



(43) International Publication Date
21 November 2019 (21.11.2019)

(51) International Patent Classification:

G05B 15/02 (2006.01) F24F 11/62 (2018.01)
G05B 13/02 (2006.01) F24F 120/20 (2018.01)
F24F 11/30 (2018.01)

(21) International Application Number:

PCT/US2019/026932

(22) International Filing Date:

11 April 2019 (11.04.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

15/980,547 15 May 2018 (15.05.2018) US

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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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,

(54) Title: BUILDING MANAGEMENT AUTONOMOUS HVAC CONTROL USING REINFORCEMENT LEARNING WITH OCCUPANT FEEDBACK

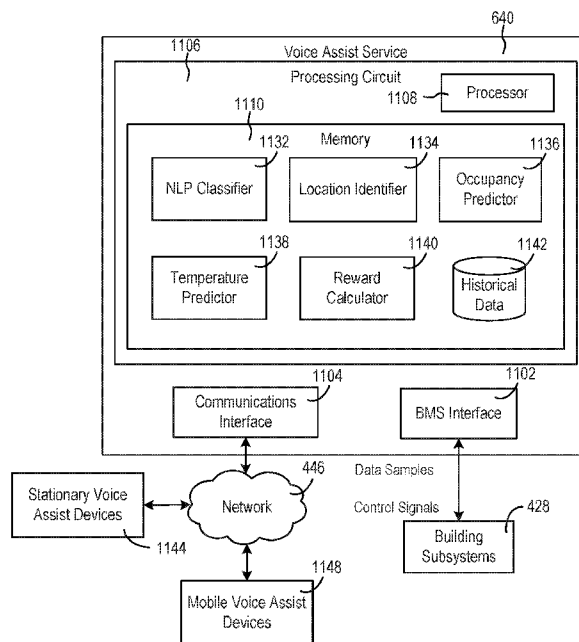


FIG. 11

(57) Abstract: A building management system includes one or more processors, and one or more computer-readable storage media communicably coupled to the one or more processors and having instructions stored thereon that cause the one or more processors to: define a state of a zone or space within a building; control an HVAC system to adjust a temperature of the zone or space corresponding to a first action; receive utterance data from a voice assist device located in the zone or space; analyze the utterance data to identify a sentiment relating to the temperature of the zone or space; calculate a reward based on the state, the first action, and the sentiment; determine a second action to adjust the temperature of the zone or space based on the reward; and control the HVAC system to adjust the temperature of the zone or space corresponding to the second action.

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).

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:

09 January 2020 (09.01.2020)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/026932

A. CLASSIFICATION OF SUBJECT MATTER
 INV. G05B15/02 G05B13/02 F24F11/30 F24F11/62
 ADD. F24F120/20

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)
 G05B F24F

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2018/100662 A1 (FARAHMAND AMIR-MASSOUD [US] ET AL) 12 April 2018 (2018-04-12) paragraph [0007] - paragraph [0010] paragraph [0022] - paragraph [0063] paragraph [0088] paragraph [0099] - paragraph [0104] -----	1-20
X	US 2018/024520 A1 (SINHA SUDHI [US] ET AL) 25 January 2018 (2018-01-25) paragraph [0034] paragraph [0054] - paragraph [0056] paragraph [0079] - paragraph [0140] paragraph [0168] - paragraph [0184] -----	1-20
X	US 2001/001318 A1 (KAMIYA TSUYOSHI [JP] ET AL) 17 May 2001 (2001-05-17) paragraph [0005] - paragraph [0012] paragraph [0105] - paragraph [0120] -----	1-20
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Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search 25 November 2019	Date of mailing of the international search report 02/12/2019
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Orobitg Oriola, R

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/026932

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/026932

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