Title: LOW-LATENCY INTELLIGENT AUTOMATED ASSISTANT

FIG. 9

Abstract: In an example process, low-latency operation of a digital assistant is provided. In this example, natural language processing, task flow processing, dialogue flow processing, speech synthesis, or any combination thereof can be at least partially performed while awaiting detection of a speech end-point condition. Upon detection of a speech end-point condition, results obtained from performing the operations can be presented to the user. In another example, robust operation of a digital assistant is provided. In this example, task flow processing by the digital assistant can include selecting a candidate task flow from a plurality of candidate task flows based on determined task flow scores. The task flow scores can be based on speech recognition confidence scores, intent confidence scores, flow parameter scores, or any combination thereof. The selected candidate task flow is executed and corresponding results presented to the user.

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/029042

A. CLASSIFICATION OF SUBJECT MATTER
INV. G10L15/22 G06F17/27 G10L25/78
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, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>Y</td>
<td>US 9 437 186 B1 (LIU BAIYANG [US] ET AL) 6 September 2016 (2016-09-06)</td>
<td>1,2,7, 9-12, 15-19, 54,57,60</td>
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<td>A</td>
<td>paragraph [0036]</td>
<td>42-46</td>
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* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
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"S" document member of the same patent family

Date of the actual completion of the international search: 9 November 2018
Date of mailing of the international search report: 20/11/2018

Name and mailing address of the ISA/
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
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Authorized officer: Dobl er, Ervi n
### 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).

### 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 - 19, 39-54, 56, 57, 59, 60, 62

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

1. claims: 1-19, 54, 57, 60 (completely); 51-53 (partially)

A digital assistant with a first and a second portion of audio and determining a user intent, a task flow and presenting results to the user based on detecting a speech end point at the end of the second audio portion.

2. claims: 20-38, 55, 58, 61 (completely); 51-53 (partially)

A digital assistant with a first and a second portion of audio and generating one of a text dialogue; determining whether audio corresponding to text exists and generating audio if not.

3. claims: 39-50, 56, 59, 62 (completely); 51-53 (partially)

Determining candidate text representations, user intents and a plurality of task flows based thereon. Executing the task flows and presenting results to the user.
<table>
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<td>US 9437186 B1</td>
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