(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization

International Bureau





(10) International Publication Number WO 2018/118895 A2

(43) International Publication Date 28 June 2018 (28.06.2018)

(51) International Patent Classification: G06F 3/16 (2006.01) H01H 11/00 (2006.01) H04R 1/02 (2006.01)

(21) International Application Number:

PCT/US2017/067274

(22) International Filing Date:

19 December 2017 (19.12.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 15/389,818

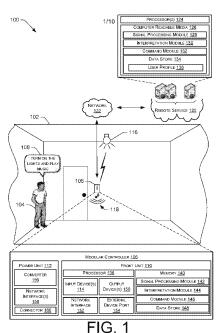
23 December 2016 (23.12.2016) US

- (71) Applicant: AMAZON TECHNOLOGIES, INC. [US/US]; P.O. Box 81226, Seattle, WA 98108-1226 (US).
- (72) Inventors: CHUA, Albert John, Yu Sam; c/o Amazon Technologies, Inc., P.O. Box 81226, Seattle, WA 98108-1226 (US). GEJJI, Pushkaraksha; c/o Amazon Technologies, Inc., P.O. Box 81226, Seattle, WA 98108-1226 (US). CYBART, Adam, Kenneth; c/o Amazon Technologies, Inc., P.O. Box 81226, Seattle, WA 98108-1226 (US). PANCE, Aleksandar; c/o Amazon Technologies, Inc., P.O. Box 81226, Seattle, WA 98108-1226 (US). CANIZARES, Wilfrido, Loor; c/o

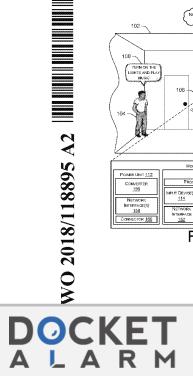
Amazon Technologies, Inc., P.O. Box 81226, Seattle, WA 98108-1226 (US). **WALLISER, Marc, Rene**; c/o Amazon Technologies, Inc., P.O. Box 81226, Seattle, WA 98108-1226 (US).

- (74) Agent: CUNNINGHAM, Aaron et al.; Lee & Hayes, PLLC, 601 W. Riverside Ave, Suite 1400, Spokane, WA 99201 (US).
- (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, 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,

(54) Title: VOICE ACTIVATED MODULAR CONTROLLER



(57) Abstract: A modular controller may be mounted in an opening, such as a standard single wide or double wide electrical junction box, in a wall or other surface. The modular controller may include a power module and a front module. The power module may be mounted in the opening of the surface, and may be configured to provide electrical power to the front module. The front module may be detachably coupleable to the power module. The front module may be configured to receive audio commands, gesture commands, and/or presence input corresponding to a desired action, and may cause the action to be performed by a device of the front module and/or an external device. The front module may include various devices (e.g., components) capable of providing various functionalities, and may be selected for coupling to a power module in a particular location based at least in part on the functionalities.





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:

 without international search report and to be republished upon receipt of that report (Rule 48.2(g))



WO 2018/118895 PCT/US2017/067274

VOICE ACTIVATED MODULAR CONTROLLER

RELATED APPLICATIONS

[0001] This application claims priority to U.S. Patent Application No. 15/389,818, filed on December 23, 2016, the entire contents of which are incorporated herein by reference.

BACKGROUND

[0002] Homes are becoming more wired and connected with the proliferation of computing devices such as desktops, tablets, entertainment systems, and portable communication devices. As these computing devices evolve, many different ways have been introduced to allow users to interact with computing devices, such as through mechanical devices (e.g., keyboards, mice, etc.), touch screens, motion, and gesture. Another way to interact with computing devices is through natural language input such as speech input and gestures.

BRIEF DESCRIPTION OF THE DRAWINGS

- 15 [0001] The detailed description is set forth below with reference to the accompanying figures. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The use of the same reference numbers in different figures indicates similar or identical items. The systems depicted in the accompanying figures are not to scale and components within the figures may be depicted not to scale with each other.
- 20 **[0002]** FIG. 1 shows an example interactive device computing architecture set in a home environment. The architecture includes at least one modular controller physically situated in the home.
 - [0003] FIG. 2 illustrates a perspective view of an example front unit and an example power unit of a modular controller.
 - [0004] FIG. 3 illustrates an example mounting bracket for a two-gang modular controller.
- 25 [0005] FIG. 4 illustrates an example connector configured to transmit electrical power and/or data between a power unit and a front unit.
 - [0006] FIG. 5 illustrates another example connector configured to transmit electrical power and/or data between a power unit and a front unit.
- [0007] FIG. 6 illustrates a front view of an example two-gang modular controller. In this example, the modular controller includes a first front unit and a second front unit, each with different functionality.
 - [0008] FIG. 7A illustrates a perspective view of an example modular controller having a front unit with a front panel configured to fit within an opening of a standard wallplate.
 - [0009] FIG. 7B illustrates the assembled modular controller of FIG. 7A with the standard wallplate mounted on the modular controller.
- 35 **[0010]** FIG. 8A illustrates a sequence of views showing an example microphone array expanding on a front panel of a front unit by sliding microphones of the microphone array into a second position.



WO 2018/118895 PCT/US2017/067274

[0011] FIG. 8B illustrates a sequence of views showing an example microphone array expanding on a front panel of a front unit by swinging microphones of the microphone array into a second position.

[0012] FIG. 9 illustrates an example process for remotely controlling a device of an environmental and/or entertainment control system using a modular controller.

5 [0013] FIG. 10 illustrates an example process for configuring a modular controller for use in an environmental and/or entertainment control system.

DETAILED DESCRIPTION

[0014] This disclosure describes, in part, techniques and devices for providing centralized environmental and/or entertainment control with an interactive modular controller. Environmental control may include control of lights (e.g., on, off, dim, etc.), temperature (e.g., air conditioning, heating, fan control, etc.), alarm systems, doors, windows, window shades, and/or various other environmental systems. Entertainment control may include control of visual displays, audio presentations, two-way communications, and the like. The modular controller includes a power unit and a front unit. The power unit may be configured to mount onto a surface in an environment. The power unit may be sized to fit in a standard electrical junction box. Multiple different front units may be configured to interchangeably couple to a standardized power unit. For example, the power unit may be mounted into a wall so that a front side of the power unit is substantially aligned with (i.e., flush against) the wall. The environment may include multiple power units. For example, each room in a home environment may include one or more power units. Each power unit may provide electrical power and/or data to a front unit.

20 **[0015]** The front unit may detachably couple to the power unit in the environment. The front unit may comprise a voice, touch, and/or gesture-controlled device. The front unit may include a computing system that is communicatively coupled (*e.g.*, wired or wireless connection) to internal and/or external devices to affect the environment and/or entertainment control. The internal and/or external devices to which the front unit computing system is communicatively coupled may include mobile and/or stationary computing devices (*e.g.*, a tablet computing device, a mobile phone, a laptop computer, a desktop computer, a set-top box, a wearable device, etc.), appliances (*e.g.*, a television, an audio system, a garage door opener, a washing machine, a dryer, a dishwasher, a coffee maker, a refrigerator, a door, motorized window shades, a telephone, a tablet, etc.), fixtures (*e.g.*, a light, a lock, a sink, a toilet, a door bell, a smoke alarm, a fire alarm, a carbon monoxide detector, etc.), or other types of devices in the environment.

The front unit may include various components and settings based on a location of the front unit in the environment. For example, a front unit located in a foyer of a house may include a display for a presenting a weather forecast for a user to view prior to departing the house, and speakers for greeting the user upon entry into the house. For another example, a front unit located in a living room may include a mechanical switch configured to control one or more lights and/or a display to view thermostat settings. A user may select a front unit for a particular location in the home environment based on the functionalities of the front unit.

[0017] The user in the environment may issue, to the front unit, a command (e.g., voice, touch, and/or gesture input) including a request for the front unit to cause a second device in the environment to perform an action



WO 2018/118895 PCT/US2017/067274

(e.g., operation). The command may include a request for the front unit to cause a component (e.g., internal device) of the front unit to perform the action, such as "play music." Additionally or alternatively, the command may include a request for the front unit to cause an external device to perform the action, such as "turn on the lights." [0018] The front unit may include a microphone array configured to receive a voice command, a touch 5 command, and/or one or more sensors configured to receive a gesture command (e.g., a movement of a body part corresponding to a request for the front unit to cause an action to be performed) and/or a touch command (e.g., physical touch via an input device corresponding to a request for the front unit to cause an action to be performed). The respective component of the front unit may receive the command and send, over a network, a signal corresponding to the command to a computing system, which in some cases may include a main logic board 10 housing a system on a chip. The computing system may be a local computing system (e.g., internal to the front unit and/or power unit of the modular controller) and/or a remote computing system (e.g., a computing device external to the modular controller). The computing system may perform speech and/or gesture recognition on the signal to identify the command. The computing system may then interpret (e.g., determine a meaning) the command, and a device corresponding thereto. For instance, if the command is a request to "turn on the lights," the computing system may identify the location of the front unit and one or more lights corresponding to the location. The computing system may then generate a control signal including an instruction for a controller of the identified device to perform an action, the control signal including an identification and/or location of the identified device. The computing system may then send the control signal to the controller over the network. In examples in which the computing system includes a remote service, the computing system may send the control signal to the 20 controller via the front unit.

[0019] Furthermore, while the above examples describe a user requesting an action to be performed, in other instances a device may initiate a process for causing an internal and/or external device to perform an action. For example, a front unit may be programmed to cause a device to perform a certain action upon one or more conditions being met, such as a user being detected in an environment, a time of day occurring, or the like. For example, a 25 motion sensor may detect the presence of a user and may initiate a process for causing a light to turn on. For another example, a front unit may be configured to track user activity and/or preferences. The front unit may generate an activity model to anticipate settings for various devices based on the user activity and/or preferences. [0020] The present disclosure provides an overall understanding of the principles of the structure, function, manufacture, and use of the systems and methods disclosed herein. One or more examples of the present disclosure are illustrated in the accompanying drawings. While the techniques and devices presented herein are described with respect to the home environment, those of ordinary skill in the art will understand that the systems and methods specifically described herein and illustrated in the accompanying drawings are non-limiting embodiments and that the techniques and devices described herein may also be used in other environments (e.g., business environments, commercial environments, etc.). The features illustrated or described in connection with one 35 embodiment may be combined with the features of other embodiments, including as between systems and methods. Such modifications and variations are intended to be included within the scope of the appended claims.



DOCKET

Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

