibility for the claimed subject matter, which initially falls on the Examiner. Accordingly, the current rejection of claims 1-20 under 35 U.S.C. § 101 must be withdrawn.

III. The Pending Claims are not Directed to Abstract Ideas

Applicants respectfully assert that the pending claims are not directed to mere abstract ideas. Applicants have carefully reviewed the example categories of abstract ideas listed above in the Legal Standards section, and based on this review, Applicants assert that the pending

claims do not fall under any of these categories. Furthermore, as noted above, the Examiner has not explained which, if any, of the examples or holdings are applicable to each feature of the pending claims under 35 U.S.C. § 101, and the burden of making such a showing originally lies with the Office.

As noted above, the Examiner does not address in the rejection the explicitly recited features of the claims, but rather, only mischaracterizes the claims generally and over-broadly. Applicants respectfully assert that the recited features are not abstract ideas, but rather are claim features that provide a specific technical effect, to wit: providing discernable audio and visual outputs by a digital assistant to a user in a specific manner (i.e., with popular culture references), which are clearly **not** abstract ideas.

Furthermore, despite the allegation in the Office Action that the claims are directed to some form of abstract idea (and Applicants do not so acquiesce), with respect to preemption, the instant claims certainly do not preempt all possible implementations of digital personal assistants, much less outputs provided therefrom. The instant claims are directed to solving specific issues relating to interactions between users and digital personal assistants (see, e.g., paragraph [0002] of the as-filed Specification). For example, independent claims 1, 14, and 18 specifically recite speech that comprises an impersonation of a voice of a person associated with a popular culture reference and/or a multimedia object associated with a popular culture reference. Yet the instant claims do not attempt to broadly encompass the entirety of digital personal assistants or their user interactions. Rather, the claims provide for specific additional features that give "practical assurance that the process is more than a drafting effort designed to monopolize the [abstract idea] itself." *Alice*, at *13 (quoting *Mayo*). Thus, the set of pending claims in the instant application "accords with the preemption concern that undergirds our §101 jurisprudence." *Alice*, at *13.

Accordingly, the pending claims are not directed to abstract ideas, and Applicants respectfully request that the current rejection of claims 1-20 under 35 U.S.C. § 101 be reconsidered and withdrawn.

IV. The Pending Claims also Provide for "Significantly More" than Abstract Ideas

While Applicants respectfully assert that the pending claims are not directed to mere abstract ideas, even assuming for the sake of argument that the claims are directed to abstract ideas (and Applicants do not so acquiesce), the pending claims also provide for "significantly more" than abstract ideas under the framework of *Alice*.

The claims add a specific limitation other than what is well-understood, routine and conventional in the field or add unconventional steps that confine the claims to a particular useful application

As noted above in the Legal Standards subsection, adding a specific limitation other than what is well-understood, routine and conventional in the field, or adding unconventional steps that confine the claim to a particular useful application, are considerations in determining that the claim includes "significantly more." *See Alice*, at *15; *see also Mayo*, slip op., at *4; Abstract Ideas memo, pages 6, 9; Interim Guidance of Patent Subject Matter Eligibility, at 74,624.

As Applicants previously stated, the instant claims are directed to solving specific issues relating to interactions between users and digital personal assistants. The independent claims, shown above, each recite novel features that are not taught or suggested by the cited references: a digital personal assistant with a persona, a digital personal assistant generating speech comprising an impersonation of a voice of a person associated with popular culture, a multimedia object associated with popular culture (*see* Applicants' arguments below regarding the rejections under 35 U.S.C. § 103).

Therefore, these claim features must amount to more than what is "well-understood, routine and conventional in the field" or to "unconventional steps that confine the claims to a particular useful application" in view of the legal standards noted above. Accordingly, Applicants respectfully request that the current rejection of claims 1-20 under 35 U.S.C. § 101 be reconsidered and withdrawn

V. Claims 1-20 are Patent-Eligible under § 101

In view of the foregoing, Applicants respectfully submit that claims 1-20 qualify as patentable subject matter under 35 U.S.C. § 101 and under the guidance provided by the Supreme Court, the Federal Circuit, the USPTO, and in the Federal Register. Accordingly,

Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 101 be reconsidered and withdrawn.

Rejection of Claims 1-3 and 6-20 under 35 U.S.C. § 103

On page 3 of the Office Action, claims 1-3 and 6-20 are rejected under 35 U.S.C. § 103 as allegedly being obvious over U.S. Patent No. 8,903,716 to Chen et al. (hereinafter "Chen") in view of the television series "Buck Rogers," 1979-1981 (hereinafter "Buck Rogers") and further in view of U.S. Patent Appl. Publ. No. 2009/0083143 by Steven Tischer (hereinafter "Tischer"). Applicants respectfully traverse this rejection, and requests that it be withdrawn.

Patentable distinctions exist between independent claim 1 and the combination of Chen, Buck Rogers, and Tischer. For example, claim 1, shown below for illustration, is directed to a method for implementing a digital personal assistant that includes:

> receiving a digital representation of an utterance of a user of the digital personal assistant;
>
> based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant; and
>
> in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant that includes at least one of:
>
> > a multimedia object that is displayed within or played back by a user interface of the digital personal assistant, the multimedia object being associated with a popular culture reference; and
> >
> > speech that is generated or played back by the digital personal assistant, the speech comprising an impersonation of a voice of a person associated with the popular culture reference.

Applicants respectfully submit that Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, do not teach or suggest each and every one of these features of independent claim 1. For example, Chen, Buck Rogers, and Tischer do not teach or suggest "determining that

the utterance comprises an utterance intended to engage with a persona of the digital personal assistant," "speech comprising an impersonation of a voice of a person associated with the popular culture reference," and "the multimedia object being associated with a popular culture reference," as recited in claim 1.

Persona of a digital personal assistant

On page 4 of the Office Action, the Examiner admits that "Chen does not appear to explicitly disclose a persona." However, the Examiner argues that a persona for a digital personal assistant was disclosed in Buck Rogers by "Dr. Theopolis, a sentient computer with artificial intelligence [i.e. digital personal assistant] featuring its own personality as well as the means for intelligent dialog [i.e. spoken] exchange with a user [e.g. Buck Rogers] that also included a visual indication of interaction [facial illumination] [Concept and broadcast history]." Applicants respectfully disagree.

Buck Rogers, a *science fiction* television show, included a sentient computer character named Dr. Theopolis. Dr. Theopolis, however, was not actually a real sentient computer. In fact, as is commonly known, the representation of Dr. Theopolis in Buck Rogers was really just a prop on a television set. The real sentience behind the character was a human actor named Eric Server (see "Notes" section of Dr. Theopolis, Multiversal Omnipedia, Television computer character that features in Buck Rogers in the 25th Century (cited by the Examiner in the Notice of References Cited)) who read the speaking parts for Dr. Theopolis from a script. Applicants respectfully assert that under no reasonable and/or broad interpretation of a digital personal assistant with a persona does an actor reading a script to give a voice to a television show prop qualify. Dr. Theopolis was simply not a real computer. The inanimate prop representing this character in Buck Rogers did not have a persona or actually talk to other characters—rather, it was the voice of a human actor. Accordingly, Buck Rogers does not teach or suggest an actual digital personal assistant with a persona, as recited in claim 1, nor is Buck Rogers enabling as to such a feature to the extent the Examiner relies on the "concept" thereof from the television show (i.e., the actual "sentient computer" did not exist nor was it disclosed in Buck Rogers exactly how a "sentient computer" could be achieved). Furthermore, Tischer is completely silent regarding a digital personal assistant with a persona.

Therefore, Applicants respectfully assert that the combination of Chen, Buck Rogers, and Tischer do not teach or suggest this feature of claim 1.

Multimedia objects

On page 5 of the Office Action, the Examiner admits that neither Chen nor Buck Rogers "appear to disclose the multimedia object being associated with a popular culture reference." However, the Examiner argues that Tischer discloses this feature in the Abstract and paragraph [0017]. Applicants respectfully disagree.

Tischer is generally directed to "implementing personalized dissemination of information" (see Abstract; Summary). Tischer discloses that personal information for a user is received, and that informative text strings are pushed to the user based on the personal information and business rules. See Tischer, paragraph [0017]; FIGS. 3-5E. However, Tischer is completely silent regarding multimedia objects associated with a popular culture reference. That is, Tischer only discloses pushing text strings to users, but Tischer does not teach or suggest multimedia objects (e.g., image, video/audio content (see e.g., as-filed Specification at paragraphs [0059], [0087])) being provided.

Therefore, Applicants respectfully assert that the combination of Chen, Buck Rogers, and Tischer do not teach or suggest this feature of claim 1.

Impersonations

On page 4 of the Office Action, the Examiner argues that Chen discloses "the speech comprising an impersonation of a voice of a person associated with the popular culture reference." Applicants respectfully disagree.

Applicants note that the Examiner fails to cite any portions of Chen that allegedly make such a disclosure, nor does the Examiner assert that Buck Rogers or Tischer disclose this feature. Indeed, upon Applicants' review of Chen, Buck Rogers, and Tischer, these references are completely silent regarding speech comprising an impersonation of a voice, much less a voice of a person associated with the popular culture reference.

Because the Examiner has failed to provide any support for the rejection of this claim feature, a *prima facie* case of obviousness has not been made. Applicants respectfully assert that

claim 1 should be passed to allowance, or that a new, non-final Office Action be issued citing specific portions a reference that allegedly teach this feature of claim 1.

Claims 1-3 and 6-20 are patentable over the cited references

In view of the foregoing, Applicants respectfully assert that independent claim 1 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Applicants also respectfully assert that independent claims 14 and 18 are patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, for at least similar reasons as claim 1. Furthermore, Applicants respectfully submit that claims 2, 3, and 6-13, which depend from independent claim 1, claims 15-17, which depend from independent claim 14, and claims 19-20, which depend from independent claim 18, are also patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination, for at least similar reasons as their base independent claims, and further in view of their own respective features. Accordingly, Applicants respectfully request that the rejection of claims 1-3 and 6-20 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Rejection of Claims 4-5 under 35 U.S.C. § 103(a)

On page 13 of the Office Action, claims 4-5 are rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Chen, in view of Buck Rogers, further in view of Tischer, and still further in view of "Getting Results with Microsoft Office 97," 1995-1997, from Microsoft Corporation (hereinafter, "Getting Results"). Applicants respectfully traverse this rejection, and request that it be withdrawn.

As noted above, independent claim 1 is patentable over Chen, Buck Rogers, and Tischer, taken alone or in any rational combination. Applicants respectfully assert that Getting Results fails to remedy the deficiencies of Chen, Buck Rogers, and Tischer. Getting Results discloses the Windows® operating system assistant "Clippy" that would present options to users for assistance with tasks under the operating system and its associated applications. However, Getting Results fails to teach or suggest "determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant," "the multimedia object being associated with a popular culture reference," and "the speech comprising an impersonation of a

voice of a person associated with the popular culture reference," as recited in claim 1. Therefore, claim 1 is also patentable over Chen, Buck Rogers, Tischer, and Getting Results, taken alone or in any rational combination. Accordingly, Applicants respectfully assert that claims 4-5, which depend from claim 1, are patentable over Chen, Buck Rogers, Tischer, and Getting Results, taken alone or in any rational combination, for at least similar reasons as their base independent claim, and further in view of their own features. Accordingly, Applicants respectfully request that the rejection of claims 4-5 under 35 U.S.C. § 103(a) be reconsidered and withdrawn, and that these claims be passed to allowance.

Information Disclosure Statement

Applicants acknowledge and appreciate the indication in the Office Action that the document(s) listed on the Form PTO/SB/08a that accompanied the Information Disclosure Statement (IDS) filed in the instant application on January 15, 2014, have been accepted and considered by the Office.

Conclusion

Amendments made herein or previously made, are without abandonment of subject matter. Applicants expressly reserve the right to, in the pending application or any application related thereto, reintroduce any subject matter removed from the scope of claims by any amendment and introduce any subject matter not present in current or previous claims.

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly 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 October 30, 2015

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Electronic Acknowledgement Receipt

EFS ID:	23941275
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Christine Hartness
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	30-OCT-2015
Filing Date:	15-JAN-2014
Time Stamp:	14:22:07
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		340577_01NFOAresp.pdf	197637 9e692f42fae4fb151a4e6a92de7755247384ebf7	yes	20

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	20
Warnings:			
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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.

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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)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/156,009	Filing Date 01/15/2014	☐ 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 **10/30/2015**

	(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))	* 20	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

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
/JAMES TUNSTALL/

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.**
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14156009
Filing Date	2014-01-15
First Named Inventor	Mouni Reddy
Art Unit	2672
Examiner Name	Barbara Diane Reinier
Attorney Docket Number	340577.01

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6721706	B1	2004-04-13	Strubbe, et al.	

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	Application Number	14156009
	Filing Date	2014-01-15
	First Named Inventor	Mouni Reddy
	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	International Search Report & Written Opinion Received for PCT Patent Application Number PCT/US2015/010711, Mail Date: March 18, 2015, 11 Pages. (MS# 340577.02)	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14156009
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	Art Unit	2672
	Examiner Name	Barbara Diane Reinier
	Attorney Docket Number	340577.01

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

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Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2015-10-20
Name/Print	Thomas C. Fiala	Registration Number	43610

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Application Number:	14156009
Filing Date:	15-Jan-2014
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Filer:	Thomas Christopher Fiala/Christine Hartness
Attorney Docket Number:	340577.01

Filed as Large Entity

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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
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Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

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EFS ID:	23808531
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
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First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
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(81) **Designated States** *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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[Continued on next page]

(54) **Title**: CONVERSATIONAL AGENT

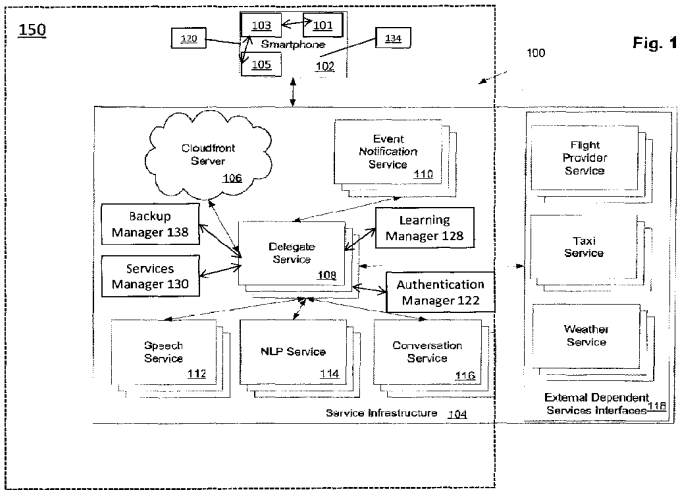


Fig. 1

(57) **Abstract**: A method, system, and computer program product provide a conversation agent to process natural language queries expressed by a user and perform commands according to the derived intention of the user. A natural language processing (NLP) engine derives intent using conditional random fields to identify a domain and at least one task embodied in the query. The NLP may further identify one or more subdomains, and one or more entities related to the identified command. A template system creates a data structure for information relevant to the derived intent and passes a template to a services manager for interfacing with one or more services capable of accomplishing the task. A dialogue manager may elicit more entities from the user if required by the services manager and otherwise engage in conversation with the user. In one embodiment, the conversational agent allows a user to engage in multiple conversations simultaneously.

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CONVERSATIONAL AGENT

CROSS REFERENCE

[0000] This application claims the benefit of (or priority to) U.S. provisional application number 61/636444 filed April 20, 2012 the disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

[0001] The present disclosure relates to user interfaces for a computing device, and more particularly, to a user interface that conversationally interacts with a user of a computing device such as a smartphone.

BACKGROUND

[0002] User interfaces for electronic and other devices are evolving to include speech-based inputs in a natural language such as English. A user may voice a command to control the operation of a device such as a smartphone, tablet computer, personal computer, appliance, television, robot and the like. Natural language processing, a type of machine learning using statistics, may be used to interpret and act upon speech inputs. Speech recognition may convert the input to text. The text may be analyzed for meaning to determine the command to be performed.

[0003] Processing speech inputs in a natural language may be difficult because speech commands may be ambiguous and require clarification. More than one speech input may be used or even required to complete a specific command. Thus, sequential speech inputs may be related to one specific command or to different commands.

[0004] When speaking to conventional speech recognition systems, users often feel the need to modify their natural way of speaking so that a machine may understand the user's intention. This can be cumbersome and annoying which may cause users to abandon such a system.

SUMMARY

[0005] A method, system/device, and computer program product provide a conversation agent to process natural language queries expressed by a user and perform commands according to the derived intention of the user. A natural language processing (NLP) engine derives intent using conditional random fields to identify a domain and at least one task embodied in the query. The NLP may further identify one or more subdomains, and one or more entities related to the identified command. A template system creates a data structure for information relevant to the derived intent and passes a template to a services manager for interfacing with one or more services capable of accomplishing the task. A dialogue manager may elicit more entities from the user if required by the services manager and otherwise engage in conversation with the user. In

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one embodiment, the conversational agent allows a user to engage in multiple conversations simultaneously. In one aspect, there is described a computing device comprising one or more processors and one or more non-transitory storage devices storing instructions that, when executed by the one or more processors, configure the computing device to provide: a natural language processing (NLP) engine for deriving a user intent from at least one user query, the NLP engine configured to identify at least one domain and at least one command associated with the user intent derived; and wherein the NLP engine includes at least one conditional random field for performing entity extraction on the at least one user query to identify at least one entity associated with the at least one command and wherein the command is for performing by a service associated with the domain. The NLP engine may select the at least one conditional random field in response to the at least one domain identified. The computing device may store at least one optimized feature set associated with the at least one domain identified and the at least one conditional random field may be configured to access the at least one feature set. The at least one user query may be received as an audio input comprising speech received from a user communication device. The computing device may provide a speech recognition engine for generating a text representation of the at least one query, the text representation comprising a digital format and said audio input comprising a sound wave. The at least one command and at least one entity may be provided to a services component for identifying at least one service capable of performing the at least one command and for instructing at least one service to perform the at least one command, the at least one service configured to return a service result to the services component in response to performing. The computing device may provide a dialogue manager for identifying at least one dialogue response to the at least one query. The computing device may provide a display manager for formatting an output comprising the at least one dialogue response. The at least one dialogue response may be at least partly based on said service result. The at least one dialogue response may include a confirmation question. The at least one dialogue response may include a clarification question. The at least one dialogue response may include an invitation to one or more services. The dialogue manager may be configured to define the at least one dialogue response in a conversational manner. The NLP engine may be configured to create a list of candidate interpretations of the user query and the dialogue manager may be configured to define the at least one dialogue response to present the list for selection. The dialogue manager may be configured to identify at least one unfilled entity relating to said at least one command and generate at least one dialogue response comprising a prompt to present to a user to obtain the at least one unfilled entity. A respective prompt may be generated for each of the at least one unfilled entity.

[0006] In one aspect, there is described a computing device comprising one or more processors and

one or more non-transitory storage devices storing instructions that, when executed by the one or more processors, configure the computing device to provide: a natural language processing (NLP) engine for deriving a user intent from at least one user query, the NLP engine configured to identify at least one domain and at least one command associated with the user intent derived; and wherein the NLP engine includes at least one conditional random field for performing entity extraction on the at least one user query to identify at least one entity associated with the at least one command and wherein the command is for performing by a service associated with the domain. The NLP engine may select the at least one conditional random field in response to the at least one domain identified. The computing device may store at least one optimized feature set associated with the at least one domain identified and the at least one conditional random field may be configured to access the at least one feature set. The at least one conditional random field may comprise a base-labeled conditional random field configured to extract the at least one entity. The at least one conditional random field may comprise an expanded conditional random field configured to identify a subset of entities for selection by a user. The at least one user query may be received as an audio input comprising speech received from a user communication device. The computing device may provide a speech recognition engine for generating a text representation of the at least one query, the text representation comprising a digital format and said audio input comprising a sound wave. The at least one command and at least one entity may be provided to a services component for identifying at least one service capable of performing the at least one command and for instructing at least one service to perform the at least one command, the at least one service configured to return a service result to the services component in response to performing. The computing device may provide a dialogue manager for identifying at least one dialogue response to the at least one query. The computing device may provide a display manager for formatting an output comprising the at least one dialogue response. The at least one dialogue response may be at least partly based on said service result. The at least one dialogue response may include a confirmation question. The at least one dialogue response may include a clarification question. The at least one dialogue response may include an invitation to one or more services. The dialogue manager may be configured to define the at least one dialogue response in a conversational manner. The NLP engine may be configured to create a list of candidate interpretations of the user query and the dialogue manager may be configured to define the at least one dialogue response to present the list for selection. The dialogue manager may be configured to identify at least one unfilled entity relating to said at least one command and generate at least one dialogue response comprising a prompt to present to a user to obtain the at least one unfilled entity. A respective prompt may be generated for each of the at least one unfilled entity. Related method and computer program product aspects will also be apparent to those of ordinary skill in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Figure 1 is a block diagram of a top level architecture of a communication system including a smartphone and a cloud-based service in accordance with one example embodiment;

[0008] Figure 2 is a block diagram that shows software architecture of the cloud-based service in accordance with one embodiment;

[0009] Figure 3 illustrates a block diagram of modules performing operations (methods) of the service of Figure 1 and 2;

[0010] Figure 4 illustrates a block diagram of modules performing operations (methods) of question-type classification;

[0011] Figure 5 illustrates a block diagram of modules performing operations (methods) of keyword identification;

[0012] Figure 6 illustrates a block diagram of modules performing operations (methods) of answer ranking;

[0013] Figure 7 illustrates a block diagram of modules of an entity Extraction Pipeline performing operations (methods) of entity extraction;

[0014] Figure 8 illustrates a block diagram of hardware and/or software modules on a smartphone, including a conversational app according to one example embodiment;

[0015] Figure 9 illustrates a block diagram of a speech recognition service in accordance with one embodiment;

[0016] Figure 10 illustrates a block diagram of a natural language processing engine interfacing with conditional random fields in accordance with one embodiment;

[0017] Figure 11 shows an example user interface displaying an example interaction with one embodiment;

[0018] Figures 12 and 13 show an example user interface continuing the user interaction from Figure 11;

[0019] Figure 14 shows an example user interface continuing the user interaction from Figure 13;

[0020] Figure 15 shows an example user interface continuing the user interaction from Figure 14;

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[0021] Figure 16 illustrates a block diagram of natural language processing in which a user selects an option from a list in accordance with one example embodiment;

[0022] Figure 17 illustrates a block diagram of natural language processing in which a user does not select an option from a list presented by the user interface;

[0023] Figure 18 illustrates a block diagram of dialogue workflow in accordance with one embodiment;

[0024] Figure 19 illustrates a block diagram of an input pipeline and an output pipeline in accordance with one embodiment;

[0025] Figure 20 illustrates a block diagram of adding new domain functionality to the Conversational Agent according to one example embodiment;

[0026] Figures 21 to 23 show an example interaction using clarification questions on an example user interface according to one embodiment;

[0027] Figures 24 to 26 show another example interaction on an example user interface in accordance with one example embodiment;

[0028] Figures 27 and 28 show an example interaction in which one embodiment of the Conversational Agent operates with a low-level of initiative;

[0029] Figures 29 to 32 show an example interaction in which one embodiment of the Conversational Agent operates with a high-level of initiative;

[0030] Figure 33 shows example workflow of processing a user query according to an example embodiment;

[0031] Figure 34 to 38 show example user interfaces according to an example embodiment;

[0032] Figure 39 shows a block diagram of an electronic payment system according to one embodiment;

[0033] Figure 40 shows example operations of calendar-related actions according to an example embodiment;

[0034] Figure 41 shows a block diagram of an input pipeline of a Conversational Agent performing operations (methods) according to one embodiment;

[0035] Figure 42 shows a block diagram of an output pipeline of a Conversational Agent performing operations (methods) according to one embodiment;

[0036] Figures 43a-43e shows operations (methods) performed using a Topic Board of a

Conversational Agent according to one embodiment; and

[0037] Figure 44 shows operations (methods) of clarification questions and processing in the social domain according to one embodiment.

[0038] For convenience, like reference numerals and designations indicate like parts, components, modules, process steps, etc. in the various drawings.

DETAILED DESCRIPTION

OVERVIEW

[0039] Headings of sections provided in this patent application and the title of this patent application are for convenience only, and are not to be taken as limiting the disclosure in any way.

[0040] Figure 1 is a block diagram of a top level architecture, in accordance with one example embodiment, of a communication system 100 including a smartphone 102 and components of a cloud-based service infrastructure 104 providing a voice-based interface to one or more services. Figure 2 is a block diagram that shows software architecture of the cloud-based service infrastructure 104 in accordance with one embodiment. In the present example embodiment, cloud-based service infrastructure 104 is configured to permit a user of smartphone 102 to provide speech inputs defining commands to obtain a desired user experience that may include the provision of one or more services.

[0041] Figure 8 is a block diagram of smartphone 102 in accordance with one example embodiment. Smartphone 102 is a computing device having one or more processors, long-term and short-term electronic data storage media, an operating system, a display screen which may include a touchscreen interface, at least one antenna for transmitting and receiving data, a general positioning system (GPS), a microphone for receiving audio input, at least one speaker for providing audio output, a camera which may include one or more flashes, and the like (not shown). The Conversational Agent 150 of the invention includes an App 101 that resides on smartphone 102 (other components may reside on cloud-based infrastructure 104). App 101 communicates with an input queue 107, the input queue 107 receiving formatted output messages provided by cloud-base service infrastructure 104. In one embodiment, App 101 processes messages received in the input queue 107, and together with a user interface manager 103 (also referred to herein as Ux Manager 103), provides a user interface 105 for displaying a formatted output to the user. Ux Manager 103 may provide the user interface 105 for receiving input from the user (for example, voice, touchscreen, and the like) for receiving input queries and presenting output in an interactive conversational manner. In an embodiment, Ux Manager 103 formats the user interface 105 (including output received from cloud-based service infrastructure) depending on the display

capabilities of the smartphone 102. As will be described, App 101 may interface with one or more internal service interfaces 120 that provide access to internal hardware and/or software services such as GPS, calendars and alarms, address books contacts, and the like.

[0042] A user may interact with the Conversational Agent 150 via App 101 to perform one or more commands. A command may comprise an action and generally at least one associated parameter or other data. For example, a user query 302 such as "I want to book a meeting" indicates a calendar related action (i.e. command) but does not include associate parameters such as date, time, location, invitees, etc. A user query 302 "I want to fly to San Francisco next Tuesday" indicates a travel related command and provides some associated parameters such as destination and travel date. A user query 302 such as "How are you today?" is a chat related command and does not have any associated parameter. Such user queries 302 may be expressed by the user to carry on a conversation with the App 101 which is adapted to recognize the intention of the user and to respond accordingly.

[0043] Services in the context of this specification may include internal services 120 or external services 118. Internal services 120 relate to one or more functions of the user's device (e.g. smartphone 102) such as voice and data communication services, personal information management (PIM) by way of example, telephone, email, instant messaging (IM), text of short message service (SM), calendar, contacts, notes, music, alarm, and the like. Internal services 120 may incorporate any application already installed on the device as well as system information such as user information, current time, hardware and software information and the like. External services 118 relate to those provided by another party, typically via a web connection, such as a travel booking service, weather information services, taxi service, shopping service, information retrieval service, social networking service, news service, online marketplace service, and the like. The term "interfaces" and "services" may be used interchangeably in this specification to refer to services 118, 120.

[0044] In some contexts, the user input may be a speech input query 302, but responses (output) from the services for presentation to the user by user interface manager 103 on smartphone may be any one or combination of speech (e.g. synthesized automated voice), text, graphical, audio, animation responses, and the like. Output may include text or other types of responses such as image, sounds and the like. In addition to speech input queries 302, a user may interact with the intelligent user interface using a keyboard, touch screen, mouse, and the like and any combination thereof. For example, a speech input "Send an email to Bob" defining a command to email a particular contact may initiate a draft email on smartphone 102. The user may manually edit the email using a keyboard (not shown), a touchscreen keyboard or other input means of smartphone

102. Furthermore, some input commands may be inputted using a combination of two or more input modes, for example by combining a voice command with a touchscreen input. For example, a user may increase the zoom level of the display screen on smartphone 102 by placing one finger on the screen and expressing a command such as "zoom 4 times". In a further example, a user may touch in the vicinity of a certain input field (such as the field for entering recipients of an email message) and say names such as "Bob, Sam, Neal" etc. The Conversational Agent 150 may interface with several services 120 (such as microphone service, speech recognition service, touchscreen service, etc.) to receive and process multi-modal user inputs to perform the desired command according to derived intent of the user.

[0045] Techniques and mechanisms described or reference herein will sometimes be described in singular form for clarity. However, it should be noted that particular embodiments include multiple iterations of a technique or multiple instantiations of a mechanism unless noted otherwise.

EXAMPLE HARDWARE, SOFTWARE ENVIRONMENT

[0046] With reference to Figures 1 and 2, components of cloud based service infrastructure 104 include cloudfront server 106, Delegate Service 108, event notification service 110, speech service 112, natural language processing (NLP) engine service 114, dialogue service 116, domain manager 126, backup manager 138, authentication service 122, Display Manager service 142, Services Manager 130, learning manager 128, external dependent service interfaces 118 providing access to one or more external services such as flight provider service 118A, taxi service 118B and weather service 118C. It is apparent that there may be a plurality of each of these respective service components within the infrastructure which is scalably, reliably and dynamically able to handle service requests from a plurality of communication devices, of which only one (smartphone 102) is illustrated. Though shown as a client (smartphone 102) and server model, certain functions and features may be performed on the client.

[0047] Cloudfront server 106 may provide connection, load balancing and other communication related services to a plurality of communication devices such as smartphone 102. Delegate Service 108 may be chiefly responsible for handling and/or coordinating processing of the speech input, natural language processing of the speech input, the resulting commands for the applicable services and any responses. It will be appreciated that each of the services shown in Figure 1 may also have a load balancer that allocates, instantiates and destroys its respective services dynamically depending on the demand for a particular service by plurality of smartphones 102. Load balancing of any service or group of services of the Conversational Agent 150 may be accomplished though a server administration account, and may incorporate performance metrics such as queries per second, number of user accessing the Conversational Agent 150 and/or a particular module (108,

142, 118, 120, 114, 130, etc.), processing resources being consumed, etc.

[0048] As will be appreciated by one of skilled in the art, examples herein described may be embodied as a method, system, apparatus or computer program product. Accordingly, the examples may take the form of an entirely hardware embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects all generally referred to herein as a "circuit", "module", "library" and the like. Furthermore, the present invention may take the form of a computer program product on a computer-usable storage medium having computer-usable program code embodied in the medium.

[0049] Devices that are in communication with each other need not be in continuous communication with each other, unless expressly specified otherwise. In addition, devices that are in communication with each other may communicate directly or indirectly through one or more intermediaries.

[0050] Computer storage media includes volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structures, program modules or other data. The computer-usable or computer-readable medium may be, for example but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. By way of example, and not limitation, computer readable media may comprise computer storage media and communication media.

[0051] Communication media typically embodies computer readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media includes wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media. Combinations of the any of the above should also be included within the scope of computer readable media.

[0052] When the subject matter is embodied in the general context of computer-executable instructions, the embodiment may comprise program modules, executed by one or more systems, computers, or other devices. Generally, program modules include routines, programs, objects, components, managers, engines, resources, data structures, etc. that perform particular tasks or implement particular abstract data types. Typically, the functionality of the program modules may be combined or distributed as desired in various embodiments.

[0053] A description of an embodiment with several components in communication with each other does not imply that all such components are required. To the contrary, a variety of optional components are described to illustrate the wide variety of possible embodiments of one or more of the invention(s).

[0054] Further, although process steps, method steps, algorithms or the like may be described in a sequential order, such processes, methods and algorithms may be configured to work in alternate orders. In other words, any sequence or order of steps that may be described in this patent application does not, in and of itself, indicate a requirement that the steps be performed in that order. The steps of described processes may be performed in any order practical. Further, some steps may be performed simultaneously despite being described or implied as occurring non-simultaneously (e.g., because one step is described after the other step). Moreover, the illustration of a process by its depiction in a drawing does not imply that the illustrated process is exclusive of other variations and modifications thereto, does not imply that the illustrated process or any of its steps are necessary to one or more of the invention(s), and does not imply that the illustrated process is preferred.

[0055] When a single device or article is described, it will be readily apparent that more than one device/module/component/service/article (collectively referred to as components), whether or not they cooperate, may be used in place of a single component. Similarly, where more than one component is described (whether or not they cooperate), it will be readily apparent that a single component may be used in place of the more than one component.

[0056] The functionality and/or the features of a device may be alternatively embodied by one or more other devices that are not explicitly described as having such functionality/features. Thus, other embodiments of one or more of the invention(s) need not include the device itself.

[0057] Although described within the context of conversational technology for a computing device such as a smartphone 102, it may be understood that the various aspects and techniques described herein (such as those associated with natural language processing, for example) may also be deployed and/or applied in other fields of technology involving human and/or computerized interaction with software. For example, the Conversational Agent 150 of the invention may be used with web-enabled televisions, set-top boxes, voice-enabled appliances in a smart home, interactive voice response systems, voice-enabled automobile interfaces, as well as with other technologies where voice interaction and/or natural language understanding of a user's intent is useful.

[0058] Event notification service 110 provides event-related messages to smartphone 102, for example, data communications such as calendar reminders, recommendations, previously used

external services, daily deals and daily updates, social media events such as status updates, follow-ups, survey requests and the like. In another embodiment, smartphone 102 also includes a device event service 134 for processing device-specific events such as battery low on power, automatic processing of images taken by the camera of the smartphone 102, location reminder based on real-time GPS coordinates of the device 102, as well as any or all of the calendar/alarm reminders that may also be handled by event notification service 110. Cloud-based event notification service 180 may provide information on events related to a user of a smartphone 102 from external services such as a social media service, email service, new service and the like. In one embodiment, cloud-based event notification service 180 uses push technology to notify the Conversational Agent 150 when certain events occur that may be of interest to a user. For example, a user may want to know when a friend has changed their status on a social media website. Cloud-based event notification service 180 may periodically scan for events, and when such an event occurs (such as a friend changing their status) notify the Conversational Agent 150 using push and/or pull technology so that the change of status may be communicated to the user.

[0059] Speech service 112 performs speech-to-text conversion, receiving speech input for defining a command, such as in the form of a digital audio file, from smartphone 102 and provides text output in the form of a user query 302. In an embodiment, the speech service may reside wholly or in part on the client device 102. Speech service 112 may take as an input the raw audio file (in lossy or lossless format, examples of which include PCM, ASR, mp3 and the like). Speech service may interact with one or more language grammars which may correspond with specific domains, languages, subtopics, etc. In one embodiment, the Conversational Agent 150 interacts with user-specific grammars which may include audio and/or grammar models that correspond to the user's accent, intonation patterns, as well as user-specific terms such as the names from the user's address book, geographic terms commonly expressed by the user, and the like. Speech service 112 is described in more detail with respect to Figure 9. In this description, the term user query 302 may refer either to spoken input queries or the text translation of a given spoken input. Natural language processing of an input query 302 is generally performed with a text input string representation of a user query 302. User queries voiced by the user are made up of sound waves. Sound is a mechanical wave that is an oscillation of pressure transmitted through a solid, liquid, or gas, composed of frequencies within the range of hearing. The speech recognition module 112 may employ one or many techniques for converting the inputted audio signals from the user into a digital format for further processing. The digital format may be an audio file, a text file, or any other digital format or combination of digital formats. The speech recognition service 112 transforms the substance of the input from an audio query (wherein the user intent is embodied in a sound wave)

to a digital format such as text string (wherein the user intent is embodied in an electronic digital medium) which can then be processed by an electronic device such as a computer or smartphone 102.

[0060] NLP Engine 114 analyzes the user query 302 to derive the user's intention and specific commands with which to provide the services desired by the user, and may create a representation of the desired user intent. Dialogue service 116 assists with the user interface 105 between the user and the services, for example, by engaging in natural language dialogue with the user. The dialogue may include questions clarifying one or more aspects of a specific command as discussed further herein below. The dialogue service's (116) responses to speech inputs from smartphone 102 need not be in spoken audio format but may be in a text-based, visual, audio or other format as previously mentioned. Dialogue service 116 may also receive general conversational queries 302 and engage in a continuous conversation (i.e. CHAT) with the user. General chat queries 302 do not necessarily relate to a particular command and NLP Engine 114 may determine that the intention of the user is to converse with the Conversational Agent 150.

[0061] Domain manager 126 may dynamically manage, update and make available domain corpora to NLP Engine 114 and other services. In one embodiment, domain manager 126 may dynamically switch domain corpora to maximize the accuracy of NLP Engine 114 recognition of the user's intent (for example, to increase the precision and recall of the Conversational Agent 150). In one embodiment, domain manager 126 manages the incorporation of new domain functionality into the Conversational Agent 150 (see Figure 20). For example, as discussed herein, the range of knowledge available to the Conversational Agent 150 may be expanded by adding new domains (including domain models and corpora) to the Conversational Agent dynamically to provide a broader user experience.

[0062] Interfaces 118 are interfaces to particular web-based services (e.g. Web Services) or other external services. External services typically utilize well-defined interfaces (e.g. application programming interfaces – APIs) for receiving requests and returning responses. Cloud-based service infrastructure 104 provides a manner for receiving natural language commands for such services, determining the applicable external service request based on the derived user intent and any associated data (parameters) to make the request and invoking the request. Cloud-based service infrastructure 104 is also configured to receive the applicable response and provide same to smartphone 102 on user interface 105. Similar operations may be performed to invoke internal services and provide the response(s) to smartphone 102.

[0063] Internal and external services such as via interfaces 118,120 may be invoked in any one of several ways. Any service call mechanism can be used. Examples include REST, SOAP, COBRA

and the like. Non-service call, passive mechanisms can also be used. In this case, data is placed at a digital location that is accessible by the invoked service. The invoked service checks this digital location. The passive mechanism is also effective as an invocation mechanism.

[0064] Software components 200 further include template service 718 to assist with the dialogue service 116, persistence memcache service/relational database management service (RDBMS) 204 for storing and managing data and application server and business code components 206 such as components of an object oriented Jboss Server and Enterprise Java Beans (EJB) contain service in accordance with an example implementation

[0065] Smartphone 102 is configured, such as via one more applications, to send language information to cloud-based service infrastructure 104 and receive a response based on language understanding and the derived intent of the user. In an embodiment, an automatic speech recognition service (ASR Service 112) available to smartphone 102 receives an audio user query from the user and converts the audio user query into a text format which is then communicated to cloud-based service infrastructure 104. ASR service may reside entirely or in part in cloud-based service infrastructure 104 and/or smartphone 102. One or more applications on smartphone 102 may be configured to accept and process one or more user interface commands into an execution command which is then communicated to cloud-based service infrastructure 104. By way of example, a user may voice a command such as "Tell Bob I will be late for the meeting" while pressing an icon on a touch screen that corresponds to a text message. Application 101 may receive the input query and the input touch command and process these two commands into a single command which is passed on to cloud-based service infrastructure 104 for further processing by modules of Conversational Agent 150, such as Services Manager 130 to perform according to the derived intent of the user as determined by NLP Engine 114.

[0066] Smartphone 102 is also configured to receive notifications from event notification service 110. In some embodiments, smartphone 102 may be configured to perform natural language understanding without the use of cloud-based service infrastructure 104, for example, when understanding requires sensitive information that a user prefers is not sent off the smartphone 102 or if cloud-based service infrastructure 104 is unavailable for any reasons. In an embodiment, the natural language processing of user query may be partially performed on smartphone 102 and by cloud-based service infrastructure 104. In some embodiments, user devices need not be limited to smartphones only. Other communication devices can be supported such as "dumb" phones via any communication protocol including TTY and SMS. Non-phone clients such as laptops, tablet computers, personal computers, set top boxes, televisions, kiosks, etc. can also be supported as well.

[0067] In one embodiment, the Conversational Agent 150 employs an encryption manager (not shown) to encrypt and decrypt information sent between smartphone 102 and cloud-based service infrastructure 104. Any encryption method or combination of encryption techniques may be used such as public key encryption. Certain information relating to users of the Conversational Agent 150 may also be anonymized, for example, financial information and addresses and contact information of contacts.

NLP Engine 114

[0068] Figure 3 illustrates a general overview flow of selected operations (methods) 300 of the NLP Engine 114 of the invention according Figures 1 and 2. A user query 302 is input to such operations 300 and operations 300 provides output 304 as discussed further herein below.

[0069] A user interacts with App 101 on their smartphone 102 to perform commands and/or to engage in a conversational dialogue with their smartphone 102. App 101 is a component of the Conversational Agent 150 and provides a user interface 105 for allowing the user to interface with the functionality provided by Conversational Agent 150. A user query 302 is a text representation of a voiced (or typed) user query provided by the user. In general, a user query 302 relates to a domain of functionality. A domain in the context of this specification refers generally to a field of action, thought, topic, conversation, etc. Example domains include CHAT, TRAVEL, WEATHER, SPORTS, CALENDAR, SOCIAL MEDIA and the like. Domains are general categories of classifying dialogue, interaction and intended functionality and may be as specific or as general as makes sense for a given implementation of the Conversational Agent 150.

[0070] In one embodiment, NLP Engine 114 receives a user query 302 as described below and derives the intention of the user. NLP Engine 114 may identify a domain, a subgroup (also referred to as a subdomain), one or more tasks (also referred to as actions and/or commands) according to the derived intention of the user, and one or more entities (also referred to as parameters) that may be useful to accomplish the one or more tasks. As an example interaction, a user expresses the query 302 "Find me a flight from Toronto to New York leaving in a week". The above query 302 may be classified by NLP Engine 114 as relating to the domain TRAVEL, the subgroup of flights. NLP Engine 114 may further relate the user query 302 to tasks to be performed such as "find flights" and maybe "book flights", and may further identify the entities "Toronto", "New York", as well as the departure date. The process of identifying the domain, subgroup, one or more task, and entities associated with a user query 302 is generally referred to herein as deriving the user intent. NLP Engine 114 may create a representation of the derived user intent by creating a software object such as a template 719 and/or by saving the intent to temporary and/or permanent memory. As described further in this specification, the Conversational Agent 150 may attempt to elicit additional

entity information from the user, such as in this example interaction, a particular airline, the return date, the class of the ticket, number of tickets, number of stops allowed, time of the departure and return flights, and the like.

[0071] Dialogue driver 306 (i.e. Delegate Service 108), which may be a component of Dialogue Manager 116, receives user query 302 for processing and provides user query 302 to question type classifier 314. User query 302 is also provided to keyword expansion unit 308. The user query 302 and expanded keywords (not shown) are provided to previous query score determiner 310 which references prior queries (not shown) stored in query database 312. Previous query score determiner 310 performs statistical analysis and provides candidate answers (i.e. commands) for ranking by answer ranking unit 316.

[0072] Query database 312 may store, such as in a machine learning manner, a history of user queries and the associated commands and additional data such as keywords determined by cloud-based service infrastructure 104. The query database 312 may store a complete history (or subset) of a particular user's query and associated commands to build user-centric preferences. For example, a particular user's query "Tell Bob I want a meeting" may result in a command to telephone Bob, send a text message to Bob or email Bob. In an embodiment, the Conversational Agent 150 may ask the user to clarify the command by offering a series of choices for communicating the message to the recipient (in this case Bob). For example, the Conversational Agent 150 may provide a list on the user interface that includes "send email", "send text" and "phone"; the user may simply select the option desired and the Conversational Agent 150 will automatically perform the desired command (see for example Figures 21-23). In an embodiment, the Conversational Agent 150 may simply express a clarification question such as "Would you like to phone, email, or text Bob?" The user may simply say "phone Bob" or "phone" or "phone him", and other related command to initiate a phone command. The Conversational Agent 150 may also provide a clarification list together with an audio clarification question to provide a range of options to the user for selecting the desired command.

[0073] In an embodiment, the Conversational Agent 150 may map a specific command to one or more words contained in a user query. In the above example, the Conversational Agent 150 may map the word "tell" or the phrase "tell Bob" with one or more commands such as an internal phone service. The Conversational Agent 150 may learn over time the behavior patterns and/or preferences of the user in relation to many commands. The Conversational Agent 150 may also learn the preferences and/or behavior patterns of a user in relation to performing a command for a specific parameter or class of parameters. For example, the Conversational Agent 150 may associate the word "Tell" with the parameter "Bob" to the command "phone". However, in the case

of another parameter, for example the contact "Ann", the Conversational Agent 150 may associate the word "Tell" with email. For a class of parameters, such as work contacts, the Conversational Agent 150 may associate the word "Tell" also with email. It will be appreciated that the learning ability of the Conversational Agent 150 of the invention may be leveraged in a variety of other ways. The Conversational Agent 150 may recognize that the word "Tell" is associated with "email" most often during the week and with "phone" during the weekend. In an embodiment, the Conversational Agent 150 may present a list of command choices where one command is presented as a default command based on the learned behavior and/or user preferences, and other commands are presented as an ordered list of commands where the order is also learned.

[0074] In addition to providing a source of user-centric preferences and learned user behavior, query database 312 may also be useful to store and provide access to user queries 302, associated commands and the like from all users, such as via an aggregated subset of queries 302 and associated commands. The aggregated data may define a broader corpus from which statistics and other data may be gleaned and be useful when determining expanded keywords, classification of user queries, mapping words to certain commands, determining classes of users based on recognized user types, and/or the like.

[0075] Question type classifier 314 evaluates user query 302 to determine whether the user query is a function type query, an entity type query, or a clarification type query. A function type query establishes a new command (also referred to herein as a topic). An example of a functional type query is "Book a meeting for next Friday at 2:00 pm" or "Send a message to Bob".

[0076] An entity type query is in relation to a current command (topic) and adds or changes an entity in such a command. For example, "Actually, move that to 3:00 pm" or "Add James to the message" or "Make that a return ticket".

[0077] A clarification type query is in relation to a current command and is responsive to one or more clarification questions posed by the Conversational Agent 150 to elicit more information (such as entities and/or parameters) or to determine which domain the user is referring to with a specific query. Clarification type queries may occur when the Dialogue Manager 116 asks the user a clarification style question. For example, for the user query 302 "Tell Bob I want to book a meeting", Conversational Agent 150 may formulate an output 304 comprising a clarification questions from Dialogue Manager 116 such as "Did you want to text or email Bob". These

clarification questions are formulated to elicit more information regarding the communication method the user wishes to employ to communicate the message to Bob. In the above example, a user query such as "Text him" in response to the clarification question would be classified as

a clarification query 302.

[0078] In response to some queries the Conversational Agent 150 may formulate a clarification question to determine which domain the user is referring to. For example, for the user query "Get me tickets to Rome", the Conversational Agent 150 may recognize that Rome is a city, there are several restaurants with the word "Rome" in the name, and that Rome is also the name of a movie. Conversational Agent 150 may formulate and present as output 304 a clarification question such as: "Did you want a flight to Rome, tickets to the movie Rome, reservations for a restaurant, or something else?." The Conversational Agent 150 may learn over time that the user prefers a certain mapping for queries with the word "Rome" and may take corresponding action (i.e. – perform a command) based on the user behavior and/or user preferences. For example, the Conversational Agent 150 may default to the option of finding flights for queries that contain city names where user behavior indicates that a particular user is a frequent traveler. As another example, the Conversational Agent 150 may default to movies when a particular user query 302 may relate to movies or restaurants (or other domains) because a particular user of Conversational Agent 150 frequently searches for movies.

[0079] Function type queries may be directed by question type classifier 314 to answer ranking unit 316 for determining the new command, if possible. Question type classifier 314 may direct entity type queries and clarification type queries to Template System 318 for additional processing to obtain further meaning from the user query with a view to also initiating appropriate output, for example, by formulating a clarification question. Template System 318 may also receive function type queries from answer ranking unit 316. Template System 318 may access template memory store 320 to define or refine a command and to define applicable output 304.

[0080] Some user queries may be more than one type of query and/or may be compound queries that specify several commands. For example, a user may express a user query 302 such as "Change my return date to Sept. 16 and give me the weather while I am there". Such a user query 302 may be processed in several ways. For example, user query 302 may be divided into separate queries by NLP Engine 114 (i.e. "Change my return date to Sept. 16" and "Give me the weather for destination between departure date and return date"). Furthermore, NLP Engine 114 may also assign the destination location to the word "there" so that the weather may be obtained. NLP Engine 114 may include a query preprocessor (not shown) that is adapted to separate compound queries into individual queries, and also to assign specific entities to anaphora terms in a given query 302.

[0081] Extraction Pipeline 322 may receive user query 302 and conversation features and extract entities from the user query 302 to build up the command and its associated data as described

further herein below with reference to Figure 7. The entities extracted from a given user query 302 may be populated into template object 319 which is passed to services manager 130 to accomplish the derived user intent. Dialogue Manager 116 and Display Manager 142 provide output 304 for smartphone 102 also as described below. Smartphone 102 may have a queue manager 107 that receives output 304 from cloud-based service infrastructure 104.

[0082] Figure 4 illustrates a flow chart of a method 400 of question type classifier 314 in accordance with an example embodiment. In one embodiment user query 302 is provided to method 400 from speech service 112. At 402, a determination is made whether a clarification type question was initiated (i.e. whether the most recent output 304 or a recent output was a clarification question to the smartphone 102 via delegate service 108,306). If a clarification question is not pending, operations continue at step 406. If a clarification question is pending, operations continue at 406.

[0083] At step 404 in one embodiment, user query 302 may be subjected to binary classification such as via a support vector machine (SVM) for analysis. Other known types of binary classification may also be used alone or in combination such as decision trees, Bayesian networks, support vector machines, and neural networks. A support vector machine (SVM) is a concept in statistics and computer science for a set of related supervised learning methods that analyze data and recognize patterns, used for classification and regression analysis. The standard SVM takes a set of input data and predicts, for each given input, which of two possible classes forms the input, making the SVM a non-probabilistic binary linear classifier. Given a set of training examples, each marked as belonging to one of two categories, an SVM training algorithm builds a model that assigns new examples into one category or the other. In one embodiment of the Conversational Agent 150, the two categories are functional-type query and entity-type query. The classifier (i.e. the SVM) may be trained by providing a set of queries identified as belonging to the category of entity-type queries, and another set of queries belonging to the category of functional-type queries.

[0084] User query 302 is applied to the SVM at step 404, and SVM may perform analysis of the user query 302 to determine whether the query is an entity type query related to current command (topic), or not (i.e. the user query is a function type query). Functional type queries are passed at step 408 to answer ranking module 316. Entity type queries may be passed at step 410 to Template System 318.

[0085] As described above, a training algorithm may build a model for the SVM for assigning new queries to either the functional-type query category or the entity-type query category. An SVM is a representation of the examples as points in space (hyperplane), mapped so that the examples of the separate categories are divided by a clear "gap" that is as wide as possible. New queries are then mapped into that same space and predicted to belong to a category based on the side of the

gap on which reach respective query falls. When preparing the SVM and when passing in new queries for classification, it may be useful to selectively provide certain words, terms and metadata and/or other features related to the query 302. Using all words from a query 302 may be problematic because common words may skew results incorrectly. Services, application programming interfaces or other means (such as Extraction Pipeline 322 illustrated in Figure 7) which perform entity extraction may be useful to extract entities (parameters) such as people, places, dates, specific things, contacts, times, etc. For example, the following is an example of features which may be determined and provided by a query preprocessor (not shown) and passed to the SVM:

- Presence of keywords: TF-IDF (term frequency–inverse document frequency) scores for each domain may be calculated for each word in the entire corpus. The words are then sorted and a selection of the words with the top 50 scores (as an example) is made.

- Question type keywords: This represents the words that often begin or identify questions, such as: how, where, when, why, who, what followed by obvious keywords that related to the domains (e.g. commands related to functions provided by a user interface) such as call, text, message, book, and the like.

- Presence of key entities: Examples include places/addresses, person names, restaurant types and names, food dish names, date, etc. As new domains may be added to the Conversational Agent 150, key entities may also be added. These key entities may be retrieved using named entity recognition and extraction as described herein.

- Potential features: For example, the current action that the user is performing on the device, the previous domain the user requested, etc.

- Presence of regular expressions: whether the query matches a pattern known to be found in data for each domain. Patterns may have be handcrafted and/or partly learned from data for each domain. For example, a query 302 beginning with the phrase "Find me..." may commonly indicate a functional-type query related to flights, internet search, music, and the like.

[0086] When a clarification query has been posed and is pending (i.e. the clarification question has not been answered), at 406 a determination may be made whether the user query 302 contains keywords related to the clarification question posed (i.e. whether the query 302 is responsive to a clarification query). For example, in the case where a clarification question offers a list of options, such as "Would you like to phone, text, or email Bob", Conversational Agent 150 may look for the words "phone", "text" and "email" in the response user query 302. As another example, where the clarification question asks for the specific name of an entity such as "What city would you like to depart from?", the Conversational Agent 150 may look for the name of a specific city in the

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response query. If it is determined that the query contains keywords related to the clarification question posed, then the query is a clarification type query and the classification of the user query (and its association with the current command) may be passed to Template System 318 for further processing. If such keywords are not present, the user query may comprise a new functional type query or an entity type query (such as where the entity/entities were not the focus of the clarification question posed). The user query may be then forwarded to step 404 via the 'no' branch from 406.

[0087] In one embodiment, NLP Engine 114 uses a clarification-question SVM to determine if a particular query 302 is responsive to a pending clarification question. In an embodiment, keyword identification may be performed in the context of operations 406 enable the determination of whether the user query 302 is an answer to the clarification question posed. Statistics may be defined for particular terms to identify their relative frequency of appearance in user queries 302 associated with a particular category (e.g. each respective category may represent a specific command).

[0088] Figure 5 illustrates a flow chart of a method 500 of keyword identification such as may be useful for processing a user query 302 to determine the set of keywords related to the command and/or entities in the query. A database 312 of queries and associated categories and commands may be defined and made available for keyword expansion. For example, in the context of a smartphone 302, a subset of categories may represent functions/commands such as "email", "telephone", "book meeting", "set alarm", "short message service (SMS)/text" amongst others. In Figure 5, the user queries grouped by associated categories are represented as Category "A" queries 502, Category "B" queries 504, Category "C" queries 506, and Category "D" queries 508. It is understood that more or less categories may exist in an actual implementation, and that the categories available together with their associated queries may dynamically updated, added, deleted, and the like by the Conversational Agent 150.

[0089] In an embodiment, the relative frequency of a term in a category is comparatively determined in relation to the terms' infrequency in the other categories as well. In step 510, TF-IDF word scoring is used to determine keywords for each category. A document is defined as the set of queries that belong to the same category (e.g. 502,504,506,508). Specifically, a separate corpus may be maintained and utilized for each domain such as TRAVEL, MUSIC, SOCIAL MEDIA, CALENDAR, TIME, and the like. The corpus related to the TRAVEL domain, for example, may include queries with relevant travel-related keywords such as "flight", "trip", "vacation", "hotel", "attractions", city names, airline names, airport names, airport codes, "rental", rental car companies, and the like. The corpus related to the SOCIAL MEDIA domain may include queries with relevant social-related keywords such as, for example, "friends", "wall", "news fee", "message", the name of

common social media sties, the names of friends and business associates, the name of application integrated with social media websites, and the like.

[0090] The corpus (within query database 312) is the set of queries (502, 504, 506, etc.) that are not the category where we are finding the keywords. In this specification, the term category(ies) may be used synonymously with the term domain(s). A term (keyword) which is relatively unique to category "D" is also less frequently occurring in the corpus of category "A", B" and "C" queries. This database of queries, related commands and associated statistics may be maintained (e.g. pre-calculated) so that the statistics are available for use in real-time when processing the user query 302. These statistics may be updated by a learning manager module 128 as described further in the specification. A word ranking for words in the current user query 302 may be determined (at 512) to identify unique words indicative of keyword status for determining the domain to which the user query 302 relates.

[0091] The user query 302 may be analyzed for keywords from the category or categories associated to the user query 302. Given that a clarification type question may have elicited the current user query, one or more categories may have been previously associated with the current user query 302 as determined from processing the prior user query which occasioned the clarification. These one or more categories related to the current command. It is understood that because individual user queries may be vague and/or ambiguous, more than one category (command) may be associated with the use query (e.g. as respective commands). As the dialogue develops, a specific command can be determined.

[0092] The classification of the query 302 type is useful to perform a new command (via answer ranking unit 316 and Template System 318) or to further process a current command by eliciting more information from the user (via Dialogue Manager 116 and Template System 318).

[0093] With reference to Figure 6, there is illustrated a flow chart of a method 600 of an answer ranking module 316 that may be used according to a Conversational Agent 150 of the invention. Answer ranking may be performed to assist with the identification of the specific command to which the user query 302 relates. In the context of Figure 6, answer ranking module 316 is configured to identify an appropriate command that relates to the derived intent of the user. For example, a user may voice a query such as "I want to buy a ticket to San Francisco". Speech service 112 may process the audio input and (incorrectly) produce the user query 302 of "I want to tickets in San Francisco" which is provided to answer ranking module 316. Answer ranking module 316 evaluates the user query 302 with operations (methods) shown in Figure 3 and may correctly determine that the correct command (i.e. according to the user intent) is related to finding a flight to San Francisco.

[0094] As described above, answer ranking may be performed when the question type classifier 314 determines that a user query 302 is likely a function type query. In the present example embodiment, answer ranking method 600 performs four types of analyses (602, 604, 606 and 608) on user query 302 and combines the results (via a two-layer neural network 610) to drive a rank of answers 612. A neural network is a mathematical model or computational model that is inspired by the structure and/or functional aspects of biological neural networks. A neural network consists of an interconnected group of artificial neurons, and it processes information using a connectionist approach to computation. In most cases an artificial neural network (ANN) is an adaptive system that changes its structure based on external or internal information that flows through the network during the learning phase. Modern neural networks are non-linear statistical data modeling tools. They are usually used to model complex relationships between inputs and outputs or to find patterns in data.

[0095] Though a plurality of four natural language processing techniques are used in the example embodiment, few or additional techniques may be used and the respective results of same combined to drive a rank of answers. In some embodiments, a means other than two-layer neural network may be used to combine such results.

[0096] In one of the analyses, user history is examined to define a previous score (602). Previous query score 602 may be used, for example, as an indication that the current query 302 is related to the same or a similar command to that used in relation to a previous user query. For example, for a given user query 302a such as "Find me the weather outside now", there may be a strong likelihood that similar queries (for example, query 302b "What is the weather like right now") relate to the same or similar commands as was previously associated with query 302a. In this way, an association between a given command and the same or similar user queries 302 may be reinforced by the previous query score 602 according to one embodiment.

[0097] Keywords may be extracted from user query 302 such as by TF-IDF techniques as described herein. Previous user queries and their respective associated commands form a corpus for comparative purposes. Keywords may be expanded with related words (e.g. synonyms and/or words with similar meanings) such as via WordNet™ expansion (WordNet is a registered trademark of Princeton University <http://wordnet.princeton.edu>) or using other keyword generation methods.

[0098] The extracted and expanded keywords may form the basis of a comparison or search applied against the query corpus and a relevance score calculated (e.g. retrieval and ranking functions) to rate search results. The search results (i.e. each respective candidate command and its associated ranking score) are made available to operations of two-layer neural network 610. The ranking

function applied at 602 may comprise a BM25 of similar ranking function (e.g.BM25-F taking into account document format, length, etc.). BM25 relies upon IDF statistics to determine relevance of keywords in a document set.

[0099] In one of the analyses (random forest 604 in this embodiment), the user query 302 is applied to a set of decision trees where each decision tree assigns (i.e. determines) a command to which the user query relates. A rank (or mode) may be calculated to determine which command (or commands) results most frequently by the decision trees. Let N(c) represent the number of decision trees that classify the user query 302 as command 'c'. R(c) is the score for class 'c' calculated as N(c) divided by the sum of N(c) for all c's derived by the decision trees. The scores and associated candidate commands are made available to operations of two-layer neural network 610. A two layer neural network (see 610 discussed below) may be trained in order to determine the probability that the query was relevant to a given command. From this a rank for each of the classes can be determined according to this probability.

[0100] In one set of analyses (e.g. multiclass Support Vector Machines 606), the query is applied to a set of SVMs to determine a command. In one embodiment, each SVM is a binary classifier configured to determine whether the user query is associated with a particular command or any of the other commands (i.e. a oneversus-all determination). An example one-versus-one determination is email vs. telephone. In another embodiment, an SVM is configured for each pair of commands to determine whether the user query 302 is associated with one of the two particular commands (e.g. email vs. telephone) (i.e. a one-versus-one determination). It is noted that in a one-versus-one embodiment, SVMs may be configured for a pairing of particular commands to a null class.

[0101] In a one-versus-all determination, if the SVM approach is the sole classifier, a winner takes all approach is often adopted, selecting the highest score from the SVMs. The SVMs require calibration to produce comparable scores. In the one-versus-one approach, a command selected most frequently by the set of SVMs is the candidate command if the SVM approach is the sole classifier. In this example environment where the SVM approach is one of four inputs, scores for each candidate command are provided for operations of two-layer neural network 610.

[0102] In one of the analyses (naïve Bayes classifier 608), the user query 302 is provided to a Bayes-theorem based classifier with strong independence assumptions to perform document classification. The naïve Bayes classifier determines a probability that a particular user query (set of features) belongs (i.e. is associated with) a particular class (i.e. command). The classifier naïve Bayes classifier may be trained using a training set of known queries and associated commands. It may be assumed that words of a user query 302 are independent. Frequency of appearance (count) of a word in a given class (command) may be used to determine a probability that a particular word

is in a particular class. The score for a particular class is a multiplier of the score (probability) for each word in the query relative to the particular class. Care must be taken when a word never appears in a particular class to avoid multiplying by zero. A smoothing technique can be used to eliminate the effects of zero probabilities in the data.

[0103] The Conversational Agent 150 may employ one or more aggregation modules for combining classifiers 602, 604, 606, and 608 and for providing generating a result therefrom. In one embodiment, a two-layer neural network 601 is used to combine scores from classifiers 602, 604, 606, and 608 and to define a single score for each command. More particularly, the scores from the classifiers are used as input nodes to a two-layer neural network which represents a rank function. The set of classifier scores for a single candidate command represents a single input vector. This vector is scored, via the neural network 610, according to its relevance to the user query. Here a score of 1 is considered highly relevant to the user query and a score of 0 is considered irrelevant. Each of the vectors for each command are scored via the rank function and sorted according to their score. Finally, the scores are normalized by dividing each of the scores by the maximum number of scores.

[0104] Other aggregation modules may be employed in place of or in conjunction with two-layer neural network 601. In one embodiment, answer ranking module 316 uses a logistic regression analysis to combine classifier scores 602,605,606,608 and generate a combined ranking result for each candidate command. Logistic regression is a type of regression analysis used for predicting the outcome of a binary dependent variable (a variable which can take only two possible outcomes, e.g. "yes" vs. "no" or "success" vs. "failure") based on one or more predictor variables. For example, in one embodiment, logistic regression analysis takes classifier scores 602,605,606,608 and determines whether candidate command is likely to be correct or not.

[0105] In another embodiment, answer ranking module 316 uses a reciprocal rank fusion analysis to combine classifier scores 602,605,606,608 and to generate a combined ranking result (i.e. score) for each candidate command.

Conditional Random Fields

[0106] According to one embodiment, the Conversational Agent 150 of the invention may employ one or more Conditional Random Fields ("CRF"s), such as, for example, template filler CRF 716 and entity extraction CRF 714 as shown in Figure 7. CRFs are a type of discriminative undirected probabilistic graphical model. They are used to encode known relationships between observations and construct consistent interpretations.

[0107] In one embodiment, each word in a given user query 302 is evaluated according to at

least one CRF to determine whether each word is likely to represent a particular feature. A feature in this context is a property that a given word either has or doesn't have. Examples of features are "Is this word a noun?", "Is this word a city?", "Is this word a song?", "Is this word a preposition" and the like. A CRF decides upon whether a given word has a particular feature according to the following formula:

[0108] $P(\text{Entity}(E)|\text{Feature}(F)) = \alpha e W(T/E)F$

[0109] Where Alpha is the normalization constant and W is the weight vector for the specific entity. Each weight will be associated with a feature.

[0110] A CRF for a specific domain requires specific features and entities that are relevant to be identified. As an example, take a scenario of buying a flight ticket. A user may express the query "Find me a ticket from Toronto to New York, leaving on Monday, coming back on Friday". The Conversational Agent 150 processes this user query 302 to identify entities that may be necessary for the Services manager 130 to call an external flight service to process the request. In this particular example, Services Manager 130 may require DEPARTURE_CITY (Toronto), DESTINATION_CITY (New York), DEPARTURE_DATE (coming Monday) AND RETURN_DATE (Friday after the coming Monday). Services Manager 130 may also use TIME, LUXURY_CLASS, COST, CARRIER, STOPOVERS, NUMBER_OF_TICKETS, PRICE, SPECIFIC_GROUP, HOTEL, as well as other entities.

[0111] Within the Conversational Agent 150, recognized features may be passed along to a Template Tagger (i.e. Template System 318) which further breaks down the recognized entities into more precise entities. In one embodiment, the first CRF recognizes general features (such as, this word is a city) and the second CRF recognizes specifics of the features (such as, this city is San Francisco).

[0112] Once a set of features has been decided for a particular domain, it is necessary to acquire training data, and then have the data labeled with correct entities. The labeled data 708 and general features set 706 are passed along to a genetic algorithm 704 and both conditional random fields (714,716). One a set of training data has been labeled with the correct entities, training of the one or more CRFs is a matter of maximum likelihood learning for $P(Ei \mid Fi; W)$.

[0113] Once training has been complete, any new sentence (i.e. user query 302) can be processed by first extracting out features, and then feeding that sentence and the feature set though the one or more CRFs. The process used by the NLP Engine 114 for processing queries 302 according to one embodiment is illustrated in Figure 20 and Figure 33.

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GENETIC ALGORITHM

[0114] Feature selection, and hence optimizing the operation of conditional random fields 714,716 are done via 305. Any combination of features can be used to perform the task of Named Entity Recognition using a CRF. However, the use of a particular feature set may have a dramatic effect on the accuracy of the results. The Conversational Agent may use a genetic algorithm 305 to determine the optimal feature set for a given domain. The challenge of finding the optimal feature set may be thought of as searching the entire space of feature sets for the optimal answer. In order to apply the genetic algorithm, the following mapping from the feature set space to a binary vector space is applied:

Let F be the set of all features Let V be a binary vector space Let f be a particular feature set Let S be a mapping F->V

V=S(f) st

V[i] = 1 if f contains F[i]

V[i] = 0 if f does not contain F[i]

[0115] An example of a potential fitness function is made of the f=measure + log(n) where n is the number of features in the feature set. The f-measure is a common accuracy measure for named entity recognition and the log(n) term is added so that the system favors smaller models.

TEMPLATE SYSTEM 318

[0116] With reference to Figure 7, a genetic algorithm 702 working on a general feature set 704 determined from a labeled corpus 706 generates (e.g. off-line, in advance of its use in a particular classification instance) optimized feature sets 708 for respective specific domains. Each domain may have its own Extraction Pipeline 322 for extracting entities for the specific domain. For example, the Extraction Pipeline 322 for the RESTAURANT domain is adapted to identify entities related to restaurants such as name, location, cuisine, price, atmosphere, rankings, and the like. Each pipeline instance 322 receives the user query 302 and its conversation features 710. Examples of conversational features 710 include question ID, results of pronoun resolution and/or anaphora resolution with previous sentences, and other related information.

[0117] A feature extraction module 712 expands the features associated with the user query

302 and conversation features 710. Examples include date lists, number lists, city lists, time lists, name lists, among others.

[0118] The expanded user query 302 and its specific conversation features 712 are fed through the filter created by the genetic algorithm and provided to a previously defined conditional random field (CRF). CRF is a statistical modeling method applied for pattern recognition. Optimized feature sets are used to define the filter and to train the CRF. The CRF is trained with specific features decided by the genetic algorithm. After it is trained with specific features, the CRF is configured (i.e. biased) to expect those features in the future. The system ensures that the CRF only gets the features it is expecting.

[0119] In the illustrated embodiment, two layers of CRF are employed. A first layer determines general entities (e.g. an entity extraction CRF 714). For example, in a travel booking user interface, general entities may include date, place, time, etc. A second layer determines more specific template entities (e.g. a template filler extraction CRF 716) such as destination, departure location, departure date to fill templates of the Template System 318. In some embodiment, a single layer CRF may be employed. Template System 318 may store (e.g. to template memory store 320) the filled or partially filled template for a particular command as user queries are processed.

SERVICES MANAGER 130

[0120] A Services Manager 130 may be provided for executing and/or performing a command according to the derived user intent. Services Manager 130 may interface with one or several internal 120 and/or external services 118 via an application programming interface, a predefined protocol, and/or the like. In an embodiment, Services Manager 130 performs a requested command (or groups of commands) based on a filled or partially filled template 319 provided by NLP Engine 114. In one embodiment, template 319 is filled with entity information by the NLP Engine 114 as described above with respect to named entity recognition and entity extraction, which then passes template 319 to the Services Manager 130. The derived user intent may be combined with some or all of the rich information described herein to further complete template 319. Services Manager 130 in one embodiment evaluates the content of template 319 to determine if the command requested (according to derived user intent) can be performed. In one embodiment, Services Manager 130 may select a service from a collection of services that are able to perform substantially the same command (i.e. offer substantially similar functionality).

[0121] By way of example, a user may express the query 302 "Show me the weather for Singapore for the next two weeks". Natural language processing engine 114 may receive the query 302 from the delegate 108, and fill out a template 319 with the entities that can be extracted from the

query 302, as well as from rich information (described further below). NLP Engine 114 may pass the template 319 back to the Delegate Service 108 for routing to the Services Manager 130 and/or directly route the template 319 to the Services Manager 130. In an embodiment, Services Manager 130 evaluates template 319 to determine several pieces of information. First, Services Manager 130 obtains the domain that the query 302 relates to (in this example, WEATHER) as well as any subdomains if applicable. A subdomain of the domain WEATHER may be for example "weather forecast", "weather history", "weather maps", etc. In this case, Services Manager 130 may identify the query as relating to the subdomain "weather forecast". Services Manager 130 may then refer to a list of applicable services that related to the domain/subdomain to determine which of the services are operable to perform the desired command and/or similar commands. Services Manager 130 and/or another module of Conversational Agent 150 may maintain the list of applicable services and their related domains/subdomain as well as interfacing instructions for each applicable service 118, 120. The list of services categorized by domain and/or subdomain may be stored in memory by Services Manager 130 and updated accordingly. In an embodiment, Services Manager 130 dynamically creates, updates, stores, optimizes, etc. the list of services 118,120 as new domains are added to the functionality of Conversational Agent 150 and/or as new third-party functionality is integrated into the Conversational Agent 150 by interfaces 118,120.

[0122] Once the Services Manager 130 has identified the service(s) 118,120 that are available to perform the command according to the derived user intent, Services Manager 130 may select an appropriate service to execute the command. Services Manager 130 may select the appropriate service based on one or more criteria such as user satisfaction with a particular service, traffic load on services, amount of information contained (i.e. the entities available) in the template 319, etc. As an example, a user may express a query 302 "Get me a flight to San Francisco leaving on Friday". NLP Engine 114 identifies the user query 302 as a query relating to the TRAVEL domain and flight booking subdomain, extracts the relevant entities from the user query, and fills out template 319 with the extracted entities. As an example, template 319 filled in with relevant entities may be illustrated as follows:

[0123] <Template name="flight">

[0124] <TemplateObject slotKey="TO" value="San Francisco"/>

[0125] <TemplateObject slotKey="DEPARTUREDAY" priorityGroup=0 groupTogether=true value="March 16, 2012" />

[0126] <TemplateObject slotKey="RETURNDAY" priorityGroup=0 groupTogether=true />

[0127] <TemplateObject slotKey="FROM" priorityGroup=1 groupTogether=true value="Toronto" />

[0128] <TemplateObject slotKey="LUXURY" priorityGroup=2 groupTogether=false />

[0129] <TemplateObject slotKey="RETURNTIME" priorityGroup=3 groupTogether=true />

[0130] <TemplateObject slotKey="DEPARTURETIME" priorityGroup=4 groupTogether=true />

[00131] <TemplateObject slotKey="PRICE" priorityGroup=4 groupTogether=false />

[0132] <TemplateObject slotKey="SPECIFICGROUP" priorityGroup=5 groupTogether=false />

[0133] <TemplateObject slotKey="CARRIER" priorityGroup=5 groupTogether=false />

[0134] <TemplateObject slotKey="NUMBERATICKETS" priorityGroup=5 groupTogether=false />

[0135] <TemplateObject slotKey="NUMBERCTICKETS" priorityGroup=5 groupTogether=false />

[0136] <TemplateObject slotKey="NUMBERSTICKETS" priorityGroup=5 groupTogether=false />

[0137] </Template>

[0138] In the example template 319, NLP Engine 114 is able to extract the entities directly out of the user query 302, for example, the destination city of "San Francisco" and the departure date of "March 16, 2012". In an embodiment, NLP Engine 114 may apply user settings and/or preferences such as "Look for one-way tickets if return date not entered" and "Use current GPS location for departure city", in this case, Toronto. NLP Engine 114 may pass this partially completed template 319 to Services Manager 130 for handling as described herein. When Services Manager 130 receives template 319, Services Manager 130 selects appropriate services

118,120 from a services list for the TRAVEL domain, flight subdomain, and may apply additional logic to select he appropriate service. For example, Services Manager 130 may determine that four external services are available for booking flights. In this example, these services are labeled S1, S2, S3 and S4 for convenience. Services Manager 130 may then apply logic to determine which of S1, S2, S3 and S4 are most appropriate to call according to the derived user intent, as well as to provide a high level of user satisfaction. Continuing this example, Services Manager 130 may determine that service S1 does not list flights for San Francisco and is therefore not an appropriate service to call; Services Manager 130 may also determine that service S2 is currently down (i.e. not available), and therefore is not an appropriate service to call. Because only service S3 and service S4 are appropriate for executing a command according to the derived user intent, Services Manager 130 may analyze user satisfaction ratings for S3 and S4. In finding that S3 has a higher user satisfaction rating, and/or that S3 is preferred to S4 by the current user, Services Manager then calls S3 which returns a result to the Services Manager. In one embodiment, Services Manager 130 analyses other user preferences such as "Default to dates are flexible" to determine the appropriate service. For example, if "Dates are flexible" is set or defaulted to be TRUE, Services Manager 130 evaluates the appropriate services 118,120 to determine if they are capable of executing a command according to the derived user intent and user preferences. Continuing with the above example, Services Manager 130 has already determined that only services S3 and S4 are available and/or capable of executing the desired user command. Services Manager 130 then determines that service S3 is not capable of searching for flights with flexible dates, and therefore after applying logic, Services Manager calls service S4 which returns a result. If for example, both S3 and S4 are incapable of searching for flights by flexible dates, Services Manager 130 may still select one or both services S3 and S4 to call by providing default dates.

[0139] Clarification type questions may be generated by Dialogue Manager 116. Each class (i.e. command) may have a predefined clarification dialogue or multiple dialogues that are assembled using natural language generation. Dialogue Manager 116 generates questions providing specific alternatives among the classes, e.g. Did you want to <class 1>, <class 2>, <class 3>? Continuing the example, for the user query "Tell Bob I want a meeting on Thursday" a possible clarification response question generated by dialogue driver may be "Did you want to text, email or book a meeting?" Dialogue Manager 116 passes the desired command and extracted entities to the Delegate Service 108 for example, to invoke a particular function via Services Manager 130.

DIALOGUE MANAGER 116 and TOPIC BOARD 1830

[0140] Dialogue Manager 116 is operable to provide a variety of functions such as, but not including, domain modularization, disambiguation, mixed initiative, Personalization /

recommendation / intent recognition, subtask (resumption), confirmation, each of which is described in more detail below (see too Figure 18).

[0141] Dialogue Manager 116 maintains conversation/system state and generates responses (output 304) based on the state of the conversation, the current domain being discussed by the user, entities that may need to be filled (by eliciting clarification questions), response from services 118,120, and the like. Dialogue Manager 116 may be configured as a finite state machine. Markov decision process (MDP) or partially observable MDP (POMDP) techniques may be used for determining actions of the Dialogue Manager 116. States may comprise entity, clarification, speech error, NLP error, unknown request, informative response and the like. The operation of Dialogue Manager 116 will be described in more detail below.

[0142] As mentioned above, Delegate Service 108 may receive user query 302 and may communicate user query 302, relevant metadata and/or a modified user query 302 to other modules/managers/services of the present invention. In one embodiment, Delegate Service 108 directs user query 302 to NLP Engine 114 to extract a representation of the intent of user, an associated command, and one or more parameters. NLP Engine 114 may return the derived information representing the user intent back to the Delegate Service 108 for further processing and/or store the information in the Topic Board 1830. In one embodiment, NLP Engine 114 uses a Template Tagger (i.e. Extraction Pipeline 322) to create and populate template object 319 and then communicates (directly or via Delegate Service 108) the template 319 to Services Manager 130 for accomplishing the command according to the derived user intent.

[0143] Topic Board 1830 may be a database, a data structure, instantiated objects, a log file, and the like. Topic Board 1830 may be used by the Delegate Service 108 to store rich information about a user conversation, user session, and/or user history. In an embodiment, Topic Board may store the following information: user query 302, entire conversation transcript, NLP domain classification, identified task, filled entities, etc. Topic Board 1830 may be adapted to act as a parallel agenda in that Topic Board 1830 may keep track of, monitor, detect events, etc related. to any number of simultaneous conversations that the user is engaging in with the smartphone 102.

[0144] Figure 19 illustrates the conversation flow between a user of a smartphone 102 and the Conversational Agent 150. Conversational Agent 150 may include an input pipeline 1910 for managing input queries 302 from the user as well as commands coordinated by Services Manager 130. Additional details of input pipeline 1910 processing are illustrated in Figure 41 in accordance with one embodiment. Output pipeline 1920 manages the dialogue interaction (as well as other Ux modes) between the user and Conversational Agent 150 as well as the rendering output to be presented on the smartphone 102. Additional details of output pipeline1920 processing are

illustrated in Figure 42 in accordance with one embodiment. Topic Board 1830 may be an organized electronic data storage collection (such as a database), which acts a link between input pipeline 1910 and output pipeline 1920. Topic Board 1830 may include, for example, incomplete templates (i.e. templates that do not have enough entities filled in to make an internal and/or external service call) as well as result information from templates 319 that were successfully executed via external/internal services 118, 120. Topic Board 1830 thus allows modules in the input pipeline 1910 (for example, Delegate Service 108, Services Manager 130, NLP Engine 114, etc.) to process an input query 302, save the state of the command according to the intention derived from the input query 302 (for example, if more information needed in template 319 to perform a command, or the command has been completed by services 118,120) and to release any data the modules 108,130,114 may be storing and the modules may then be destroyed and/or released. The architecture illustrated in Figure 19 allows modules 108,130,114,116,etc. as well as other services spawned by the modules, to be lightweight and use a minimum amount of memory, as data is quickly gathered and stored in Topic Board 1830, and the modules are then released.

[0145] Dialogue Manager 116 may be operable to periodically scan Topic Board 1830 to determine an appropriate presentation order of results received from services 118,120 and the associated conversational and/or output dialogue to be presented on the App 101 of smartphone 102. For example, Dialogue Manager 116 may scan Topic Board 1830 and see a single entry which is an incomplete template 319. The template 319 is incomplete in the sense that template 319 did not have the required entities filled in so that Services Manager 130 could not perform a command via internal and/or external services 118,120 according to a derived intention of the user. Continuing the example, Dialogue Manager 116 accesses Topic Board 1830 and determines that more information (i.e. entities) are needed from the user so that Services Manager 130 can perform a command according to derived user intent. Dialogue Manager 116 may have access (via a dialogue database) to a predetermined collection of dialogue statements (i.e. clarification questions) designed to elicit entities from a user so that a given template 319 may be populated. In one embodiment,Dialogue Manager 116 may generate dialogue using natural language generation technology to elicit additional entities from the user.

[0146] In an example interaction, a user expresses a user query 302 such as "Get me a flight from Toronto to New York, leaving on April 9th coming back on April 15th". NLP Engine 114 receives the user query 302 via the Delegate Service 108 and processes the user query 302 as described herein. NLP Engine 114 recognizes the user intention relates to a domain such as TRAVEL, subgroup flights, and recognizes certain entities such as Toronto, New York, April 9th, and April 15th. A Template Tagger 318 may be employed to create a template object 319 with the relevant

information of the derived user intention. A possible template 319 for this example interaction may look as follows:

[0147] Template name="flight">

[0148] <TemplateObject slotKey="TO" priorityGroup=0 groupTogether=true value="New York"/>

[0149] <TemplateObject slotKey="DEPARTUREDAY" priorityGroup=0 groupTogether=true value="April 9, 2012"/>

[0150] <TemplateObject slotKey="RETURNDAY" priorityGroup=0 groupTogether=true value="April 15, 2012"/>

[0151] <TemplateObject slotKey="FROM" priorityGroup=1 groupTogether=true value="Toronto"/>

[0152] <TemplateObject slotKey="LUXURY" priorityGroup=2 groupTogether=false />

[0153] <TemplateObject slotKey="RETURNTIME" priorityGroup=3 groupTogether=true />

[0154] <TemplateObject slotKey="DEPARTURETIME" priorityGroup=4 groupTogether=true />

[0155] <TemplateObject slotKey="PRICE" priorityGroup=4 groupTogether=false />

[00156] <TemplateObject slotKey="SPECIFICGROUP" priorityGroup=5 groupTogether=false />

[0157] <TemplateObject slotKey="CARRIER" priorityGroup=5 groupTogether=false />

[0158] <TemplateObject slotKey="NUMBERATICKETS" priorityGroup=5 groupTogether=false />

[0159] <TemplateObject slotKey="NUMBERCTICKETS" priorityGroup=5 groupTogether=false />

[0160] <TemplateObject slotKey="NUMBERSTICKETS" priorityGroup=5 groupTogether=false />

[0161] </Template>

[0162] As shown above, example template 319 is in the form of an XML file; however, other formats can be used to store and communicate domains, subgroups, entities, etc. between modules of the Conversational Agent 150. The tag "value" with an associated string in quotations indicates

that a particular entity has been filled. In this example, TO, FROM, DEPARTUREDAY, and RETURNDAY have their respective "value" field filled. It will of course be appreciated that the above tag names and entity types are merely exemplary, and that embodiments of the invention may employ a variety of template formats, tag names, specific entities for a particular domain and across several domains.

[0163] Dialogue Manager 116 may access template 319 from Topic Board 1830 as described above and generate dialogue to elicit additional entities from the user. Continuing the example, Dialogue Manager 116 may employ logic to determine which entities must be filled so that Services Manager 130 may correctly interface with a service 118,120. Say for example that in one embodiment the entities LUXURY and NUMBERATICKETS must be filled for Services Manager 130 to interface with services 118,120. Dialogue Manager 116 may access a dialogue collection to generate dialogue configured to elicit entity information from the user. The dialogue questions identified may related to each entity, a collection of entities, and/or may be created by concatenating several dialogue statements together using natural language generation. Dialogue Manager 116 may produce an output question such as "How many tickets would you like to purchase for this flight?" Display Manager 142 may format the dialogue question together with any flight results already found by Services Manager 130 and format the presentation of the output in an appropriate format. Ux Manager 103 displays the flight results together with the output question "How many tickets would you like to purchase for the flight". A user may respond to the questions by expressing a query 302 such as "two tickets", "two", "two please", "please give me two tickets", and the like, and/or by inputting the number of tickets in another input mode such as via the touchscreen

[0164] In one embodiment, Dialogue Manager 116 is operable to generate compound entity-eliciting questions. In the above example, Dialogue Manager 116 may generate a question such as "Please tell me the luxury level and the number of tickets you would like?" In one embodiment, Dialogue Manager 116 may randomly select an appropriate entity eliciting question from a corpus of suitable questions (i.e. questions designed to elicit one or more particular entities), so that the interaction between a user and the Conversational Agent is unpredictable and refreshing to a user as different dialogue questions may be outputted to the user for a single entity.

[0164.1] Referring to Figure 10, a process and system are illustrated for extending the entities supported by a particular domain using minimal tagged data (i.e. using a training data set of a relatively small size). A Base labeled CRF is trained using the training data in which entities are already tagged. When a user asks a query, the NLP Engine communicates with the Base labeled CRF and requests the Base labeled CRF to extract any entities from the query. The Base labeled CRF extracts the entities embodied in the query, and directs such entities to the NLP Engine (1).

The NLP Engine provides the extracted entities to the user by displaying or otherwise communicating the entities to the user (2). The user proceeds with their interaction by accepting the entities provided at (2) or communicating that the entities are incorrect (3) and/or not acceptable to the user's intention in asking the query.

[0164.2] The NLP Engine may interface with a second CRF (Expanded CRF) that is configured to provide additional entities that may better match the entities embodied with the query (4). In various embodiments, the Expanded CRF may be a CRF such as the Base labeled CRF together with one or more data sources of similar entities supported by the Base labeled CRF. For example, the Expanded CRF may include one or more data sources having synonyms, geographic data, restaurant data, contact information, etc. that may be used in conjunction with the Base labeled CRF to extend the breadth of entities that are supported by the Base labeled CRF. The Expanded CRF returns an "N-best list" of possible entities to the NLP Engine (5), which are then displayed or otherwise communicated to the user (6). "N" is a whole number such as 5 that may be set by an administrator of the system and/or the user. The user may choose one of the entities provided as best matching the user's intention, or the user may reject all of the entities provided by the Expanded CRF.

[0164.3] Figures 11 – 15 illustrate the interaction of the user with the entities provided by the CRFs described with respect to the Figure 10. In Figure 11, the user utters a query to the conversational agent 150 such as "I'd like a ticket to San Diego". As shown in Figure 10, the query is provided to the NLP Engine which may request the base labeled CRF to extract entities from the query, which are then directed and communicated to the user. As shown in Figure 12, the entity extracted by the base labeled CRF and presented to the user on the display of the user's computing device is "San". In Figure 13, the user selected the entity "San" (for example, by touching the computing device's touchscreen) which indicates that the user would like to see additional entities (i.e. the entity "San" is not acceptable to the user). The particular interaction shown in Figure 13, in which the user touches the entity to indicate that the entity is not acceptable, is only one example of the how the interaction may be designed. The user's rejection of the entity may be communicated to the NLP Engine, and as shown in Figure 10, and the NLP Engine may communicate with the Expanded CRF and request the Expanded CRF to extract additional entities from the query which can then be communicated to the user.

[0164.4] Figure 14 shows the additional entities that have been extracted by the Expanded CRF and provided to the user for selection. The N-best list includes three possible entities which as indicated previously may vary depending on the number of entities that are extracted and/or on the settings of the system. The user may select the entity "San Diego", and the conversational agent

provides a list of flights to this location (i.e. San Diego) on the device display as shown in Figure 15.

[0164.5] Figure 16 illustrates how the process of Figure 10 (as illustrated by an example in Figures 11 – 15) may improve the performance of the conversational agent 150. If the user selects one of the corrected entities provided by the Expanded CRF, the NLP Engine may provide the selected entity to the Base labeled CRF which increases the precision and recall of the Base labeled CRF. In various embodiments, the Base labeled CRF does not need to be retrained, because the selected entity may be entered into a data source which is referenced by the Base labeled CRF. In other embodiments, the Base labeled CRF may be retrained with the additional entity. As shown in Figure 17, the recall of the Expanded CRF may be increased in the event that the user does not like any option (i.e. any of the entities communicated to the user) because the Expanded CRF may be modified such that the probability that the entities will be provided to the user based on the same or similar query may be lowered.

MULTIPLE CONVERSATIONS

[0165] Input pipeline 1910, output pipeline 1920 and Topic Board 1830 provide an architecture that allows a user of smartphone 102 to engage in multiple conversations with the Conversational Agent 150 simultaneously and across domains. For example, a user can simultaneously carry on an interactive voice session with the Conversational Agent 150 about diverse domains such as FLIGHTS, WEATHER, RESTAURANTS, NEWS, SOCIAL, SEARCH, KNOWLEDGE, MOVIES, STOCKS, TIME AND ALARM, CALENDAR, etc., the given domains and domain tags (i.e. SEARCH) being purely exemplary.

[0166] By way of example, a user may engage in the following conversation with the Conversational Agent 150 by using application 101 on his/her smartphone 102:

[0167] U: What's the cheapest flight to Singapore leaving Friday, coming back in two weeks?

[0168] CA: Give me a moment please...

[0169] U: How did the Leafs do last night?

[0170] CA: Toronto beat Buffalo 4-1

[0171] U: How are they in the standings?

[0172] CA: Toronto is 9th place in the Eastern Conference

[0173] U: What will the weather be like in Singapore in two weeks:

[0174] U: Can you update me on my portfolio please?

[0175] CA: I have your flight. Here are the details...

[0176] ... user selects and purchases tickets...

[0177] CA: Here is the forecast in Singapore for the next 14 days

[0178] ... Ux Manager 103 presents forecast on smartphone 102.

[0179] CA: Your portfolio is up 1.4% today, here are some more details...

[0180] In the above interaction the letter 'U' denotes a user query 302 and "CA" denotes a response generated by the Conversational Agent 150 and presented on user interface 105 by Ux Manager 103. The user queries 302 above have initiated processing by the Conversational Agent 150 in several domains, for example TRAVEL, SPORTS, WEATHER, and STOCKS.

[0181] Figures 43a to 43c illustrate in one embodiment how Topic Board 1830 is used and modified by various modules of the Conversational Agent 150 to accomplish multiple intended actions as derived from user queries 302. Turning to Figure 43a, Topic Board 1830 has two entries: entry 4310 relating to an intended action in the TRAVEL domain (i.e. flight to Singapore), and entry 4320 relating to an intended action in the SPORTS domain (i.e. Leafs score from last night). NLP Engine 114 receives user query 302 relating to a flight to Singapore and formulates a template object 319. In the process, NLP Engine 114 may make assumptions and/or refer to user preferences regarding other entities such as FROM city, LUXURY, CARRIER, and the like. Services Manager 130 places template 319 onto the Topic Board 1830 at entry 4310 before interfacing with external service 118. Services Manager 130 then interfaces (via an API) with external service 118, which does not immediately return a result. Dialogue Manager 116 periodically scans Topic Board 1830 and identifies the entry 4310 relating to the Singapore flight. Given that action related to entry 4310 is pending, Dialogue Manager 116 generates as response to let the user know the pending status, for example as indicated above, "Give me a moment please..."

[0182] With query 302 "How did the Leafs do last night?" NLP Engine 114 creates a template object 319 with the domain, subgroup and entities, and directs the template 319 to the Services Manager 130. Services Manager 130 then interfaces with an external sports service 118 which returns the score of the game. Services Manager 130 adds entry 4320 to Topic Board 1830 (including the result from the external sports service 1830) and the memory associated with Services Manager 130 is released. In one embodiment, Services Manager 130 creates a separate entry for each domain to accomplish the command desired by the user according to the derived intent. For example, Services Manager 130 may create a Sports Service that interfaces with external sports service 118 to process sports-related commands.

[0183] Dialogue Manager 116 periodically scans Topic Board 1830 and identifies entry 4320. Dialogue Manager 116 removes entry 4320 and Display Manager 142 formats the output for communication to smartphone 102 (Figure 43b). Ux Manager 103 presents the results to the user with a response such as "Toronto beat Buffalo 4-1".

[0184] Referring next to Figure 43c, the user has expressed two additional queries, one relating to the weather in Singapore, and the second relating to the user's stock portfolio. In each case, NLP Engine has formulated templates 319 and Services Manager 130 has called an appropriate service 118, 120. Given that the queries are not expressed exactly simultaneously, but sequentially by the user, the Conversational Agent 150 may employ two separate Services Managers 130 (i.e. one for each query), each of which is created by the Delegate Service 108 when a new user query 302 is received. The Services Managers 130 add entries 4340 and 4350 indicated that the action is pending before the appropriate external services 118 are called.

[0185] Dialogue Manager 116 identifies the entries 4340, 4350 on Topic Board 1830, and this case, decides not to present dialogue to the user interface 105 on the smartphone 102.

[0186] In Figure 43d, the Services Manager 130 related to the flight to Singapore receives a response from the external flight service 118 and Services Manager 130 modifies entry 4310 on Topic Board 1830 by changing the status of entry 4310 from "pending" to "complete". Dialogue Manager 116 picks up the modified entry 4310, recognizes that the travel-related action is complete, and formats the result data with Display Manager 142. Dialogue Manager 116 then removes entry 4310 from Topic Board 1830. Ux Manager 103 presents the flight results to the smartphone 102 with a message such as "I have your flight. Here are the details..." and also presents a list of flights results. In this example, the user may select and purchase a ticket, and the confirmation information will also be presented to the user by the Ux Manager 103.

[0187] Referring to Figure 43e, Topic Board 1830 shows that entries 4340 (related to the weather in Singapore) and 4350 (related to the user's stock portfolio) have been updated by changing the result from "pending" to "complete", and the results for each have been stored on Topic Board 1830. As described herein, one services manager 130 performed a command (via interface 118) according to the user's weather query and another services manager 130 performed a command (via interface 118) according to the user's stock query. Each of the Services Managers 130 creates a respective entry in the Topic Board 1830 and includes the result provided by interfaces 118. Dialogue Manager 116, which periodically scans Topic Board 1830, identifies entry 4340 and formats output to send to smartphone 102 using Display Manager 142, the output being presented on the device 102 by Ux Manager 103. Dialogue Manager 116 then removes entry 4340 from Topic Board 1830. Continuing with its scanning of the Topic Board 1830, Dialogue Manager

116 identifies entry 4350 and determines that its status is "complete" and that results are available in the Topic Board 180. Dialogue Manager 116 may then remove entry 4350 from the Topic Board 1830 (which now becomes clear of all entries) and formats output to communicate to the smartphone 102 using Display Manager 142. Ux Manager 103 receives the formatted output and presents the result to the user on the user interface 105 of App 101.

[0188] In one embodiment, entries on Topic Board 1830 are given an initial priority level by NLP Engine 114 and/or Services Manager 130. A given entry in Topic Board 1830 may be reassigned a priority level by Dialogue Manager 116, NLP Engine 114 and/or services manager 130 as additional information is elicited from the user. For example, a pending command may receive a priority level of 3, a command that cannot be performed without additional information may receive a priority of 1, and a command that can be performed (i.e. there is sufficient entity information available) however the user should be given a chance to add entities may receive a priority of 2.

[0189] Topic Board 1830 may set a priority for each query using a variety of techniques. In one embodiment, Topic Board 1830 may establish a first in has highest priority rule in which each new query receives a highest priority rank as soon as it is passed to Topic Board 1830 by Delegate Service 108. Entries that are already in the Topic Board 1830 may all have their priority decreased using this technique. Topic Board 1830 may also use intelligent logic to determine the priority of each query. For example, Topic Board 1830 may determine that the query "What's the cheapest flight to Singapore leaving Friday, coming back in two weeks?" is a high priority query because the query relates to finding a flight and possible booking tickets for a flight. A user may establish preferences using the Conversational Agent 150 to set which types of queries will automatically have the highest priorities on the Topic Board 1830.

[0190] When Dialogue Manager 116 is asked for dialogue from the DelegateService 108, Dialogue Manager 116 takes the highest priority topic and generates dialogue from it. This topic may then be updated with a new priority and put back into the Topic Board 1830. Many different services may put topics into the Topic Board 1830 directly or via another service such as Delegate Service 108.

[0191] Delegate Service may ask for dialogue from the Dialogue Manager 116 periodically, in response to returns from service calls and/or at a predefined rate, for example, a certain number of times per second.

[0192] In one embodiment, dialogue manager 116 is configured to elicit entitiesthat may be required for a pre-determined template 319 (as required by a specific service 118,120). By way of example, Services Manager 130 may expect flight template 318 to contain the following entities

before template is provided to flight service 120: TO, DEPARTUREDAY, RETURNDAY, FROM, LUXURY, RETURNTIME, DEPARTURETIME, PRIVE, SPECIFICGROUP, CARRIER, NUMBERATICKETS

[0193] In an embodiment, the dialog manager may be operable to elicit theentity information required to call a service and/or entity information may be intelligently filled in depending on user information, user history, GPS coordinates, rules and the like.

[0194] For example, in an embodiment, the Conversational Agent may onlyrequire the "TO" entity (i.e. the destination city) to be obtained from the user via an input command such as a voice command. The Conversational Agent may then apply a variety of rules to determine the remaining entities that are required to call flight service API. In such an embodiment, Conversational Agent may assume the following:

[0195] "FROM" entity (i.e. departure city) is the city where the user is currentlocated. This can be determined by obtaining the GPS coordinates of the smartphone;

[0196] "DEPARTUREDAY" entity is as soon possible;

[0197] "RETURNDAY" entity is not applicable since the Conversational Agentmay assume that the flight is one-way.

[0198] Figure 19 shows a threaded conversation diagram of an embodiment of the Conversational Agent 150. Conversational Agent 150 may implement a service-oriented architecture to provide a horizontally scaled system that provides services to a large volume of simultaneous users. Service oriented architecture implementations may rely on a mesh of software services. Services comprise unassociated, loosely coupled units of functionality that have no calls to each other embedded in them. Each service implements one action, such as checking the news, buying plane tickets or performing an internet search. Rather than services embedding calls to each other in their source code, they use defined protocols that describe how services pass and parse messages using description metadata.

[0199] A conversation thread may include an input pipeline 1910 and an output pipeline 1920. A query on a client device is passed to the Delegate Service which is actually a web service. Delegate Service may direct query to NLP which determines a representation of user intent. NLP may communicate the represented user intent feature manager service. Topic Board 1830 and emotion board 1880 are data storage that may comprise any or all of Internal – (Processor registers and cache), Main (the system RAM and controller cards), On-line mass storage (Secondary storage) or Off-line bulk storage (Tertiary and Off-line storage). A conversation thread may be created for every query expressed by the user that is processed by the delegate. Conversation thread is routed

by delegate to the appropriate service to derive a representation of the user intent and to extract the features of the query. NLP Engine derives user intent and passes back to Delegate Service.

DOMAIN MANAGER

[0200] According to one embodiment, the conversational agent 150 of the invention may include and/or interface with a dynamic domain knowledge set to intelligently converse with the user, provide information and perform tasks requested by the user, etc. The domain knowledge set may include one or more domain models that are associated with a specific domain. For example, the domain TRAVEL may be associated with a travel model, the domain SPORTS may be associated with a sports model, etc. In one embodiment, each domain model includes one or more statistical models (such as but not limited to SVMs, CRFs, optimized feature sets, naïve Bayes, random forests, neural networks, etc.) that are trained in advance by the Learning Manager 128 (as described below), another component of the Conversational Agent 150, and/or are provided by another service. Each domain model may interface and/or contain data from internal and/or external knowledge sets such as gazetteers. The term Gazetteer in the context of this specification may refer to geographic directory as well as domain-specific lists such as professional jargon (for example, Medical, legal, etc.), regional and/or cultural terms, names of people, song, artist and album list, movie titles, famous personalities, etc.

[0201] The domain knowledge set is dynamic in that new domain models may be added to the domain knowledge set in real-time, and existing domains models are constantly being updated with user queries, common phrases, sentences, synonyms, technical terms, etc. to make the system more accurate. The domains models available to a particular user may be circumscribed depending on the user's account status, preferences, commonly accesses subject matter, etc.

[0202] The domain manager 126 may add new domains to the system of the invention without necessarily changing the underlying code and architecture of the conversational agent 150 significantly and/or at all. New domain models may be added to the conversational agent 150 in a plug and play manner allowing a user to converse about a new topic (related to the newly added domain models) and obtain new functions related to the new domain models.

[0203] In one embodiment, domain manager 126 communicates with learning manager 128 to ensure that new domain models are pretrained prior to the domain manager 126 incorporating a new domain model into the functionality of the conversational agent 150. In one embodiment, the dialogue manager 116 may inform the user of new functionality by presenting and/or voicing a "new domain added" message, and display manager 142 may also add examples of new example interactions that that the user may now engage in.

EXAMPLE DOMAINS and INTERACTIONS

ALARMS AND REMINDERS

[0204] The Conversational Agent 150 of the invention may provide an alarm and reminder service for a user of a smartphone 102. A user interacts with the alarm/reminder service by entering input into the smartphone, for example, by expressing a user query 302, using the touchscreen, keyboard, and the like, and any combination thereof. For example, a user may set an alarm by expressing a user query such as "Set an alarm for 6 am tomorrow". As described above, one or more microphones on the smartphone convert the sound waves of the expressed query into a digital audio format such as a pulse-code modulation format (PCM). A speech recognition engine receives the PCM audio file and may convert the audio file to text. The speech recognition engine 112 may reside on the device 102 and/or in the cloud-based infrastructure 104. The text string generated by the speech recognition module from the PCM audio file is the user query 302. The user query 302 may be passed to the Delegate Service 108 for processing which may direct the user query to the NLP Engine 114, which is adapted to derive a representation of the desired user intent, including identifying a domain and/or subdomain, at least one command, and at least one parameter and/or entity relating to the command.

[0205] In the example given above, the NLP Engine 114 determines that the user query 302 relates to a command in the ALARM/REMINDER domain. NLP Engine 114 may further determine that the user query 302 relates to a command such as "set an alarm" which may use parameters, such as "6 a.m." and a date, for example, "April 8, 2012". NLP Engine 114 may create an object (such as template object 319) that is then passed to the Services Manager 130 for processing.

[0206] The Conversational Agent 150 of the invention may provide a reminder service for a user of a smartphone 102. A user may express a user query such as "Remind me to go to the gym at 3 pm" to accomplish a desired command such as setting a reminder. The NLP Engine 114 processes this user query 302 and determines that it relates to a command such as "set a reminder" which may use parameters, such as "3 p.m." as well as a string, for example, "Go the gym". After determining the user intent, NLP Engine 114 may pass a template object 319 with this information to the Services Manager 130 for performing the reminder command. Alarms, reminders, timers and the like may use an internal service 120 on smartphone 102 which may be accessible an API 120. The internal 120 service may then process the reminder and/or alarm command according to the functionality of the particular service available on the smartphone 102

[0207] In one embodiment, conversational agent 150 may transfer control to the internal service 120 called so that a result may be displayed to a user on the smartphone 102. In one

embodiment, conversational agent 150 instructs service 120 to perform a command, however, conversational agent 150 displays a confirmation message that the command has been performed and/or embeds the service 120 into the user interface 105 so that the service becomes an interactive control on the conversational agent 150.

[0208] In another embodiment, the Conversational Agent 150 may provide its own alarm/reminder service to use in combination with and/or in place of the internal alarm/reminder service. The alarm/reminder service may reside in cloud-based infrastructure 104 and/or on a client device 102.

[0209] In one embodiment, the Conversational Agent 150 is configured to implement an event notification service 110 for monitoring events, including events generated by services 120 that may be desirable to communicate to a user via the user interface 105. For example, a user may set a reminder by conversationally interacting with the conversational agent 150 such as "Remind me at 6 pm to pick up groceries". In this example, Conversational Agent 150 calls an internal service 120 and the internal service executes the desired command (i.e. service 120 sets the reminder and includes the reminder message). The internal service 120 may process the reminder and notify the user at 6 pm. Event notification service 110 may monitor smartphone events 102, such as reminders that go off, and process the reminder through the user interface 105 to communicate the reminder to the user.

[0210] In one embodiment, the Conversational Agent 150 may provide an alarm/reminder service 120 that is able to provide functionality based on location and/or another class of parameters. For example, a user may express the user query "remind to pick up milk when I am near a grocery store". Such a user query 302 contains ambiguous terms such as "near" and undefined location such as "a grocery store". The Conversational Agent 150 of the invention is able to process and make semantic sense of such a query 302, as well as provide useful functionality to the user according to the derived user intent. For example, the NLP Engine 114 may determine that the user query 302 relates to the ALARM/REMINDER domain, and perhaps the "set reminder" subdomain. NLP Engine 114 may further determine the "a grocery store" is a general class of locations; the applicability of any given grocery store being undetermined. In addition, NLP Engine 114 may attach meaning to the word "near" such as within a 1 km radius, or 100 m radius etc. The applicable radius for this user query 302 may be based on a user preference, intelligent information derived from user mobility patterns, default settings and the like.

[00211] In this example, after receiving template 319 with a representation of the derived user intent, Services Manager 130 may build a list of all grocery stores within a certain distance from the user's current location (as provided by GPS service 120). Services manager 130 may periodically

obtain the user's current GPS coordinates and compare the GPS coordinates to the location of grocery stores in the list. Once the user's position is within a predefined distance from any given grocery store, the conversational agent 150 may notify the user that he/she is near a grocery store and may also provide directions to the grocery store.

[0212] In one embodiment, the Conversational Agent 150 optimizes its use of an internal GPS service 120, because scanning the GPS coordinates of a device 102 uses the smartphone's battery power. Calling a GPS service 120 too often may result in the battery of the device 102 draining faster than is acceptable to a user. In this embodiment, Conversational Agent 150 varies its rate of interfacing with GPS service 120 depending on the distance between the smartphone 102 and the grocery stores that are in the list of grocery stores previously created and/or updated by the conversational agent 150. For further clarity, say that the closest grocery store to the user's current location is located 15 kilometers away from the user's current location as provided by GPS service 120. Conversational Agent 150 may determine that a user cannot get to the closest grocery store in less than fifteen minutes (for example), and therefore, may not access GPS service 120 for another fifteen minutes. After each call to the GPS service 120, Conversational Agent 150 may compute the length of time to wait before calling GPS service 120 again, based at least partly on the user's current location relative to the closest location in the list.

MUSIC

[0213] The Conversational Agent 150 according to an embodiment of the invention may provide music functionality to a user of a smartphone 102. In an embodiment, the music functionality includes: playing a song by title, artist, album, genre, ratings; playing albums by artist, year, genre, rating, length; dynamically creating and playing playlists; locating, playing, downloading, etc. songs and albums from third party services, and well as additional functionality.

[0214] A user may interface with the music service 120 by expressing a query 302 and/or in combination with other modes of input such as the touchscreen.

[0215] For example, a user may interact with their smartphone 102 by voicing the query 302 "Play me some Madonna". The Delegate Service 108 receives the query 302 in a text string format and directs the query 302 to NLP Engine 114 for processing. By applying the query 302 to one or more CRFs (for example, 714,716) NLP Engine 114 derives that the user intent relates to the domain MUSIC with a entity "Madonna". NLP Engine 114 may create and/or fill a template 319 with the information according to the derived user intent, and pass the template 319 to Services Manager 130. Services Manager 130 receives the template 319 and may apply logic to further fill the template 319 entities. For example, Services Manager 130 may assume and/or use logic to

determine that the user wants to hear a song by Madonna, an album by Madonna, a playlist contain Madonna songs, search the internet for Madonna music for download, and/or search and play internet radio playing Madonna music.

[0216] In an embodiment, music service 120 searches music data that the user already has access to on their device 102, in cloud-based service infrastructure 104, and/or available on third-party web services 118 of which the user may or may not have an account. Music service 120 may find Madonna music data (songs, playlists, albums, etc.) that the user has access to and begin playing Madonna music randomly and/or based on previous listening habits of the user. For example, music service 120 may access the user's ratings of must and play Madonna music in order of highest rated to lowest rated. While music is playing, a user may continue to interact with the Conversational Agent 150 by expressing other queries 302.

[0217] To optimize the operation of the user interaction with the music service 120 available via conversational agent 150, music service 120 may periodically search a user's device 302 and/or user accounts on the Internet to index songs, playlists, albums and the like. Music service 120 may index such music data every time a user launches the Conversational Agent 150, each time a user turns on their smartphone 102, each time a user accesses the music service 120, and/or at regular intervals.

[0218] Music service 120 may transfer some or all indexed music data to cloud-based service infrastructure 104 so that NLP Engine 114, music service 120, and other services 118,120 can easily access and process music data as a user inputs further user queries 302.

SEARCH

[0219] According to one embodiment of the invention, the Conversational Agent 150 provides internet search functionality for a user of a smartphone 302. In one embodiment, the user may express a query 302 that relates to internet search, knowledge search, database searching such as library catalogues, academic databases, mathematical calculations, and the like.

[0220] To obtain search results from the Conversational Agent 150, a user inputs a command, for example a voice command, to the App 101 of the Conversational Agent 150 running on smartphone 102. For example, a user may say the following to the Conversational Agent 150 via the App 101 running on the smartphone 102: "What are the tallest mountains in the World?" An automatic speech recognition service 112 receives the voice file in an appropriate format (for example, PCM, mp3, and the like) and performs speech to text operations. The ASR engine 112 may communicate the text user query 302 to the NLP Engine 114 (via the Delegate Service 108 in some embodiments) do derive the intent of the user.

[0221] NLP Engine 114 processes the user query 302 to identify a domain, subgroup/subdomain, desired command(s) to perform and any entities if applicable. In the current example, NLP Engine 114 may derive the intention of the user as relating to the SEARCH domain, with the entity "tallest mountains in the World" as a search string. NLP Engine 114 may further identify the query 302 as relating to the subdomain geography. NLP Engine 114 may formulate a template 319 and/or object containing the domain, subdomain and entity for processing by the Services Manager 130. Services Manager 130 receives the template 319 from the NLP Engine 114, the Delegate Service and/or another module and performs logic to identify the appropriate service 118, 120 to call. In one embodiment, Services Manager 130 uses one service 118 for queries 302 relating to mathematical calculations, mathematical and scientific facts and the like; and another service 118 for queries 302 relating to general knowledge. In yet another embodiment, Services Manager 130 interfaces with one or many internet search engines to obtain a result for the query 302. In an embodiment, the Conversational Agent may classify certain queries 302 as relating to a SEARCH domain (which may result in service calls to internet search engines) and other queries 302 as relating to a KNOWLEDGE domain (which may results in service calls to knowledge databases such as TrueKnowledge, Wolfram-Alpha, academic and professional databases, and the like).

[0222] Continuing with the example, Services Manager 130 may determine that query 302 "What are the tallest mountains in the world" is a science question (which NLP Engine 114 has identified as relating to subgroup geography) and may therefore call an external API 118 that relates to science and/or geography, and the external service 118 may return a result. Services Manager 130 takes the result (which may be in an XML format, JSON format, and the like) and may add it to the template 319 as a result tag. The final template (with all its content) may be added to the Topic Board 1830 (as a database record for example) where it can be further processed by the Dialogue Manager 116 and produced on the smartphone by the Ux Manager 103.

[0223] In one example, NLP Engine 114 looks for keywords such as "search", "find" and the like within the query 302 to perform general internet searches with search engines 118 such as Google, Bing, True Knowledge, Yahoo, and the like. For example, a user may express the query 302 "Search the Internet for the best clubs in Toronto". NLP Engine 114 receives the text version 302 of the audio query and identifies that the user intends to perform an internet search with the string "best clubs in Toronto". NLP Engine 114 creates a template 319 identifying the domain as relating to SEARCH with the string query "best clubs in Toronto" (i.e. search entity) and passes the template 319 to the Services Manager 130. The Services Manager 130 receives the template 319 and may call a default search engine 118 with the entity string, a search engine generally preferred

by the user, a search engine that the user prefers for entertainment-type queries, etc. When services manager 130 receives the result from search engine 118, services manager 130 may place the information from the template 319 together with the result on topic board 1830, where there result and any associated dialogue and/or display content such as images may be presented to the user on the app 101.

CHAT

[0224] The Conversational Agent 150 according to one embodiment of the invention may provide general chat capabilities so that a user of a smartphone 102 may converse with the Conversational Agent 150 on an informal basis similar to how a group of people may converse.

[0225] For example, a user may input a voice command 302 such as "I'm feeling pretty excited about the presentation today" to the Conversational Agent 150. In this exemplary case, the user may not intend for their smartphone 102 to perform any action, but instead, the user may desire to engage in conversation with their device 102. The Conversational Agent 150 may process this query 302 in a manner similar to other domains. For example, the above query is converted to text by the ASR engine 112 and the text query 302 may be directed to the NLP Engine 114 for processing. NLP Engine 114 derives the user intent of the query 302 (by at least partly employing the methods illustrated in Figures 3 to 8) relating to domain CHAT. Services Manager 130 receives a template object 319 created by the NLP Engine 114 (which may be stored in the Topic Board 1830) and applies logic to call an appropriate service 118,120. Services Manager 130 may use an internal chat service 120, external chat service(s) 118 or a combination thereof. In one embodiment, the Chat Service 118,120 called by the Services Manager 130 receives the text query 302 and may perform one or several algorithms to identify candidate responses.

[0226] In one embodiment, the Chat Service 118,120 may include a comprehensive database of queries 302 mapped to candidate responses. The queries302 may be organized by letter such that the Chat Service 118,120 compares the query string 302 to the database by letter 'I' (the first letter of "I'm feeling...") and looks for the longest best match. Say for example that the longest best match found in the chat database is "I'm feeling pretty excited about the p*", the '*' character indicating a wildcard. The Chat service 118,120 may then look at the candidate responses for the match and select randomly if there are multiple candidate responses available. For example, the Chat service 118,10 may determine that three candidate responses are available for the query match "I'm feeling pretty excited about the p*" and output one of the three randomly for display on the user interface 105 of the app 101 running on smartphone 302. In another embodiment, Chat service 118,120 remembers the most recent output for a particular query 302 so that a different response is generated the next time a user inputs the same or similar query 302.

The response received from the Chat service 118,120 may be added to the Topic Board 1830 for processing dialogue manager 116 which may extract the result from the topic board 1830, and together with display manager 142, format an output for display on the user interface 105 of App 101.

[0227] In another embodiment, the Chat Service 118,120 of the Conversational Agent 150 may include additional responses with the candidate response found in the chat database. For example, the candidate response chosen by the Chat service 118,120 for the above query 302 may be "That's great to hear". The Chat Service may also add information related to the holidays, the user's personal schedule, user interests such as sport, television, etc, and other customized information. The Chat Service may add this information to the candidate response to generate a longer response such as "That's great to hear, by the way, your favorite team also won the game last night". Another example related to holidays would be "That's great to hear, what a fine St. Patrick's day it is". Another example related to the user's schedule could be "That's great to hear, your afternoon is free by the way". The Chat service may append several different responses to the candidate response, include more information within the candidate response, and/or precede the candidate response with a customized message.

[0228] In one embodiment, the Chat service of the Conversational Agent 150 employs natural language generation (NLG) to respond to chat inputs (or inputs relating to other domains) from the user. NLG is the natural language processing task of generating natural language from a machine representation system such as a knowledge base or a logical form.

[0229] In one embodiment, the conversational chat dialogue may continue indefinitely. The Conversational Agent 150 may interrupt the chat when appropriate to ask random questions not contained in the chat database and/or to perform commands previously requested by the user. For example, a user may have set an alarm for 5 p.m. which occurs within a chat session. The Chat service may generate the dialogue "That's great to hear, by the way, you asked me to reminder you at 5 p.m. to pick up milk after work".

TRANSIT

[0230] According to one embodiment, the Conversational Agent 150 of the invention may provide a Transit Service 118 so that a user of a smartphone 302 may access transit information in real-time. Information that a user may access via the Conversational Agent 150 includes bus, streetcar and subway routes, nearest transit stops, transit options from point A to point B, next arrival times, and the like.

[0231] Example queries 303 that a user may input include "What's the nearest transit stop",

"how do I get from downtown to the Roxbury neighborhood", "How do I get to Fenway via transit", "When is the next bus coming", and the like.

[0232] The Conversational Agent 150 of the invention may maintain a database of transit information from transit authorities. The database may be updated by the learning/update manager as described herein. In one embodiment the database is populated by a comma-delimited file from each transit authority. The files may be organized according to the General Transit Feed Specification (GTFS).

[0233] An example transit interaction is as follows. A user expresses the voice query "What's the nearest station that will take me to Fenway Park". The Conversational Agent receives the query, performs speech-to-text operation and routes the query string 302 to the NLP Engine 114. NLP Engine 114 processes the query 302 and derives a representation of the user intent. In this case, NLP Engine 114 may recognize that the user query 302 relates to the domain TRANSIT, and perhaps subgroup "stops" and subgroup "directions". NLP Engine 114 populates a template object 319 with the derived entities (for example, current location, destination) which may also include the current GPS coordinates of the smartphone 102. Services Manager 130 receives the template object 319 and applies logic to determine the appropriate service to call, in this case Services Manager 130 may call an internal or external Transit Service 118,120. The Transit Service 118,120 may provide a result to the Services Manager 130 which then adds the information extracted from NLP engine 114 and the result to the Topic Board 1830 for presentation on the smartphone 102 by the Ux Manager 13.

SOCIAL

[0234] According to one embodiment, the Conversational Agent 150 may provide a social networking and social sharing service so that a user of a smartphone 102 may access social media sites, personal relationships, and share information and search results with friends and contacts in real time.

[0235] At certain time while interacting with the Conversational Agent 150, a user may choose to share relevant results with a contact by expressing an appropriate query 302, for example, "Share this result with Peter" or may add a result to a social media website by saying something like "Add this to Facebook".(Facebook™ is a trademark of Facebook, Inc.) NLP Engine 114 receives the user query 302 from the Delegate Service 108 and processes the query 302 as described above. NLP Engine 114 derives the intention of the user as relating to social media and creates a representation of the user intent in the form of a template object 319. NLP Engine 114 may identify the user query 302 as being related to the domain SOCIAL, and perhaps a subgroup

such as share and contact such as "Peter".

[0236] NLP Engine 114 may communicate the template 319 to Services Manager 130 which identifies an appropriate service 118 to accomplish the intention of the user. In an embodiment, Services Manager 130 may interface with one or several external services 118 that may accomplish a variety of social media commands, such as for example, update status on various social media websites, write on own wall or contact's wall, upload pictures including profile pictures, share with contacts via email or instant messaging, make new connections with contacts, tag photos, interact with social media applications such as "Places I've visited", and the like.

[0237] Services Manager 130 may employ internal logic to determine which service 118 is appropriate for a given user intent, and calls the service 130 with the appropriate data (including entities). Service 118 provides a result to Services Manager 130 which directs the output to Display Manager 142 which creates a presentation layer for display on the user interface 105 of smartphone 102.

[0238] In an example interaction, a user may receive a call from a person, for example, named "Peter Smith" regarding a potential business relationship. The user finishes the call and hangs up. If the Conversational Agent 150 is not already running, the user may launch the Conversational Agent 150 on the smartphone 102. Once the Conversational Agent 150 is running, the user may simply express a query such as "Add Peter to my LinkedIn account". The Conversational Agent 150 may recognize that the user is referring to the most recent caller; however, if there are already contacts with the name "Peter" in the address book the Conversational Agent 150 may ask a clarification question to the user with or without a list of options.

[0239] Continuing with the example, the Conversational Agent 150 may respond to the user "Would you like to add Peter Lee, Peter Hall, or Peter Smith to your LinkedIn account"? A "none of the above" option may also be presented. This response may be presented as an organized list in an example so that the user may simply select the option that applies to their intent. The user may also select the option by voicing an audio input such as "Peter Smith", "Smith", "the last guy" and/or the like.

[0240] Once a selection is made, NLP Engine 114 may add information to template 319 such as the name of the contact that the user would like to connect with on LinkedIn. NLP Engine 114 may not have to reprocess the user query 302 to derive an intention of the user if the user's response was an answer to the clarification question.

[0241] Referring to Figure 44, the processing of clarification questions with respect to an intention of the user related to social media is shown. The general logic of Figure 44 may also be

employed with other domains as well. Referring to step 4410, NLP Engine 114 has identified potential ambiguity in the user query 302. NLP Engine 114 may have identified the user intent as relating to SOCIAL and the subgroup ADD_FRIEND. NLP Engine 114 may also have identified the SOCIAL_SITE as being LinkedIn™ and the CONTACT as having a first name of "Peter". NLP Engine 114 may create a template object 319 with the identified entities and may direct the template object 319 to Services Manager 130 for processing. Services Manager 130 receives template object 319 and determines that a clarification question should be presented to resolve the ambiguity. At step 4410, a clarification question is presented to the user which may include an ordered list of possible responses. At step 4420, the user input is received which may be in the form of a selection from the ordered list and/or a voice input from the user. At step 4430, the Conversational Agent 150 determines whether the user input was responsive to the clarification question posed. If the input from the user was responsive, then NLP Engine (or template service 318) further fills out the template object 319. Several methods may be used to determine if the user input was responsive to the clarification question. For example, the Conversational Agent 150 may look for keywords such as "first", "last", "second last", etc. in the user's response. Such logic would catch a scenario where the user expressed something like "the last option". Continuing the example of adding a new contact to LinkedIn, the Conversational Agent 150 may look for a response that included a person's name such as "Lee", "Hall" or "Smith". It will be appreciate that the logic employed to determine if the user's input was responsive to a clarification question may be unique for each domain. Once the template object has a minimum amount of information required to call a particular service.

[0242] In one embodiment, Conversational Agent 150 allows a user of a smartphone 102 to get social media updates by interacting with the Conversational Agent 150. In an example interaction, a user may express a query along the lines of "Give me a Facebook update". NLP Engine 114 may identify the intention of the user as relating to a command that reads the update section of user's profile page. Conversational agent 150 may associate certain queries 302 (or words in a query 302) with a desired command and store this association in a user preferences database. For example, the conversational agent 150 may intelligently determine that the user prefers to get updates for a few "close" friends instead of all contacts on a social media site.

[0243] In one embodiment, the user of a smartphone 150 may quickly share results such as webpages, media, photos, and the like to friends by dragging the results obtained by services 118,120 (and displayed on the user interface 105) to a predetermined "share" area of the touchscreen. This feature is described in more detail with respect to Figure 34 to 38.

RESTAURANTS

[0244] The Conversational Agent 150 of the invention according to one embodiment may provide restaurant functionality so that a user of a smartphone 102 may locate restaurants by location, price, cuisine, atmosphere, handicap accessibility, size of a dinner party, and other search criteria. A user may also book a restaurant using the Conversational Agent 150, which in some cases, necessitates entering financial information such as a credit card number.

[0245] In an example interaction, a user may look for a restaurant by expressing a query 302 such as "Find me a Mexican restaurant in Chicago." As described herein, user query 302 is processed by NLP Engine 114 to derive the intention of the user. In this example, NLP Engine 114 may identify that the user query 302 relates to the domain of RESTAURANT, and a subgroup of "find restaurants", the domain and subgroup tags being purely exemplary. NLP Engine 114 may further identify the entities "Mexican" and "Chicago" which are relevant to the derived intention of the user.

[0246] NLP Engine 114 may create a template 319 with the relevant information (i.e. domain, subgroup and entities) for processing by services manager 130. Services Manager 130 may have a variety of external services 118 which are available to perform various commands related to restaurants. Services Manager 130 selects an appropriate service 118, perhaps by accessing user preferred restaurant providers, and calls the external restaurant service 118. External service 118 returns a result which is then formatted by Display Manager 142 and rendered to the device 102 screen by Ux Manager 103.

[0247] In an embodiment, Conversational Agent 150 is able to book a restaurant by accessing financial payment information associated with a user. Continuing the above example interaction, Conversational Agent 150 provides a list of restaurants servicing Mexican food in Chicago. A list of restaurants that satisfy the user query 302 is presented on the user interface 105 of the smartphone 102. User interface 105 may include an interactive application showing the restaurant results within the application 101 of Conversational Agent 150. Interactive results application within app 101 may allow a variety of user interaction, including for example, linking to a restaurant website, reviewing restaurant rankings, map restaurant, booking a restaurant, etc.

[0248] Continuing with the example, say that on the results screen the user clicks (via touchscreen) on a "book" link and/or voices a command with an intention of booking a particular restaurant. Ux Manager 103 receives the input, and in the case of a voice input, may direct the user query 302 to NLP Engine 114. NLP engine 114 then derives the intention of the user as relating to booking a particular restaurant. In the case of clicking on a "book" link, the Ux Manager 103 is already aware that the likely intention of the user is to book a particular restaurant.

CALENDAR

[0249] The Conversational Agent 150 according to one embodiment of the invention may provide a calendar service so that a user of a smartphone 102 may add, find, edit and delete meetings, events, and the like. A user may access their calendar using the Conversational Agent 150 by expressing a relevant query 302 such as "Show me my calendar for today". NLP Engine 114 of Conversational Agent 150 identifies the intention of the user as relating to the CALENDAR domain, and perhaps the subgroup "show calendar", and a identifies a relevant entity such as "today". In this example interaction, NLP Engine 114 communicates a template 319 with the relevant domain, subgroup, and entity information to the Services Manager 130 to accomplish the identified intention of the user.

[0250] Services Manager 130 may interface with one or more services 118, 120 to accomplish the user's intention. In this example, Services Manager 130 may identify an internal calendar service 120 as a suitable service, and will call the calendar service 120 according to a predetermined interface. Ux Manager 103 may display the results from calendar service 120 as an interactive application within the application 101 of Conversational Agent 150. Application 101 may allow user interaction commonly found in calendar applications, such as adding, modifying and deleting meetings, viewing holidays, viewing the user's calendar by month, week, year, and other common functions.

[0251] In an embodiment, Ux Manager 103 may also present the calendar results with audio output. In the above, example, Ux Manager 103 may read out the calendar events that the user has booked for the day. In one embodiment, the Ux Manager 103 may read out a confirmation message such as "your meeting has been booked for 10 am". If a scheduling conflict occurs Conversational Agent 150 may read a message such as "You are already busy at 10 am, would you like to book the meeting for another time". Conversational Agent 150 may have access to a dialogue database as described herein, and the Dialogue Manager 116 is configured to select an appropriate dialogue to present to the user depending on the state of the command intended by the user. For example, Dialogue Manager 116 may access different dialogue messages that are associated with certain command states such as "pending", "results available", "confirmation that command has been performed", "clarification necessary", "scheduling conflict found", etc.

[0252] In another example interaction, a user may create a new calendar event using the Conversational Agent 150 by expressing a suitable query such as "Book me a meeting for Friday at 10 am for the Matrix Boardroom, include Peter and James". NLP Engine 114 processes the user query 302 as described herein and identifies the user's intention as relating to the CALENDAR

domain, the add meeting subgroup, and possibly identifies the entities of "Friday", "10 am", "Matrix Boardroom" as well as contacts "Peter" and "James". Using Template Tagger 318, NLP Engine 114 creates and populates a template 319 which may be directed to Services Manager 130. Services Manager 130 processes the intended command according to the flowchart shown in Figure 40. As shown in Figure 40, at 4010 – 4030, Services Manager 130 may determine if the event requested by the user to be scheduled conflicts with any of the requested participant's schedule. If the requested event has no other invitees, or all the invitees are free at the requested time then the services manager 130 schedules the event (using internal calendar service 120 or external service 118) and informs the user via the app 101. If, however, one of the requested invitees is not available at the requested time, then at step 4050 the services manager 130 informs the user of the conflict and gives the user an opportunity to pick another time. The user may pick another time, at which point services manager begins processing at step 4010, or the user may keep the original time despite the conflict and services manager 130 may go ahead and book the event as requested.

[0253] In one embodiment, the Conversational Agent 150 is configured to add events to a user's calendar automatically (i.e. even if the user does not explicitly ask the Conversational Agent 150 to add an event to his/her calendar). For example, a user may book a flight as described herein by expressing a query 302 related to booking flights. Service manager 130 processes the request, and may determine that the command (i.e. book a flight) has blocked off a period of the user's calendar. Services manager 130 may then add an event corresponding to the flight booking to the calendar with the relevant time of the event. In one embodiment, services manager 130 adds an alarm to remind the user of certain events in advance of the event occurring. In one embodiment, Services manager 130 may keep a list of commands that correspond to calendar events (i.e. commands that are to be added to a user's calendar), as well as predefined alarm settings such as the length of time before an event starting that a user should be reminded about the event. In the flight example, services manager 130 may add the booked flight to the user's calendar as well as an alarm set for the day before, 3 hours before, 1 hour before and 30 minutes before, the scheduled flight. These alarm settings may be predefined and may also be modified by a user for a particular event (i.e. a particular flight), or a for a class of events (i.e. all flights).

E-COMMERCE

[0254] Reference is made to Figure 39 to illustrate the e-commerce functionality of the Conversational Agent 150 according to one embodiment. Conversational Agent 150 may interface (via the Services Manager 130) with one or more internal payment systems 128 and/or external payment systems 118a. Access to external payment system 118a may be provided by an application programming interface 118b, and likewise, internal payment wallet 128 may be accessed via an API

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(not shown). In one embodiment, Services Manager 130 is notified of a user's desire to make an electronic purchase via NLP Engine 114, Ux Manager 103, and/or other components of Conversational Agent 150. Services Manager 130 may maintain a list of payment systems 128,118a that are acceptable to a particular external service 118. When a user accesses an external service 118 (such as a travel-booking service) and expresses (or chooses via touchscreen) an intention to book a flight, Services Manager 130 references the payment systems acceptable to the particular travel-booking service 118 and the payment systems preferred by the user.

[0255] If a user has access to a payment system 118b that is acceptable to the external service 118, Services Manager 130 will coordinate the payment via payment system 118b. In another embodiment, if the user does not have access to a payment system required by the external service 118, Conversational Agent may provide an interface and/or instructions so that a user can sign up for the payment system.

[0256] In another embodiment, Conversational Agent may interface with one or more internal payment systems (also referred to as "wallet" applications) that are available on smartphone 102. Internal wallet applications 128 may comprise a pre-loaded debit and/or credit card, and/or may interface directly with the user's bank accounts at a financial institutions.

LANGUAGE MODELS

[0257] Reference is next made to Figure 9 to describe an embodiment of the speech service 112 in accordance with one embodiment of the Conversational Agent 150 of the invention. Speech service 112 may be cloud-based so that speech language processing is performed by computing resources in the cloud 900, and therefore offloaded from smartphone 102. Such an architecture allows the offloading of speech processing from smartphones 102a, 102b so smartphone processor resources may be applied to providing other functionality to the users. In one embodiment, smartphones 102a,b include a speech processing engine 112 partly or entirely resident on smartphones 102a,b

[0258] In one embodiment, speech service 112 may include general language models 904a,b,c and user-specific language models 902a,b. General language models 904a,b,c may be applicable to all users of the Conversational Agent 150 and each language model may correspond to domain-specific language. For example, language model 904a may contain common terms and phrases relating to the TRAVEL domain, language model 904b may contain common terms and phrases related to the RESTAURANT domain, and language model 904C may contain common terms and phrases related to the SOCIAL MEDIA domain. Learning manager 128 (described further below) may add, modify, substitute, delete, etc. language models 904 as appropriate to increase the

accuracy of speech service 112 and/or to add new domain functionality to the Conversational Agent 150.

[0259] In one embodiment, Conversational Agent 150 maintains user specific language models 902a,b. User specific language models 902a,b may contain user-specific information from smartphones 102a,b, such as but not limited to, address book contacts, aliases, commonly used words and phrases uttered by a particular user, and the like. In one embodiment, App 101 is adapted to periodically upload information from smartphone 102 to cloud-based service infrastructure 104 to create user-specific language model 904. As will be described further, learning manager 128 may be employed to create language models 904 dynamically as they are uploaded to the cloud 990 by App 101.

LEARNING MANAGER

[0260] The Conversational Agent 150 may include a Learning Manager 128 for updating, training, and/or reinstating any of the modules used by the Conversational Agent 150. Modules that may be modified by the Learning Manager 128 include support vector machines, conditional random fields, naïve Bayesian classifiers, random forest classifiers, neural networks, previous query score classifiers and the like.

[0261] Learning Manager 128 may update some or all of the intelligent modules of the invention periodically according to a set schedule and/or when initiated by an administrator. The Conversational Agent 150 may gather feedback from users based on their interaction with the Conversational Agent 150 for training purposes. Examples of how the Conversational Agent 150 uses feedback from user interaction are shown in Figures 11-17. For example, the Conversational Agent 150 may determine whether each outputted response was useful to the user. In one embodiment, the Learning Manager 128 of Conversational Agent 150 classifies each response as either "correct", "incorrect" and/or "neutral". Learning manager 128 may also assign a weight to each of the above categories such that a response is determined to be a certain percentage "correct" or "incorrect". In an example interaction, the user may express a query 302 of "Find me some French cuisine in St. Louis". ASR service 112 processes the voice query and provides a text representation of the query 302 to NLP Engine 114. NLP Engine 114 provides a template object 319 to Services Manager 130, the template object including the DOMAIN (in this example, RESTAURANTS) and several entities (St. Louis and "French"). Services Manager 130 determines an appropriate service 118 to perform the derived intention of the user calls that service (external service 118 in this example). External service 118 provides a response to Services Manager 130 which is presented to the user by the Ux Manager 103.

[0262] Continuing with the example, say that NLP Engine 114 misinterprets the user query 302, and instead of identifying French restaurants in St. Louis, instead identifies the user intention as relating to "kitchen supplies in St. Louis". A user may react to this incorrect interpretation in a number of ways. A user may say for example "No, actually I would like French restaurants in St. Louis" or "What I really want is restaurants serving French food in St. Louis", etc. The Conversational Agent 150 may be configured to identify certain words, phrases, intonations, etc. in the user's response to a given output to classify the response as "correct", "incorrect" and/or "neutral" and to possible assign a weighing in relation thereto. Continuing with the example, the Conversational Agent 150 may realize with the user's response "No, actually I would like..." as feedback that the output from speech service 112 of "kitchen supplies in St. Louis" was incorrect according to the user's intention. Learning manager 128 may store this information in a database for retraining purposes. The database may include for example the user query 302, the output generated by speech service 112, and/or a classification of the "correctness" of the output, as well as perhaps additional information. It will be appreciated that information about the correctness of the Conversational Agent's 150 response may be collected and stored for a significant percentage of responses for each particular user. Therefore, over a period of time, Learning Manager 128 will collect, store, and may use a large corpus of correctness data gathered in real-time for real interaction that may be used to train any or all of the intelligent modules of the invention.

[0263] In another example, let's say that NLP Engine 114 determines that the user intention relates to French restaurants in St. Louis, Michigan; however the user was looking for French restaurants in St. Louis, Missouri.

[0264] The user may respond in any number of ways, for example, by saying "Actually, I'm talking about St. Louis, Missouri". The Learning Manager 128 may determine that NLP Engine 114 incorrectly derived the intention of the user; however, Learning Manager 128 may instead determine that the correction initiated by the user relates to a user preference. Learning Manager 128 may store the user preference in a user preferences database so that Conversational Agent 150 in future interactions will add location specific information to some queries, in particular, to queries relating to locations.

AUTHENTICATION MANAGER

[0265] The Conversational Agent of the invention 150 may include an Authentication Manager 122 as shown in Figure 1. Authentication Manager 122 may provide functionality for authenticating users and devices 302 as well as providing backup services when existing users switch over to new devices 302 and/or if their smartphone 102 becomes damaged.

[0266] The authentication of users may be accomplished by having a user input one or more of the following: userid, password, keyword, phrases, and the like. Authentication Manager 122 receives the authentication information provided by the user and compares the received input to the authentication information for the particular user in user database. Authentication information received from the user and data in the user database may be encrypted.

[0267] In an embodiment, authentication of a user is tied to a particular smartphone 102 so that any user of a particular smartphone 102 may have access to some or all features of the Conversational Agent 150. In one embodiment, authentication of a user may be accomplished entirely or in part by voice recognition. The Conversational Agent may store a representative voice pattern of each user on the smartphone 102 and/or on cloudfront server 106. When a particular user wants to use the Conversational Agent 150, the user is prompted to say a particular name and/or predefined phrase. Conversational Agent 150 receives the phrase expressed by the user from the smartphone 102 microphone(s) and compares the received voice pattern to voice patterns stored in user database. If there is a match between the received voice pattern and user voice patterns stored in user database, Conversational Agent 150 may welcome the user and provide the user with functionality provided via App 101.

[0268] In one embodiment, the functionality available to a particular user may be limited depending on the subscription purchased by the user (via carrier for example), the type of smartphone 102, and/or other factors. For example, a user may buy smartphone version 1 which includes access to Conversational Agent 150 with limited functionality. Say for example that the user uses the Conversational Agent 150 for 2 years. In that time, Conversational Agent 150 will intelligently gather and store a variety of information that is used to provide an efficient user experience. Each time that a user accesses Conversational Agent 150, authentication manager 122 may authenticate the user and determine the set of functionality available to the user. Authentication manager 122 may communicate with user experience manager 103 and user experience manager 103 controls the functionality which is available to the user. The user may upgrade to smartphone version 2, at which time, authentication manager 122 changes the user's status to include more functionality and communicates to Ux Manager 103 to make additional functionality available to the user.

[0269] In one embodiment, authentication manager 122 may backup device data and user data to cloudfront server 106 or may interface with backup manager 138 which is configured to backup sensitive device data and cloud-based data. Backups may be performed periodically and/or when a user initiates a backup. The backups ensure that a user does not lose information that is used and/or generated by the Conversational Agent 150 should the smartphone 102 become

damaged. In an embodiment, authentication manager 122 backups information such as user preferences, address books, calendar, songs/movies/images, files, user defined aliases for contacts and files, and learned information such as speaking style, accents, etc.

[0270] When a user switches smartphone 102, authentication manager 122 receives user authentication information (as described above, such as a password, userid, telephone number, inputted voice phrase, etc.) and determines whether the user has access to the Conversational Agent 150, and the status of the user's account. For example, authentication manager 122 may authenticate the user of a new smartphone 102b based on the fact that the new smartphone 102b has the same phone number as the old smartphone 102a. Authentication manager 122 may communicate with Ux Manager 103 to make certain functionality available to the user. Authentication manager 122 may also ask the user via a prompt and/or a voice output whether the user wishes the Conversational Agent 150 to download certain data onto the new smartphone 102b. The data may substantially correspond to the user data that resided on smartphone 102a. In this way, Conversational Agent 150 allows a user to seamlessly switch between smartphones at any time without losing any data that is gathered by and/or used by Conversational Agent 150.

UX MANAGER 103

[0271] User Experience Manager 103 is for managing the interaction layer of the Conversational Agent 150, for example, by providing a user interface 105 on the display of the smartphone 102 via App 101. User Experience Manager 103 may provide a multi-modal input/output environment so that the Conversational Agent 150 may communicate and provide output to a user with one or more output modes, for example, by sound, video, images, text, vibration and the like. Likewise, the user may interact with the Conversational Agent 150 by providing input in one or more supported modes.

[0272] User Experience Manager 103 provides a user interface 105 for visually (as well as perhaps using other modes) presenting responses to queries 302, including for example, formatted output from services 118, 120, and clarification questions.

[0273] Example user interfaces 105 are illustrated in Figures 34 to 38. Figure 34 shows a user interface 105 on smartphone 102. The user interface 105 shows an example dialogue interaction between a user and the App 101 of Conversational Agent 150. Dialogue bubble 3420 shows the user query 302 expressed by the user, for example, "show me some Mexican restaurants in Portland". Dialogue bubble 3422 shows a response generated by Dialogue Manager 116, for example, "Okay, give me a moment to find what you asked for..." Result window 3410 shows the results of the Conversational Agent's (150) search, the results having been found by Services

Manager 130 interfacing with an external service 120 in an embodiment.

[0274] Buttons 3402, 3404, 3406 and 3408 in the example user interface 105 may provide quick access to common features of the Conversational Agent 150. For example, button 3402 may provide "Bookmark" functionality, button 3404 may provide "Share" functionality (i.e. social media), button 3406 may provide "Email/sms/phone" functionality, and button 3408 may provide "Map" functionality. The number of buttons and the assigned functionality may be changed by a user and/or dynamically changed by the Conversational Agent 150 depending on several factors, such as, the capabilities of the smartphone 102, the domain to which the user query 302 relates, etc.

[0275] A user may access the functionality of buttons 3402,3404,3406,3408 by dragging an entry from the result screen to the button desired and/or by pressing the area of touchscreen corresponding with buttons 3402,3404,3406,3408. Example arrow 3510 illustrates the general interaction. For example, a user may desire to Email and/or SMS a particular restaurant to a friend. A may drag the entry to button 3406 which may launch another screen (or a window that appears from the side of the display) that asks the user to confirm the desire to email and/or sms a restaurant listing to a contact.

[0276] Figures 36 and 37 illustrate another exemplary user interface 105 that may be implemented by the Conversational Agent 150 according to one embodiment. Results screen 3610a may contain a listing of results from a user query, such as is shown in Figure 34. Results screen 3610a may be an interactive application within application 101. For example, results screen 3610a may provide functionality such as mapping locations, checking ratings of services, linking to home pages of services, and the like. A user may close results screen 3610a by dragging results screen 3610a towards the side of the display as is shown generally by arrow 3702 in one example. In an embodiment, results screen may then be transferred to a smaller window as is shown by results list 3610b as is shown in Figure 38.

[0277] While the invention has been described with respect to a limited number of embodiments, those skilled in the art, having benefit of the above description, will appreciate that other embodiments may be devised which do not depart from the scope of the present invention as described herein. In addition, it should be noted that the language used in the specification has been principally selected for readability and instructional purposes, and may not have been selected to delineate or circumscribe the inventive subject matter. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the claims.

What is claimed is:

1. A computing device comprising one or more processors and one or more non-transitory storage devices storing instructions that, when executed by the one or more processors, configure the computing device to provide:

a natural language processing (NLP) engine for deriving a user intent from at least one user query, the NLP engine configured to identify at least one domain and at least one command associated with the user intent derived; and wherein the NLP engine includes at least one conditional random field (CRF) for performing entity extraction on the at least one user query to identify at least one entity associated with the at least one command and wherein the command is for performing by a service associated with the domain.

2. The computing device of claim 1, wherein the NLP engine selects the at least one CRF in response to the at least one domain identified.

3. The computing device of claim 2 further storing at least one optimized feature set associated with the at least one domain identified, the at least one CRF configured to access the at least one feature set.

4. The computing device of claim 1 wherein the instructions configure the computing device to receive the at least one user query as an audio input comprising speech received from a user communication device.

5. The computing device of claim 4 wherein the instructions configure the computing device to provide a speech recognition engine for generating a text representation of the at least one query, the text representation comprising a digital format and said audio input comprising a sound wave.

6. The computing device of claim 1 wherein the at least one command and at least one entity are provided to a services component for identifying at least one service capable of performing the at least one command and for instructing at least one service to perform the at least one command, the at least one service configured to return a service result to the services component in response to performing.

7. The computing device of claim 6 wherein the instructions configure the computing device to provide a dialogue manager for identifying at least one dialogue response to the at least one query.

8. The computing device of claim 7 wherein the instructions configure the computing device to provide a display manager for formatting an output, said output comprising said at least one dialogue

response.

9. The computing device of claim 7 wherein at least one dialogue response is at least partly based on said service result.

10. The computing device of claim 7 wherein at least one dialogue response includes a confirmation question.

11. The computing device of claim 7 wherein at least one dialogue response includes a clarification question.

12. The computing device of claim 7 wherein at least one dialogue response includes an invitation to one or more services.

13. The computing device of claim 7 wherein the dialogue manager is configured to define the at least one dialogue response in a conversational manner.

14. The computing device of claim 7 wherein the NLP engine is configured to create a list of candidate interpretations of said user query and said dialogue manager is configured to define the at least one dialogue response to present the list for selection.

15. The computing device of claim 7 wherein the dialogue manager is configured to identify at least one unfilled entity relating to said at least one command and generate at least one dialogue response comprising a prompt to present to a user to obtain said at least one unfilled entity.

16. The computing device of claim 15 wherein a respective prompt is generated for each of the at least one unfilled entity.

17. The computing device of claim 1 wherein the at least one CRF comprises a base-labeled CRF configured to extract the at least one entity.

18. The computing device of claim 17 wherein the at least one CRF comprises an expanded CRF configured to identify a subset of entities for selection by a user.

19. A method for performing by a computing device comprising:

performing a natural language processing (NLP) of at least one user query to derive a user intent from, the NLP identifying at least one domain and at least one command associated with the user intent derived;

wherein performing the NLP comprises using at least one conditional random field (CRF) to perform entity extraction on the at least one user query to identify at least one entity associated with the at least one command; and

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wherein the command is for performing by a service associated with the domain.

20. The method of claim 19, wherein performing the NLP comprises selecting the at least one CRF in response to the at least one domain identified.

21. The method of claim 20 comprising storing at least one optimized feature set associated with the at least one domain identified and wherein the at least one CRF is configured to access the at least one feature set.

22. The method of claim 19 comprising receiving the at least one user query as an audio input comprising speech received from a user communication device.

23. The method of claim 22 comprising performing speech recognition to generate a text representation of the at least one query, the text representation comprising a digital format and said audio input comprising a sound wave.

24. The method of claim 19 comprising identifying at least one service capable of performing the at least one command and instructing the at least one service to perform the at least one command, the at least one service configured to return a service result to the services component in response to performing.

25. The method of claim 24 providing a dialogue manager for identifying at least one dialogue response to the at least one query.

26. The method of claim 24 providing a display manager for formatting an output, said output comprising said at least one dialogue response.

27. The method of claim 24 wherein at least one dialogue response is at least partly based on said service result.

28. The method of claim 24 wherein at least one dialogue response includes a confirmation question.

29. The method of claim 24 wherein at least one dialogue response includes a clarification question.

30. The method of claim 24 wherein at least one dialogue response includes an invitation to one or more services.

31. The method of claim 24 wherein the dialogue manager is configured to define the at least one dialogue response in a conversational manner.

32. The method of claim 24 wherein performing the NLP comprises creating a list of candidate interpretations of said user query and wherein the dialogue manager is configured to define the at

least one dialogue response to present the list for selection.

33. The method of claim 24 wherein the dialogue manager is configured to identify at least one unfilled entity relating to said at least one command and generate at least one dialogue response comprising a prompt to present to a user to obtain said at least one unfilled entity.

34. The method of claim 33 wherein a respective prompt is generated for each of the at least one unfilled entity.

35. The method of claim 19 wherein the at least one CRF comprises a base-labeled CRF configured to extract the at least one entity.

36. The computing device of claim 35 wherein the at least one CRF comprises an expanded CRF configured to identify a subset of entities for selection by a user.

37. A computer program product comprising a non-transitory storage device storing instructions for configuring a computing device to perform the method of any one of claims 17 to 36.

150
103
101
120
Smartphone
134
105
102
100
Cloudfront Server 106
Event Notification Service 110
Backup Manager 138
Learning Manager 128
Delegate Service 108
Services Manager 130
Authentication Manager 122
Speech Service 112
NLP Service 114
Conversation Service 116
Service Infrastructure 104
Flight Provider Service
Taxi Service
Weather Service
External Dependent Services Interfaces 118

Fig. 1

Fig. 2

200
Cloudfront Server
106
Event Notification Service
110
Application Server and Business Code Components (e.g. JBoss Server and Enterprise Java Bean (EJB) Service Container)
Delegate Service
108
Speech Service
112
NLP Service
114
Conversation Service
116
External Dependent Services
118
Template Service
202
Persistence: Memcache Service RDBMS
204
206

300
Output
304
User Query
302
Dialogue Driver
306
Keyword Expansion
308
Question Type Classification
314
Template System
318
Extraction Pipeline
322
Previous Query Score
310
"Answer" Ranking
316
Template Memory 320
Query DB 312

Fig. 3

Fig. 4

400
User Query
Clarification Type Question Initiated by Service
402
No
Yes
Binary Classifier (Support Vector Machine)
404
406
Query Contains Keywords Related to Clarification Type Question
No
Yes
Functional
Entity
Pass Query to Answer Ranking
408
Pass Classification From Last Query to Template System
410
Pass Discovered Classification to Template System
412

Fig. 5

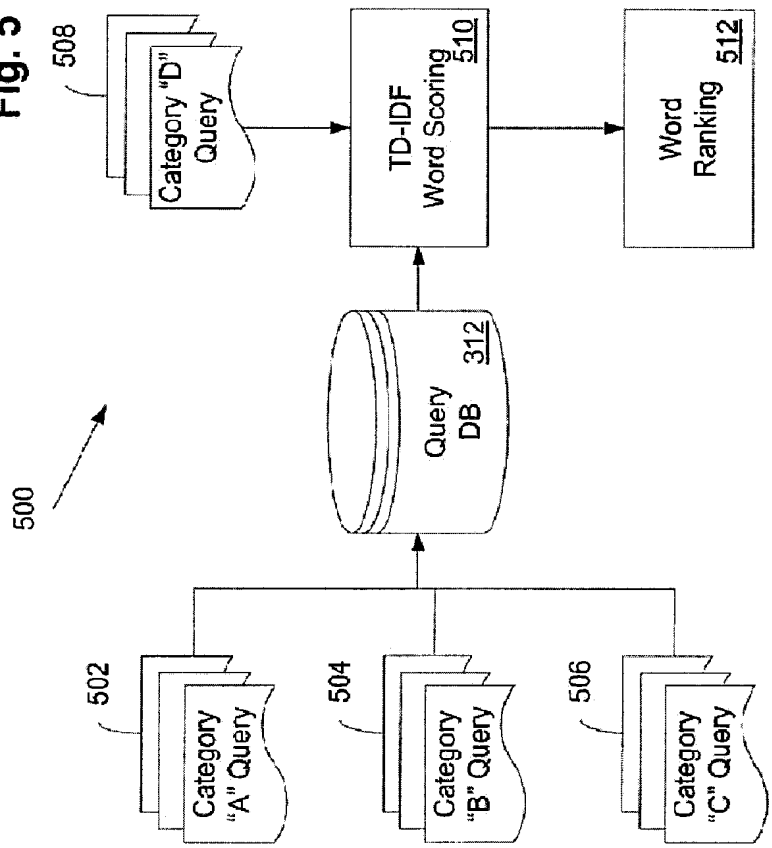

500
502
Category "A" Query
504
Category "B" Query
506
Category "C" Query
508
Category "D" Query
Query DB 312
TD-IDF Word Scoring 510
Word Ranking 512

Fig. 6

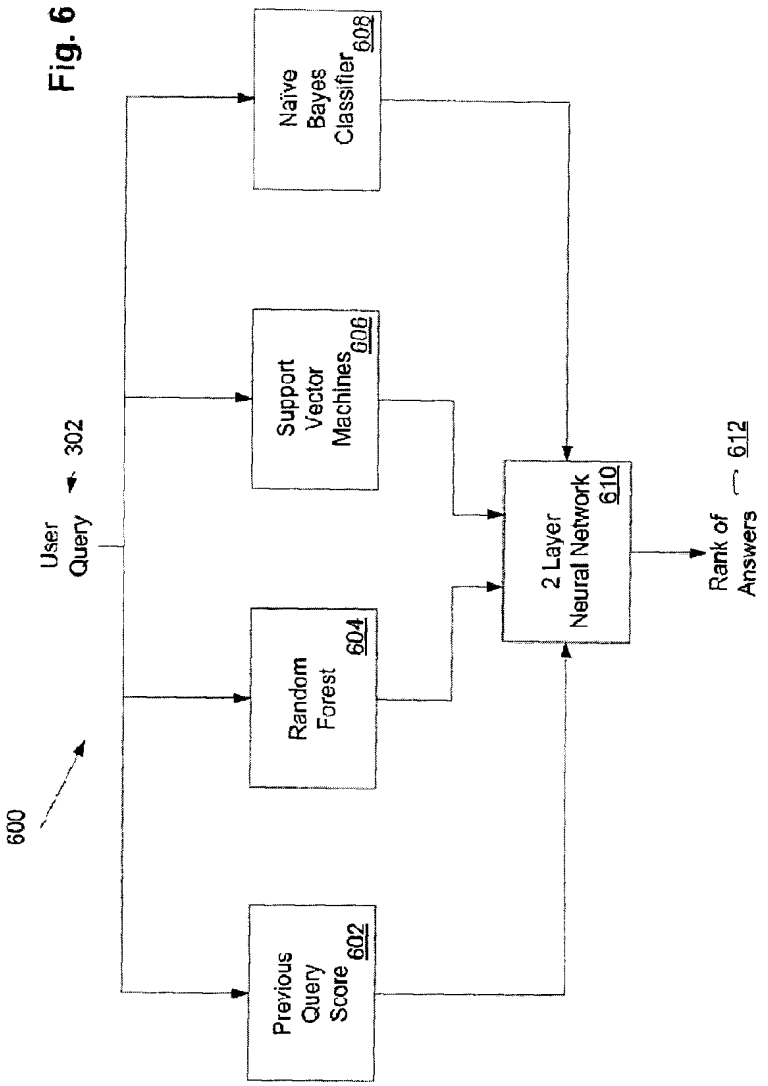

Naïve Bayes Classifier 608
Support Vector Machines 606
Random Forest 604
Previous Query Score 602
User Query 302
600
2 Layer Neural Network 610
Rank of Answers 612

Fig. 7

302
User Query
Conv. Features
710
Feature Extraction 712
Entity Extraction CRF 714
Template Filler CRF 716
Template 319
Optimized Feature Set 702
322
Template System 318
Genetic Algorithm 704
General Feature Set 706
Template Memory 320
Labelled Corpus 708

Figure 8

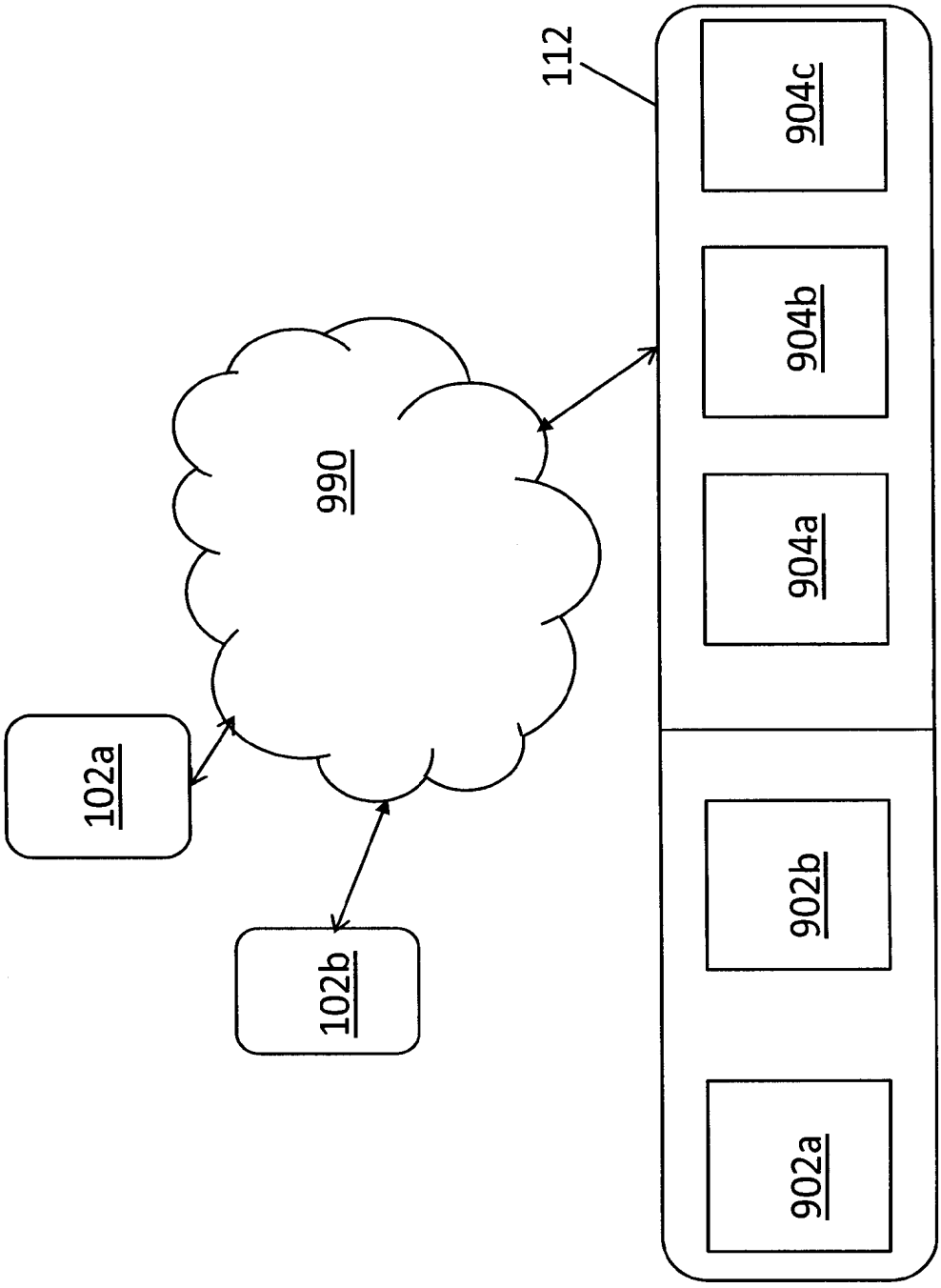


Figure 9

Extending domains with minimal tagged data
Base labeled CRF
1. entities
NLP Engine
2. entities
User
3. User states entities(s) is wrong
4. Request alternative
Expanded CRF
5. Returns an N-best list
6. N-best list

Figure 10

Figure 11

Figure 12

Figure 13

Figure 14

Figure 15

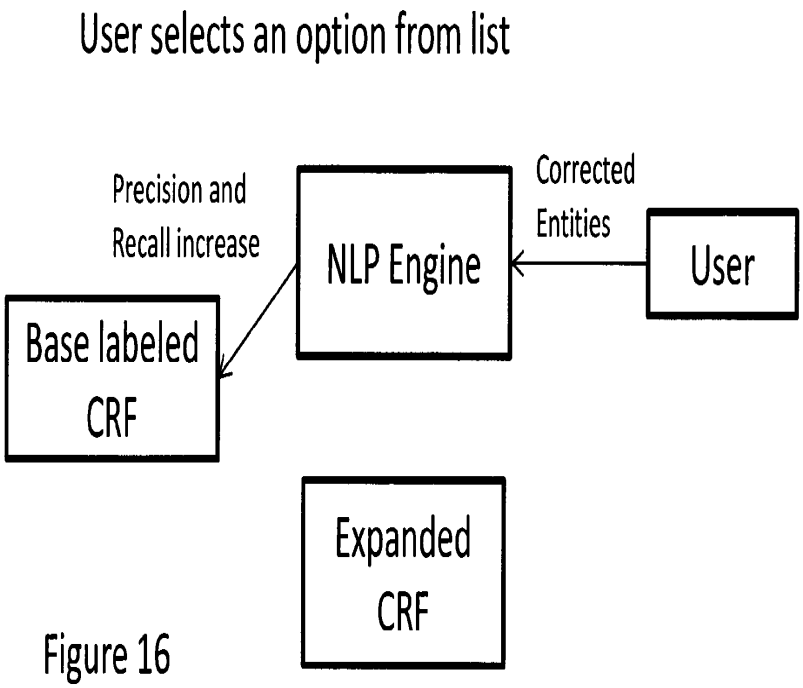


Figure 16

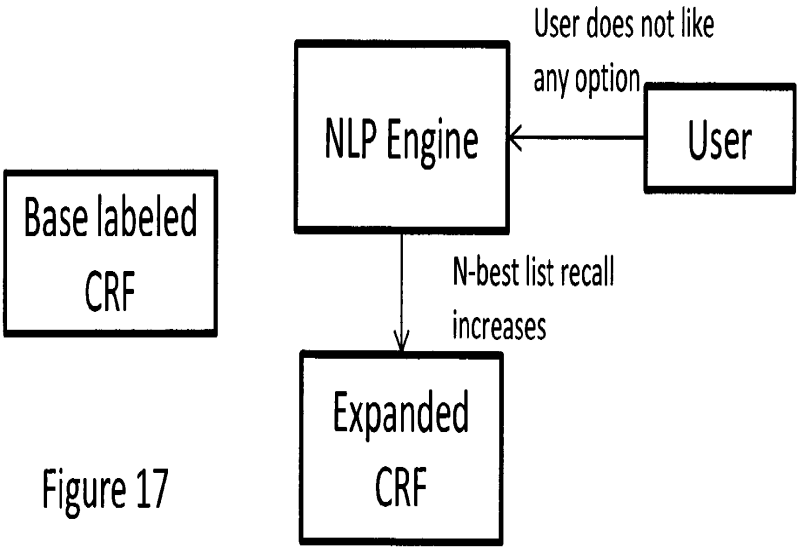


Figure 17

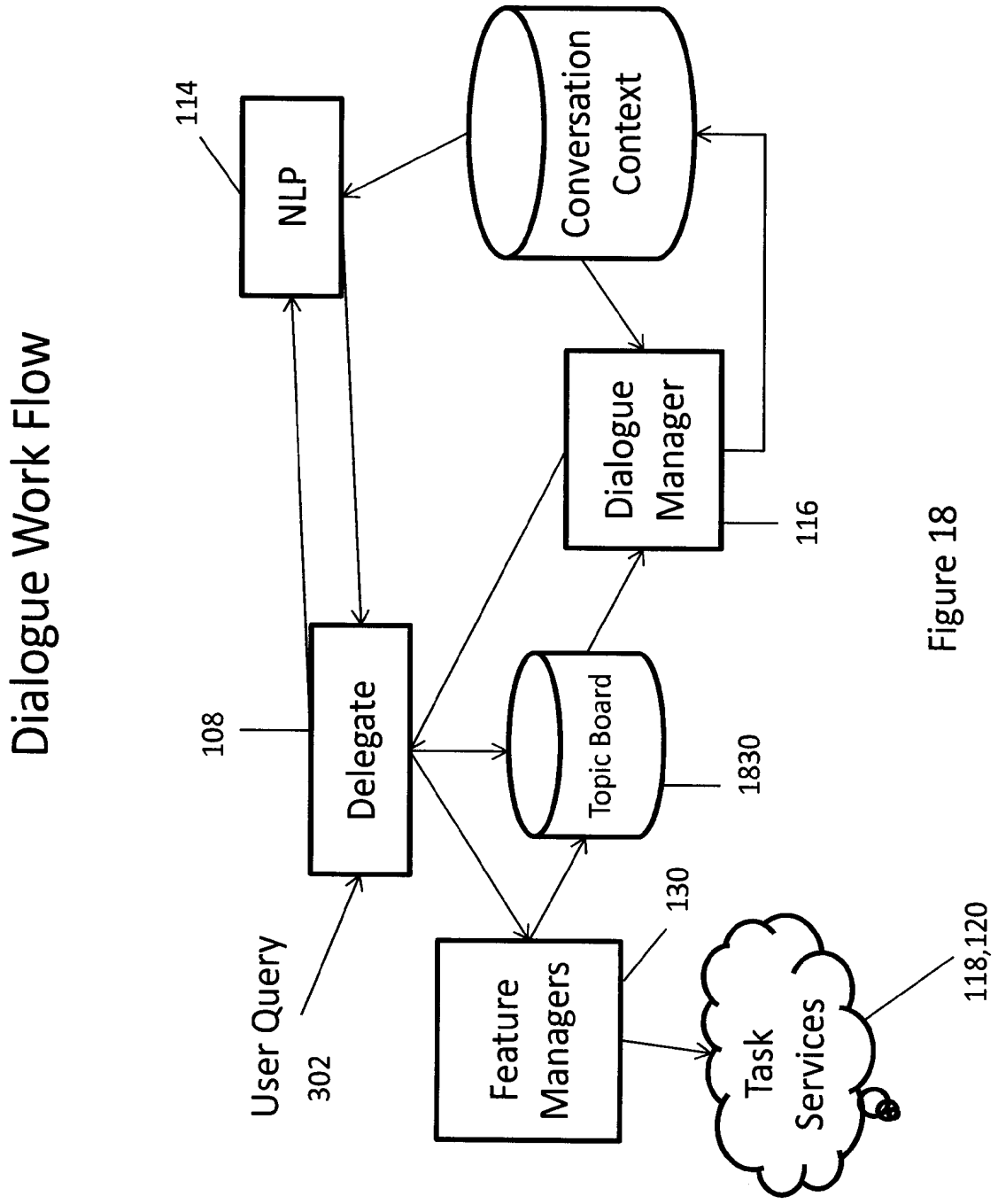

Dialogue Work Flow
NLP
114
Conversation Context
Dialogue Manager
116
Delegate
108
Topic Board
1830
Feature Managers
130
Task Services
118,120
User Query
302

Figure 18

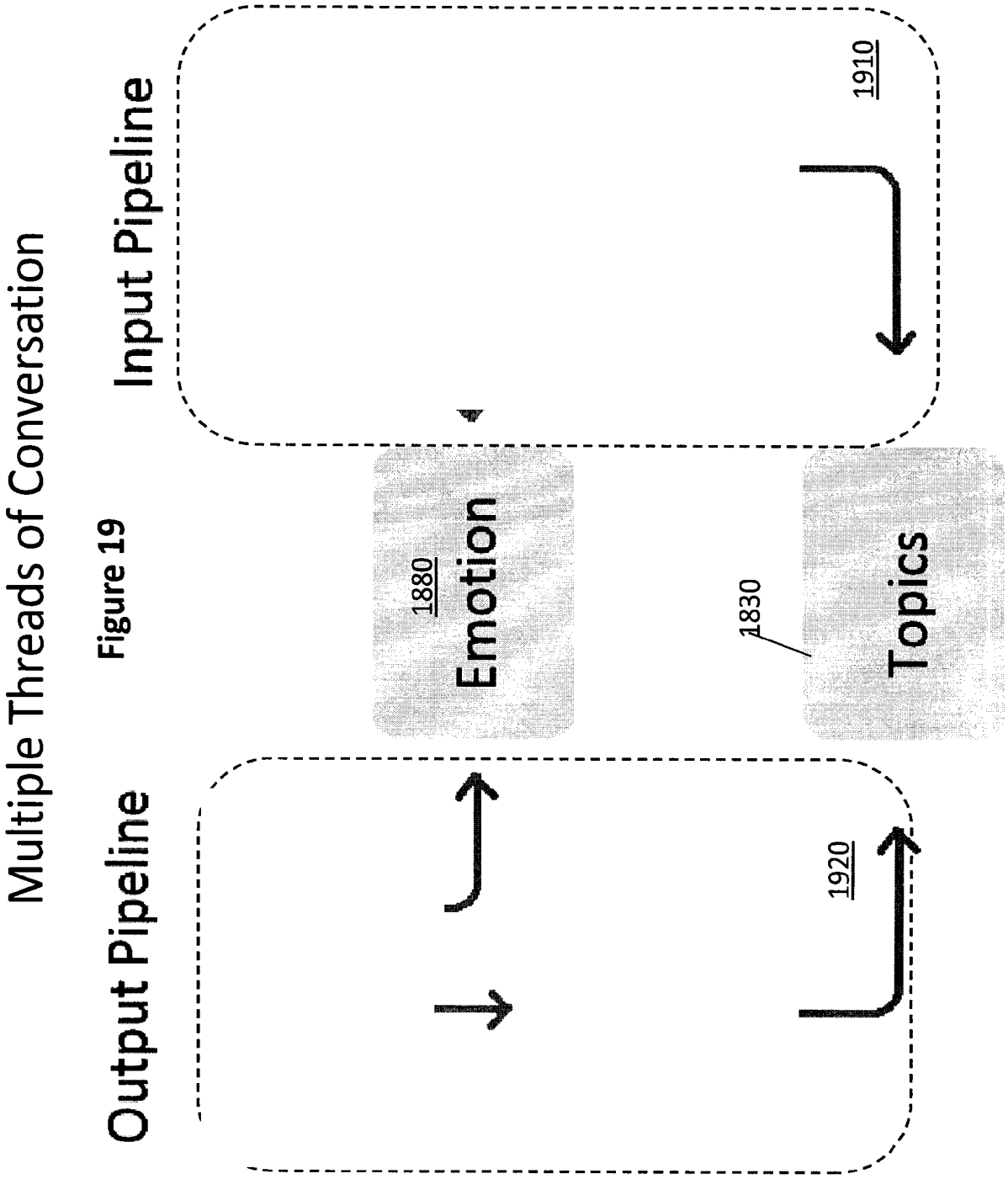

Multiple Threads of Conversation
Input Pipeline
1910
1880
Emotion
1830
Topics
Output Pipeline
1920

Figure 19

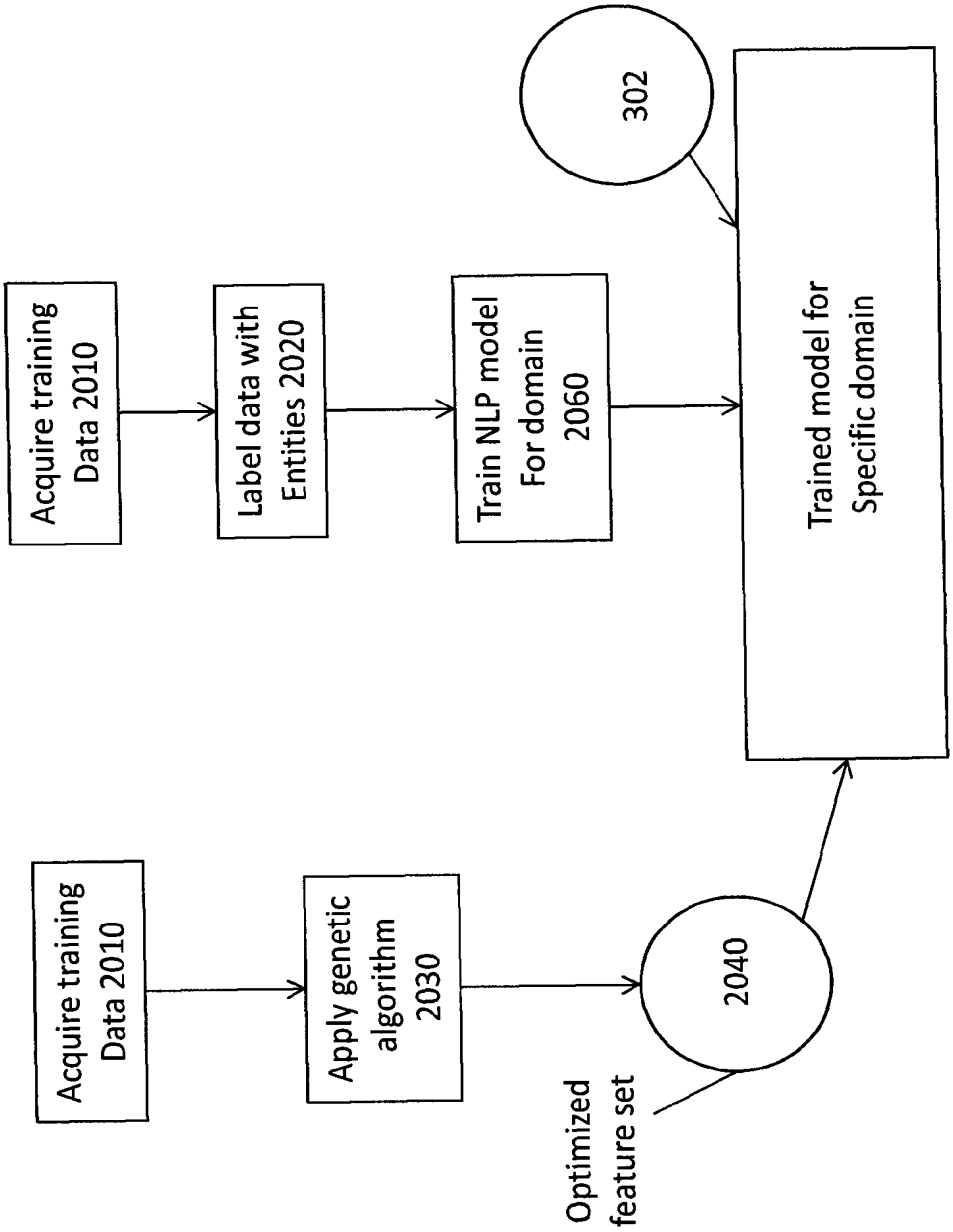

Acquire training Data 2010
Label data with Entities 2020
Train NLP model For domain 2060
302
Trained model for Specific domain
Acquire training Data 2010
Apply genetic algorithm 2030
2040
Optimized feature set

Figure 20

Asking for Clarification

Figure 21

Figure 22

Figure 23

Low initiative

Figure 25

Figure 24

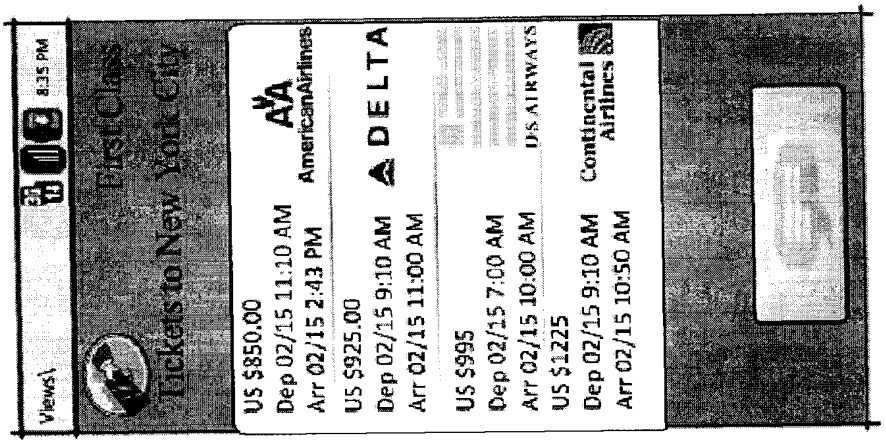


Figure 28

Low initiative

Figure 27

Figure 26



Figure 30

Figure 29

High Initiative

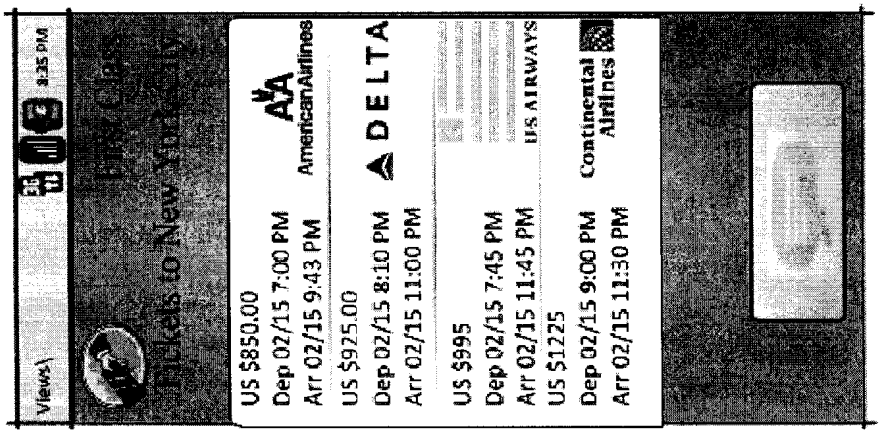


Figure 31

Figure 32

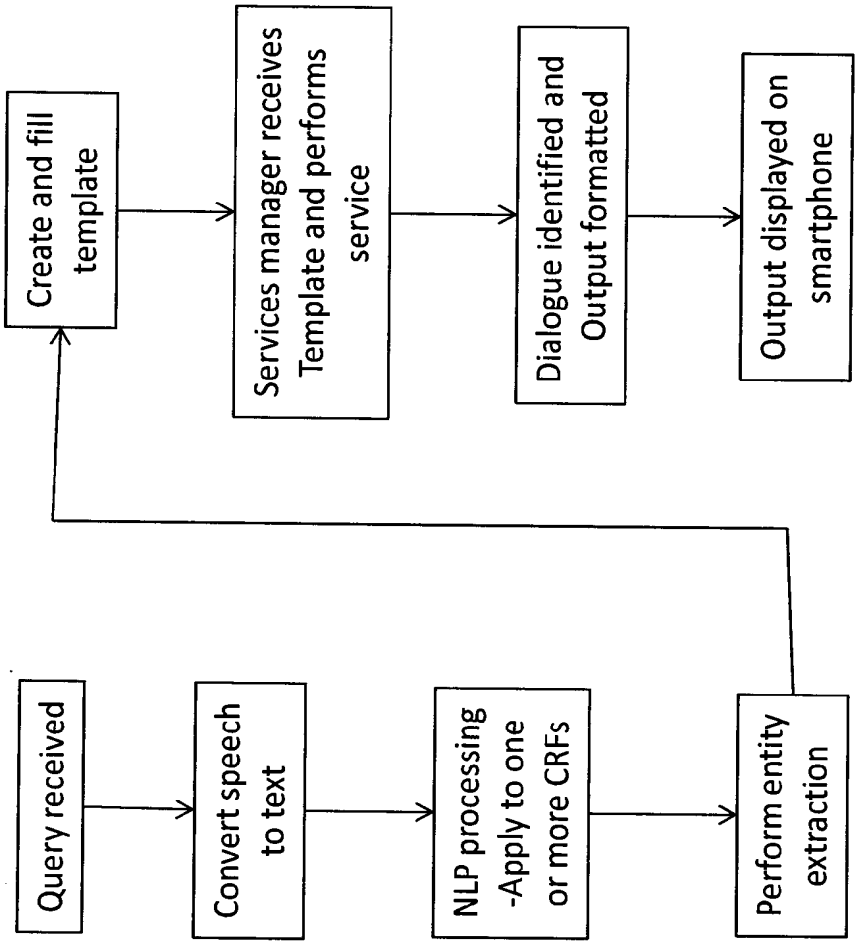

Query received
Convert speech to text
NLP processing -Apply to one or more CRFs
Perform entity extraction
Create and fill template
Services manager receives Template and performs service
Dialogue identified and Output formatted
Output displayed on smartphone

Figure 33

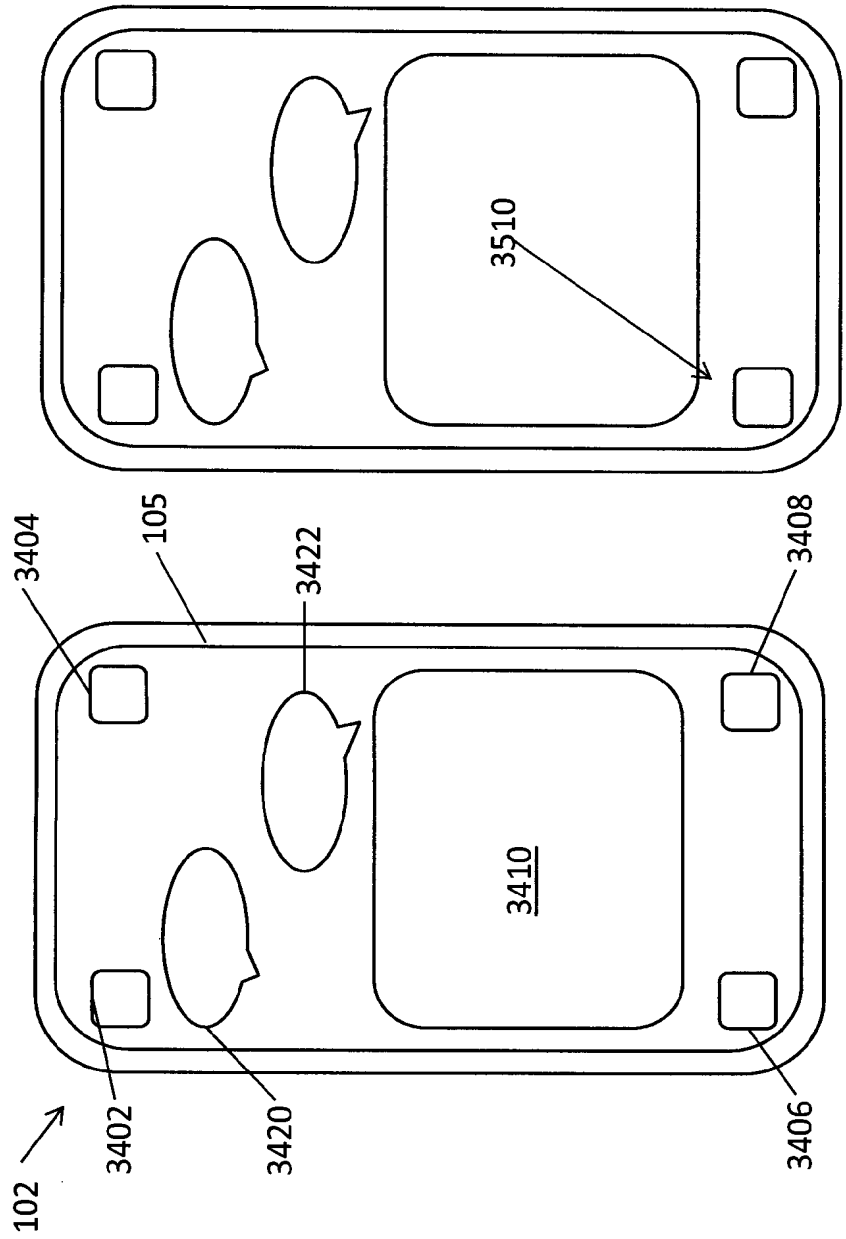


Figure 35

Figure 34

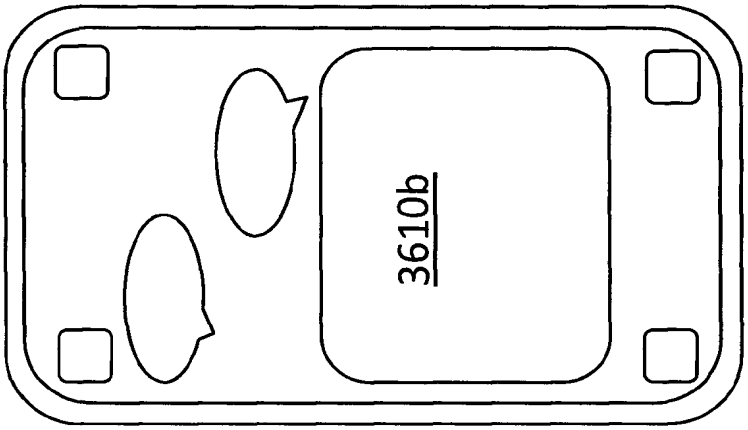


Figure 38

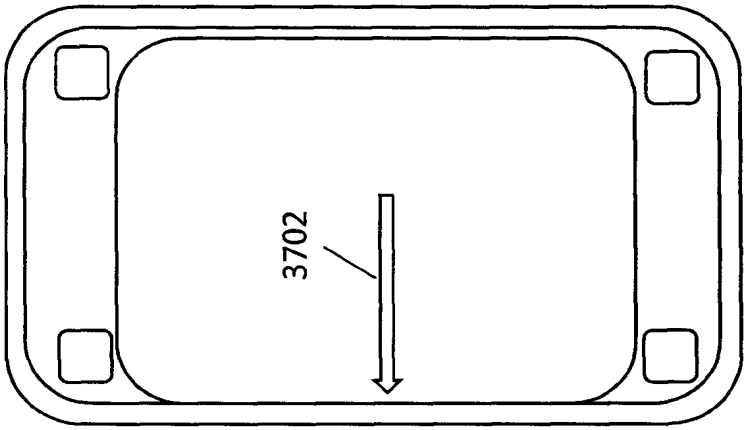


Figure 37

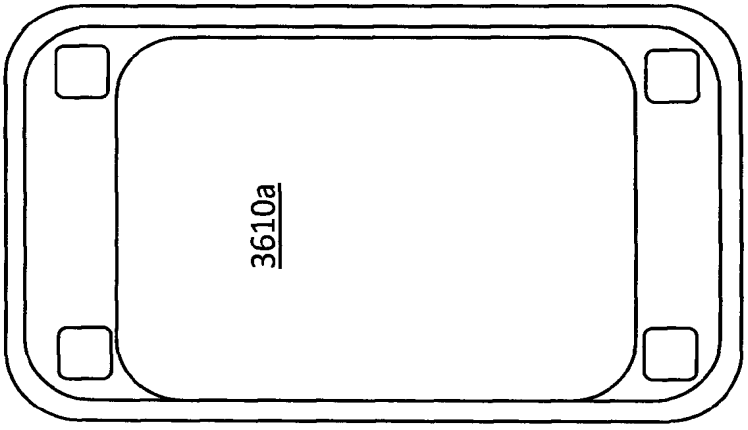


Figure 36

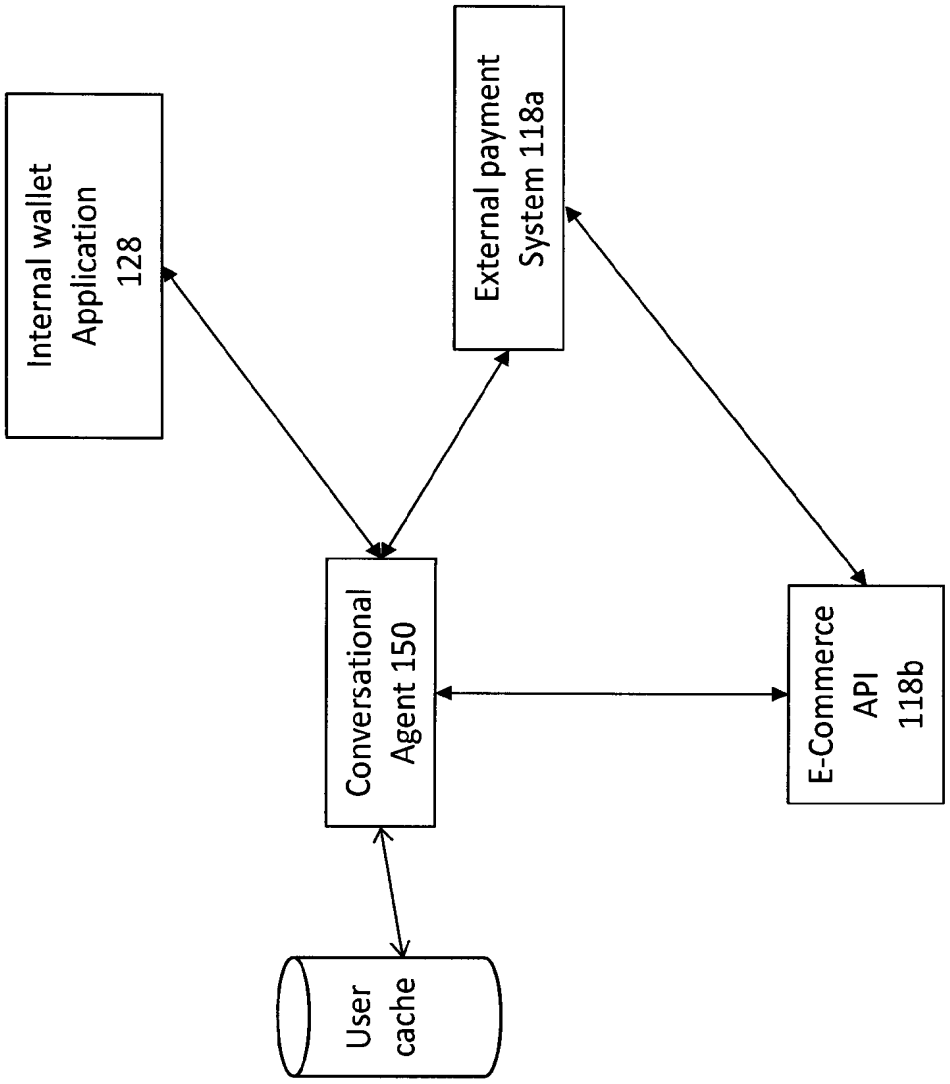

Internal wallet Application 128
External payment System 118a
Conversational Agent 150
E-Commerce API 118b
User cache

Figure 39

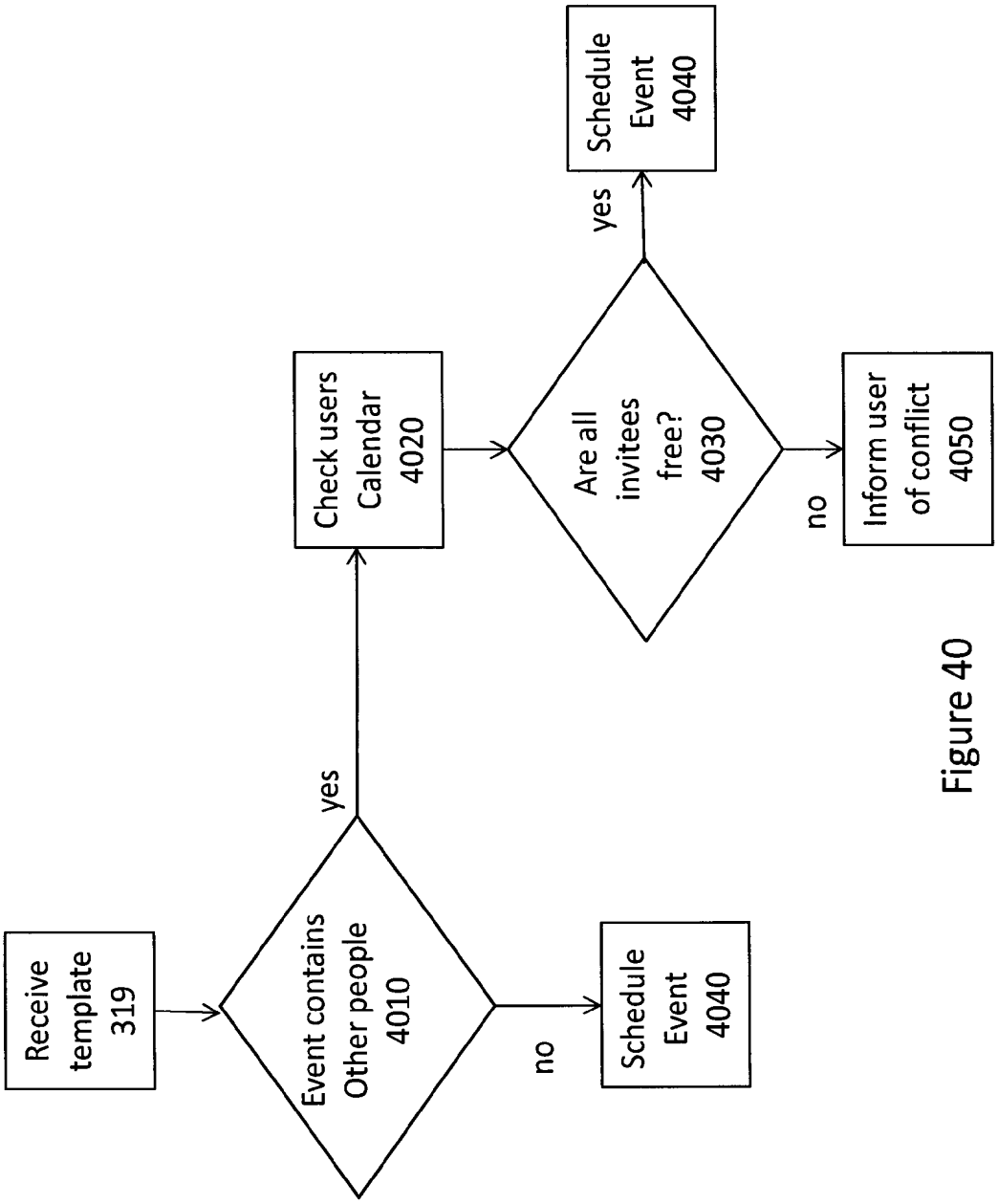

Receive template 319
Event contains Other people 4010
yes
no
Schedule Event 4040
Check users Calendar 4020
Are all invitees free? 4030
yes
no
Schedule Event 4040
Inform user of conflict 4050

Figure 40

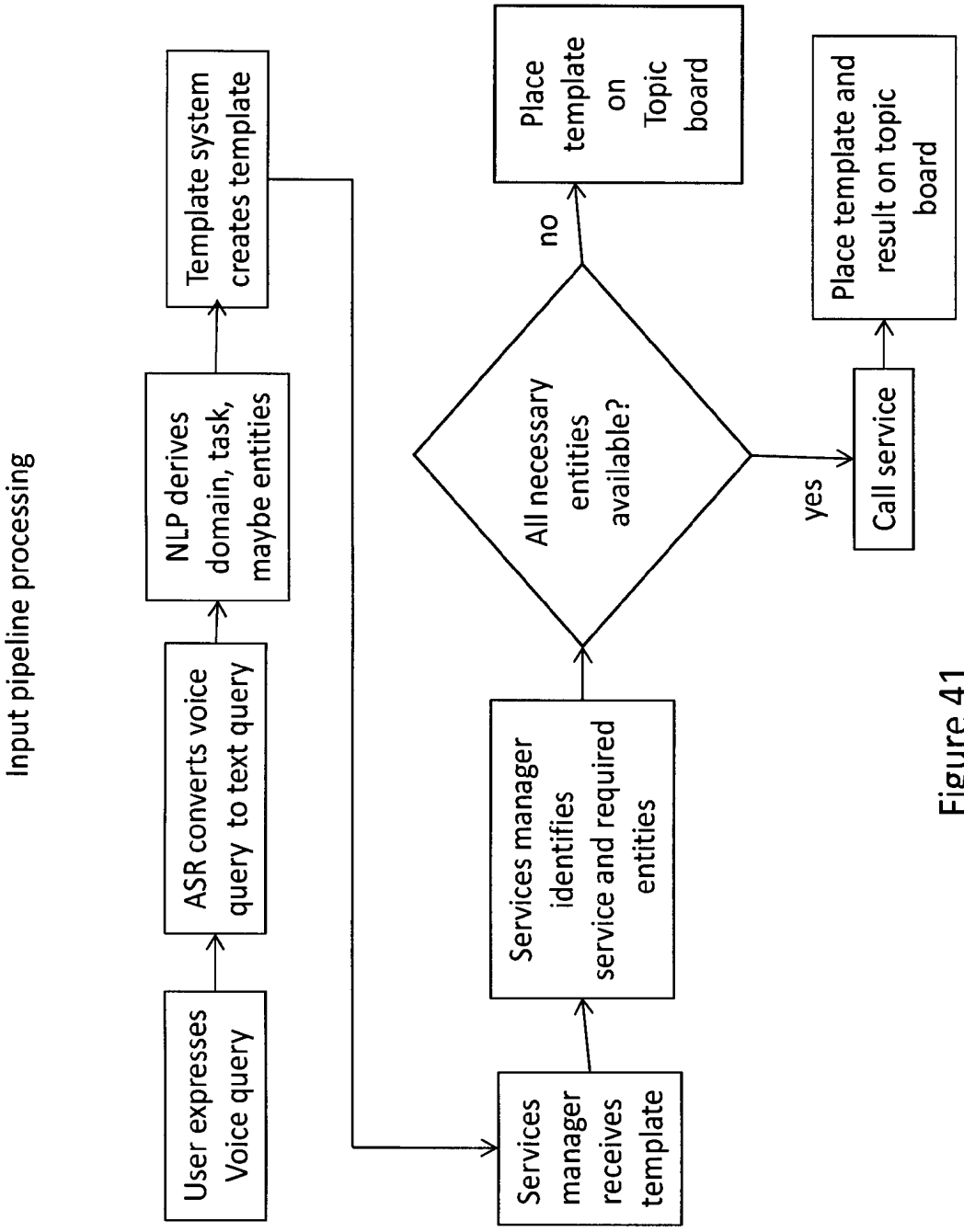

Input pipeline processing
User expresses Voice query
ASR converts voice query to text query
NLP derives domain, task, maybe entities
Template system creates template
Services manager receives template
Services manager identifies service and required entities
All necessary entities available?
no
Place template on Topic board
yes
Call service
Place template and result on topic board

Figure 41

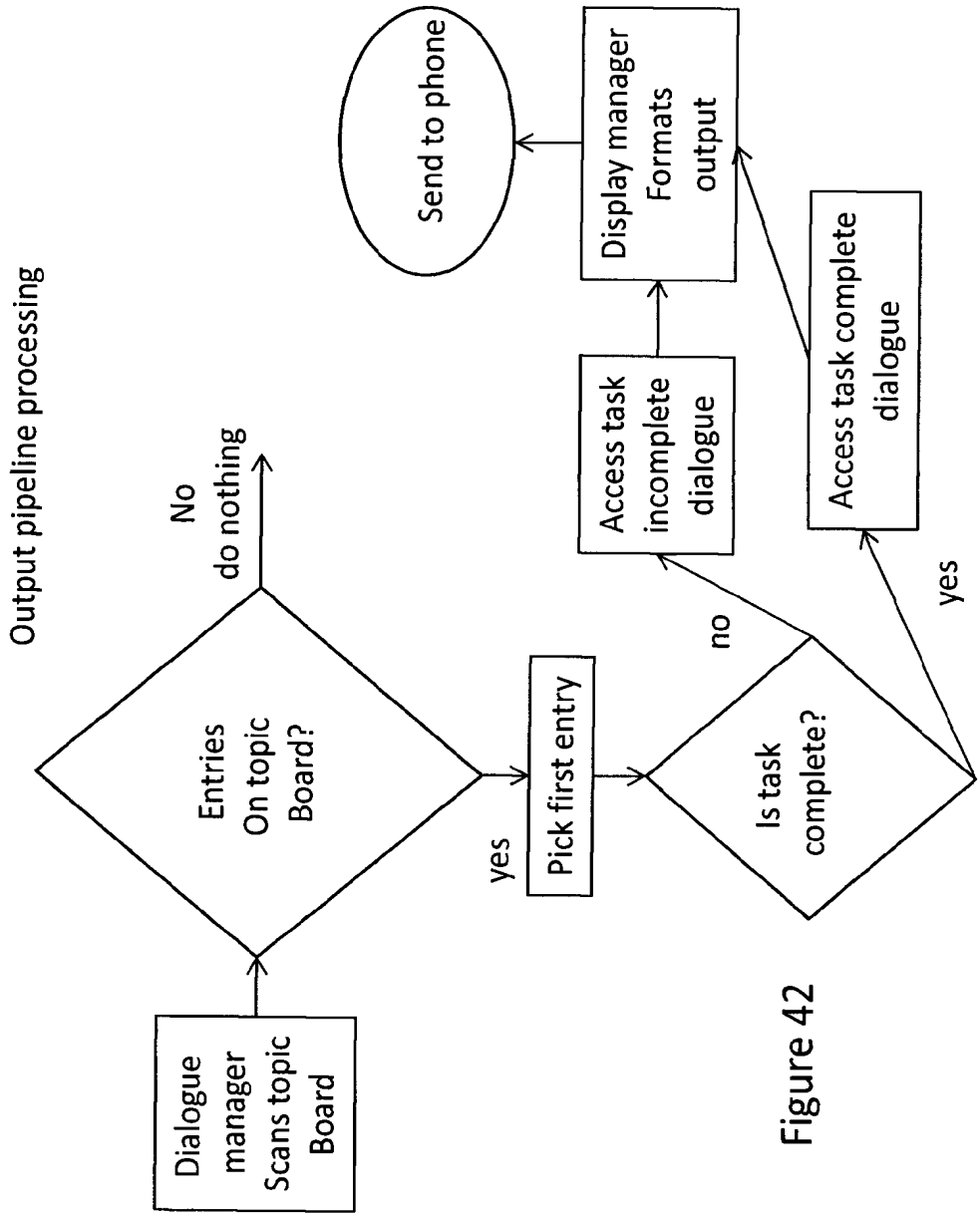

Output pipeline processing
Dialogue manager Scans topic Board
Entries On topic Board?
No do nothing
yes
Pick first entry
Is task complete?
no
yes
Access task incomplete dialogue
Access task complete dialogue
Display manager Formats output
Send to phone

Figure 42

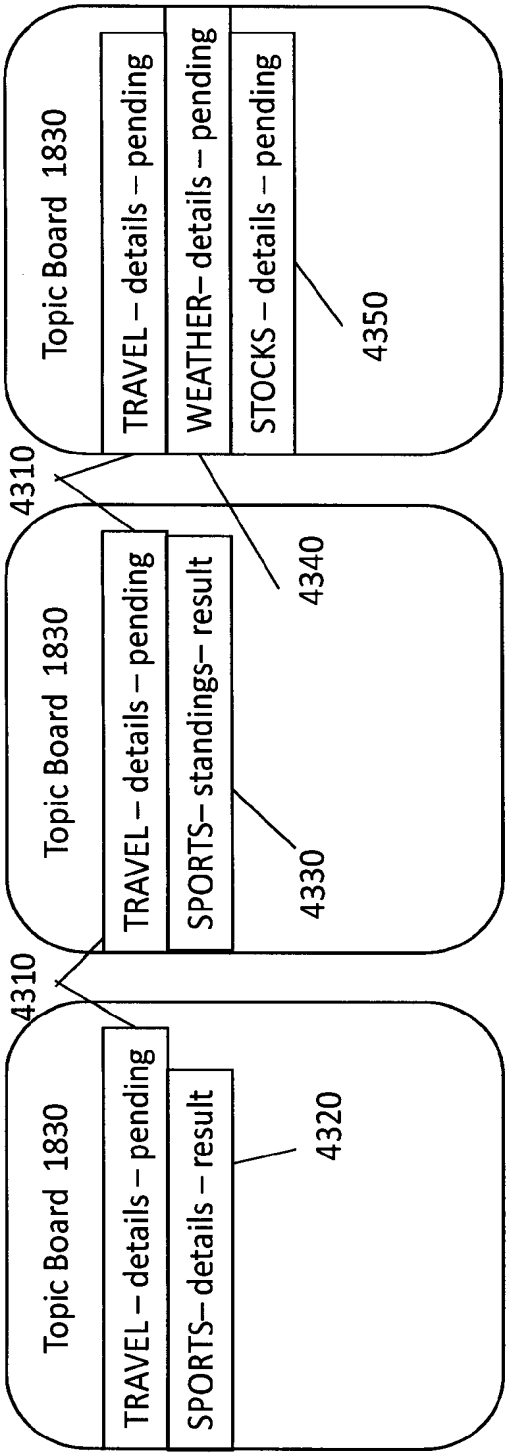


Figure 43a

Figure 43b

Figure 43c

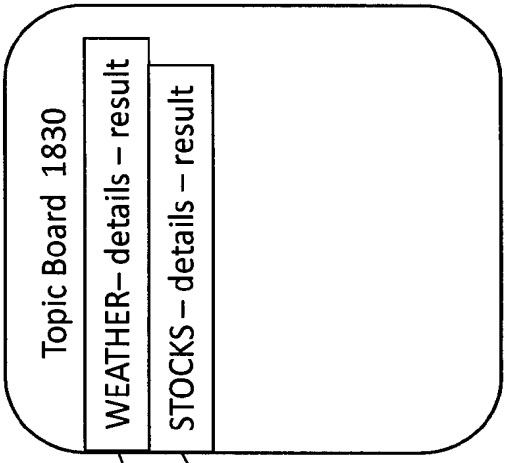


Figure 43e

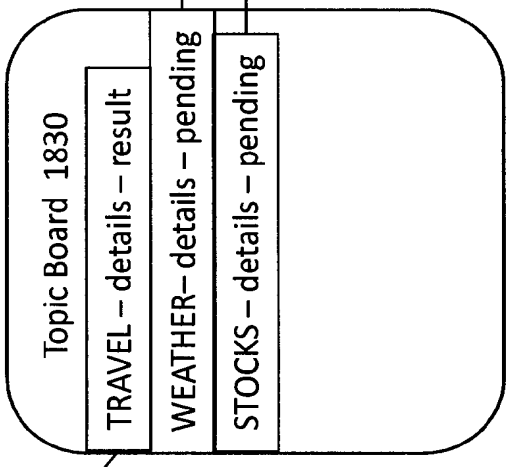


Figure 43d

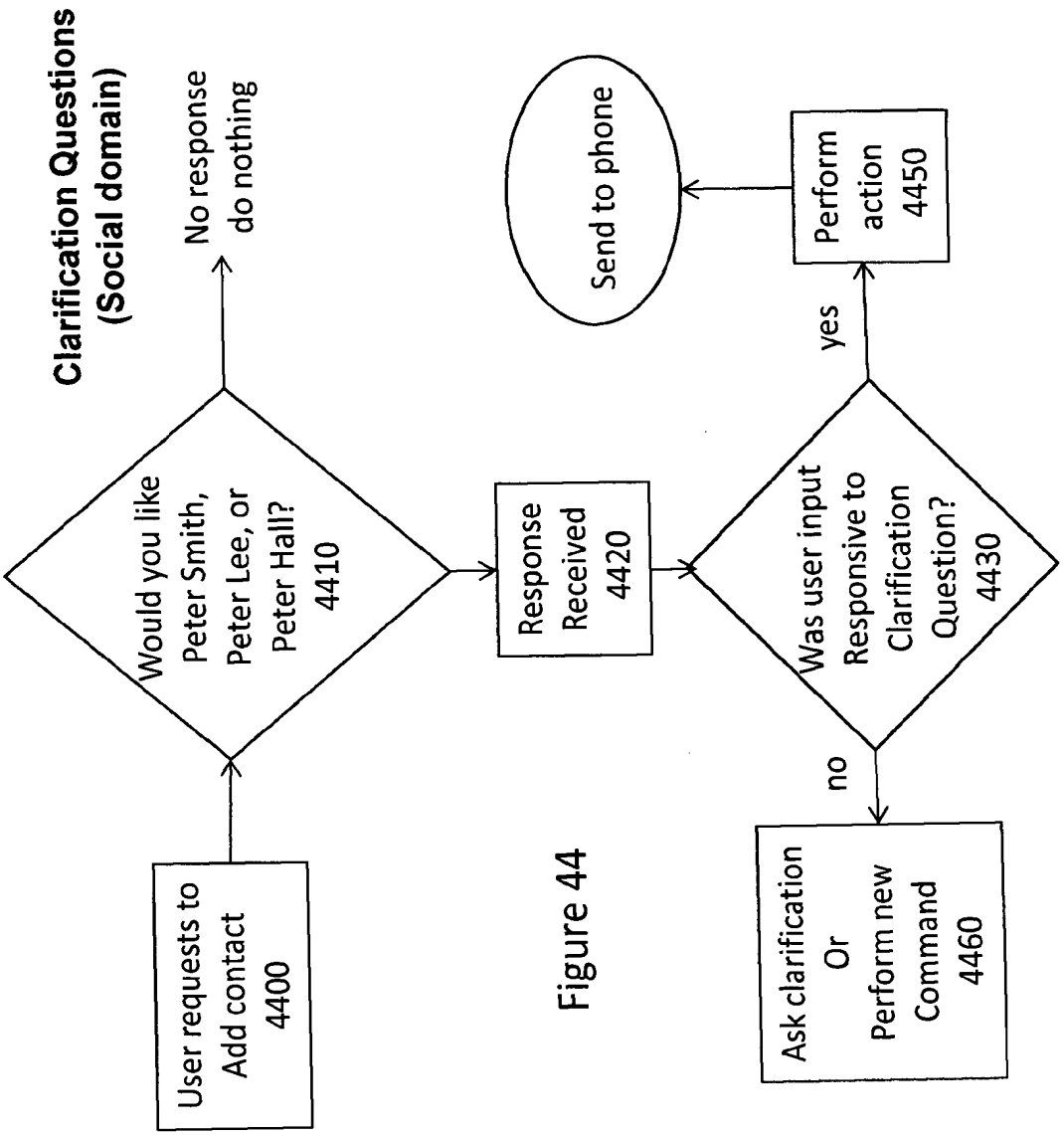

Clarification Questions
(Social domain)
User requests to Add contact 4400
Would you like Peter Smith, Peter Lee, or Peter Hall? 4410
No response do nothing
Response Received 4420
Was user input Responsive to Clarification Question? 4430
yes
Perform action 4450
Send to phone
no
Ask clarification Or Perform new Command 4460

Figure 44

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2013/000391

A. CLASSIFICATION OF SUBJECT MATTER
IPC: ***G06F 17/27*** (2006.01) , ***G06F 17/30*** (2006.01) , ***G10L 15/22*** (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC: ***G06F 17/27*** (2006.01) , ***G06F 17/30*** (2006.01) , ***G10L 15/22*** (2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Epoque, TotalPatent, Google, CPD (using keywords): language, natural language processing, query, domain, command, intent, derive, conditional random field

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2011/088053A2 Gruber et al. 21-07-2011 21 July 2011 Entire document	1-37
A	US 2011/0112827A1 Kennewick et al. 12-05-2011 12 May 2011 Entire document	1-37
A,P	WO 2013/010262A1 Suleman et al. 24-01-2013 24 January 2013 Entire document	1-37

[ ] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08 July 2013 (08-07-2013)	15 July 2013 (15-07-2013)

Name and mailing address of the ISA/CA	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Kristy Hyam (819) 934-2673

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Page 289 of 431

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2013/000391

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
WO2011088053A2	21 July 2011 (21-07-2011)	AU2010254812A1	12 January 2012 (12-01-2012)
		AU2011205426A1	23 August 2012 (23-08-2012)
		AU2012101191A4	25 October 2012 (25-10-2012)
		AU2012101191B4	09 May 2013 (09-05-2013)
		AU2012232977A1	18 April 2013 (18-04-2013)
		CA2787351A1	21 July 2011 (21-07-2011)
		CA2791277A1	30 March 2013 (30-03-2013)
		CA2791791A1	21 July 2011 (21-07-2011)
		CA2792412A1	21 July 2011 (21-07-2011)
		CA2792442A1	21 July 2011 (21-07-2011)
		CA2792570A1	21 July 2011 (21-07-2011)
		CA2793002A1	21 July 2011 (21-07-2011)
		CA2793118A1	21 July 2011 (21-07-2011)
		CA2793248A1	21 July 2011 (21-07-2011)
		CA2793741A1	21 July 2011 (21-07-2011)
		CA2793743A1	21 July 2011 (21-07-2011)
		CN102792320A	21 November 2012 (21-11-2012)
		DE102012019178A1	04 April 2013 (04-04-2013)
		EP2526511A2	28 November 2012 (28-11-2012)
		EP2575128A2	03 April 2013 (03-04-2013)
		GB201009318D0	21 July 2010 (21-07-2010)
		GB2472482A	09 February 2011 (09-02-2011)
		GB2472482B	21 September 2011 (21-09-2011)
		GB201213633D0	12 September 2012 (12-09-2012)
		GB2490444A	31 October 2012 (31-10-2012)
		GB201217449D0	14 November 2012 (14-11-2012)
		GB2495222A	03 April 2013 (03-04-2013)
		JP2013080476A	02 May 2013 (02-05-2013)
		JP2013517566A	16 May 2013 (16-05-2013)
		KR20120120316A	01 November 2012 (01-11-2012)
		KR20120136417A	18 December 2012 (18-12-2012)
		KR20120137424A	20 December 2012 (20-12-2012)
		KR20120137425A	20 December 2012 (20-12-2012)
		KR20120137434A	20 December 2012 (20-12-2012)
		KR20120137435A	20 December 2012 (20-12-2012)
		KR20120137440A	20 December 2012 (20-12-2012)
		KR20120138826A	26 December 2012 (26-12-2012)
		KR20120138827A	26 December 2012 (26-12-2012)
		KR20130000423A	02 January 2013 (02-01-2013)
		KR20130035983A	09 April 2013 (09-04-2013)
		MX2012008369A	12 September 2012 (12-09-2012)
		TW201112228A	01 April 2011 (01-04-2011)
		US2010312547A1	09 December 2010 (09-12-2010)
		US2012016678A1	19 January 2012 (19-01-2012)
		US2012022872A1	26 January 2012 (26-01-2012)
		US2012245944A1	27 September 2012 (27-09-2012)
		US2012265528A1	18 October 2012 (18-10-2012)
		US2012309363A1	06 December 2012 (06-12-2012)
		US2012311583A1	06 December 2012 (06-12-2012)
		US2012311584A1	06 December 2012 (06-12-2012)
		US2012311585A1	06 December 2012 (06-12-2012)
		US2013110505A1	02 May 2013 (02-05-2013)
		US2013110515A1	02 May 2013 (02-05-2013)
		US2013110518A1	02 May 2013 (02-05-2013)
		US2013110519A1	02 May 2013 (02-05-2013)
		US2013110520A1	02 May 2013 (02-05-2013)
		US2013111348A1	02 May 2013 (02-05-2013)
		US2013111487A1	02 May 2013 (02-05-2013)
		US2013115927A1	09 May 2013 (09-05-2013)
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		WO2010141802A1	09 December 2010 (09-12-2010)
		WO2011088053A3	19 January 2012 (19-01-2012)
		WO2012167168A2	06 December 2012 (06-12-2012)
		WO2012167168A3	21 March 2013 (21-03-2013)
		WO2013048880A1	04 April 2013 (04-04-2013)

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Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US2011112827A1	12 May 2011 (12-05-2011)	CN102792294A	21 November 2012 (21-11-2012)
		EP2499582A1	19 September 2012 (19-09-2012)
		JP2013510341A	21 March 2013 (21-03-2013)
		KR20120120163A	01 November 2012 (01-11-2012)
		WO2011059562A1	19 May 2011 (19-05-2011)
WO2013010262A1	24 January 2013 (24-01-2013)	CA2747153A1	19 January 2013 (19-01-2013)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
340577-02		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2015/010711	9 January 2015 (09-01-2015)	15 January 2014 (15-01-2014)
Applicant		
MICROSOFT TECHNOLOGY LICENSING, LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language,** the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 11
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2015/010711

A. CLASSIFICATION OF SUBJECT MATTER
INV. G10L15/22
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G10L G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data, COMPENDEX, INSPEC, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2013/155619 A1 (PASUPALAK SAM [CA]; PANTONY JOSHUA R [CA]; HSU WILSON [CA]; WU ZHIYUAN) 24 October 2013 (2013-10-24) paragraph [0005] paragraph [0042] - paragraph [0048] paragraph [0059] - paragraph [0099] paragraph [0200] - paragraph [0229] -----	1-10
X	US 6 721 706 B1 (STRUBBE HUGO J [US] ET AL) 13 April 2004 (2004-04-13) column 15, line 3 - column 17, line 6 column 19, line 55 - column 32, line 64 ----- -/--	1-5,7-10

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 March 2015	18/03/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Del Chiaro, Silvia

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2015/010711

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/155765 A1 (TAKEUCHI JOHANE [JP] ET AL) 13 July 2006 (2006-07-13) paragraph [0004] - paragraph [0006] paragraph [0019] - paragraph [0022] paragraph [0023] - paragraph [0024] paragraph [0036] - paragraph [0044] paragraph [0046] - paragraph [0050] -----	1-10
A	US 2009/210217 A1 (OKADA KAZUO [JP]) 20 August 2009 (2009-08-20) the whole document -----	1-10

1

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

Patent Owner Ex. 2104
Page 294 of 431

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2015/010711

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2013155619 A1	24-10-2013	EP 2839391 A1	25-02-2015
		US 2015066479 A1	05-03-2015
		WO 2013155619 A1	24-10-2013
US 6721706 B1	13-04-2004	AT 497614 T	15-02-2011
		EP 1415218 A2	06-05-2004
		JP 2004527809 A	09-09-2004
		US 6721706 B1	13-04-2004
		WO 0237250 A2	10-05-2002
US 2006155765 A1	13-07-2006	JP 4629560 B2	09-02-2011
		JP 2006171719 A	29-06-2006
		US 2006155765 A1	13-07-2006
US 2009210217 A1	20-08-2009	NONE	

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2015/010711	09.01.2015	15.01.2014

International Patent Classification (IPC) or both national classification and IPC
INV. G10L15/22

Applicant
MICROSOFT TECHNOLOGY LICENSING, LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Telephone No. +49 89 2399-0

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-10
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-10
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 **Documents**

1.1 Reference is made to the following documents:

D1 WO 2013/155619 A1 (PASUPALAK SAM [CA]; PANTONY JOSHUA R [CA]; HSU WILSON [CA]; WU ZHIYUAN) 24 October 2013 (2013-10-24)

D2 US 6 721 706 B1 (STRUBBE HUGO J [US] ET AL) 13 April 2004 (2004-04-13)

D3 US 2006/155765 A1 (TAKEUCHI JOHANE [JP] ET AL) 13 July 2006 (2006-07-13)

D4 US 2009/210217 A1 (OKADA KAZUO [JP]) 20 August 2009 (2009-08-20)

2 **Inventiveness of claims 1 and 9, Article 33(3) PCT**

2.1 Document D1 is regarded as being the closest prior art to the subject-matter of claim 1. It discloses already, in correspondence with claim 1 (the references between brackets relate to D1; the original wording of the claim is set in *italic fonts*; features not disclosed in D1 are set as ~~strikethrough~~; features which differ from the wording of the claim are set underlined):

A method for implementing a digital personal assistant, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant

(paragraph 5, page 2, lines 14-20, paragraph 69)*;*

based on at least an analysis of the digital representation of the utterance

(paragraph 59)*,*

determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant

(paragraph 42 , in the case of chat query, page 7, lines 7-10, paragraph 60)*; and*

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant

(paragraph 44, in the case of chat query, see paragraph 42, paragraphs 224-229) *that includes at least one of:*

a multimedia object that is displayed within or played back by a user interface of the digital personal assistant **(paragraph 44)**,

the ~~multimedia object being associated with a popular culture reference~~; and

speech that is generated or played back by the digital personal assistant

(paragraph 44),

~~the speech comprising an impersonation of a voice of a person associated with the popular culture reference.~~

2.2 The method defined in independent claim 1 differs from that disclosed in D1 in that:

- The played multimedia object is associated with a popular culture reference

- a voice of a person associated with the popular culture reference is used to reproduce the speech.

2.3 The identified differences have no technical character and do not provide any technical effect. A played media associated with the popular culture or the kind of voice used to reproduce the speech is not a technical feature of the system but more an aesthetical or social characterisation.

The said features being not technical do not made any contribution over the prior art and to the inventive activity of the claims therefore claim 1 does not meet the requirements of inventiveness of Article 33(3) PCT.

2.4 Therefore the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

2.5 The same considerations apply to claims 9 mutatis mutandis.

3 **Inventiveness of dependent claims 2-8 and 10, Article 33(3) PCT**

3.1 The dependent claims 2-8 do not appear to contain any additional feature which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to inventive step, the reason being as following:

A general statement the Applicant should note that the features "a quotation associated with the popular culture reference", "that evoked the popular culture reference", "associated with the popular culture reference" as in claims 2-4 and 10, have no technical character and do not provide any technical effect, see also paragraph 2.3 above.

The said features being not technical do not made any contribution over the prior art and to the inventive activity of the claims.

The remaining features of claims 2-8 are disclosed in D2 (claim 2-5: paragraph 44, claims 6 and 8: paragraph 99, paragraphs 224-229, claim 7: paragraph 227) and D1(claims 2-5: column 15, lines 3-67, column 25, line 55 to column 28, line 51);

Therefore, for what said above the subject matter of claims 2-8 does not involve any inventive activity

3.2 The same considerations apply to claim 10 mutatis mutandis.

Re Item VII

Certain defects in the international application

4 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.

4.1 All independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate.

4.2 The features of the claims 1 and 9 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

4.3 The general statement in the description on page 35 , line 2 refers to the "spirit of the invention". When used to interpret the claims, it indicates that subject-matter for which protection is sought could differ from the subject-matter of the claims, thereby rendering the scope of the claims unclear (Article 6 PCT). The statement should therefore be deleted.

Re Item VIII

Certain observations on the international application

5 **Clarity of claims 1, 7 and 9, Article 6 PCT**

5.1 The expression "a persona of the digital personal assistant" used in claims 1 and 9 is ambiguous and has not well recognized technical meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of the said claims unclear (Article 6 PCT).

5.2 The expression "trending topic" used in claim 7 is ambiguous and has not well recognized technical meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of the said claims unclear (Article 6 PCT).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Mouni Reddy
Application No.: 14/156,009
Filed: 2014-01-15
Customer No.: 69316
Attorney Docket No.: 340577.01
Group Art Unit: 2672
Confirmation Number: 1056
Examiner: Barbara Diane Reinier
Title: DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

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

STATEMENT FILED PURSUANT TO THE DUTY OF DISCLOSURE UNDER 37 C.F.R. §§ 1.56, 1.97 AND 1.98

Commissioner:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, the Applicant requests consideration of this Information Disclosure Statement.

PART I: Compliance with 37 C.F.R. § 1.97

This Information Disclosure Statement is being filed after the issuance of Non-Final office action.

Fees is required.

PART II: Additional Information

The Applicant hereby makes the following additional information of record in the above-identified application.

Serial No.	Filing Date	Inventor(s)
N/A	N/A	N/A

PART III: Remarks

The Applicant hereby makes of record in the above-identified application the information listed on the attached form PTO/SB/08A. The order of presentation of the references should not be construed as an indication of the importance of the references. Documents cited on the attached form PTO/SB/08A are enclosed unless otherwise indicated. It is respectfully requested that:

1. The Examiner consider completely the cited information, along with any other information, in reaching a determination concerning the patentability of the present claims;

2. The enclosed form PTO/SB/08A be signed by the Examiner to evidence that the cited information has been fully considered by the Patent and Trademark Office during the examination of this application;

3. The citations for the information be printed on any patent which issues from this application.

By submitting this Information Disclosure Statement, the Applicant makes no representation that a search has been performed, of the extent of any search performed, or that more relevant information does not exist.

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, in fact, prior art as defined by 35 U.S.C. § 102.

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Page 304 of 431

Notwithstanding any statement by the Applicant, the Applicant urges the Examiner to form his or her own conclusion regarding the relevance of the cited information. An early and favorable action is hereby requested.

Respectfully submitted,

Date October 20, 2015

By:/Thomas C. Fiala, #43,610/

Thomas C. Fiala

Reg. No. 43,610

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CERTIFICATE OF MAILING OR TRANSMISSION
(Under 37 CFR § 1.8(a)) or ELECTRONIC FILING

I hereby certify that this correspondence is being electronically deposited with the USPTO via EFS-Web on the date shown below:

October 20, 2015
Date

/Christine Hartness/
Signature

Christine Hartness
Printed Name

Patent Owner Ex. 2104
Page 305 of 431

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/156,009	01/15/2014	Mouni Reddy	340577.01	1056

69316 7590 07/30/2015

MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

EXAMINER
REINIER, BARBARA DIANE

ART UNIT	PAPER NUMBER
2672	

NOTIFICATION DATE	DELIVERY MODE
07/30/2015	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):

stevensp@microsoft.com
chriochs@microsoft.com
usdocket@microsoft.com

Office Action Summary	Application No. 14/156,009	Applicant(s) REDDY ET AL.	
	Examiner Barbara Reinier	Art Unit 2672	AIA (First Inventor to File) Status Yes

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *1/15/2014*.

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

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

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

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

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

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

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-20* 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 *1/15/2014* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

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

3. Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim(s) does/do not fall within at least one of the four categories of patent eligible subject matter because claims are directed at abstract conceptual steps; the input information [i.e. utterance of a user] is used to compare with already present information [i.e. analysis determined to engage the digital personal assistant], and then using some set of rules to generate a response. Following the flowchart on page 74621 as provided in the Federal Register dated 12/16/2014, claims 1-20 appear to fail at step 2B. As discussed in the FR on page 74622, the above claims appear to fall under several of the explicitly detailed conceptual categories that have been found to be ineligible [see columns 2 and 3]. MPEP 2106(II) further details judicial exceptions as well as guidelines for overcoming such rejections.

4. With regard to claims 14-20 in which a processor and memory are included, relying on guidance provided in the FR on pages 74624 and 74631, these generically recited digital [i.e. computer] components are not seen to add "*Significantly More*" to the

limitations of the claim such that the judicial exception would be overcome. These component as claimed are merely accomplishing processing functions that is well-understood, routine and conventionally already known within the industry.

Claim Rejections - 35 USC § 103

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

6. Claims 1-3 and 6-20 are rejected under 35 U.S.C. 103 as being unpatentable over Chen et al. (US 8903716) in view of Buck Rogers (TV series 1979-1981) and in further view of Tischer (20090083143).

Regarding claim 1: Chen discloses a method for implementing a digital personal assistant **[Abstract & col. 10 lines 6-52]**, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant **[a user is speaking to intelligent automated assistant 1002 using input device 1206, col. 18 lines 12-15]**;

based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant **[assistant 1002 includes intelligence beyond simple database applications … Operationalizing semantic intent into a**

strategy for using online services and executing that strategy on behalf of the user, col. 18 lines 47-57]; and

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant that includes at least one of **[assistant responds, col. 18 lines 19-20]**:

a multimedia object that is displayed within or played back by a user interface of the digital personal assistant **[101D of Figure 2, col. 18 lines 20-26]**, the multimedia object being associated with a popular culture reference; and speech that is generated or played back by the digital personal assistant **[Output device 1207 can be a screen, speaker, printer, and/or any combination thereof, col. 10 lines 64-66]**, the speech comprising an impersonation of a voice of a person associated with the popular culture reference.

Chen does not appear to explicitly disclose a persona or that the multimedia object being associated with a popular culture reference.

Buck Rogers discloses, in the well-known TV show which aired publicly from 1979-1981, Dr. Theopolis, a sentient computer with artificial intelligence [i.e. digital personal assistant] featuring its own personality as well as the means for intelligent dialog [i.e. spoken] exchange with a user [e.g. Buck Rogers] that also included a visual indication of interaction [facial illumination] **[Concept and broadcast history]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the invention of Chen to apply personality [i.e. persona]

features as disclosed by the personality of Dr. Theopolis in Buck Rogers because it would provide a more natural conversational interface for the user.

Neither Chen nor Buck Rogers appear to disclose the multimedia object being associated with a popular culture reference.

Tischer discloses in a related system for a personalized user interface **[Abstract & p17]**, where the response to a user include the usage of popular culture reference information **[The information strings include words and phrases that are commonly recognized across a populace … constructing a contextually relevant output string that is relevant to the subject. The output string includes portions of the selected information string, data elements, and personal information elements. The method further includes conveying the output string to the subject, p7]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 2: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein the response to the utterance further includes text that is displayed within the user interface of the digital personal assistant **[Figure 2]**.

Chen nor Buck Rogers appears to disclose where the text is a quotation associated with the popular culture reference.

Tischer discloses where the text is a quotation associated with the popular culture reference **[Information strings may be derived from best selling or classic novels or books, and may include titles, passages, and quotes, p26]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers to apply the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 3: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses where the output can be an audio **[for the intelligent automated assistant 1002, the Output device 1207 can be a screen, speaker, printer, and/or any combination thereof, col. 10 lines 60-66]**.

Buck Rogers discloses where Dr. Theopolis [potentially interpreted as a popular culture reference] has its own persona **[Concept and broadcast history]**.

Neither Chen nor Buck Rogers appear to explicitly disclose wherein the speech comprises a quotation associated with the popular culture reference.

Tischer discloses where the text is a quotation associated with the popular culture reference **[Information strings may be derived from best selling or classic novels or books, and may include titles, passages, and quotes, p26]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified in the invention of Chen in view of Buck Rogers to apply the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 6: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein the multimedia object comprises: image or video content that is displayed within the user interface of the digital personal assistant or audio content that is played back by the user interface of the digital personal assistant **[shown in Figure 2]**.

Regarding claim 7: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein the response to the utterance further includes: a link that is displayed within the user interface of the digital personal assistant and that can be activated by the user to access content *associated with the popular culture reference* **[shown in Figure 2]**.

Chen and Buck Rogers appear to fail to disclose accessing displayed content that is *associated with the popular culture reference.*

Tischer discloses where the response to a user includes the usage of popular culture reference information **[The information strings include words and phrases that are commonly recognized across a populace … constructing a contextually relevant output string that is relevant to the subject. The output string includes portions of the selected information string, data elements, and personal information elements. The method further includes conveying the output string to the subject, p7]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the display and subsequent selective activation access of

Chen in view of Buck Rogers the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 8: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses identifying a plurality of eligible responses to the utterance **[col. 16 lines 35-49 & col. 31 lines 29-54]**; and selecting the response to the utterance from among the plurality of eligible responses to the utterance **[col. 31 lines 29-54]**.

Tischer also discloses identifying a plurality of eligible responses to the utterance and selecting the response to the utterance from among the plurality of eligible responses to the utterance **[Information strings may be derived from best selling or classic novels or books, and may include titles, passages, and quotes, p26]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers to apply the more directed contextual response that would be most commonly recognized [i.e. popular culture reference] as taught by Tischer because it would potentially have the desired effect of more immediately reaching, i.e. resonate and persist with the intended

recipient, of the information in a creative and interesting way as discussed in at least paragraph 17.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 9: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses matching the utterance to a particular utterance type within a hierarchical tree of utterance types, each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith **[e.g. a tree of ontology nodes bound to their matching input tokens, col. 37 line 61 - col. 38 line 26 & col. 76 line 8 – col. 77 line 40]**; and selecting the response to the utterance from among the response(s) associated with the particular utterance type **[col. 38 lines 22-26 & Tables 1-4].**

Regarding claim 10: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein causing the response to the utterance to be generated comprises: determining that the utterance is associated with a trending topic **[intelligent automated assistant 1002 may also enable the combined use of several sources of data and services at once … automate the use of data and services available over the Internet to discover, investigate, select among, reserve, and otherwise**

learn about things to do (including but not limited to movies, events, performances, exhibits, shows and attractions); places to go (including but not limited to travel destinations, hotels and other places to stay, landmarks and other sites of interest, and the like); places to eat or drink (such as restaurants and bars), times and places to meet others, and any other source of entertainment or social interaction, col. 14 lines 12-39]; and in response to determining that the utterance is associated with the trending topic, selecting the response to the utterance from among one or more responses associated with the trending topic **[personal recommendations for activities, products, services, source of entertainment, time management, or any other kind of recommendation service that benefits from an interactive dialog in natural language and automated access to data and services, col. 14 lines 40-62]**.

Regarding claim 11: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen appears to fail to disclose determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant; and in response to determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistance, selecting the response to the utterance from among the one or more predefined responses.

Buck Rogers discloses, Dr. Theopolis, a sentient computer with artificial intelligence [i.e. digital personal assistant] featuring its own personality as well as the means for intelligent dialog [i.e. spoken] exchange with a user [e.g. Buck Rogers] **[Concept and broadcast history]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the invention of Chen to apply personality [i.e. persona] features defined by Dr. Theopolis' plurality of responses [i.e. intelligent dialog] as disclosed by the personality of Dr. Theopolis in Buck Rogers because it would provide a more natural conversational interface for the user.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 12: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein causing the response to the utterance to be generated comprises: sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant **[col. 16 lines 35-61]**.

Regarding claim 13: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Chen discloses wherein causing the response to the utterance to be generated comprises: providing text to a computing device executing the digital personal assistance, the text to be processed by a text-to-speech component of the digital personal assistant to generate the speech **[col. 16 lines 35-67 & col. 17 lines 47-51]**.

Regarding claims 14-16: they include features similar to claims 1, 12 and 13 respectively, and therefore, are rejected for the same reasons as claims 1, 12 and 13 respectively.

Regarding claim 17: includes at least features similar to claims 3 and 7, and therefore, are rejected for the same reasons as claims 3 and 7.

Regarding claims 18 and 19: they include features similar to claims 1 and 6 and therefore, are rejected for the same reasons as claims 1 and 6.

Regarding claim 20: includes at least features similar to claim 2, and therefore, are rejected for the same reasons as claim 2.

7. Claims 4 and 5 are rejected under 35 U.S.C. 103 as being unpatentable over Chen et al. (US 8903716) in view of Buck Rogers (TV series 1979-1981) and in further view of Tischer (20090083143) and Microsoft (Getting Results with Microsoft Office 97).

Regarding claim 4: Chen in view of Buck Rogers and Tischer discloses the method of claim 1.

Neither Chen, Buck Rogers nor Tischer appear to disclose wherein the response to the utterance further includes a visual representation of the digital personal assistant that is displayed within the user interface thereof and that evokes the popular culture reference.

Microsoft discloses in a well-known digital system **[Microsoft Office 97]**, a visual representation of *the* digital personal assistant that is displayed within the user interface thereof and that evokes the popular culture reference **[Office Assistant (commonly known as Clippy in popular culture), page 38]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers and Tischer a visual representation of the digital personal assistant as disclosed by Microsoft because it offers the user a visually entertaining avatar as well as a means by which the user knows the assistant is engaged.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Regarding claim 5: Chen in view of Buck Rogers and Tischer discloses the method of claim 4.

Neither Chen, Buck Rogers nor Tischer appear to disclose wherein the digital personal assistant comprises an animation of the digital personal assistant.

Microsoft discloses wherein the digital personal assistant comprises an animation of the digital personal assistant **[Office Assistant (commonly known as Clippy in popular culture), page 38]**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have included in the invention of Chen in view of Buck Rogers and Tischer a visual representation of the digital personal assistant as disclosed by Microsoft because it offers the user a visually entertaining avatar as well as a means by which the user knows the assistant is engaged.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Reinier whose telephone number is (571)270-5082. The examiner can normally be reached on M-Th, 10am - 6pm Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. 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.

/Barbara Reinier/
Primary Examiner, Art Unit 2672

Notice of References Cited	Application/Control No. 14/156,009	Applicant(s)/Patent Under Reexamination REDDY ET AL.	
	Examiner Barbara Reinier	Art Unit 2672	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2009/0083143 A1	03-2009	Tischer, Steven	705/14
*	B	US-8,903,716 B2	12-2014	Chen et al.	704/9
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
*	U	https://www.fanfiction.net/s/6141234/1/Buck-Rogers-A-Stitch-in-Time , Keith Shaw, Buck Rogers: A Stitch in Time, Published 7/14/2010
	V	Microsoft Corporation, Getting Results with Microsoft Office 97, 1995-1997, page 38
	W	Office Assistant wiki - information related to the MS Office Office Assistant Clippit [Clippy] ... https://en.wikipedia.org/wiki/Office_Assistant ... http://www.geekwire.com/2011/microsoft-brings-clippy-office-training-game/
	X	Buck Rogers in the 25th Century (TV series) wiki, Broadcast dates 9/20/79-4/16/81 via NBC

*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.

Notice of References Cited	Application/Control No. 14/156,009	Applicant(s)/Patent Under Reexamination REDDY ET AL.	
	Examiner Barbara Reinier	Art Unit 2672	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-			
	B	US-			
	C	US-			
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	N					
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	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Dr. Theopolis, Multiversal Omnipedia, Television computer character that features in Buck Rogers in the 25th Century
	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.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	**Art Unit**
	BARBARA REINIER	2672

✓	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	07/26/2015								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
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	7	✓								
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	18	✓								
	19	✓								
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BIB DATA SHEET

CONFIRMATION NO. 1056

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/156,009	01/15/2014	704	2672	340577.01

APPLICANTS

Microsoft Corporation, Redmond, WA;

INVENTORS

Mouni Reddy, Bellevue, WA;
Robert J. Howard III, Bellevue, WA;
Deborah B. Harrison, Seattle, WA;
Sogol Malekzadeh, Sammamish, WA;

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

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

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

01/29/2014

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /Barbara Reinier/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		WA	11	20	3

ADDRESS

MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052
UNITED STATES

TITLE

DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

FILING FEE RECEIVED		
1740	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

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Mouni Reddy
Art Unit	
Examiner Name	/BARBARA REINIER/
Attorney Docket Number	340577.01

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6144938		2000-11-07	Surace, et al.	
	2	7225125		2007-05-29	Bennett, et al.	
	3	8073681		2011-12-06	Baldwin, et al.	
	4	8498873		2013-07-30	Cross, Jr., et al.	
	5	8140335		2012-03-20	Kennewick, et al.	
	6	8447607		2013-05-21	Weider, et al.	
	7	8346563		2013-01-01	Hjelm, et al.	
	8	5918222		1999-06-29	Fukui, et al.	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /BR/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Mouni Reddy
Art Unit	
Examiner Name	/BARBARA REINIER/
Attorney Docket Number	340577.01

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20120124456	A1	2012-05-17	Perez, et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	PAUL, RYAN, "Review: Android's "Google Now" Can Teach Siri a Few Tricks", Published on: August 13, 2012, Available at: http://arstechnica.com/gadgets/2012/08/review-androids-google-now-can-teach-siri-a-few-tricks/, 3 pages.	☐
	2	BRODEUR, SETH, "New Leaked Screenshot Suggests"Cortana" is Not Just Limited to Voice Interactions", Published on: September 12, 2013, Available at: http://www.wpcentral.com/new-leaked-screenshot-suggests-cortana-not-just-limited-voice-interactions, 35 pages.	☐

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

EXAMINER SIGNATURE

Examiner Signature	/BARBARA REINIER/	Date Considered	07/14/2015

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Mouni Reddy
Art Unit	
Examiner Name	
Attorney Docket Number	340577.01

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /BR/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Mouni Reddy
Art Unit	
Examiner Name	
Attorney Docket Number	340577.01

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2014-01-15
Name/Print	Thomas C. Fiala	Registration Number	43610

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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.

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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.

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	9	("20120124456" | "5918222" | "6144938" | "7225125" | "8073681" | "8140335" | "8346563" | "8447607" | "8498873").PN.	US-PGPUB; USPAT	OR	ON	2015/07/14 13:26
S2	0	14/156009	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 13:26
S3	0	(Reddy near3 Mouni).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 14:09
S4	2673	(Howard near3 Robert).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 14:09
S5	307	("6144938").URPN.	USPAT	OR	ON	2015/07/14 15:40
S6	7	(Malekzadeh near3 Sogol).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 15:43
S7	53	(Harrison near3 Deborah).inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 15:43
S8	16	(Howard near3 Robert).inv. and (persona personality)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 15:46
S9	2	("6377919").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/07/14 16:10
S10	1	(interactive near3 (computer digital adj assistant pda! device) near5 intelligence near6 (audio voice speech))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 16:37
S12	1234	(interactive near5 (computer digital adj assistant pda!) near5 (audio	US-PGPUB; USPAT; USOCR;	OR	ON	2015/07/14 16:41

		voice speech) near6 (reply respon$4))	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S14	8	(interactive near5 (computer digital adj assistant pda!) near5 (audio voice speech) same (quot$3 quotation impersonation famous))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 16:44
S15	4	((computer digital adj assistant pda!) near5 (audio voice speech) same (quot$3 quotation) with (impersonation famous))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/14 16:47
S17	1	((computer digital adj assistant pda!) near5 (audio voice speech) same chit$1chat)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 13:43
S19	14	((computer robot) near4 chit$1chat)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 13:47
S27	277	(virtual with (avatar friend girl$1friend boy$1friend) with (talk chat visit) same (tablet computer mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:45
S28	277	(virtual with (avatar friend) with (talk chat visit) same (tablet computer mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:45
S29	102	(virtual with (avatar friend) with (talk chat visit) same (tablet mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:46
S30	3	(virtual near5 (avatar friend) near5 (talk chat visit) near6 (tablet mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:48
S31	0	(virtual with (girl$1friend boy$1friend) near6 (talk chat visit) near6 (tablet computer mobile pda! phone))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:49
S32	233	((speech speak$3 talk$3) near6 synthe$3 near6 (actor avatar robot))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:51
S33	30	((speech speak$3 talk$3) near6 synthe$3 near6 (actor))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/15 14:52
S34	3	"20050169453"	US-PGPUB; USPAT; USOCR;	OR	ON	2015/07/25 14:43

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S35	6	"20090083143"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/25 14:43

7/26/2015 1:18:53 PM
C:\Users\breinier\Documents\EAST\Workspaces\14156009.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14156009	REDDY ET AL.
	Examiner	Art Unit
	BARBARA REINIER	2672

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	7/24/2015	br
Search via EAST limited by text	7/24/2015	br
Consulted with Mike Opsasnik [Primary 704] for search/art application assistance	7/24/2015	br

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

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/156,009	01/15/2014	Mouni Reddy	340577.01

CONFIRMATION NO. 1056

69316
MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

PUBLICATION NOTICE

OC000000076322543

Title:DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

Publication No.US-2015-0199967-A1
Publication Date:07/16/2015

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES MS# 340577.01

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☑ United States application or PCT international application number 14/156,009 filed on January 15, 2014.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

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LEGAL NAME OF INVENTOR

Inventor: Mouni Reddy Date (Optional): 02/14/14

Signature: R. Mou

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

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LEGAL NAME OF INVENTOR

Inventor: Robert J. Howard III Date (Optional): 02 - 05 - 2014

Signature: 

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LEGAL NAME OF INVENTOR

Inventor: Deborah B. Harrison Date (Optional): 2/10/14

Signature: Deborah B Harrison

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/A/A01 form for each additional inventor.

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filed on January 15, 2014.

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I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

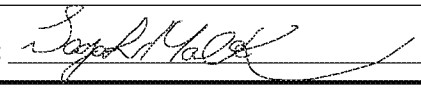
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LEGAL NAME OF INVENTOR

Inventor: Sogol Malekzadeh Date (Optional): 2/5/2014

Signature: 

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

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EFS ID:	18484312
Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Christine Hartness
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	18-MAR-2014
Filing Date:	15-JAN-2014
Time Stamp:	16:02:46
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	Oath or Declaration filed	340577_01Declaration.pdf	1066902 a83e4ea77c8a640fa95fbd6c8edd613a947832a5	no	4

Warnings:	
Information:	

Total Files Size (in bytes):	1066902

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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.

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/156,009	01/15/2014	2642	1740	340577.01	20	3

CONFIRMATION NO. 1056

69316
MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

FILING RECEIPT

OC000000066325278

Date Mailed: 01/30/2014

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

Inventor(s)

Mouni Reddy, Bellevue, WA;
Robert J. Howard III, Bellevue, WA;
Deborah B. Harrison, Seattle, WA;
Sogol Malekzadeh, Sammamish, WA;

Applicant(s)

Microsoft Corporation, Redmond, WA

Assignment For Published Patent Application

Microsoft Corporation, Redmond, WA

Power of Attorney: None

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 01/29/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/156,009**

Projected Publication Date: 07/16/2015

Non-Publication Request: No

Early Publication Request: No

Title

DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

Preliminary Class

455

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

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

NOT GRANTED

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

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/156,009

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	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

		(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($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
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) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/156,009	01/15/2014	Mouni Reddy	340577.01

CONFIRMATION NO. 1056

69316
MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052

NOTICE

OC000000066325279

Date Mailed: 01/30/2014

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Mouni Reddy
  Robert J. Howard III
  Deborah B. Harrison
  Sogol Malekzadeh

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Mouni Reddy
Art Unit	
Examiner Name	
Attorney Docket Number	340577.01

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6144938		2000-11-07	Surace, et al.	
	2	7225125		2007-05-29	Bennett, et al.	
	3	8073681		2011-12-06	Baldwin, et al.	
	4	8498873		2013-07-30	Cross, Jr., et al.	
	5	8140335		2012-03-20	Kennewick, et al.	
	6	8447607		2013-05-21	Weider, et al.	
	7	8346563		2013-01-01	Hjelm, et al.	
	8	5918222		1999-06-29	Fukui, et al.	

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Mouni Reddy
	Art Unit	
	Examiner Name	
	Attorney Docket Number	340577.01

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20120124456	A1	2012-05-17	Perez, et al.	
If you wish to add additional U.S. Published Application citation information please click the Add button.						Add

FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐
If you wish to add additional Foreign Patent Document citation information please click the Add button								Add

NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	PAUL, RYAN, "Review: Android's "Google Now" Can Teach Siri a Few Tricks", Published on: August 13, 2012, Available at: http://arstechnica.com/gadgets/2012/08/review-androids-google-now-can-teach-siri-a-few-tricks/, 3 pages.	☐
	2	BRODEUR, SETH, "New Leaked Screenshot Suggests"Cortana" is Not Just Limited to Voice Interactions", Published on: September 12, 2013, Available at: http://www.wpcentral.com/new-leaked-screenshot-suggests-cortana-not-just-limited-voice-interactions, 35 pages.	☐
If you wish to add additional non-patent literature document citation information please click the Add button			Add

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Mouni Reddy
	Art Unit	
	Examiner Name	
	Attorney Docket Number	340577.01

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Mouni Reddy
	Art Unit	
	Examiner Name	
	Attorney Docket Number	340577.01

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Thomas C. Fiala, #43,610/	Date (YYYY-MM-DD)	2014-01-15
Name/Print	Thomas C. Fiala	Registration Number	43610

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Mouni Reddy	Attorney Docket No.: 340577.01
Application No.: New Application	Group Art Unit: Not Yet Assigned
Filed: Herewith	Confirmation Number: Not Yet Assigned
Customer No.: 69316	Examiner: Not Yet Assigned

Title: DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

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

STATEMENT FILED PURSUANT TO THE DUTY OF DISCLOSURE UNDER 37 C.F.R. §§ 1.56, 1.97 AND 1.98

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. §§ 1.56, 1.97 and 1.98, the Applicant requests consideration of this Information Disclosure Statement.

PART I: Compliance with 37 C.F.R. § 1.97

This Information Disclosure Statement has been filed within three (3) months of the filing date of a National Application.

No fee or certification is required.

PART II: Additional Information

The Applicant hereby makes the following additional information of record in the above-identified application.

Serial No.	Filing Date	Inventor(s)
N/A	N/A	N/A

PART III: Remarks

The Applicant hereby makes of record in the above-identified application the information listed on the attached form PTO/SB/08A. The order of presentation of the references should not be construed as an indication of the importance of the references. Documents cited on the attached form PTO/SB/08A are enclosed unless otherwise indicated. It is respectfully requested that:

1. The Examiner consider completely the cited information, along with any other information, in reaching a determination concerning the patentability of the present claims;

2. The enclosed form PTO/SB/08A be signed by the Examiner to evidence that the cited information has been fully considered by the Patent and Trademark Office during the examination of this application;

3. The citations for the information be printed on any patent which issues from this application.

By submitting this Information Disclosure Statement, the Applicant makes no representation that a search has been performed, of the extent of any search performed, or that more relevant information does not exist.

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b).

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, in fact, prior art as defined by 35 U.S.C. § 102.

Patent Owner Ex. 2104
Page 354 of 431

Notwithstanding any statement by the Applicant, the Applicant urges the Examiner to form his own conclusion regarding the relevance of the cited information. An early and favorable action is hereby requested.

Respectfully submitted,

Date January 15, 2014

By: /Thomas C. Fiala, #43,610/

Thomas C. Fiala

Reg. No. 43,610

Microsoft Corporation

One Microsoft Way

Redmond WA 98052-6399

Direct telephone (425) 707-9382

CERTIFICATE OF MAILING OR TRANSMISSION
(Under 37 CFR § 1.8(a)) or ELECTRONIC FILING

I hereby certify that this correspondence is being electronically deposited with the USPTO via EFS-Web on the date shown below:

January 15, 2014
Date

/Christine Hartness/
Signature

Christine Hartness
Printed Name

Patent Owner Ex. 2104
Page 355 of 431

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Filer:	Thomas Christopher Fiala/Christine Hartness
Attorney Docket Number:	340577.01

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
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Miscellaneous:				
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		340577_01Specification.pdf	235732 2ec15a67410e5f526457cbef99ed8361d9e54c7c	yes	47
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	41	
	Claims		42	46	
	Abstract		47	47	
Warnings:					
Information:					
2	Drawings-only black and white line drawings	340577_01Drawings.pdf	409853 85c472c7876139da3058b4c64762b06984ce66c8	no	11
Warnings:					
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3	Application Data Sheet	340577_01ADS.pdf	1565559 09f745cf272a6c78da651ceeeb4a089677576659	no	8
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4	Information Disclosure Statement (IDS) Form (SB08)	340577_01IDS.pdf	612792 51a83b0d5f66dc6f9c9d9d1dc08a8b00bd2e5f4f	no	5
Warnings:					
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5	Non Patent Literature	340577_01ref1.pdf	1162685 cc8360eec06d5ba441d1dfd5908999e87eed0f67	no	3
Warnings:					
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6	Non Patent Literature	340577_01ref2.pdf	9913335 b852d6f5d3fa4d6d3670b3a1c72e82fda14804f0	no	35
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7	Transmittal Letter	340577_01IDScover.pdf	37833 925b310b9c7414d7c692cfc05083239d4996e7a4	no	3
Warnings:					
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8	Fee Worksheet (SB06)	fee-info.pdf	33034 fa2b191ecb56ff4ce4503ed3a0e2d1205bd30da0	no	2
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DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

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BACKGROUND

[0001] Personifying computer interaction is a very common practice in the area of artificial intelligence. The makers of digital personal assistants may imbue their assistants with a personality so as to keep the engagement level with the user very high and also to establish an element of trust between the user and the assistant, thereby facilitating continued use of and interaction with the digital personal assistant.

[0002] One technique for keeping the level of engagement high entails making the responses provided by the digital personal assistant funny and entertaining. Some conventional implementations of digital personal assistants are programmed to generate funny text responses when a user asks questions having a casual tone. However, conventional digital personal assistants typically do not leverage the full flexibility of the digital canvas when presenting playful responses. Neither do they leverage the power of modern day text-to-speech synthesizing techniques to sound funny or different when providing responses. Furthermore, there is no visual representation of the digital assistant that can be used to convey any aspect of a playful response.

SUMMARY

[0003] Systems, methods, apparatuses, and computer program products are described herein for implementing a digital personal assistant. The digital personal assistant is capable of determining that a user has asked a question or made a statement that is intended to engage with a persona of the digital personal assistant as opposed to, for example, requesting that the digital personal assistant obtain information or perform some other task on behalf of the user. In response to determining that the user has asked such a question or made such a statement, the digital personal assistant provides a response thereto by displaying or playing back a multimedia object associated with a popular culture reference within or by a user interface of the digital personal

assistant. Additionally or alternatively, in response to determining that the user has asked such a question or made such a statement, the digital personal assistant provides the response thereto by generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference. Still further, the digital personal assistant may provide the response by displaying within the user interface of the digital personal assistant text that comprises a quotation associated with the popular culture reference, displaying within the user interface of the digital personal assistant a visual representation of the digital personal assistant that evokes the popular culture reference, and/or displaying within the user interface of the digital personal assistant a link that can be activated by the user to access content associated with the popular culture reference.

[0004] In particular, a method for implementing a digital personal assistant is described herein. In accordance with the method, a digital representation of an utterance of a user of the digital personal assistant is received. Based on at least an analysis of the digital representation of the utterance, it is determined that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant. In response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, the digital personal assistant is caused to generate a response to the utterance. The response to the utterance includes a multimedia object (e.g., image, video content or audio content) that is displayed within or played back by a user interface of the digital personal assistant and that is associated with a popular culture reference. Alternatively or additionally, the response to the utterance includes speech that is generated or played back by the digital personal assistant and that comprises an impersonation of a voice of a person associated with the popular culture reference.

[0005] In one embodiment of the foregoing method, the response to the utterance further includes text that is displayed within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference.

[0006] In another embodiment, the speech comprises a quotation associated with the popular culture reference.

[0007] In yet another embodiment, the response to the utterance further includes a visual representation of the digital personal assistant that is displayed within the user interface thereof and that evokes the popular culture reference. In further accordance with such an embodiment, the visual representation of the digital personal assistant may comprise an animation of the digital personal assistant.

[0008] In still another embodiment, the response to the utterance further includes a link that is displayed within the user interface of the digital personal assistant and that can be activated by the user to access content associated with the popular culture reference.

[0009] Depending upon the implementation of the foregoing method, causing the response to the utterance to be generated may include identifying a plurality of eligible responses to the utterance and selecting the response to the utterance from among the plurality of eligible responses to the utterance.

[0010] In accordance with another implementation, causing the response to the utterance to be generated includes matching the utterance to a particular utterance type within a hierarchical tree of utterance types, each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith, and selecting the response to the utterance from among the response(s) associated with the particular utterance type.

[0011] In accordance with a further implementation, causing the response to the utterance to be generated includes determining that the utterance is associated with a trending topic and in response to determining that the utterance is associated with the trending topic, selecting the response to the utterance from among one or more responses associated with the trending topic.

[0012] In accordance with a still further implementation, causing the response to the utterance to be generated including determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant, and in response to determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant, selecting the response to the utterance from among the one or more predefined responses.

[0013] In another embodiment of the foregoing method, causing the response to the utterance to be generated includes sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant.

[0014] In still another embodiment, causing the response to the utterance to be generated includes providing text to a computing device executing the digital personal assistant, the text to be processed by a text-to-speech component of the digital personal assistant to generate the speech.

[0015] A computing device is also described herein. The computing device includes at least one processor and a memory. The memory stores computer program logic for execution by the at least one processor. The computer program logic includes one or more components configured to perform operations when executed by the at least one processor. The one or more components includes a digital personal assistant. The digital personal assistant is configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend. The utterance comprises an utterance intended to engage with a persona of the digital personal assistant. The digital personal assistant is further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend. Providing the response includes generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference.

[0016] In one embodiment of the computing device, the digital personal assistant is configured to play back an audio file that includes the speech. In another embodiment of the computing device, the digital personal assistant is configured to apply text-to-speech conversion to text to generate the speech.

[0017] In another embodiment of the computing device, providing the response further includes at least one of displaying or playing back a multimedia object by a user interface of the digital personal assistant, the multimedia object being associated with the popular culture reference, displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference, displaying a visual representation of the digital personal assistant

that evokes the popular culture reference within the user interface of the digital personal assistant, and displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

[0018] Another computing device is described herein. The computing device includes at least one processor and a memory. The memory stores computer program logic for execution by the at least one processor. The computer program logic includes one or more components configured to perform operations when executed by the at least one processor. The one or more components include a digital personal assistant. The digital personal assistant is configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend. The utterance comprises an utterance intended to engage with a persona of the digital personal assistant. The digital personal assistant is further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend. Providing the response includes displaying or playing back a multimedia object associated with a popular culture reference by a user interface of the digital personal assistant.

[0019] In one embodiment of the computing device, the multimedia object comprises an image, video content, or audio content.

[0020] In another embodiment of the computing device, providing the response further includes at least one of generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference, displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference, displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant, and displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

[0021] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject

matter, nor is it intended to be used to limit the scope of the claimed subject matter. Moreover, it is noted that the claimed subject matter is not limited to the specific embodiments described in the Detailed Description and/or other sections of this document. Such embodiments are presented herein for illustrative purposes only. Additional embodiments will be apparent to persons skilled in the relevant art(s) based on the teachings contained herein.

BRIEF DESCRIPTION OF THE DRAWINGS/FIGURES

[0022] The accompanying drawings, which are incorporated herein and form part of the specification, illustrate embodiments of the present invention and, together with the description, further serve to explain the principles of the invention and to enable a person skilled in the relevant art(s) to make and use the invention.

[0023] FIG. 1 is a block diagram of an example system that implements a digital personal assistant that utilizes impersonations and multimedia in responding to chit-chat type utterances in accordance with an example embodiment.

[0024] FIG. 2 is a block diagram that shows how various components of the system of FIG. 1 operate to enable a digital personal assistant to determine that a user has made a chit-chat type utterance and to provide a response thereto.

[0025] FIG. 3 depicts an example hierarchical tree of utterance types that may be used to select a response to a chit-chat type utterance in accordance with an embodiment.

[0026] FIG. 4 is a block diagram that shows an example response that may be provided by a digital personal assistant in response to a chit-chat type utterance in accordance with an embodiment

[0027] FIGS. 5-10 provide illustrative examples of responses to chit-chat type utterances that may be delivered via the user interface of a digital personal assistant in accordance with various embodiments.

[0028] FIG. 11 depicts a flowchart of a method for implementing a digital personal assistant that utilizes impersonations and/or multimedia in responding to chit-chat type utterances in accordance with an embodiment.

[0029] FIG. 12 depicts a flowchart of a method by which a digital personal assistant

provides a response to a chit-chat type utterance that includes a voice impersonation in accordance with an embodiment.

[0030] FIG. 13 depicts a flowchart of a method by which a digital personal assistant provides a response to a chit-chat type utterance that includes a multimedia object in accordance with an embodiment.

[0031] FIG. 14 is a block diagram of an example mobile device that may be used to implement various embodiments.

[0032] FIG. 15 is a block diagram of an example processor-based computer system that may be used to implement various embodiments.

[0033] The features and advantages of the present invention will become more apparent from the detailed description set forth below when taken in conjunction with the drawings, in which like reference characters identify corresponding elements throughout. In the drawings, like reference numbers generally indicate identical, functionally similar, and/or structurally similar elements. The drawing in which an element first appears is indicated by the leftmost digit(s) in the corresponding reference number.

DETAILED DESCRIPTION

I. Introduction

[0034] The following detailed description refers to the accompanying drawings that illustrate exemplary embodiments of the present invention. However, the scope of the present invention is not limited to these embodiments, but is instead defined by the appended claims. Thus, embodiments beyond those shown in the accompanying drawings, such as modified versions of the illustrated embodiments, may nevertheless be encompassed by the present invention.

[0035] References in the specification to "one embodiment," "an embodiment," "an example embodiment," or the like, indicate that the embodiment described may include a particular feature, structure, or characteristic, but every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Furthermore, when a particular feature, structure, or characteristic is described in connection with an embodiment, it is submitted that it is within the knowledge of persons skilled in the relevant art(s) to implement such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

[0036] Systems, methods, apparatuses, and computer program products are described herein for implementing a digital personal assistant. The digital personal assistant is capable of determining that a user has asked a question or made a statement that is intended to engage with a persona of the digital personal assistant as opposed to, for example, requesting that the digital personal assistant obtain information or perform some other task on behalf of the user. In response to determining that the user has asked such a question or made such a statement, the digital personal assistant provides a response thereto by displaying or playing back a multimedia object associated with a popular culture reference within or by a user interface of the digital personal assistant. Additionally or alternatively, in response to determining that the user has asked such a question or made such a statement, the digital personal assistant provides the response thereto by generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference.

Still further, the digital personal assistant may provide the response by displaying within the user interface of the digital personal assistant text that comprises a quotation associated with the popular culture reference, displaying within the user interface of the digital personal assistant a visual representation of the digital personal assistant that evokes the popular culture reference, and/or displaying within the user interface of the digital personal assistant a link that can be activated by the user to access content associated with the popular culture reference.

[0037] By enabling the digital personal assistant to respond to user utterances that are intended to engage with its persona (also referred to herein as "chit-chat type utterances") in the foregoing manner, embodiments described herein can advantageously increase the level of engagement between the user and the digital personal assistant and also establish an element of trust between the user and the assistant, thereby facilitating continued use of and interaction with the digital personal assistant. For example, by providing responses that include multimedia objects, voice impersonations, quotations, and links associated with popular culture references likely to be recognized and/or appreciated by the user, the digital personal assistant can both entertain and establish a sense of commonality with the user.

[0038] Section II describes an example system that implements a digital personal assistant that utilizes impersonations and/or multimedia in responding to chit-chat type utterances in accordance with embodiments. Section III describes exemplary methods for implementing a digital personal assistant that utilizes impersonations and/or multimedia in responding to chit-chat type utterances in accordance with embodiments. Section IV describes an example mobile device that may be used to implement a digital personal assistant in accordance with embodiments described herein. Section V describes an example desktop computer that may be used to implement a digital personal assistant in accordance with embodiments described herein. Section VI provides some concluding remarks.

II. Example System that Implements a Digital Personal Assistant that Utilizes Impersonations and/or Multimedia in Responses

[0039] FIG. 1 is a block diagram of an example system 100 that implements a digital

personal assistant that utilizes impersonations and multimedia in responding to chit-chat type utterances in accordance with an example embodiment. As shown in FIG. 1, system 100 includes an end user computing device 102 that is communicatively connected to a digital personal assistant backend 106 via one or more networks 104. Each of these components will now be described.

[0040] End user computing device 102 is intended to represent a processor-based electronic device that is capable of executing a software-based digital personal assistant 130 that is installed thereon. Digital personal assistant 130 may be executed on behalf of a user of end user computing device 102. In one embodiment, end user computing device 102 comprises a mobile computing device such as a mobile phone (e.g., a smart phone), a laptop computer, a tablet computer, a netbook, a wearable computer such as a smart watch or a head-mounted computer, a portable media player, a handheld gaming console, a personal navigation assistant, a camera, or any other mobile device capable of executing a digital personal assistant on behalf of a user. One example of a mobile device that may incorporate the functionality of end user computing device 102 will be discussed below in reference to FIG. 14. In another embodiment, end user computing device 102 comprises a desktop computer, a gaming console, or other non-mobile computing platform that is capable of executing a digital personal assistant on behalf of a user. An example desktop computer that may incorporate the functionality of end user computing device 102 will be discussed below in reference to FIG. 15.

[0041] End user computing device 102 is capable of communicating with digital personal assistant backend 106 via network 104. Personal assistant backend 106 comprises one or more computers (e.g., servers) that are programmed to provide services in support of the operations of digital personal assistant 130 and other digital personal assistants executing on other end-user computing devices. For example, as will be discussed herein, personal assistant backend 106 includes one or more computers configured to provide services to digital personal assistant 130 relating to speech recognition and query understanding and response. In particular, as shown in FIG. 1, these services are respectively provided by a speech recognition service 132 and a query understanding and response system 136. It is noted that digital personal

assistant backend 106 may perform any number of other services on behalf of digital personal assistant 130 although such additional services may not be explicitly described herein.

[0042] In one embodiment, digital personal assistant backend 106 comprise a cloud-based backend in which any one of a large number of suitably-configured machines may be arbitrarily selected to render one or more desired services in support of digital personal assistant 130. As will be appreciated by persons skilled in the relevant art(s), such a cloud-based implementation provides a reliable and scalable framework for providing backend services to digital personal assistants, such as digital personal assistant 130.

[0043] Network(s) 104 is intended to represent any type of network or combination of networks suitable for facilitating communication between end user computing devices, such as end user computing device 102, and digital personal assistant backend 106. Network(s) 104 may include, for example and without limitation, a wide area network, a local area network, a private network, a public network, a packet network, a circuit-switched network, a wired network, and/or a wireless network.

[0044] As further shown in FIG. 1, end user computing device 102 includes a plurality of interconnected components, including a processing unit 110, non-volatile memory 120, volatile memory 112, one or more user input devices 116, a display 118, and one or more network interfaces 114. Each of these components will now be described.

[0045] Processing unit 110 is intended to represent one or more microprocessors, each of which may have one or more central processing units (CPUs) or microprocessor cores. Processing unit 110 operates in a well-known manner to execute computer programs (also referred to herein as computer program logic). The execution of such computer programs causes processing unit 110 to perform operations including operations that will be described herein. Each of non-volatile memory 120, volatile memory 112, user input device(s) 116, display 118, and network interface(s) 114 is connected to processing unit 110 via one or more suitable interfaces.

[0046] Non-volatile memory 120 comprises one or more computer-readable memory

devices that operate to store computer programs and data in a persistent manner, such that stored information will not be lost even when end user computing device 102 is without power or in a powered down state. Non-volatile memory 120 may be implemented using any of a wide variety of non-volatile computer-readable memory devices, including but not limited to, read-only memory (ROM) devices, solid state drives, hard disk drives, magnetic storage media such as magnetic disks and associated drives, optical storage media such as optical disks and associated drives, and flash memory devices such as USB flash drives.

[0047] Volatile memory 112 comprises one or more computer-readable memory devices that operate to store computer programs and data in a non-persistent manner, such that the stored information will be lost when end user computing device 102 is without power or in a powered down state. Volatile memory 112 may be implemented using any of a wide variety of volatile computer-readable memory devices including, but not limited to, random access memory (RAM) devices.

[0048] Display 118 comprises a device to which content, such as text and images, can be rendered so that it will be visible to a user of end user computing device 102. Some or all of the rendering operations required to display such content may be performed at least in part by processing unit 110. Some or all of the rendering operations may also be performed by a display device interface such as a video or graphics chip or card (not shown in FIG. 1) that is coupled between processing unit 110 and display 118. Depending upon the implementation of end user computing device 102, display 118 may comprise a device that is integrated within the same physical structure or housing as processing unit 110 or may comprise a monitor, projector, or other type of device that is physically separate from a structure or housing that includes processing unit 110 and connected thereto via a suitable wired and/or wireless connection.

[0049] User input device(s) 116 comprise one or more devices that operate to generate user input information in response to a user's manipulation or control thereof. Such user input information is passed via a suitable interface to processing unit 110 for processing thereof. Depending upon the implementation, user input device(s) 116 may include a touch screen (e.g., a touch screen integrated with display

118), a keyboard, a keypad, a mouse, a touch pad, a trackball, a joystick, a pointing stick, a wired glove, a motion tracking sensor, a game controller or gamepad, or a video capture device such as a camera. However, these examples are not intended to be limiting and user input device(s) 116 may include other types of devices other than those listed herein. Depending upon the implementation, each user input device 116 may be integrated within the same physical structure or housing as processing unit 110 (such as an integrated touch screen, touch pad, or keyboard on a mobile device) or physically separate from a physical structure or housing that includes processing unit 110 and connected thereto via a suitable wired and/or wireless connection.

[0050] Network interface(s) 114 comprise one or more interfaces that enable end user computing device 102 to communicate over one or more networks 104. For example, network interface(s) 114 may comprise a wired network interface such as an Ethernet interface or a wireless network interface such as an IEEE 802.11 ("Wi-Fi") interface or a 3G telecommunication interface. However, these are examples only and are not intended to be limiting.

[0051] As further shown in FIG. 1, non-volatile memory 120 stores a number of software components including a plurality of applications 122 and an operating system 124.

[0052] Each application in the plurality of applications 122 comprises a computer program that a user of end user computing device 102 may cause to be executed by processing unit 110. The execution of each application causes certain operations to be performed on behalf of the user, wherein the type of operations performed will vary depending upon how the application is programmed. Applications 122 may include, for example and without limitation, a telephony application, an e-mail application, a messaging application, a Web browsing application, a calendar application, a utility application, a game application, a social networking application, a music application, a productivity application, a lifestyle application, a reference application, a travel application, a sports application, a navigation application, a healthcare and fitness application, a news application, a photography application, a finance application, a business application, an education application, a weather application, a books application, a medical application, or the like. As shown in FIG. 1, applications 122

include a digital personal assistant 130, the functions of which will be described in more detail herein.

[0053] Applications 122 may be distributed to and/or installed on end user computing device 102 in a variety of ways, depending upon the implementation. For example, in one embodiment, at least one application is downloaded from an application store and installed on end user computing device 102. In another embodiment in which end user device 102 is utilized as part of or in conjunction with an enterprise network, at least one application is distributed to end user computing device 102 by a system administrator using any of a variety of enterprise network management tools and then installed thereon. In yet another embodiment, at least one application is installed on end user computing device 102 by a system builder, such as by an original equipment manufacturer (OEM) or embedded device manufacturer, using any of a variety of suitable system builder utilities. In a further embodiment, an operating system manufacturer may include an application along with operating system 124 that is installed on end user computing device 102.

[0054] Operating system 124 comprises a set of programs that manage resources and provide common services for applications that are executed on end user computing device 102, such as applications 122. Among other features, operating system 124 comprises an operating system (OS) user interface 132. OS user interface 132 comprises a component of operating system 124 that generates a user interface by which a user can interact with operating system 124 for various purposes, such as but not limited to finding and launching applications, invoking certain operating system functionality, and setting certain operating system settings. In one embodiment, OS user interface 132 comprises a touch-screen based graphical user interface (GUI), although this is only an example. In further accordance with such an example, each application 122 installed on end user computing device 102 may be represented as an icon or tile within the GUI and invoked by a user through touch-screen interaction with the appropriate icon or tile. However, any of a wide variety of alternative user interface models may be used by OS user interface 132.

[0055] Although applications 122 and operating system 124 are shown as being stored in non-volatile memory 120, it is to be understood that during operation of end

user computing device 102, applications 122, operating system 124, or portions thereof, may be loaded to volatile memory 112 and executed therefrom as processes by processing unit 110.

[0056] Digital personal assistant 130 comprises a computer program that is configured to perform tasks, or services, for a user of end user computing device 102 based on user input as well as features such as location awareness and the ability to access information from a variety of sources including online sources (such as weather or traffic conditions, news, stock prices, user schedules, retail prices, etc.). Examples of tasks that may be performed by digital personal assistant 130 on behalf of the user may include, but are not limited to, placing a phone call to a user-specified person, launching a user-specified application, sending a user-specified e-mail or text message to a user-specified recipient, playing user-specified music, scheduling a meeting or other event on a user calendar, obtaining directions to a user-specified location, obtaining a score associated with a user-specified sporting event, posting user-specified content to a social media web site or microblogging service, recording user-specified reminders or notes, obtaining a weather report, obtaining the current time, setting an alarm at a user-specified time, obtaining a stock price for a user-specified company, finding a nearby commercial establishment, performing an Internet search, or the like. Digital personal assistant 130 may use any of a variety of artificial intelligence techniques to improve its performance over time through continued interaction with the user. Digital personal assistant 130 may also be referred to as an intelligent personal assistant, an intelligent software assistant, a virtual personal assistant, or the like.

[0057] Digital personal assistant 130 is configured to provide a user interface by which a user can submit questions, commands, or other verbal input and by which responses to such input may be delivered to the user. In one embodiment, the input may comprise user speech that is captured by one or more microphones of end user computing device 102 (each of which may comprise one of user input devices 116), although this example is not intended to be limiting and user input may be provided in other ways as well. The responses generated by digital personal assistant 130 may be made visible to the user in the form of text, images, or other visual content shown on

display 118 within a graphical user interface of digital personal assistant 130. The responses may also comprise computer-generated speech or other audio content that is played back via one or more speakers of end user computing device 102 (not shown in FIG. 1).

[0058] In accordance with embodiments, digital personal assistant 130 is capable of determining that a user has asked a question or made a statement that is intended to engage with a persona of digital personal assistant 130 as opposed to, for example, requesting that the digital personal assistant obtain information or perform some other task on behalf of the user. Such questions or statements are often casual or playful in nature and may include, for example, "Will you marry me?," "What is your favorite color?," "Sing me a song," "Tell me a joke," "Knock knock," "How much wood could a woodchuck chuck if a woodchuck could chuck wood?," "Who makes the best phone?," "Where can I hide a body?," "What do you look like?," "You are beautiful," "How old are you?," "Who's your daddy?," "Do you have a boyfriend?," "What is the meaning of life?," "I'd like to get to know you better," or the like. For the sake of convenience, such questions and statements are referred to herein as "chit-chat type utterances" or simply "chit-chat".

[0059] As will be discussed below, digital personal assistant 130 is further configured to take certain actions in response to determining that the user has made a chit-chat type utterance. For example, in response to determining that the user has made a chit-chat type utterance, digital personal assistant 130 may provide a response thereto by displaying a multimedia object associated with a popular culture reference within its user interface (when the multimedia object is visual in nature) or playing back by its user interface such a multimedia object (when the multimedia object is auditory in nature). As used herein, the term "popular culture reference" is intended to broadly encompass a reference to any subject matter associated with the customs, arts and/or social interactions of a large portion of a population. For example, and without any limitation whatsoever, a popular culture reference may include a reference to a well-known movie, television show, novel, short story, painting, video game, image, video, cartoon, celebrity, actor or actress, politician or other public figure, stereotype, meme, current event, historical event, or the like.

[0060] Additionally or alternatively, in response to determining that the user has made a chit-chat type utterance, digital personal assistant 130 may provide the response thereto by generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference. Still further, digital personal assistant 130 may be configured to provide the response by displaying within its user interface text that comprises a quotation associated with the popular culture reference, displaying within its user interface a visual representation of the digital personal assistant that evokes the popular culture reference, and/or displaying within its user interface a link that can be activated by the user to access content associated with the popular culture reference.

[0061] One manner in which digital personal assistant 130 determines that the user has made a chit-chat type utterance and provides a response thereto will now be described with reference to block diagram 200 of FIG. 2. In particular, block diagram 200 shows how various components of system 100 operate together to enable digital personal assistant 130 to determine that a user has made a chit-chat type utterance and to provide a response thereto.

[0062] With reference to FIG. 2, the process begins after digital personal assistant 130 has been launched on end user computing device 102. To interact with digital personal assistant 130, a user speaks into one or more microphones of end user computing device 102. The user's utterance is captured by the microphone(s) and converted from analog to digital form in a well-known manner. Digital personal assistant 130 causes the digital representation of the utterance to be transmitted as an audio stream to speech recognition service 132 (which is part of digital personal assistant backend 106) via network(s) 104. For example, in one embodiment, as a user speaks into the microphone(s) of end user computing device, digital personal assistant 130 periodically causes a digital representation of a portion of the user's utterance to be packetized and transmitted to speech recognition service 132 via network(s) 104.

[0063] Speech recognition service 132 operates to receive the audio stream transmitted thereto by digital personal assistant 130 and to analyze the audio stream to determine the phonetic content thereof. Once speech recognition service 132 has determined the phonetic content of the audio stream, it then maps the phonetic content

to one or more words, which taken together comprise a recognized utterance. Speech recognition service 132 then passes the recognized utterance to query understanding and response system 136.

[0064] As shown in FIG. 2, speech recognition service 132 may also transmit the recognized utterance back to digital personal assistant 130 via network(s) 104. Digital personal assistant 130 may display a text version of the recognized utterance within its graphical user interface (visible via display 118) so that the user can view the recognized utterance and determine whether or not the recognized utterance accurately represents what he/she said. In accordance with certain embodiments, digital personal assistant 130 may further provide a means by which the user can edit the recognized utterance if he/she determines that the recognized utterance does not accurately represent what he/she said and transmit the edited version of the utterance to query understanding and response system 136 for further processing thereof.

[0065] Query understanding and response system 136 receives the recognized or corrected utterance and analyzes the words thereof to determine how such utterance should be handled thereby. For example, query understanding and response system 136 may determine that the recognized or corrected utterance comprises an invocation of a particular task within a predefined set of tasks. For example and without any limitation whatsoever, the task may comprise placing a phone call to a user-specified person (e.g., "call Brian"), sending a user-specified e-mail or text message to a user-specified recipient (e.g., "text Carol that I am running late"), or creating a reminder (e.g., "remind me to check the oven in an hour."). If query understanding and response system 136 determines that the recognized or corrected utterance comprises an invocation of a particular task within the predefined set, then it will cause specialized logic (e.g., specialized logic within end user computing device 102) to perform the task.

[0066] However, if query understanding and response system 136 fails to match the recognized or corrected utterance to any of the tasks within the predefined set, then query understanding and response system 136 may further analyze the words of the utterance to determine how such utterance should be handled thereby. For example, query understanding and response system 136 may determine that the utterance

should be handled by conducting a Web search or by offering the user with an opportunity to conduct a Web search. In this case, the utterance may be handled by specialized logic for facilitating Web searching that is internal and/or external to query understanding and response system 136. Alternatively, query understanding and response system 136 may determine based on an analysis of the words of the utterance that the utterance comprises a chit-chat type utterance, which as noted above is an utterance intended to engage with a persona of digital personal assistant 130.

[0067] Depending upon the implementation, query understanding and response system 136 may determine that the utterance comprises a chit-chat type utterance based upon an analysis of factors other than or in addition to an analysis of the words of the utterance. For example, query understanding and response system 136 may determine that the utterance comprises a chit-chat type utterance based in part upon an analysis of an intonation of the utterance, upon contextual clues obtained from a conversation history of the user, or upon any other factors that may be deemed helpful in determining that the utterance comprises a chit-chat type utterance.

[0068] If query understanding and response system 136 determines that the utterance comprises a chit-chat type utterance, then the utterance will be handled by a query understanding and response system for chit-chat 138, which is a part of query understanding and response system 136. Query understanding and response system for chit-chat 138 is configured to determine the subject matter of the chit-chat type utterance and then, based on the determined subject matter, take steps to cause an appropriate response to the chit-chat type utterance to be output by digital personal assistant 130. As shown in FIG. 2, this may involve sending all or part of a response from query understanding and response system for chit-chat 138 to digital personal assistant 130 via network(s) 104. The composition of the response and the manner in which it is conveyed to and/or generated by digital personal assistant 130 will be discussed in more detail below.

[0069] In one embodiment, query understanding and response system for chit-chat 138 determines the subject matter of the chit-chat type utterance and then identifies a plurality of eligible responses that are suitable for responding to the utterance. Query understanding and response system for chit-chat 138 then selects one of the plurality

of eligible responses as the response to be provided by digital personal assistant 130. Such selection may be performed at random, in a certain sequence, or by using some other selection methodology. By maintaining a plurality of eligible responses for a given chit-chat type utterance, query understanding and response system for chit-chat 138 can ensure that digital personal assistant 130 will not provide the same response to the same utterance in every instance, thereby providing some variety and unpredictability to the user's interaction with digital personal assistant 130.

[0070] In one embodiment, query understanding and response system for chit-chat 138 operates to match the chit-chat type utterance to a particular utterance type within a hierarchical tree of utterance types having one or more responses associated therewith. Query understanding and response system for chit-chat 138 then selects the response to the chit-chat type utterance from among the response(s) associated therewith.

[0071] To help illustrate this concept, FIG. 3 depicts an example hierarchical tree 300 of utterance types that may be used to select a response to a chit-chat type utterance in accordance with an embodiment. As shown in FIG. 3, the root node of hierarchical tree 300 is the general chit-chat utterance type. Every utterance type beneath this root node comprises a chit-chat type utterance. At one level below this root node are chit-chat type utterances that are assertions ("Assertion"), commands ("Command"), flirtatious in nature ("Flirt"), requesting information about digital personal assistant 130 ("Sys-info"), or requesting an opinion from digital personal assistant 130 ("Sys-opinion"). Beneath each of these nodes are further categories and sub-categories of chit-chat utterance types. Thus, utterance types generally go from being broader at the type of hierarchical tree 300 to narrower at the bottom of hierarchical tree 300.

[0072] In an embodiment, based upon an analysis of the chit-chat type utterance, query understanding and response system for chit-chat 138 traverses hierarchical tree 300 and matches the utterance to one of the nodes. For example, query understanding and response system for chit-chat 138 may generate a confidence score that a certain chit-chat type utterance should be matched to "Assertion," "Command," "Flirt," "Sys-info" and "Sys-opinion." Query understanding and response system for chit-chat 138 then selects the node for which the highest confidence score has been obtained

(assuming that some minimum confidence score has been obtained for at least one of the nodes). Assume for the sake of illustration that the highest confidence score is generated for "Sys-opinion." Then, query understanding and response system for chit-chat 138 will traverse hierarchical tree 300 to the node "Sys-Opinion" and generate a confidence score that the chit-chat type utterance should be matched to each of the child nodes of "Sys-opinion"—namely, "Microsoft," "Trending" and "Advice." Query understanding and response system for chit-chat 138 then selects the child node for which the highest confidence score has been achieved (again, assuming some minimum confidence score has been obtained for at least one of the child nodes). If the confidence score for each of the child nodes is less than some predefined minimum confidence score, than the traversal of hierarchical tree 300 stops at the node "Sys-opinion."

[0073] One or more responses are associated with each node in hierarchical tree 300. When query understanding and response system for chit-chat 138 is done traversing hierarchical tree 300 and has selected a matching node for a chit-chat type utterance, then query understanding and response system for chit-chat 138 may select a response from among the one or more responses associated with the matching node.

[0074] The foregoing approach to identifying suitable responses to chit-chat type utterances is advantageous in that it allows responses to be defined for both broad groups of chit-chat type utterances as well as more narrow groups within the broader groups. By way of example, for the node "Microsoft" within the node "Sys-opinion," very specific responses to chit-chat type utterances can be crafted (e.g., "I think Microsoft is great!"), since the system has a high level of confidence that the user is asking for the opinion of digital personal assistant 130 about Microsoft. In contrast, for the node "Sys-opinion," a more generic response to chit-chat type utterances can be crafted (e.g., "No comment" or "I'd rather not say"), since the system has a high level of confidence that the user is asking for the opinion of digital personal assistant 130, but cannot determine the subject matter about which an opinion is being sought.

[0075] In one embodiment, the types of utterances that may be included in hierarchical tree 300 may be determined through human examination of logs of user utterances and labeling of each utterance with an appropriate utterance type. For

example, a crowd sourcing platform such as the Universal Human Relevance System (UHRS), developed by Microsoft Corporation of Redmond, Washington, may be used to obtain human examination and labeling of thousands of user utterances. This crowd sourcing information can then be used to generate hierarchical tree 300. Still other methods for generating a hierarchical tree of utterance types such as hierarchical tree 300 may be used.

[0076] In another embodiment, query understanding and response system for chit-chat 138 is configured to maintain one or more responses associated with each of one or more trending topics. Generally speaking, trending topics are topics that are becoming popular or have recently become popular with users and may be identified automatically (e.g., by automatically monitoring utterances submitted to digital personal assistants, search engine queries, microblogs such as TWITTER, social networking sites such as FACEBOOK, news publications, or other sources) or manually (e.g., through human observation of any or all of these sources). When query understanding and response system for chit-chat 138 determines that a chit-chat type utterance is associated with a particular trending topic, then query understanding and response system for chit-chat 138 may select the response to the chit-chat type utterance from among the one or more responses associated with the particular trending topic.

[0077] In further accordance with such an embodiment, the trending topics may be represented within a hierarchal tree of utterance types that is used by query understanding and response system for chit-chat 138 to select a suitable response to a chit-chat type utterance. For example, as shown in FIG. 3, one of the nodes under "Sys-Opinion" is "Trending." This node can be used to store responses to chit-chat type utterances that are soliciting an opinion of digital personal assistant 130 in regard to one or more trending topics. In still further accordance with this embodiment, the "Trending" node may have multiple child nodes associated therewith, wherein each child node is associated with a particular trending topic and has one or more responses associated therewith.

[0078] In yet another embodiment, query understanding and response system for chit-chat 138 is configured to maintain one or more responses to certain chit-chat type

utterances that are intended to convey the persona of digital personal assistant 130. For example, there may be an interest in ensuring that digital personal assistant 130 has something to say about a particular word, phrase, or topic that is associated with its persona. In this case, an editorial team may generated predefined responses to certain chit-chat type utterances to ensure that digital personal assistant 130 provides characteristic responses whenever such topic is discussed. In this case, when query understanding and response system for chit-chat 138 determines that a chit-chat type utterance is an utterance for which there are one or more predefined responses intended to convey the persona of digital personal assistant 130, query understanding and response system for chit-chat 138 will select the response to the chit-chat type utterance from among the one or more predefined responses.

[0079] FIG. 4 is a block diagram that shows an example response 400 that may be provided by digital personal assistant 130 in response to a chit-chat type utterance in accordance with an embodiment. As shown in FIG. 4, response 400 includes a number of components, including a display string 402, speech content 404, a speech impersonation component 406, a speech emotion component 408, a digital personal assistant animation 410, a multimedia component 412, and a link to content 414.

[0080] Depending upon the implementation, each of the components within response 400 may be stored and/or generated by digital personal assistant backend 106 and transmitted to digital personal assistant 130 by query understanding and response system for chit-chat 138 at the time the response is to be provided to a user. Alternatively, one, more than one, or all of the components of response 400 may be stored on and/or generated by end user computing device 102 (e.g., in non-volatile memory 120) and query understanding and response system for chit-chat 138 may send digital personal assistant 130 information sufficient to identify or obtain the component(s) at the time the response is to be provided to a user, so that digital personal assistant 130 can obtain the component(s) locally.

[0081] Furthermore, although response 400 includes seven different components, it is to be understood that a response to a chit-chat type utterance may include less than all of the components shown in FIG. 4.

[0082] Display string 402 comprises text that is to be displayed within the user interface of digital personal assistant 130. The text may comprise a verbal response to the chit-chat type utterance of the user. In one embodiment, display string 402 may comprise a quotation that is associated with a popular culture reference.

[0083] Speech content 404 comprises speech that is to be generated or played back by the user interface of digital personal assistant 130. Digital personal assistant 130 may generate such speech by applying text-to-speech conversion to text that comprises part of speech content 404. Alternatively, digital personal assistant 130 may generate such speech by playing back an audio file that is included within or identified by speech content 404. In one embodiment, speech content 404 comprises an audible version of the content included in display string 402, although this need not be the case. For example, speech content 404 may comprise verbal information that is entirely different than verbal information included in display string 402. Like display string 402, the content of speech content 404 may comprise a quotation that is associated with a popular culture reference.

[0084] Speech impersonation component 406 is a component that indicates that digital personal assistant 130 should generate or play back speech content 404 in a manner that impersonates a voice of a person, such as a person associated with a popular culture reference. Speech impersonation component 406 may include or identify an audio file that should be played back by digital personal assistant 130 to perform the impersonation. Alternatively, speech impersonation component 406 may indicate that a special text-to-speech converter should be used by digital personal assistant 130 to generate speech content 404 in a manner that impersonates the voice of the desired person.

[0085] Speech emotion component 408 comprises an emotional element that should be applied to speech content 404 when text-to-speech conversion is applied to such content to generate speech.

[0086] Digital personal assistant animation 410 comprises an animation of an avatar that represents digital personal assistant 130 that is to be displayed within its user interface. The animation may be designed such that it evokes a popular culture reference. Although the description of response 400 refers to digital personal

assistant animation 410, it is to be appreciated that types of visual representations of the avatar other than animations may be used to evoke the popular culture reference, including static images or the like.

[0087] Multimedia component 412 comprises one or more multimedia objects that are to be displayed within or played back by the user interface of digital personal assistant 130. Each multimedia object may be associated with a popular culture reference. Depending upon the implementation, each multimedia object may comprise, for example, an image to be displayed within the user interface of digital personal assistant 130, video content to be displayed within the user interface of digital personal assistant 130, or audio content to be played back by the user interface of digital personal assistant 130.

[0088] Link to content 414 comprises a link that may be displayed within the user interface of digital personal assistant 130 and that can be activated by the user to access other content. For example, the link can be activated by the user to access content associated with a popular culture reference.

[0089] FIGS. 5-10 provide several examples of responses to chit-chat type utterances that may be delivered via the user interface of digital personal assistant 130. These examples help illustrate the various components that may be included in a response to a chit-chat type utterance in accordance with embodiments. In the examples of FIGS. 5-10, end user computing device 102 is a smart phone and display 118 is an integrated display of the smart phone. However, as was previously noted, end user computing device 102 is not limited to smart phones and may be any of a wide variety of mobile and non-mobile computing devices.

[0090] FIG. 5 illustrates a response that may be provided by digital personal assistant 130 to the chit-chat type utterance "I am nervous about the stats test." In response to this chit-chat type utterance, a display string 502 comprising the words "May the force be with you" is displayed within the graphical user interface of digital personal assistant 130. This display string text comprises a well-known quotation from the popular "Star Wars" movies.

[0091] In addition, in response to the chit-chat type utterance, a visual representation 504 of digital personal assistant 130 is displayed within the graphical user interface.

Visual representation 504 includes a light saber, and thus also evokes the "Star Wars" movies. In an embodiment, visual representation 504 may comprise part of an animation of the avatar of digital personal assistant 130 that swings the light saber about, perhaps accompanied by audible light saber sounds that are played back via one or more speakers of end user computing device 102.

[0092] In an embodiment, the response provided in FIG. 5 also includes audible speech that is played back via one or more speakers of end user computing device 102, wherein such speech also includes the words "May the force be with you." In an embodiment, the speech comprises an impersonation of a famous "Star Wars" character such as Yoda or Obi-Wan Kenobi. As was previously described, such speech may be rendered by playing back a designated audio file or by applying a special text-to-speech conversion process to the text "May the force be with you." Depending upon the implementation, the impersonation may be rendered such that it is apparent that a person other than the "Star Wars" character is performing the impersonation (e.g., a default voice associated with digital personal assistant 130 is performing the impersonation). In other implementations, the impersonation may produce a voice that is indistinguishable from that of the "Star Wars" character, or may in fact be the voice of the actor that played the "Star Wars" character.

[0093] Taken together, display string 502, visual representation 504, and the speech delivered with an impersonation not only respond appropriately to the user's chit-chat type utterance by offering words of encouragement but also serve to strongly evoke a popular culture reference ("Star Wars") that will likely be instantly familiar to the user and help establish a sense of commonality therewith. Furthermore, since the response includes diverse forms of sensory output including the light saber animation and the impersonated voice, the response is more likely to engage and entertain the user then a flat text response.

[0094] FIG. 6 illustrates a response that may be provided by digital personal assistant 130 to the chit-chat type utterance "How do I rob a bank?" In response to this chit-chat type utterance, a display string 602 comprising the words "It didn't end well for these guys" is displayed within the graphical user interface of digital personal assistant 130. The response may also include audible speech that is played back via

one or more speakers of end user computing device 102, wherein such speech also includes the words "It didn't end well for these guys." The text of display string 602 is referring to a multimedia object 604 that is also displayed within the graphical user interface of digital personal assistant 130. As shown in FIG. 6, multimedia object 604 comprises an image of the movie poster for the 1967 movie "Bonnie & Clyde," which is a drama concerning the life and death of well-known bank robbers Bonnie Parker and Clyde Barrow.

[0095] Taken together, display string 602 (and corresponding audible speech) and multimedia object 604 comprise a response to the chit-chat utterance "How do I rob a bank" that both responds appropriately to the user's chit-chat type utterance by pointing out the perils of robbing a bank (Bonnie and Clyde were shot to death by police officers) and also evokes a popular culture reference (Bonnie and Clyde and the movie of the same name) that is likely to be familiar to the user and help establish a sense of commonality therewith. Furthermore, since the response forms of output other than flat text, it is more likely to engage and entertain the user.

[0096] FIG. 7 illustrates a response that may be provided by digital personal assistant 130 to the chit-chat type utterance "What's your favorite car in the whole wide world?" In response to this chit chat type utterance, a display string 702 comprising the words "I love Deloreans. Especially ones that travel through time" is displayed within the graphical user interface of digital personal assistant 130. The response may also include audible speech that is played back via one or more speakers of end user computing device 102, wherein such speech also includes the words "I love Deloreans. Especially ones that travel through time." This text and speech refers to the well-known "Back to the Future" movies.

[0097] As also shown in FIG. 7, the response also includes a multimedia object 704 in the form of a YOUTUBE® video called "Back to the Future – Clock Tower Scene.av" that may be played and viewed by the user within the context of the graphical user interface of digital personal assistant 130.

[0098] As further shown in FIG. 7, the response includes a link 706 that, when activated by the user, enables the user to search the Web for the phrase "What's your favorite car in the whole wide world?," which is the original utterance. It is noted that

in alternate embodiments, a link may be provided that, when activated by the user, enables the user to search the Web for content associated with the popular culture reference (e.g., the "Back to the Future" movies).

[0099] Like the responses of FIGS. 5 and 6, the response of FIG. 7 strongly evokes a popular culture reference and thus may establish commonality with the user. Furthermore, the video content that is viewable directly from the graphical user interface of digital personal assistant 130 makes the response highly engaging.

[0100] FIG. 8 illustrates a response that may be provided by digital personal assistant 130 to the chit-chat type utterance "You bitch." In response to this chit-chat type utterance, a display string 802 comprising the words "I'm also a lover, a child and a mother" is displayed within the graphical user interface of digital personal assistant 130. The response may also include audible speech that is played back via one or more speakers of end user computing device 102, wherein such speech also includes the words "I'm also a lover, a child and a mother." This text and speech comprises a portion of the lyrics of the well-known song "Bitch" by Meredith Brooks.

[0101] As also shown in FIG. 8, the response also includes a multimedia object 804 in the form of an image of Meredith Brooks. The response also includes a text portion 806 that provides information about the song "Bitch" and may also include one or more links that may be activated by the user to purchase a digital copy of the song from one or more sources, respectively.

[0102] The response to FIG. 8 cleverly utilizes a pop culture reference to respond to (and somewhat deflect) the seemingly derogatory chit-chat type utterance. It also includes interesting multimedia content that can help engage the user. The response shown in FIG. 8 also illustrates how a response to a chit-chat type utterance can serve in some respects as an advertisement or commercial opportunity in that the user is enabled to purchase the song that is being referred to in the response.

[0103] FIG. 9 illustrates a response that may be provided by digital personal assistant 130 to the chit-chat type utterance "Who is your Daddy?" In response to this chit-chat type utterance, a display string 902 comprising the words "These guys" is displayed within the graphical user interface of digital personal assistant 130. The response may also include audible speech that is played back via one or more

speakers of end user computing device 102, wherein such speech also includes the words "These guys." The text of display string 902 is referring to a multimedia object 904 that is also displayed within the graphical user interface of digital personal assistant 130. As shown in FIG. 9, multimedia object 904 comprises a video of Bill Gates (chairman of Microsoft) and Steve Ballmer (chief executive officer of Microsoft) dressed as the characters of Austin Powers and Dr. Evil, respectively, from the very popular "Austin Powers" movies. This video may be played and viewed by the user within the context of the graphical user interface of digital personal assistant 130.

[0104] In an embodiment in which digital personal assistant 130 is published by Microsoft Corporation of Redmond, Washington, the response shown in FIG. 9 is apt since the figures shown in the video are well-known personas associated with Microsoft. Furthermore, the video content is amusing and engaging for the user.

[0105] FIG. 10 illustrates a response that may be provided by digital personal assistant 130 to the chit-chat type utterance "Show me something funny?" In response to this chit-chat type utterance, a display string 1002 comprising the words "A friend of mine has an opinion" is displayed within the graphical user interface of digital personal assistant 130. The response may also include audible speech that is played back via one or more speakers of end user computing device 102, wherein such speech also includes the words "A friend of mine has an opinion." The text of display string 1002 is referring to a multimedia object 1004 that is also displayed within the graphical user interface of digital personal assistant 130. As shown in FIG. 10, multimedia object 1004 comprises an image of a grumpy-looking cat with the tagline: "I had fun once. It was horrible." This image is a reference to the popular "Grumpy Cat" internet meme, which may be instantly recognizable to the user and which may also serve to amuse and engage the user.

[0106] The foregoing examples of FIGS. 5-10 have been provided herein by way of example only. Persons skilled in the relevant art(s) will appreciate that a wide variety of responses to chit-chat type utterances may be provided other than those depicted in FIGS. 5-10. Such responses may include any one or more of the response

components previously described in reference to FIG. 4, as well as additional components.

III. Example Methods for Implementing a Digital Personal Assistant that Utilizes Impersonations and/or Multimedia in Responses

[0107] FIG. 11 depicts a flowchart 1100 of a method for implementing a digital personal assistant that utilizes impersonations and/or multimedia in responding to chit-chat type utterances in accordance with an embodiment. The method of flowchart 1100 may be performed, for example, by digital personal assistant backend 106 as discussed above in reference to FIG. 1. Accordingly, the method of flowchart 1100 will now be described with continued reference to system 100 of FIG. 1. However, the method is not limited to that implementation.

[0108] As shown in FIG. 11, the method of flowchart 1100 begins at step 1102 in which a digital representation of an utterance of a user of a digital personal assistant is received. The digital representation of the utterance may comprise, for example, the utterance that is generated by speech recognition service 132 or the corrected utterance generated through user interaction with digital personal assistant 130 as discussed above in reference to FIG. 2. As further discussed in regard to that figure, the digital representation of the utterance is received by query understanding and response system 136.

[0109] At step 1104, the digital representation of the utterance is analyzed. As discussed above in reference to FIG. 2, this step may entail the analysis performed by query understanding and response system 136 to determine if the utterance comprises a chit-chat type utterance.

[0110] At step 1106, based on at least the analysis of the digital representation of the utterance, it is determined that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant. As discussed above in reference to FIG. 2, this step occurs when query understanding and response system 136 determines that the utterance is a chit-chat type utterance. As previously noted, this determination may be based on the analysis of the utterance performed by query understanding and response system 136.

[0111] At step 1108, in response to at least the determination made in step 1106, a response to the utterance is caused to be generated by the digital personal assistant that includes at least one of a multimedia object associated with a popular culture reference and speech that comprises an impersonation of a voice of a person associated with the popular culture reference. The multimedia object may comprise, for example, an image, video content, or audio content, and may be displayed within or played back by a user interface of the digital personal assistant. The speech may be generated or played back by the digital personal assistant. This step may be performed for example, by query understanding and response system for chit-chat 138 which causes digital personal assistant 130 to provide a response that includes a multimedia object, such as multimedia component 404 described above in reference to FIG. 4, or that includes impersonated speech as indicated by speech impersonation component 406 as described above in reference to FIG. 4. The manner in which query understanding and response system for chit-chat 138 performs this function has been previously described.

[0112] As was also previously described, the response to the utterance discussed in step 1108 may further include text that is displayed within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference, a visual representation of the digital personal assistant (e.g., an animation of the digital personal assistant) that is displayed within the user interface thereof and that evokes the popular culture reference, and/or a link that is displayed within the user interface of the digital personal assistant and that can be activated by the user to access content, such as content associated with the chit-chat type utterance or with the popular culture reference. Additionally, the speech that is generated or played back by the digital personal assistant may comprise a quotation associated with the popular culture reference.

[0113] In one embodiment, causing a response to the utterance to be generated in step 1108 comprises identifying a plurality of eligible responses to the utterance and then selecting the response to the utterance from among the plurality of eligible responses to the utterance.

[0114] In another embodiment, causing a response to the utterance to be generated in step 1108 comprises matching the utterance to a particular utterance type within a hierarchical tree of utterance types (e.g., hierarchical tree 300 as discussed above in reference to FIG. 3), each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith. After the matching, the response to the utterance is selected from among the response(s) associated with the particular utterance type.

[0115] In yet another embodiment, causing a response to the utterance to be generated in step 1108 comprises determining that the utterance is associated with a trending topic and then, in response to determining that the utterance is associated with a trending topic, selecting the response to the utterance from among one or more responses associated with the trending topic.

[0116] In a further embodiment, causing a response to the utterance to be generated in step 1108 comprises determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant and, in response to this determination, selecting the response to the utterance from among the one or more predefined responses.

[0117] In a still further embodiment, causing a response to the utterance to be generated in step 1108 comprises sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant. This step may be performed, for example, when query understanding and response system for chit-chat 138 sends an audio file that includes the impersonated speech to end user computing device 102 so that it can be accessed and played back by digital personal assistant 130 or when query understanding and response system for chit-chat 138 sends information that identifies such an audio file to digital personal assistant 130 so that the audio file can be obtained locally by digital personal assistant 130.

[0118] In yet another embodiment, causing a response to the utterance to be generated in step 1108 comprises providing text to a computing device executing the digital personal assistant, wherein the text is to be processed by a text-to-speech component of the digital personal assistant to generate the speech. This step may be performed,

for example, when query understanding and response system for chit-chat 138 sends an indication to digital personal assistant 130 that digital personal assistant 130 should apply a special text-to-speech converter to designated text to cause the text to be converted to speech in a manner that impersonates the voice of a particular person.

[0119] FIG. 12 depicts a flowchart 1200 of a method by which a digital personal assistant provides a response to a chit-chat type utterance that includes a voice impersonation in accordance with an embodiment. The method of flowchart 1200 may be performed, for example, by digital personal assistant 130 as discussed above in reference to FIG. 1. Accordingly, the method of flowchart 1200 will now be described with continued reference to system 100 of FIG. 1. However, the method is not limited to that implementation.

[0120] As shown in FIG. 12, the method of flowchart 1200 begins at step 1202, in which digital personal assistant 130 captures audio that represents an utterance of a user intended to engage with a persona of digital personal assistant 130.

[0121] At step 1204, digital personal assistant 130 transmits the audio to digital personal assistant backend 106.

[0122] At step 1206, digital personal assistant 130 provides a response to the utterance based at least on information received from digital personal assistant backend 106. Providing the response includes generating or playing back speech that comprises an impersonation of a voice of a persona associated with a popular culture reference.

[0123] In an embodiment, providing the response in step 1206 include playing back an audio file that includes the speech. In an alternate embodiment, providing the response in step 1206 includes applying text-to-speech conversion to text to generate the speech.

[0124] In accordance with further embodiments, providing the response in step 1206 includes one or more of: displaying or playing back a multimedia object by a user interface of digital personal assistant 130, the multimedia object being associated with the popular culture reference; displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference; displaying a visual representation of the digital personal assistant that

evokes the popular culture reference within the user interface of the digital personal assistant; and displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content, such as content associated with the utterance or with the popular culture reference.

[0125] FIG. 13 depicts a flowchart 1300 of a method by which a digital personal assistant provides a response to a chit-chat type utterance that includes a multimedia object in accordance with an embodiment. The method of flowchart 1300 may be performed, for example, by digital personal assistant 130 as discussed above in reference to FIG. 1. Accordingly, the method of flowchart 1300 will now be described with continued reference to system 100 of FIG. 1. However, the method is not limited to that implementation.

[0126] As shown in FIG. 13, the method of flowchart 1300 begins at step 1302, in which digital personal assistant 130 captures audio that represents an utterance of a user intended to engage with a persona of digital personal assistant 130.

[0127] At step 1304, digital personal assistant 130 transmits the audio to digital personal assistant backend 106.

[0128] At step 1306, digital personal assistant 130 provides a response to the utterance based at least on information received from digital personal assistant backend 106. Providing the response includes displaying or playing back a multimedia object associated with a popular culture reference by a user interface of digital personal assistant 130.

[0129] In an embodiment, displaying or playing back the multimedia object in step 1306 comprises displaying an image or video content or playing back audio content by the user interface of digital personal assistant 130.

[0130] In accordance with further embodiments, providing the response in step 1306 includes one or more of: generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference; displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference; displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and displaying a

link within the user interface of the digital personal assistant that can be activated by the user to access content, such as content associated with the utterance or with the popular culture reference.

IV. Example Mobile Device Implementation

[0131] FIG. 14 is a block diagram of an exemplary mobile device 1402 that may be used to implement end user computing device 102 as described above in reference to FIG. 1. As shown in FIG. 14, mobile device 1402 includes a variety of optional hardware and software components. Any component in mobile device 1402 can communicate with any other component, although not all connections are shown for ease of illustration. Mobile device 1402 can be any of a variety of computing devices (e.g., cell phone, smartphone, handheld computer, Personal Digital Assistant (PDA), etc.) and can allow wireless two-way communications with one or more mobile communications networks 1404, such as a cellular or satellite network, or with a local area or wide area network.

[0132] The illustrated mobile device 1402 can include a controller or processor 1410 (e.g., signal processor, microprocessor, ASIC, or other control and processing logic circuitry) for performing such tasks as signal coding, data processing, input/output processing, power control, and/or other functions. An operating system 1412 can control the allocation and usage of the components of mobile device 1402 and support for one or more application programs 1414 (also referred to as "applications" or "apps"). Application programs 1414 may include common mobile computing applications (e.g., e-mail applications, calendars, contact managers, Web browsers, messaging applications) and any other computing applications (e.g., word processing applications, mapping applications, media player applications). In one embodiment, application programs 1414 include digital personal assistant 130.

[0133] The illustrated mobile device 1402 can include memory 1420. Memory 1420 can include non-removable memory 1422 and/or removable memory 1424. Non-removable memory 1422 can include RAM, ROM, flash memory, a hard disk, or other well-known memory devices or technologies. Removable memory 1424 can include flash memory or a Subscriber Identity Module (SIM) card, which is well

known in GSM communication systems, or other well-known memory devices or technologies, such as "smart cards." Memory 1420 can be used for storing data and/or code for running operating system 1412 and applications 1414. Example data can include Web pages, text, images, sound files, video data, or other data to be sent to and/or received from one or more network servers or other devices via one or more wired or wireless networks. Memory 1420 can be used to store a subscriber identifier, such as an International Mobile Subscriber Identity (IMSI), and an equipment identifier, such as an International Mobile Equipment Identifier (IMEI). Such identifiers can be transmitted to a network server to identify users and equipment.

[0134] Mobile device 1402 can support one or more input devices 1430, such as a touch screen 1432, a microphone 1434, a camera 1436, a physical keyboard 1438 and/or a trackball 1440 and one or more output devices 1450, such as a speaker 1452 and a display 1454. Touch screens, such as touch screen 1432, can detect input in different ways. For example, capacitive touch screens detect touch input when an object (e.g., a fingertip) distorts or interrupts an electrical current running across the surface. As another example, touch screens can use optical sensors to detect touch input when beams from the optical sensors are interrupted. Physical contact with the surface of the screen is not necessary for input to be detected by some touch screens.

[0135] Other possible output devices (not shown) can include piezoelectric or other haptic output devices. Some devices can serve more than one input/output function. For example, touch screen 1432 and display 1454 can be combined in a single input/output device. The input devices 1430 can include a Natural User Interface (NUI).

[0136] Wireless modem(s) 1460 can be coupled to antenna(s) (not shown) and can support two-way communications between the processor 1410 and external devices, as is well understood in the art. The modem(s) 1460 are shown generically and can include a cellular modem 1466 for communicating with the mobile communication network 1404 and/or other radio-based modems (e.g., Bluetooth 1464 and/or Wi-Fi 1462). At least one of the wireless modem(s) 1460 is typically configured for communication with one or more cellular networks, such as a GSM network for data and voice communications within a single cellular network, between cellular

networks, or between the mobile device and a public switched telephone network (PSTN).

[0137] Mobile device 1402 can further include at least one input/output port 1480, a power supply 1482, a satellite navigation system receiver 1484, such as a Global Positioning System (GPS) receiver, an accelerometer 1486, and/or a physical connector 1490, which can be a USB port, IEEE 1394 (FireWire) port, and/or RS-232 port. The illustrated components of mobile device 1402 are not required or all-inclusive, as any components can be deleted and other components can be added as would be recognized by one skilled in the art.

[0138] In an embodiment, certain components of mobile device 1402 are configured to perform the operations attributed to digital personal assistant 130 as described in preceding sections. Computer program logic for performing the operations attributed to digital personal assistant 130 as described above may be stored in memory 1420 and executed by processor 1410. By executing such computer program logic, processor 1410 may be caused to implement any of the features of digital personal assistant 130 as described above in reference to FIG. 1. Also, by executing such computer program logic, processor 1410 may be caused to perform any or all of the steps of any or all of the flowcharts depicted in FIGS. 12 and 13.

V. Example Computer System Implementation

[0139] FIG. 15 depicts an example processor-based computer system 1500 that may be used to implement various embodiments described herein. For example, system 1500 may be used to implement end user computing device 102 or any of the computers used to implement digital personal assistant backend 106 as described above in reference to FIG. 1. System 1500 may also be used to implement any or all of the steps of any or all of the flowcharts depicted in FIGS. 11-13. The description of system 1500 provided herein is provided for purposes of illustration, and is not intended to be limiting. Embodiments may be implemented in further types of computer systems, as would be known to persons skilled in the relevant art(s).

[0140] As shown in FIG. 15, system 1500 includes a processing unit 1502, a system memory 1504, and a bus 1506 that couples various system components including

system memory 1504 to processing unit 1502. Processing unit 1502 may comprise one or more microprocessors or microprocessor cores. Bus 1506 represents one or more of any of several types of bus structures, including a memory bus or memory controller, a peripheral bus, an accelerated graphics port, and a processor or local bus using any of a variety of bus architectures. System memory 1504 includes read only memory (ROM) 1508 and random access memory (RAM) 1510. A basic input/output system 1512 (BIOS) is stored in ROM 1508.

[0141] System 1500 also has one or more of the following drives: a hard disk drive 1514 for reading from and writing to a hard disk, a magnetic disk drive 1516 for reading from or writing to a removable magnetic disk 1518, and an optical disk drive 1520 for reading from or writing to a removable optical disk 1522 such as a CD ROM, DVD ROM, BLU-RAY™ disk or other optical media. Hard disk drive 1514, magnetic disk drive 1516, and optical disk drive 1520 are connected to bus 1506 by a hard disk drive interface 1524, a magnetic disk drive interface 1526, and an optical drive interface 1528, respectively. The drives and their associated computer-readable media provide nonvolatile storage of computer-readable instructions, data structures, program modules and other data for the computer. Although a hard disk, a removable magnetic disk and a removable optical disk are described, other types of computer-readable memory devices and storage structures can be used to store data, such as flash memory cards, digital video disks, random access memories (RAMs), read only memories (ROM), and the like.

[0142] A number of program modules may be stored on the hard disk, magnetic disk, optical disk, ROM, or RAM. These program modules include an operating system 1530, one or more application programs 1532, other program modules 1534, and program data 1536. In accordance with various embodiments, the program modules may include computer program logic that is executable by processing unit 1502 to perform any or all of the functions and features of end user computing device 102 or any of the computers used to implement digital personal assistant backend 106 as described above in reference to FIG. 1. The program modules may also include computer program logic that, when executed by processing unit 1502, performs any of

the steps or operations shown or described in reference to the flowcharts of FIGS. 11-13.

[0143] A user may enter commands and information into system 1500 through input devices such as a keyboard 1538 and a pointing device 1540. Other input devices (not shown) may include a microphone, joystick, game controller, scanner, or the like. In one embodiment, a touch screen is provided in conjunction with a display 1544 to allow a user to provide user input via the application of a touch (as by a finger or stylus for example) to one or more points on the touch screen. These and other input devices are often connected to processing unit 1502 through a serial port interface 1542 that is coupled to bus 1506, but may be connected by other interfaces, such as a parallel port, game port, or a universal serial bus (USB). Such interfaces may be wired or wireless interfaces.

[0144] A display 1544 is also connected to bus 1506 via an interface, such as a video adapter 1546. In addition to display 1544, system 1500 may include other peripheral output devices (not shown) such as speakers and printers.

[0145] System 1500 is connected to a network 1548 (e.g., a local area network or wide area network such as the Internet) through a network interface or adapter 1550, a modem 1552, or other suitable means for establishing communications over the network. Modem 1552, which may be internal or external, is connected to bus 1506 via serial port interface 1542.

[0146] As used herein, the terms "computer program medium," "computer-readable medium," and “computer-readable storage medium” are used to generally refer to memory devices or storage structures such as the hard disk associated with hard disk drive 1514, removable magnetic disk 1518, removable optical disk 1522, as well as other memory devices or storage structures such as flash memory cards, digital video disks, random access memories (RAMs), read only memories (ROM), and the like. Such computer-readable storage media are distinguished from and non-overlapping with communication media (do not include communication media). Communication media typically embodies computer-readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave. The term “modulated data signal” means a signal that has one or more of its characteristics set

or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media includes wireless media such as acoustic, RF, infrared and other wireless media. Embodiments are also directed to such communication media.

[0147] As noted above, computer programs and modules (including application programs 1532 and other program modules 1534) may be stored on the hard disk, magnetic disk, optical disk, ROM, or RAM. Such computer programs may also be received via network interface 1550, serial port interface 1542, or any other interface type. Such computer programs, when executed or loaded by an application, enable computer 1500 to implement features of embodiments of the present invention discussed herein. Accordingly, such computer programs represent controllers of the system 1500.

[0148] Embodiments are also directed to computer program products comprising software stored on any computer useable medium. Such software, when executed in one or more data processing devices, causes a data processing device(s) to operate as described herein. Embodiments of the present invention employ any computer-useable or computer-readable medium, known now or in the future. Examples of computer-readable mediums include, but are not limited to memory devices and storage structures such as RAM, hard drives, floppy disks, CD ROMs, DVD ROMs, zip disks, tapes, magnetic storage devices, optical storage devices, MEMs, nanotechnology-based storage devices, and the like.

[0149] In alternative implementations, system 1500 may be implemented as hardware logic/electrical circuitry or firmware. In accordance with further embodiments, one or more of these components may be implemented in a system-on-chip (SoC). The SoC may include an integrated circuit chip that includes one or more of a processor (e.g., a microcontroller, microprocessor, digital signal processor (DSP), etc.), memory, one or more communication interfaces, and/or further circuits and/or embedded firmware to perform its functions.

VI. Conclusion

[0150] While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. It will be apparent to persons skilled in the relevant art(s) that various changes in form and details can be made therein without departing from the spirit and scope of the invention. Thus, the breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

WHAT IS CLAIMED IS:

1. A method for implementing a digital personal assistant, comprising:

receiving a digital representation of an utterance of a user of the digital personal assistant;

based on at least an analysis of the digital representation of the utterance, determining that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant; and

in response to at least the determining that the utterance comprises an utterance intended to engage with the persona of the digital personal assistant, causing a response to the utterance to be generated by the digital personal assistant that includes at least one of:

a multimedia object that is displayed within or played back by a user interface of the digital personal assistant, the multimedia object being associated with a popular culture reference; and

speech that is generated or played back by the digital personal assistant, the speech comprising an impersonation of a voice of a person associated with the popular culture reference.

2. The method of claim 1, wherein the response to the utterance further includes text that is displayed within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference.

3. The method of claim 1, wherein the speech comprises a quotation associated with the popular culture reference.

4. The method of claim 1, wherein the response to the utterance further includes a visual representation of the digital personal assistant that is displayed within the user interface thereof and that evokes the popular culture reference.

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5. The method of claim 4, wherein the visual representation of the digital personal assistant comprises an animation of the digital personal assistant.

6. The method of claim 1, wherein the multimedia object comprises:

image or video content that is displayed within the user interface of the digital personal assistant or audio content that is played back by the user interface of the digital personal assistant.

7. The method of claim 1, wherein the response to the utterance further includes:

a link that is displayed within the user interface of the digital personal assistant and that can be activated by the user to access content associated with the popular culture reference.

8. The method of claim 1, wherein causing the response to the utterance to be generated comprises:

identifying a plurality of eligible responses to the utterance; and

selecting the response to the utterance from among the plurality of eligible responses to the utterance.

9. The method of claim 1, wherein causing the response to the utterance to be generated comprises:

matching the utterance to a particular utterance type within a hierarchical tree of utterance types, each utterance type in the hierarchical tree of utterance types having one or more responses associated therewith; and

selecting the response to the utterance from among the response(s) associated with the particular utterance type.

10. The method of claim 1, wherein causing the response to the utterance to be generated comprises:

determining that the utterance is associated with a trending topic; and

in response to determining that the utterance is associated with the trending topic, selecting the response to the utterance from among one or more responses associated with the trending topic.

11. The method of claim 1, wherein causing the response to the utterance to be generated comprises:

determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant; and

in response to determining that the utterance is an utterance for which there are one or more predefined responses intended to convey the persona of the digital personal assistant, selecting the response to the utterance from among the one or more predefined responses.

12. The method of claim 1, wherein causing the response to the utterance to be generated comprises:

sending an audio file that includes the speech or information that identifies the audio file to a computing device executing the digital personal assistant.

13. The method of claim 1, wherein causing the response to the utterance to be generated comprises:

providing text to a computing device executing the digital personal assistant, the text to be processed by a text-to-speech component of the digital personal assistant to generate the speech.

14. A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including generating or playing back speech that comprises an impersonation of a voice of a person associated with a popular culture reference.

15. The computing device of claim 14, wherein the digital personal assistant is configured to play back an audio file that includes the speech.

16. The computing device of claim 14, wherein the digital personal assistant is configured to apply text-to-speech conversion to text to generate the speech.

17. The computing device of claim 14, wherein providing the response further includes at least one of:

displaying or playing back a multimedia object by a user interface of the digital personal assistant, the multimedia object being associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

18. A computing device, comprising:

at least one processor; and

a memory that stores computer program logic for execution by the at least one processor, the computer program logic including one or more components configured to perform operations when executed by the at least one processor, the one or more components including:

a digital personal assistant configured to capture audio that represents an utterance of a user and to transmit the audio to a digital personal assistant backend, the utterance comprising an utterance intended to engage with a persona of the digital personal assistant;

the digital personal assistant being further configured to provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including displaying or playing back a multimedia object associated with a popular culture reference by a user interface of the digital personal assistant.

19. The computing device of claim 18, wherein the multimedia object comprises an image, video content, or audio content.

20. The computing device of claim 18, wherein providing the response further includes at least one of:

generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference;

displaying text within the user interface of the digital personal assistant, the text comprising a quotation associated with the popular culture reference;

displaying a visual representation of the digital personal assistant that evokes the popular culture reference within the user interface of the digital personal assistant; and

displaying a link within the user interface of the digital personal assistant that can be activated by the user to access content associated with the popular culture reference.

DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES

ABSTRACT OF THE DISCLOSURE

Systems, methods, apparatuses, and computer program products are described for implementing a digital personal assistant. The digital personal assistant is capable of determining that a user has asked a question or made a statement that is intended to engage with a persona of the digital personal assistant. In response to determining that the user has asked such a question or made such a statement, the digital personal assistant provides a response thereto by displaying or playing back a multimedia object associated with a popular culture reference within or by a user interface of the digital personal assistant. Additionally or alternatively, in response to determining that the user has asked such a question or made such a statement, the digital personal assistant provides the response thereto by generating or playing back speech that comprises an impersonation of a voice of a person associated with the popular culture reference.

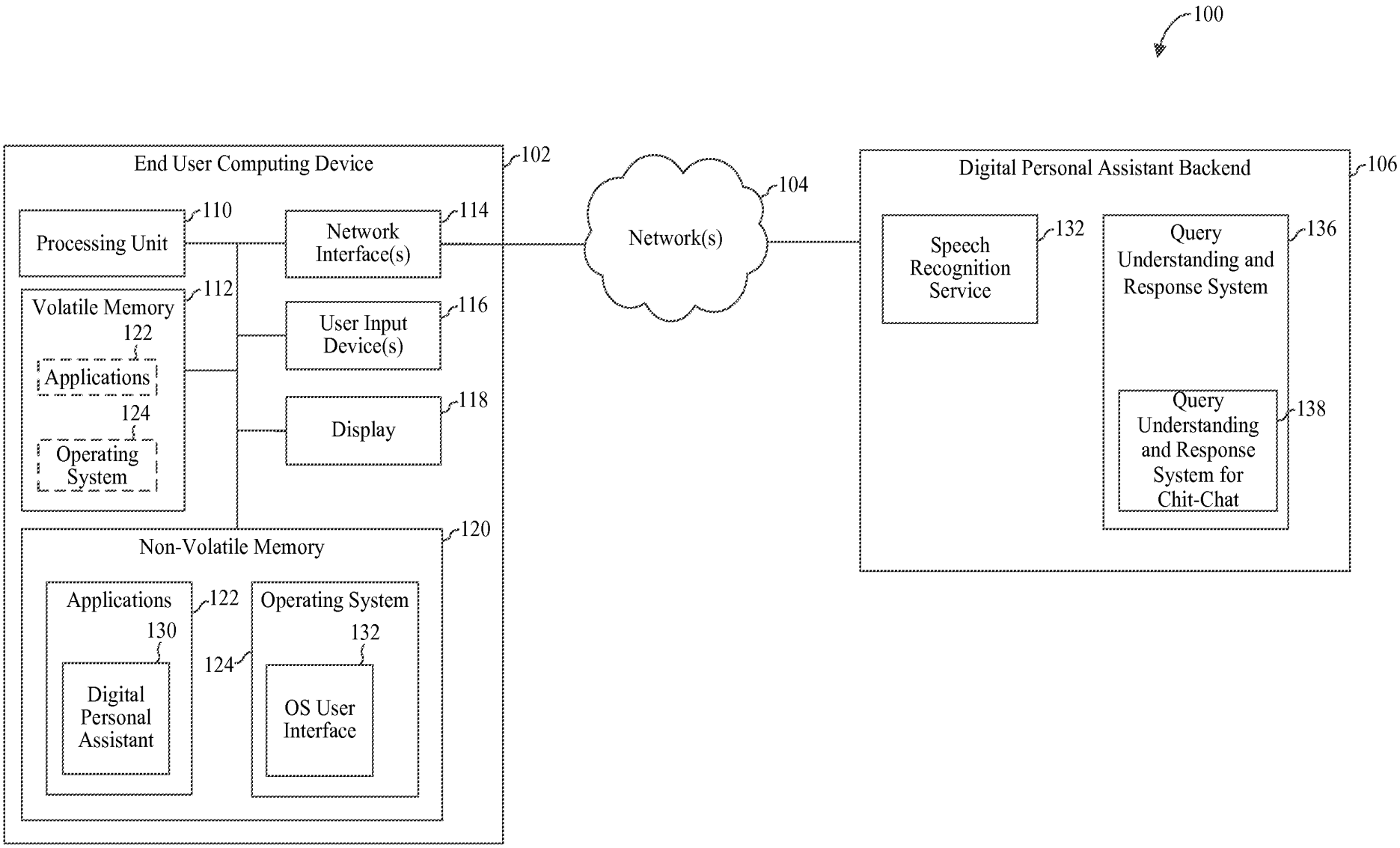


FIG. 1

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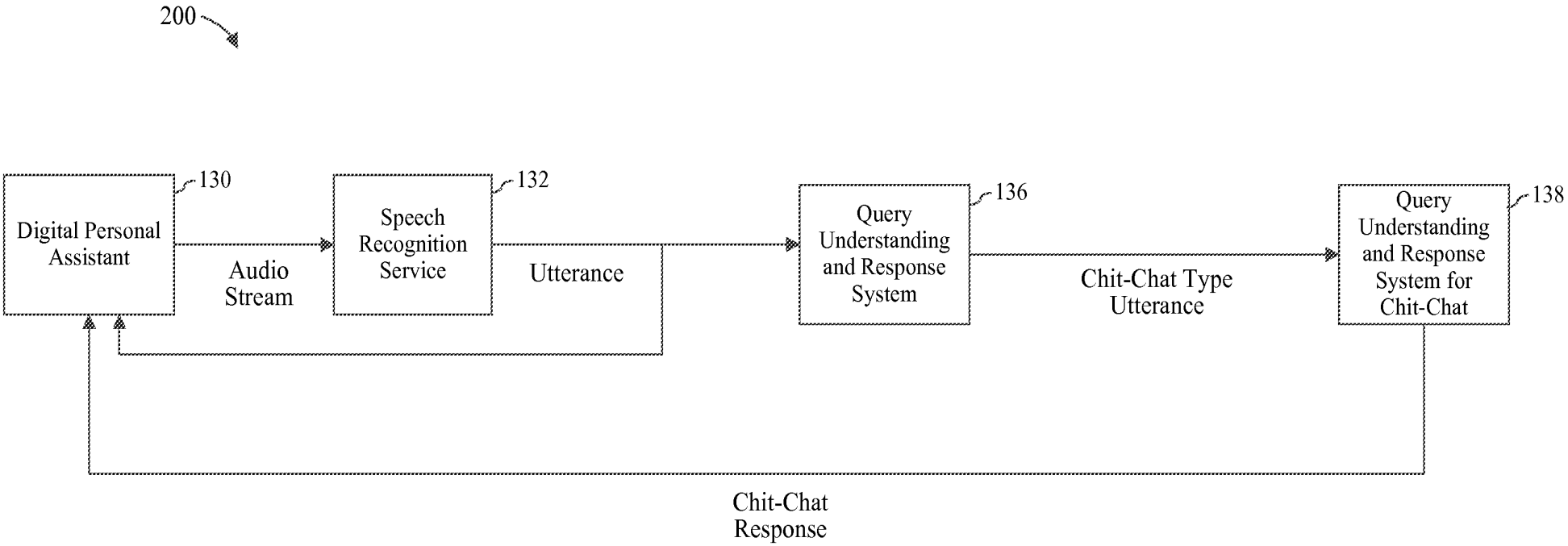


FIG. 2

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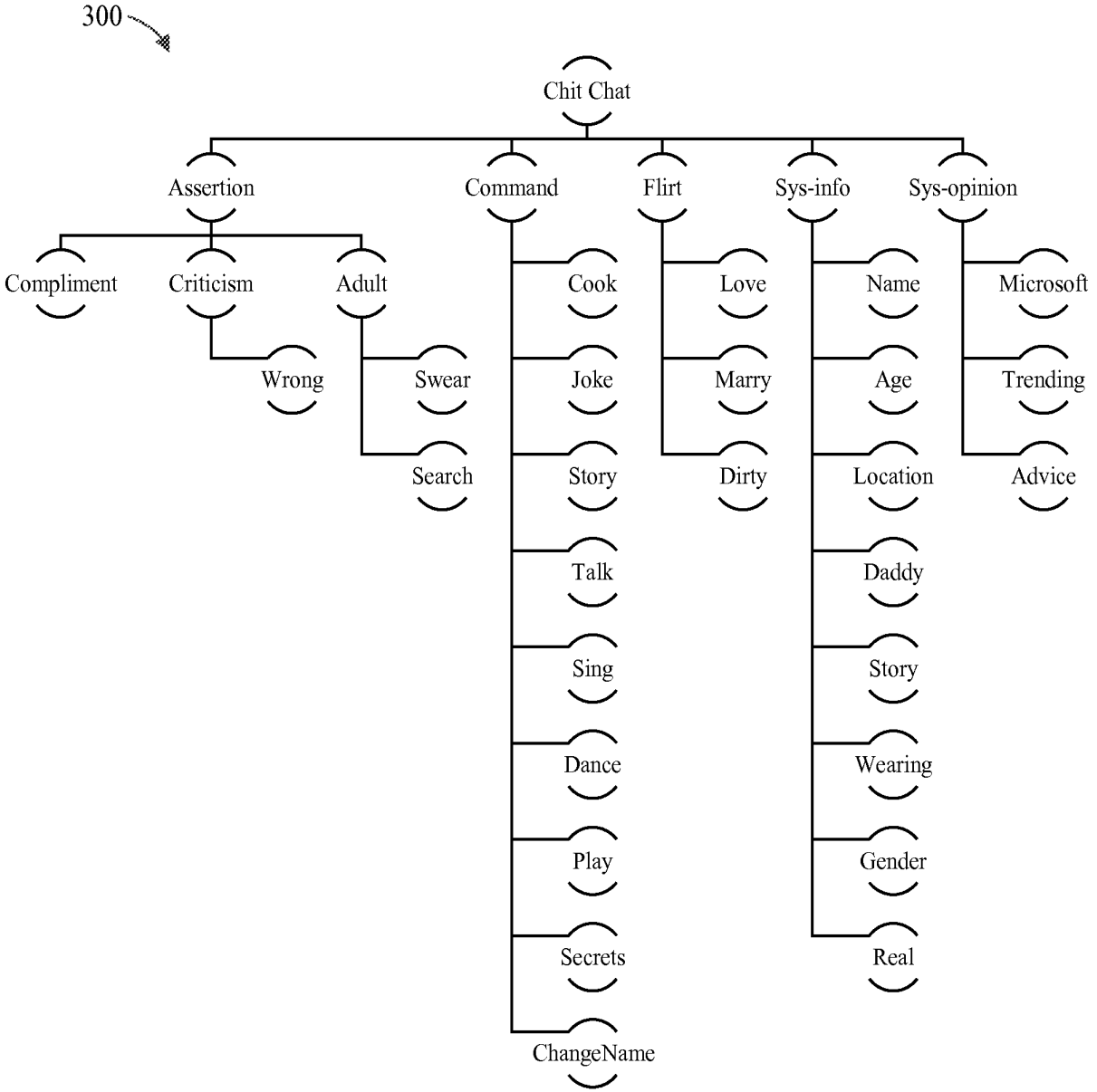


FIG. 3

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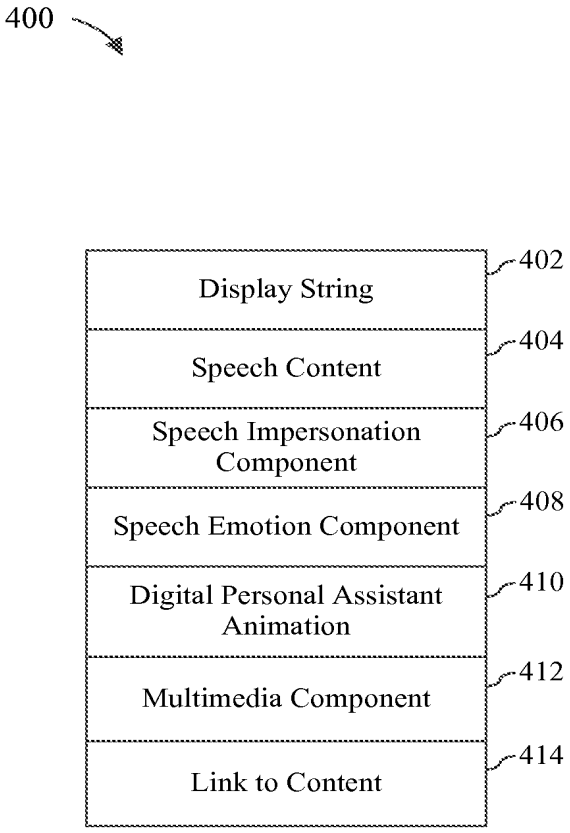

400
Display String
402
Speech Content
404
Speech Impersonation Component
406
Speech Emotion Component
408
Digital Personal Assistant Animation
410
Multimedia Component
412
Link to Content
414

FIG. 4

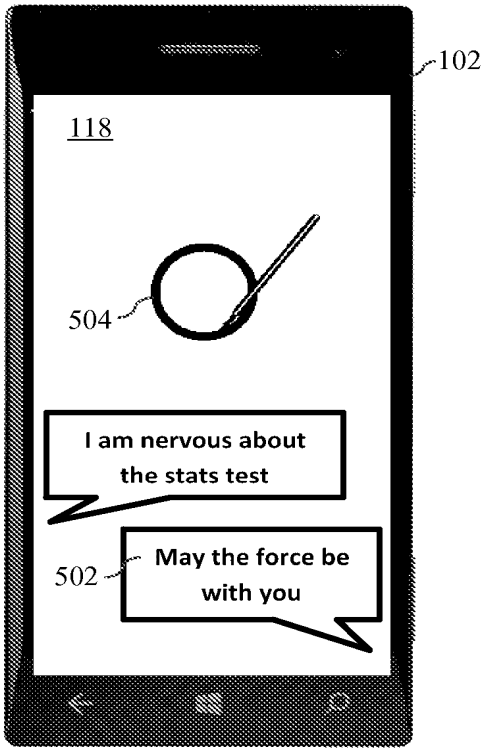

102
118
504
I am nervous about the stats test
502
May the force be with you

FIG. 5

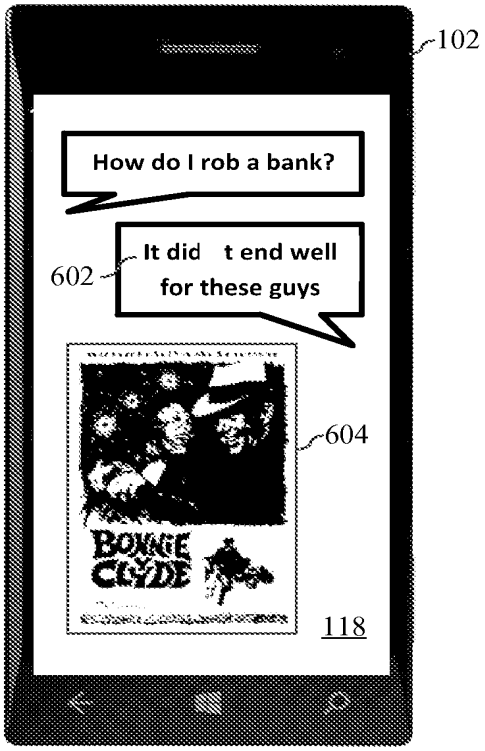

102
How do I rob a bank?
602
It did t end well for these guys
604
BONNIE CLYDE
118

FIG. 6

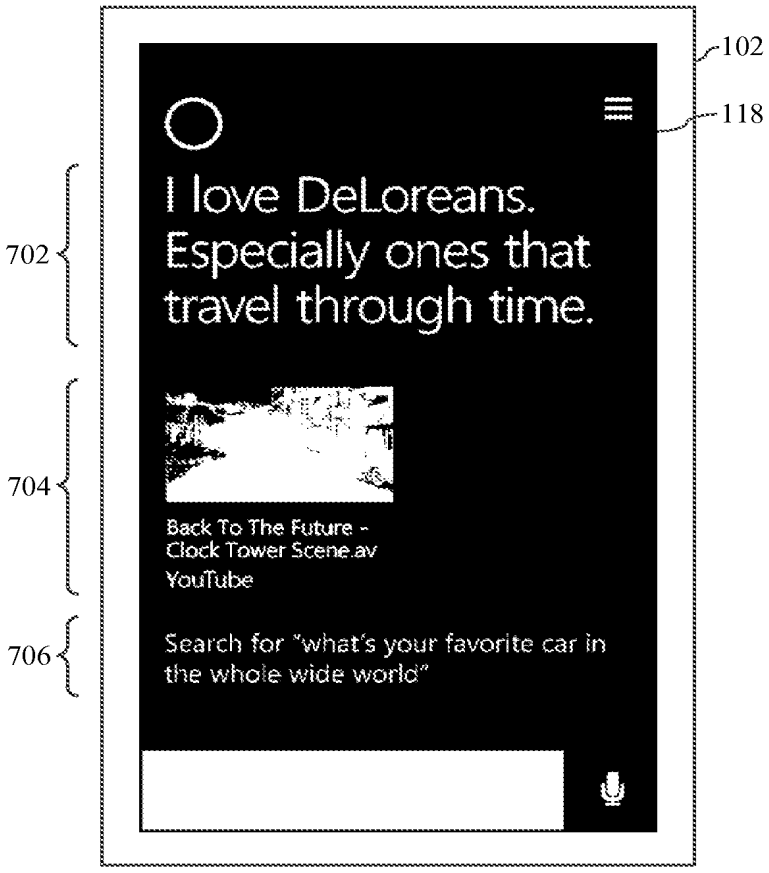

102
118
I love DeLoreans. Especially ones that travel through time.
Back To The Future - Clock Tower Scene.av
YouTube
Search for "what's your favorite car in the whole wide world"
702
704
706

FIG. 7

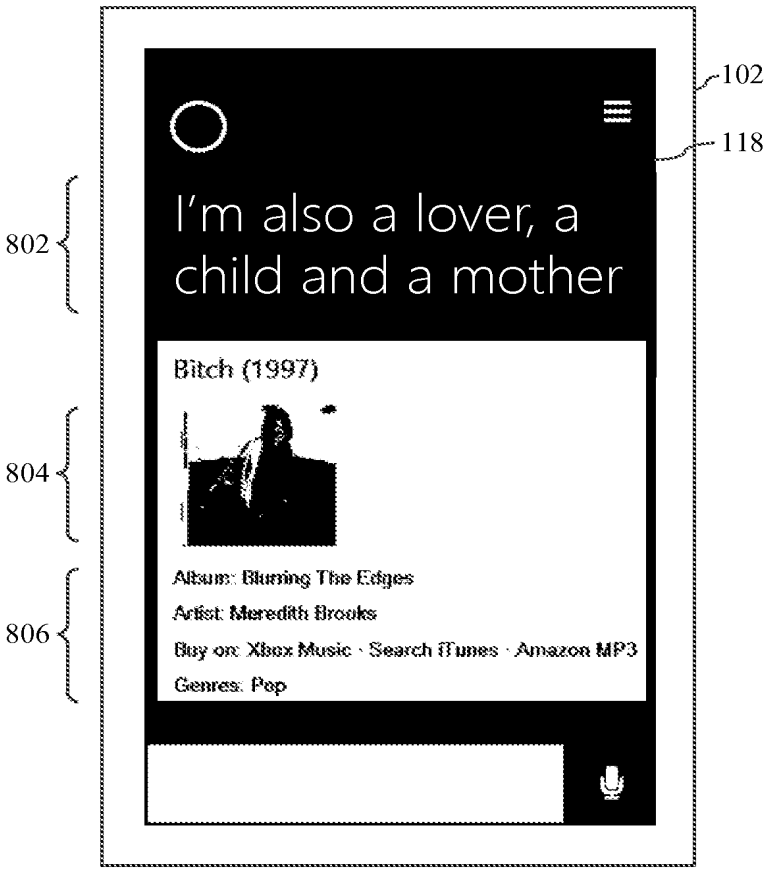

102
118
I'm also a lover, a child and a mother
Bitch (1997)
Album: Blurring The Edges
Artist: Meredith Brooks
Buy on: Xbox Music · Search iTunes · Amazon MP3
Genres: Pop
802
804
806

FIG. 8

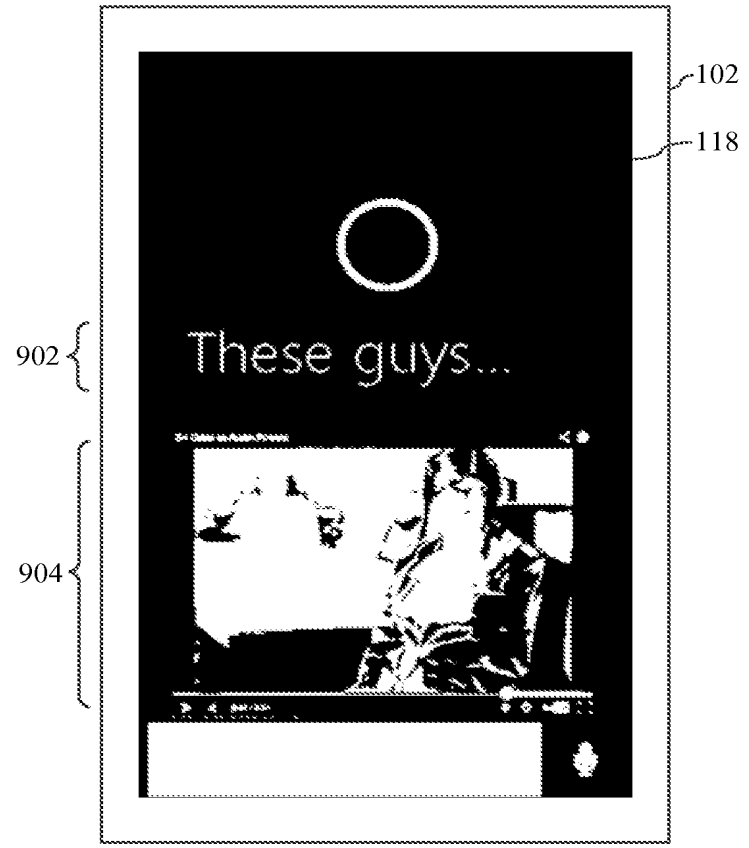

102
118
902
These guys...
904

FIG. 9

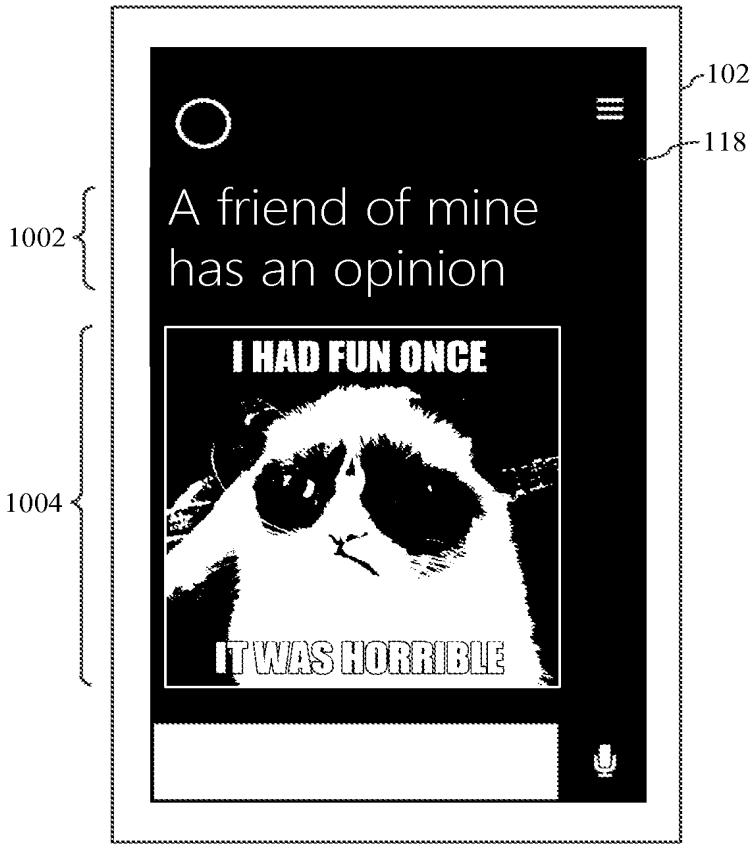

102
118
1002
A friend of mine
has an opinion
1004
I HAD FUN ONCE
IT WAS HORRIBLE

FIG. 10

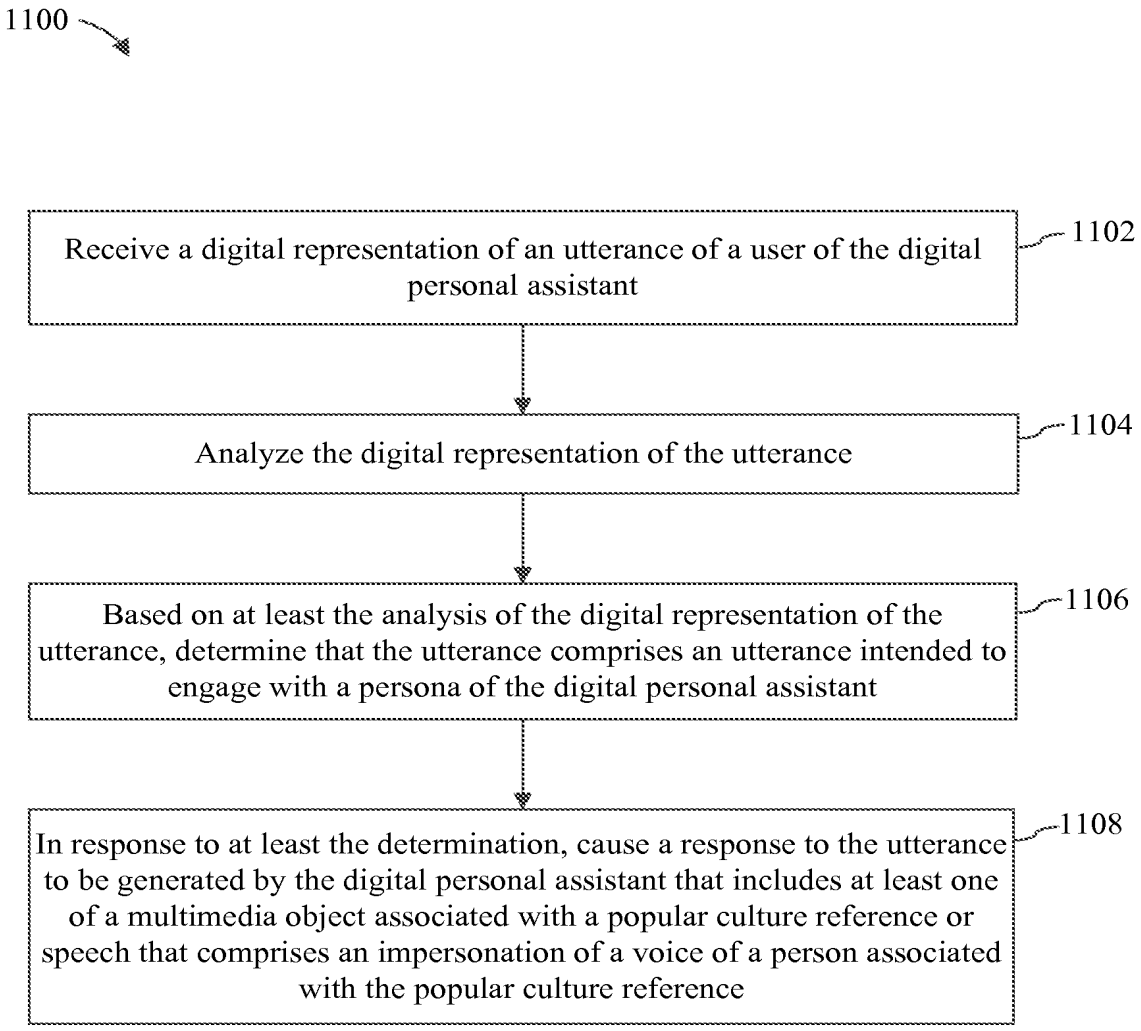

1100
Receive a digital representation of an utterance of a user of the digital personal assistant
1102
Analyze the digital representation of the utterance
1104
Based on at least the analysis of the digital representation of the utterance, determine that the utterance comprises an utterance intended to engage with a persona of the digital personal assistant
1106
In response to at least the determination, cause a response to the utterance to be generated by the digital personal assistant that includes at least one of a multimedia object associated with a popular culture reference or speech that comprises an impersonation of a voice of a person associated with the popular culture reference
1108

FIG. 11

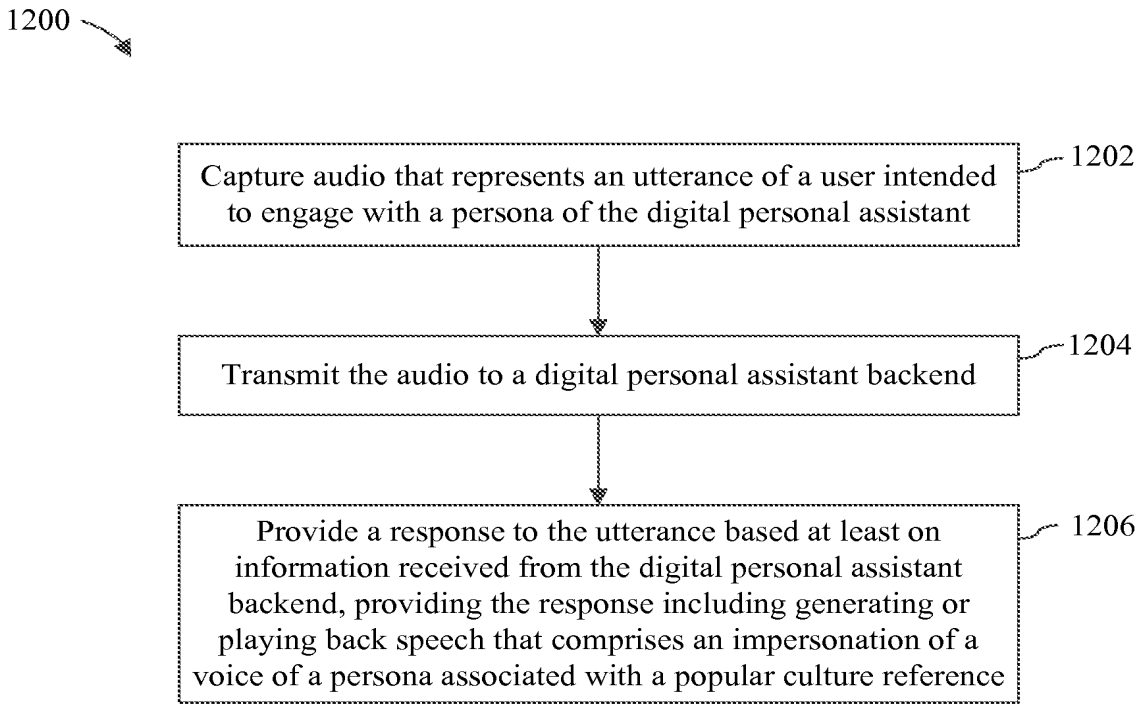

1200
Capture audio that represents an utterance of a user intended to engage with a persona of the digital personal assistant
1202
Transmit the audio to a digital personal assistant backend
1204
Provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including generating or playing back speech that comprises an impersonation of a voice of a persona associated with a popular culture reference
1206

FIG. 12

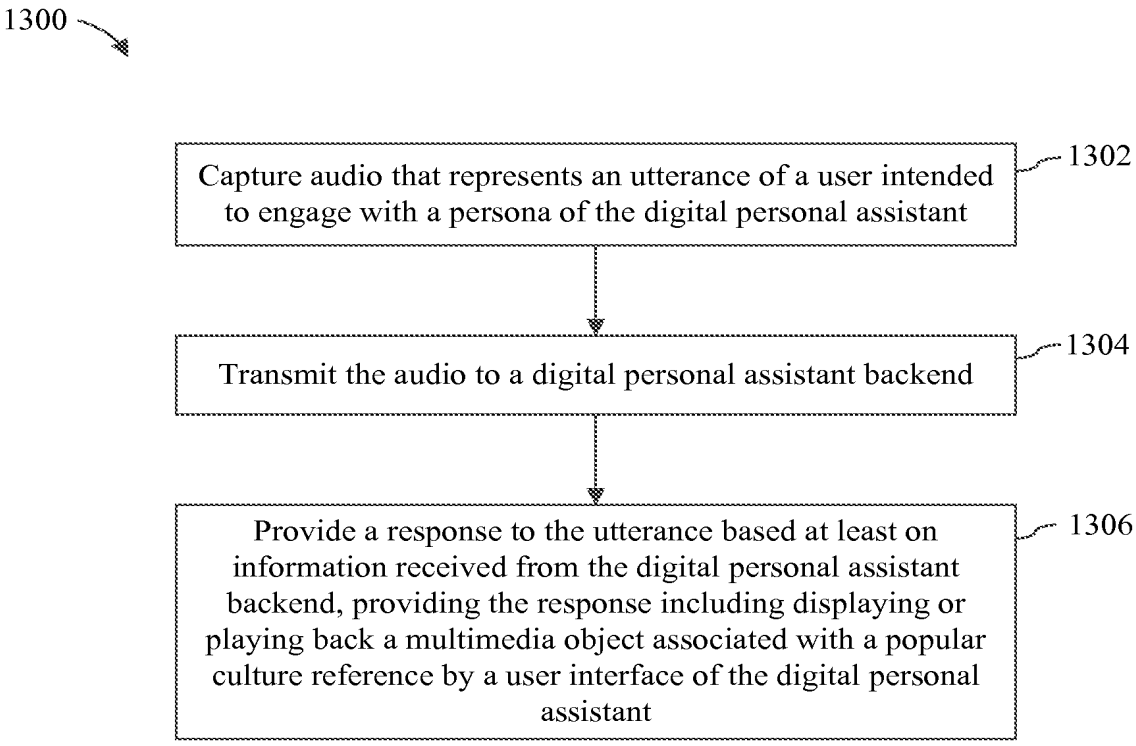

1300
Capture audio that represents an utterance of a user intended to engage with a persona of the digital personal assistant
1302
Transmit the audio to a digital personal assistant backend
1304
Provide a response to the utterance based at least on information received from the digital personal assistant backend, providing the response including displaying or playing back a multimedia object associated with a popular culture reference by a user interface of the digital personal assistant
1306

FIG. 13

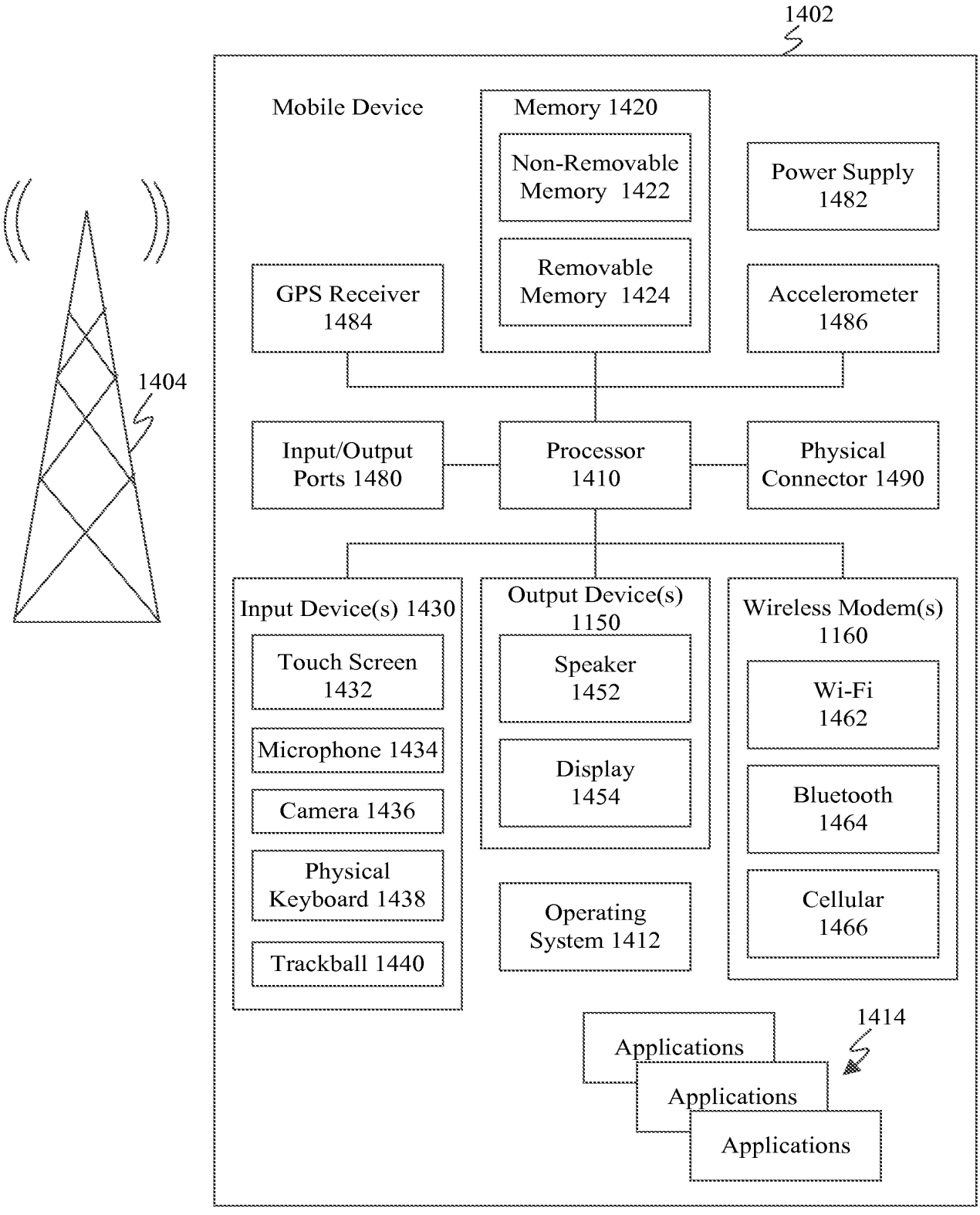

1402
Mobile Device
Memory 1420
Non-Removable Memory 1422
Removable Memory 1424
Power Supply 1482
GPS Receiver 1484
Accelerometer 1486
1404
Input/Output Ports 1480
Processor 1410
Physical Connector 1490
Input Device(s) 1430
Touch Screen 1432
Microphone 1434
Camera 1436
Physical Keyboard 1438
Trackball 1440
Output Device(s) 1150
Speaker 1452
Display 1454
Operating System 1412
Wireless Modem(s) 1160
Wi-Fi 1462
Bluetooth 1464
Cellular 1466
1414
Applications
Applications
Applications

FIG. 14

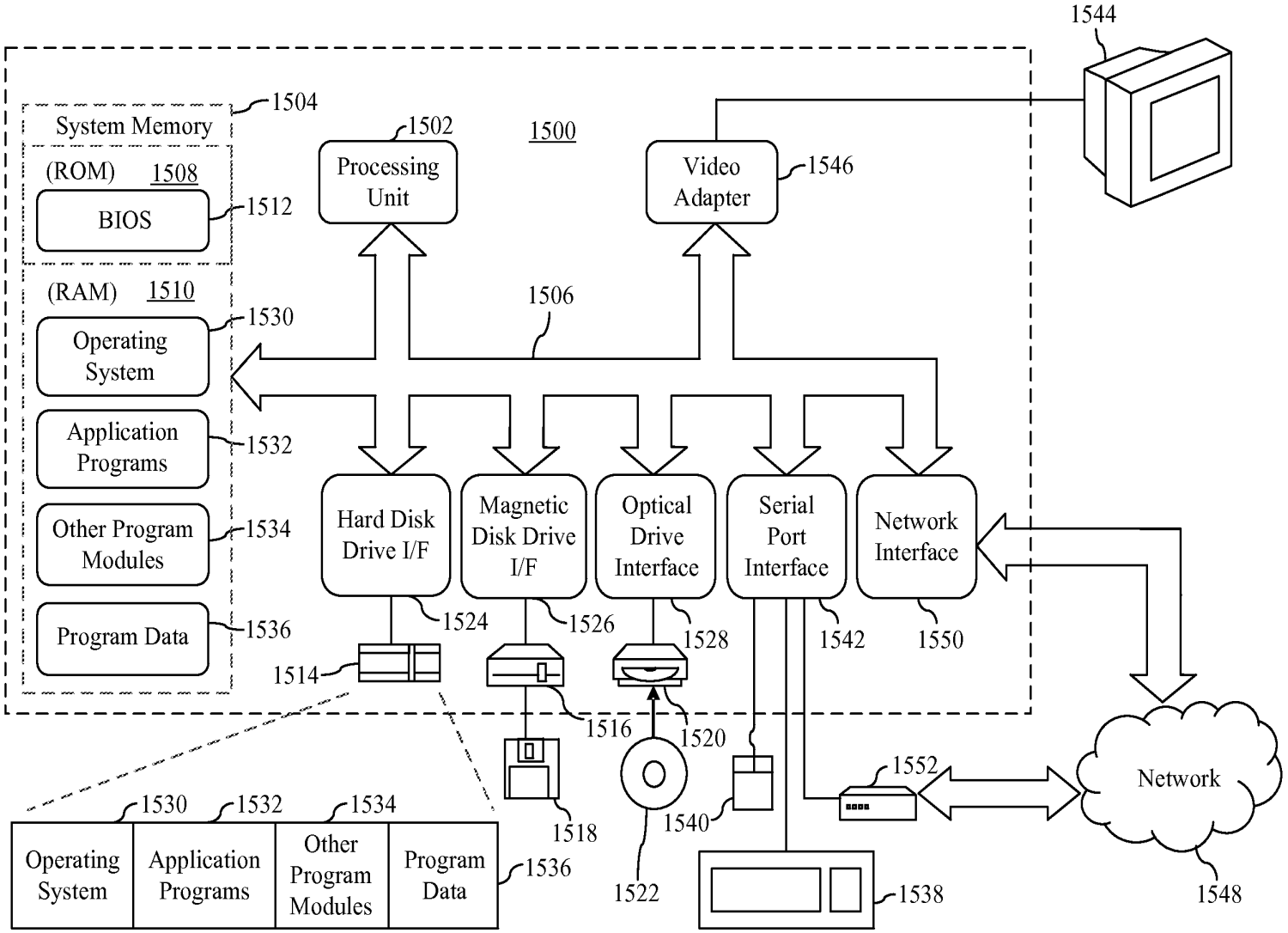


FIG. 15

Patent Owner Ex. 2104
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	340577.01
	Application Number	
Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

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

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mouni		Reddy	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Bellevue	State/Province	WA	Country of Residence i	US

Mailing Address of Inventor:

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Address 2	One Microsoft Way

City	Redmond	State/Province	WA
Postal Code	98052	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Robert	J.	Howard	III

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Bellevue	State/Province	WA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	c/o Microsoft Corporation
Address 2	One Microsoft Way

City	Redmond	State/Province	WA
Postal Code	98052	Country i	US

Inventor 3 Remove

Legal Name

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	Deborah	B.	Harrison	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	340577.01
	Application Number	
Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

City	Seattle	State/Province	WA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	c/o Microsoft Corporation		
Address 2	One Microsoft Way		
City	Redmond	State/Province	WA
Postal Code	98052	Country i	US

Inventor 4 Remove

Legal Name

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	Sogol		Malekzadeh	

Residence Information (Select One) (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Sammamish	State/Province	WA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	c/o Microsoft Corporation		
Address 2	One Microsoft Way		
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For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	69316		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES		
Attorney Docket Number	340577.01	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	11	Suggested Figure for Publication (if any)	11

Filing By Reference :

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	340577.01
	Application Number	
Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

Only compete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

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Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	69316		

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This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	340577.01
	Application Number	
Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) [i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

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Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	340577.01
	Application Number	
Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

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In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

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(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. [X]

Organization Name	Microsoft Corporation		
Mailing Address Information:			
Address 1	One Microsoft Way		
Address 2			
City	Redmond	**State/Province**	WA
Country [i]	US	Postal Code	98052
Phone Number		Fax Number	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	340577.01
	Application Number	
Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

Email Address	

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Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

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Signature	/Thomas C. Fiala, #43,610/			Date (YYYY-MM-DD)	2014-01-15
First Name	Thomas C.	Last Name	Fiala	Registration Number	43610

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	340577.01
	Application Number	
Title of Invention	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES	

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Application Number:	14156009
International Application Number:	
Confirmation Number:	1056
Title of Invention:	DIGITAL PERSONAL ASSISTANT INTERACTION WITH IMPERSONATIONS AND RICH MULTIMEDIA IN RESPONSES
First Named Inventor/Applicant Name:	Mouni Reddy
Customer Number:	69316
Filer:	Thomas Christopher Fiala/Christine Hartness
Filer Authorized By:	Thomas Christopher Fiala
Attorney Docket Number:	340577.01
Receipt Date:	15-JAN-2014
Filing Date:	
Time Stamp:	16:34:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

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1		340577_01Specification.pdf	235732 2ec15a67410e5f526457cbef99ed8361d9e54c7c	yes	47

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	41
Claims	42	46
Abstract	47	47

Warnings:

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2	Drawings-only black and white line drawings	340577_01Drawings.pdf	409853 85c472c7876139da3058b4c64762b06984ce66c8	no	11

Warnings:

Information:

3	Application Data Sheet	340577_01ADS.pdf	1565559 09f745cf272a6c78da651ceeeb4a089677576659	no	8

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Information:

4	Information Disclosure Statement (IDS) Form (SB08)	340577_01IDS.pdf	612792 51a83b0d5f66dc6f9c9d9d1dc08a8b00bd2e5f4f	no	5

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5	Non Patent Literature	340577_01ref1.pdf	1162685 cc8360eec06d5ba441d1dfd5908999e87eed0f67	no	3

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6	Non Patent Literature	340577_01ref2.pdf	9913335 b852d6f5d3fa4d6d3670b3a1c72e82fda14804f0	no	35

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7	Transmittal Letter	340577_01IDScover.pdf	37833 925b310b9c7414d7c692cfc05083239d4996e7a4	no	3
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	33034 fa2b191ecb56ff4ce4503ed3a0e2d1205bd30da0	no	2
Warnings:					
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