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(54) Title: NATURAL ASSISTANT INTERACTION

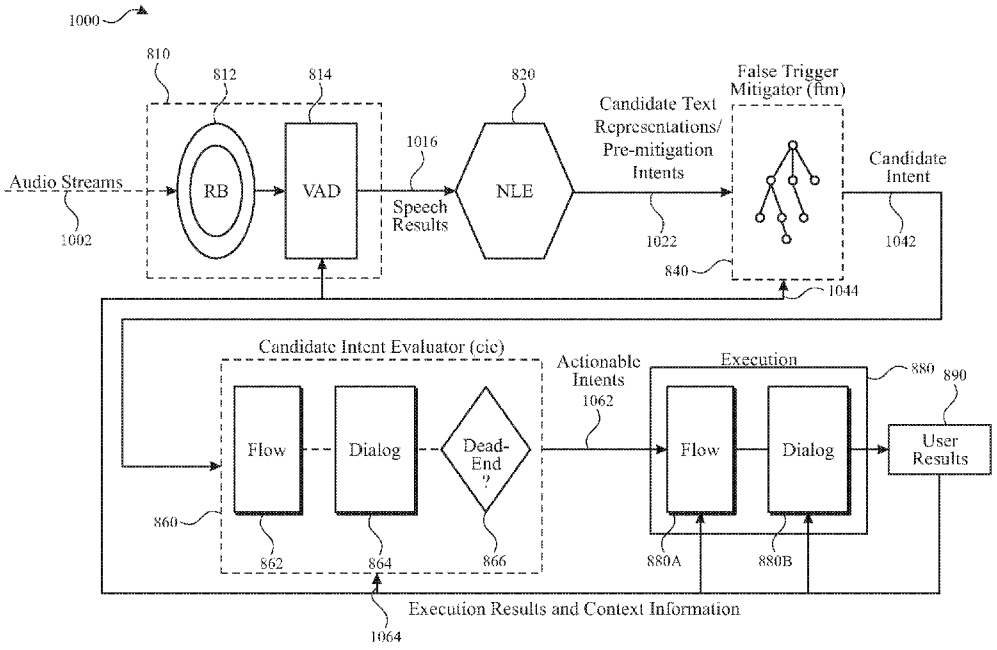


FIG. 10

(57) **Abstract:** Systems and processes for operating a virtual assistant to provide natural assistant interaction are provided. In accordance with one or more examples, a method includes, at an electronic device with one or more processors and memory: receiving a first audio stream including one or more utterances; determining whether the first audio stream includes a lexical trigger; generating one or more candidate text representations of the one or more utterances; determining whether at least one candidate text representation of the one or more candidate text representations is to be disregarded by the virtual assistant. If at least one candidate text representation is to be disregarded, one or more candidate intents are generated based on candidate text representations of the one or more candidate text representations other than the to be disregarded at least one candidate text representation.

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[Continued on next page]

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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Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) **Date of publication of the international search report:**
07 November 2019 (07.11.2019)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/017533

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

1-14, 21, 29-34

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/017533

A. CLASSIFICATION OF SUBJECT MATTER
INV. G10L15/22 G06F3/16 G06F17/27
ADD. G10L25/87

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, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/216271 A1 (KONIG LARS [DE]) 29 September 2005 (2005-09-29)	1-3,9, 10,21, 29-34
Y	paragraph [0021] - paragraph [0035]; figure 1 paragraph [0037] - paragraph [0038] -----	4-8, 11-14
X,P	US 10 192 546 B1 (PIERSOL KURT WESLEY [US] ET AL) 29 January 2019 (2019-01-29) the whole document -----	1-3,9, 10,21, 29-34
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[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

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"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
29 August 2019	23/09/2019

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	De Meuleneire, M

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	BOU-GHAZALE S E ET AL: "Hands-free voice activation of personal communication devices", ACOUSTICS, SPEECH, AND SIGNAL PROCESSING, 2000. ICASSP '00. PROCEEDING S. 2000 IEEE INTERNATIONAL CONFERENCE ON 5-9 JUNE 2000, PISCATAWAY, NJ, USA,IEEE, vol. 3, 5 June 2000 (2000-06-05), pages 1735-1738, XP010507694, ISBN: 978-0-7803-6293-2 section 2; section 2.1; section 3.2	4-8
A	Baiyang Liu ET AL: "Accurate Endpointing with Expected Pause Duration", , 6 September 2015 (2015-09-06), XP055302307, Retrieved from the Internet: URL:http://www.isca-speech.org/archive/interspeech_2015/papers/i15_2912.pdf [retrieved on 2016-09-13] paragraph bridging left-hand and right-hand columns of page 2912	5-8
A	US 2008/077400 A1 (YAMAMOTO KOICHI [JP] ET AL) 27 March 2008 (2008-03-27) abstract; figure 3	5-8
A	US 2016/379632 A1 (HOFFMEISTER BJORN [US] ET AL) 29 December 2016 (2016-12-29) paragraph [0055] - paragraph [0056]	5-8
Y	US 2015/348548 A1 (PIERNOT PHILIPPE P [US] ET AL) 3 December 2015 (2015-12-03) paragraph [0028] abstract paragraph [0038] paragraph [0044] paragraph [0056] - paragraph [0120]	11-13
A	Julien Villemure ET AL: "The Dragon rive Innovation Showcase: Advancing the ste-of-the-art in automotvie assistants", , 22 March 2018 (2018-03-22), pages 1-7, XP055568164, online Retrieved from the Internet: URL:http://essv2018.de/wp-content/uploads/2018/03/41_Villemure_ESSV2018.pdf [retrieved on 2019-03-12] section 7	11

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/017533

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2015/228275 A1 (WATANABE SHINJI [US] ET AL) 13 August 2015 (2015-08-13) paragraph [0004]	14

3

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2019/017533

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		WO 2015119174 A1	13-08-2015

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3, 9, 10, 21, 29-34

   Natural language interaction with a virtual assistant using a lexical trigger.

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2. claims: 4-8

   Detecting the lexical trigger.

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3. claims: 11-14

   Determining whether a particular utterance of a speech session is addressed to the virtual assistant.

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4. claims: 15-20

   Detecting a command.

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5. claims: 22-25

   Determining what task to be performed.

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6. claims: 26-28

   Determining whether new speech input is part of the same speech session.
