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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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, 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, SA, 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.
- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (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).

[Continued on next page]

## (54) Title: CONFERENCE WORD CLOUD

(57) **Abstract:** Various disclosed implementations involve processing and/or playback of a recording of a conference involving a plurality of conference participants. Some implementations disclosed herein involve receiving speech recognition results data, including a plurality of speech recognition lattices and a word recognition confidence score for each of a plurality of hypothesized words of the speech recognition lattices, for a conference recording. A primary word candidate and alternative word hypotheses may be determined for hypothesized words in the speech recognition lattices. A term frequency metric may be calculated for sorting the primary word candidates and the alternative word hypotheses. Hypothesized words may be re-scored according to an alternative hypothesis list.

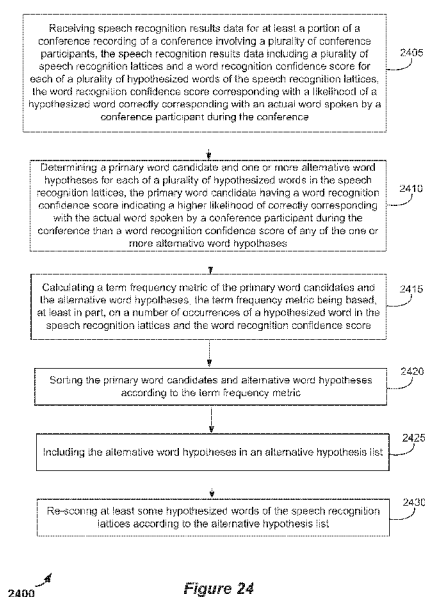


Figure 24

**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- 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:**

6 October 2016

**Published:**

- with international search report (Art. 21(3))

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2016/016282

A. CLASSIFICATION OF SUBJECT MATTER  
INV. G10L15/18 H04M3/56  
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 H04M

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)

EP0-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                                       | Relevant to claim No.            |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| A         | US 2007/100618 A1 (LEE JAE-WON [KR] ET AL)<br>3 May 2007 (2007-05-03)<br><br>paragraph [0026] - paragraph [0037]<br>-----                                                | 1,3,4,<br>11,<br>13-20,<br>24,28 |
| A         | US 2009/150337 A1 (SEIDE FRANK T B [DE] ET AL)<br>11 June 2009 (2009-06-11)<br><br>paragraph [0050] - paragraph [0061]<br>-----                                          | 1,3,4,<br>11,<br>13-20,<br>24,28 |
| A         | US 2008/319750 A1 (POTTER STEPHEN FREDERICK [US] ET AL)<br>25 December 2008 (2008-12-25)<br><br>paragraph [0001] - paragraph [0006]<br>paragraph [0044]<br>-----<br>-/-- | 1,3,4,<br>11,<br>13-20,<br>24,28 |



Further documents are listed in the continuation of Box C.



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

25 May 2016

Date of mailing of the international search report

12/08/2016

Name and mailing address of the ISA/

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# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2016/016282

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                                                                                                                                                               | Relevant to claim No.                      |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| A         | <p>JOHNSON K ET AL: "DATA-BASED CONTROL OF THE SEARCH SPACE GENERATED BY MULTIPLE KNOWLEDGE BASES FOR SPEECH RECOGNITION", ICSLP 94 : 1994 INTERNATIONAL CONFERENCE ON SPOKEN LANGUAGE PROCESSING. YOKOHAMA, JAPAN, SEPT. 18 - 22, 1994; [INTERNATIONAL CONFERENCE ON SPOKEN LANGUAGE PROCESSING. (ICSLP)], YOKOHAMA : ASJ, JP, vol. 4, 18 September 1994 (1994-09-18), pages 2147-2150, XP000855711, section 2</p> <p>-----</p> | <p>1,3,4,<br/>11,<br/>13-20,<br/>24,28</p> |

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2016/016282

### 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.:
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.:

1, 20, 24, 28(completely); 3, 4, 11, 13-19(partially)

#### 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.

**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, 20, 24, 28(completely); 3, 4, 11, 13-19(partially)

Improve a speech recognition lattice through rescoring based on term frequency information of alternative hypotheses estimated from the lattice

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2. claims: 2, 5-10, 12, 21-23, 25-27, 29-31(completely); 3, 4, 11, 13-19(partially)

Estimate topic of a conference recording from speech recognition lattice

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3. claims: 32-40

system for topic-based retrieval of conference recordings, and playback of retrieved portions

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/016282

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)           | Publication<br>date      |
|-------------------------------------------|---------------------|--------------------------------------|--------------------------|
| US 2007100618 A1                          | 03-05-2007          | KR 20070047579 A<br>US 2007100618 A1 | 07-05-2007<br>03-05-2007 |
| US 2009150337 A1                          | 11-06-2009          | US 2009150337 A1<br>WO 2009076252 A1 | 11-06-2009<br>18-06-2009 |
| US 2008319750 A1                          | 25-12-2008          | NONE                                 |                          |