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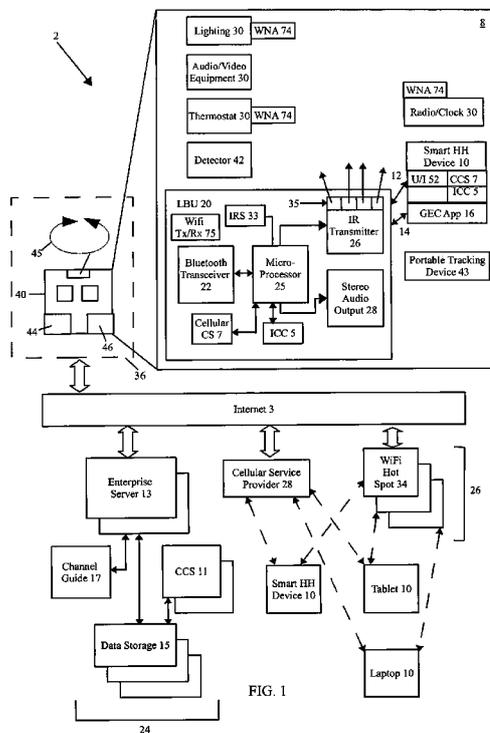
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(54) **Title:** LODGING ESTABLISHMENT CONTROL METHOD AND SYSTEM

(57) **Abstract:** Methods and systems are provided for managing a lodging establishment environment based on guest specific preferences. The methods and systems comprise a local base unit to be positioned within a designated guest space. The local base unit comprises a communications interface to communicate with a remote control device within the designated guest space to manage a parameter associated with an environment for the designated guest space. The local base unit comprises at least one transceiver configured to maintain a wireless link with a smart handheld device (SD). The system further comprises a processor, and a data store, storing program instructions by the processor. The processor, when executing the program instructions, receives a setting for the parameter and generates an instruction for the remotely controllable device to adjust the parameter associated with the designated guest space based on the setting.



LODGING ESTABLISHMENT CONTROL METHOD AND SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This Application claims priority to U.S. Provisional Application No. 62/160,775, filed 13-May-2015, which is incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The present disclosure is generally related to lodging establishment, and more specifically to methods and systems that afford environmental control for designated spaces in the lodging establishment.

[0003] Today, lodging establishments typically permit guests to manually adjust the environment in guest rooms. For example, a manually thermostat control is provided on the room wall to allow the guest to adjust the room temperature. The lights are individually manually turned on and off by the guest.

[0004] However, the current manual system has various limitations. For example, the guest must first learn how to manually change the room temperature as hotels, motels and other lodging establishments use numerous different types of thermostat control systems. Also, when guests leave a room during the day, the guest may turn the thermostat to an excess level. For example, the guest may turn the thermostat to a very cool setting, even though the guest will be gone all day. In addition, the guest may leave the lights and television on when leaving the room or hotel, even though the guest will be gone for an extended period of time.

[0005] Also, when a guest checks in, the guest must learn how to utilize the television, radio and other equipment in the room. Hotels, motels and other lodging establishments use numerous types of televisions, radios and other equipment. Consequently, the guest must spend time learning how to control the equipment.

[0006] A need remains for methods and systems that afford users easier control over the environment of guest spaces within lodging establishments, including control

over equipment therein. A need remains for methods and systems that enable lodging management to control guest space environments to be energy efficient without interfering with the guest's customer experience.

[0007] Another example of a lodging establishment represents an elderly care facility, such as an assisted living home, a nursing home and the like. Today, elderly care facilities offer very limited solutions to manage electronic devices and accessories within an individual guest's living space. A need remains for methods and systems that afford elderly individual's easier control over the living environment, including control over the equipment therein.

BRIEF SUMMARY OF THE INVENTION

[0008] Embodiments herein concern methods and systems for managing a lodging establishment environment based on guest specific preferences. The system comprises a local base unit (LBU) to be positioned within a designated guest space. The local base unit comprises a communications interface to communicate with a remote control device within the designated guest space to manage a parameter associated with an environment for the designated guest space. The local base unit comprises at least one transceiver configured to maintain a wireless link with a smart handheld device (SD). The system further comprising a processor, and a data store, storing program instructions by the processor. The processor, when executing the program instructions, receive a setting for the parameter and generate an instruction for the remotely controllable device to adjust the parameter associated with the designated guest space based on the setting. The processor and data store may be located at the LBU, within the SD, at a local computer terminal, at a remote enterprise server, or elsewhere within a hosting service.

[0009] Optionally, the processor may be provided within the LBU and the setting is received from the SD, where the setting represents a user preference setting for the parameter. Optionally, the processor may be further configured to receive an occupancy indicator indicative of at least one of an occupancy state for the designated guest space, or a relative position of a portable device to be carried by a user. The processor generates

the parameter setting based on the occupancy indicator. Optionally, the designated guest space may represent a room within a lodging establishment. The processor and data store may be provided within at least one of the SD or the local base unit. The system may further comprise a detector located within the designated guest space, the detector may sense a presence of the guest and in response thereto, may convey the presence indicator to the processor.

[0010] Optionally, the system may further comprise a detector located within the designated guest space, where the detector senses a presence of the guest and in response thereto, conveys the occupancy indicator to the processor. The detector may include a motion detector located in the designated guest space, where the motion detector generates an un-occupied indicator when a lack of motion is sensed, and the processor changes the instruction based on the un-occupied indicator.

[0011] The system may further comprise one or more remote control devices that represent at least one of entertainment equipment, a lighting control, a thermostat, a radio, a clock, or a water temperature control.

[0012] Optionally, the processor is further configured to receive an exit indicator, indicating that the guest is outside of the select proximity and in response thereto, the processor sets the parameter of the remote control device to a reference baseline setting. The system may further comprise a remote enterprise server to track a location of the SD and generate the occupancy indicator when the SD is tracked to be within a predetermined distance of the designated guest space. Optionally, the enterprise server conveys an exit indicator to a services management device to enable management of services related to the designated guest space while the guest is absent. The process server receives the occupancy indicator by monitors a presence of the SD through the link with the transceiver of the local base unity, wherein when the SD is no long present.

[0013] Embodiments herein concern a method for managing a lodging establishment environment. The method includes a remotely controllable device (RCD)

to manage a parameter associated with an environment for the designated guest space. The method receives an occupancy indicator indicative of at least one of an occupancy state for the designated guest space, or a relative position of a portable device to be carried by a user. The method generates an instruction for the RCD to adjust the parameter associated with the designated guest space in response to the occupant indicator.

[0014] Optionally, the method further comprises configuring a local base unit (LBU) to be provided in the designated guest space and configuring the LBU to communicate with the RCD. The instruction may direct the RCD to change at least one of a temperature or lighting for the designated guest space. The method may further comprise maintaining a baseline configuration that defines a baseline setting for the parameter for the RCD, and a user configuration that defines a user preference setting for the parameter for the environment. The instruction may direct the RCD to set the parameter to the baseline setting when the occupancy indicator indicated an unoccupied state, and the instruction directs the RCD to set the parameter to the user preference setting when the occupancy indicator indicated an occupied state.

[0015] Embodiments herein concern a method for managing a lodging establishment environment. The method configures a local base unit (LBU) to wirelessly communicate with a remotely controllable device (RCD) within a designated guest space to manage a parameter associated with an environment for the designated guest space. The method establishes a wireless communication link between the LBU and a smart handheld device (SD). The method further transmits an instruction from the SD to the LBU, the instruction indicating a user preference setting for the parameter managed by the RCD. The method conveys a parameter change data from the LBU to the RCD in response to the instruction.

[0016] Optionally, the method may further comprise utilizing the RCD to manage the environment for the designated guest space based on the user preference setting for the parameter. The RCD represents at least one of a lighting control, an alarm clock and a

thermostat control. The user preference settings change at least one of a lighting, alarm setting and thermostat. The RCD may represent an audio/video device, the method further comprising providing remote control of the audio/video device through the SD and LBU.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Figure 1 illustrates a block diagram of an environment control system formed in accordance with embodiments herein.

[0018] Figure 2 illustrates a process for managing an environment within a designated guest space in accordance with embodiments herein.

[0019] Figure 3 illustrates examples of some of the data that may be stored in connection with managing environments for designated guest spaces in accordance with embodiments herein.

[0020] Figure 4 illustrates examples of baseline configurations that may be stored in connection with lodging establishments in accordance with embodiments herein.

[0021] Figure 5A illustrate examples of windows presented on the user interface of the SD in accordance with embodiments herein.

[0022] Figure 5B illustrates example screenshots that may be presented on the SD when the user desires to use the SD to control a television in accordance with embodiments herein.

[0023] Figure 5C illustrates an example screenshot that may be presented when the user selects the "Change Room Settings" tab in accordance with embodiments herein.

[0024] Figure 5D illustrates a process for adjusting individual environmental parameters implemented in accordance with embodiments herein.

[0025] Figure 6 illustrates a method to enable interactive control over remotely controllable devices in accordance with embodiments herein.

[0026] Figure 7 illustrates a process for setting environmental preferences for a room of a lodging establishment in accordance with embodiments herein.

[0027] Figure 8A illustrates example screenshots that may be presented on the SD in connection with ordering delivery from a restaurant in accordance with embodiments herein.

[0028] Figure 8B illustrates a process carried out in connection with completing an order for food delivery in accordance with embodiments herein.

[0029] Figure 9 illustrates a method for managing a lodging establishment environment in accordance with embodiments herein.

[0030] Figure 10 illustrates a method for managing a lodging establishment environment in accordance with embodiments herein.

[0031] Figure 11 illustrates a system to share and transfer configuration and remote control settings between one or more LBU and physical remote control devices in accordance with embodiments herein.

[0032] Figure 12 illustrates a system configured to remotely configure LBUs in connection with select environments in accordance with embodiments herein.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

SYSTEM OVERVIEW

[0033] Detailed descriptions of embodiments are provided herein. It is to be understood, however, that the inventions described herein may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as representative.

[0034] Figure 1 illustrates a block diagram of a lodging environment control system 2 formed in accordance with embodiments. The system 2 is configured to be implemented in connection with various lodging establishments 40. Examples of lodging establishments 40 represent a hospitality environment, a lodging establishment or a chain of lodging establishments (e.g. hotels, motels, apartment complexes, vacation resorts, vacation cruise ships, and the like). Other examples of a lodging establishment 40 represent a clinic, hospital, or other medical facility. Another example of a lodging establishment 40 represents an assisted living center, senior citizen home, nursing home and the like. The lodging establishment 40 may also represent any multi-dwelling building, facility, or complex intended for temporary housing.

[0035] The lodging establishment 40 may include one or more local reservation/management computers 44. The computer 44 represents a "local" computer as the computer 44 is located at or proximate to the lodging establishment 40. The computers 44 may be used by lodging personnel to check guests in/out. Additionally or alternatively, the computers 44 may be used to perform various monitoring and environment control operations as described herein. The computers 44 communicate with local data storage 46. The local data storage 46 may store, among other things, baseline configurations, IR command sets, guest reservations and the like. The computers 44 communicate with a host service 24 or the Internet 3. The computers 44 may also communicate with the LBU 20 to perform the various operations described herein..

[0036] The guest lodging establishment 40 includes multiple designated guest spaces (DGS) 8 that represent one or more rooms assigned to the guests for the personal use of the guests, patients, residences or other individuals. Examples of DGS 8 represent hotel or motel rooms, cabins on cruise ships, apartments, condos, townhomes, rooms within resorts, hospital rooms, apartments within assisted-living facilities, rooms in senior citizen homes and the like.

[0037] One or more local base units (LBUs) 20 are located in each of the designated guest spaces 8. The designated guest spaces 8 also include remotely

controllable devices (RCDs) 30 that are configured to manage various parameters associated with the environment for the designated guest spaces 8. For example, one RCD 30 may represent the lighting controller, while another RCD 30 represents the thermostat controller for the heating and air-conditioning for the DGS 8. Other examples of RCDs 30 include a radio and/or clock, as well as audio and video equipment. For example, one RCD 30 may represent a television in a hotel room, while another RCD 30 may represent a DVD player, stereo, and the like.

[0038] The local base unit 20 may be positioned in various locations within a designated guest space 8. For example, a local base unit 20 may be set on a table within the space 8, mounted to the wall, floor or ceiling, positioned on a television, stereo, radio or other remotely controllable device.

[0039] The local base unit 20 comprises one or more communications interface to communicate with the RCDs 30. The communications interface may represent a wireless transceiver, a wired communications component, an infrared transmitter, an infrared transceiver, as well as other short range communications components. The LBU 20 communicates with one or more of the RCDs 30 through a wireless local network, through line of sight or reflective infrared communication, a combination thereof, or another medium. The LBU 20 may communicate with the RCDs 30 to adjust corresponding parameters of the RCDs 30, such as to adjust the lighting or temperature in the room. The LBU 20 may also turn on or turn off the radio, stereo, TV or other audio/visual device. The LBU 20 may instruct an RCD 30 to set a sleep timer or alarm on an alarm clock. As another example, when a guest first arrives at a room, the LBU 20 may instruct a television (RCD 30) to turn on and present an audio or video welcome message to the guest when entering a room. When messages for the guest are received, the LBU 02 may control a radio, television or other RCD 30 to audibly or visually present the message to the guest, such as when entering the room, or at any other point thereafter.

[0040] The RCDs 30 may have a wired or wireless networking adapter (WNA) 74 attached thereto or integrated therein. The WNA 74 may be formed as a detachable

device that is plugged into a port on the RCDs 30. For example, the WNA 74 may have the form factor of a USB stick that is plugged into a USB port on the RCDs 30. Alternatively, the WNA 74 may be formatted to plug into an SD port, HDMI port, A/V RCA jack ports, RGB component ports, an S-Video port, a fire-wire port, a Thunderbolt port, a DB-9 pin connector port, and the like. Alternatively, the WNA 74 may be built within and integrated into the RCDs 30 (e.g., a thermostat control, lighting control, clock, smart television). As a further alternative, the WNA 74 may be permanently secured to the RCDs 30. As one example, the WNA 74 may represent an IR receiver that receives IR codes transmitted from the LBU 20. The WNA 74 and the related communications may be implemented as explained in application publication number US-2015-0042447, titled "Entertainment Environment Remote Control and Audio/Video Streaming Method and System", published February 12, 2015, the entire subject matter of which is expressly incorporated herein by reference in its entirety.

[0041] The system 2 further includes one or more hosting service 24 located at, or remote from, the lodging establishment 40. The hosting service 24 may be operated by various entities such as a third party management company, a lodging chain (e.g., Marriott, Hilton, Hyatt), a vacation management company, a cruise line company, a healthcare provider, an elderly care provider, etc. The hosting service 24 may include one or more enterprise servers (ES) 13 and/or cloud computing services (CCS) 11. The ES 13 and CCS 11 interact with one or more lodging establishments 40 such as to provide a reservation service, as well as to facilitate management of the environment in one or more designated guest spaces 8. The ES 13 and CCS 11 facilitate management of user profiles and the parameters for each corresponding environment based on various information and data maintained in data storage 15. The data storage may store baseline configurations that define baseline settings for the remotely controllable devices 30 in one or more spaces 8. One or more baseline configurations may be used when rooms are not reserved, while the same or other baseline configurations may be used when a room is reserved by the guest is not in the room. The CCS 11 and ES 13 perform various functions, analysis, management and the like in connection with various embodiments.

[0042] As explained herein, the hosting service 24 may receive occupancy indicators indicating whether individual guests are within corresponding select proximities of their designated guest spaces 8. The hosting service 24 generates one or more instruction that is conveyed to corresponding remotely controllable devices 30. The instructions may be formatted as parameter change data. For example, parameter change data may include an identification or address of the RCD, an ID for the parameter to change, and a new level/setting for the parameter. The occupancy indicator may indicate at least one of an occupancy state for the designated guest space, or a relative position of a portable tracking device 43 to be carried by a user. The portable tracking device 43 and detector 42 may communicate through various near field proximity methods, such as Bluetooth, Bluetooth Low Energy and the like. Additionally or alternatively, the portable tracking device 43 may represent an RFID tag, while the detector 42 represents an RFID detector that periodically transmits RF signals across the guest space 8 and listens for RFID tag responses. When an RFID (or BLE) response is detected and the RFID (or BLE) response includes the ID of the tracking device 43, the detector 42 determines that the portable tracking device 43 (and user/guest/patient) is still present in (or proximate to) the space 8. The detector 42 provides occupancy indicators based on information collected from the portable tracking device 43.

[0043] The host service 24 generates an instruction for the RCD to adjust the parameter associated with the designated guest space in response to the occupancy indicator. The instructions direct the remotely controllable devices 30 to adjust an associated one or more parameters for the designated guest space 8 in response to the occupancy indicator. For example, the hosting service 24 may change the temperature or lighting in a hotel room when the guest leaves the room or hotel property.

[0044] Optionally, reservation records may be maintained at the data storage 15 in connection with one or more lodging establishments 40. The reservation records may identify each guest, as well as the arrival and departure dates and other information typically maintained in lodging reservation systems. As explained herein, in accordance

with at least some embodiments, the SD 10 may interact with the enterprise server 13, such as before or during check-in or registration. The enterprise server 13 may utilize the reservation records to determine the room assigned to the user. When the room is known, the enterprise server 13 may then access the data storage 15 to determine information such as the nature and type of remotely controllable devices in the room as well as other information utilized in connection with setting up the room environment.

[0045] As an example, when the designated guest space represents a room within a lodging establishment, the hosting service 24 may determine that a guest (and his/her corresponding SD) is within a proximity boundary 36. For example, the proximity boundary 36 may correspond to an individual room, a floor within a building, the boundary of a property, a predetermined distance from the property and the like. The hosting service 24 may determine that the guest has entered a room, has entered the grounds of the hotel or motel, and/or the guest is approaching the lodging establishment and is within a select distance (e.g. 2 - 5 mile). The system 2 may detect that the user is exiting the boundary 36 (or exiting a space 8), in response to which the system 2 may change environmental parameters for the space 8 to baseline settings.

[0046] Continuing with the foregoing example, when the guest and his/her corresponding SD 10 enters/crosses the proximity boundary 36, the hosting service 24 generates one or more instructions for the remotely controllable devices 30 in the designated guest space 8. The instructions may include changing a temperature in a room, turning on audio/video equipment, turning on lights and the like. The parameters of the RCDs 30 maybe set to levels based on general facility wide preset levels (associated with a typical returning guest). Alternatively, the parameters of the RCDs 30 may be set to levels that are uniquely associated with a profile of the individual guest. The data store 15 may maintain user profiles for individual guest indicating parameter levels preferred by the guest for the remotely controllable devices 30.

[0047] As another example, when the lodging establishment in a hospital or senior assisted living center, the user may represent a patient or elderly person living in

the assisted living center (ALC). The hosting service 24 may adjust the temperature, lighting, etc. in a hospital room or living center room/apartment according to baseline configurations when a patient or elderly person leaves the room/apartment.

[0048] The hosting service (HS) 24 monitors the occupied or unoccupied state of spaces 8 in various manners. For example, detectors 43 in or near the space 8 may sense the presence/absence of a guest, patient, etc., and based there on provide occupied/unoccupied (collectively occupancy) indicators to the ES 13, CCS 11 or computer 44. The HS 24 may also determine occupancy indicators by tracking a position of SDsIO. Additionally or alternatively, the LBU 20 may perform the operations described herein in connection with the hosting service 24. For example, the LBU 20 may receive occupancy indicators and based thereon generate one or more instructions that are conveyed to an RCD 30. The LBU 20 may detect a variety of events and based thereon trigger various specific device responses. For example, when a pressure mat is placed proximate a bed, when it is evening or past a specific time, and the pressure mat detects an individual sitting up in bed or stepping onto the mat from the bed, the LU 20 turn on a bathroom light and/or turn on bedroom lights at a preset illumination level. Alternative types of sensors (e.g. motion sensors located proximate to the sides of the bed to detect the region where an individual's feet are placed) may detect when an individual sits up in bed or stands up from the bed. Examples of other sensors include door sensors, motion sensors, beacons or any combination thereof that may be used to identify when a person has entered or exited a space eight. In response thereto, the LU 20 may set lighting or the operating conditions of other equipment to a preferred state. Examples of wearable sensors include fitness bands, health monitors, smart watches, physiologic monitors and the like. As another example, the LU 20 may turn off various lights and/or accessories in a room when certain conditions are sensed. For example, when a individual lies down on a bed, and ceases to perform a certain amount of movement, the LBU 20 and motion detectors may determine that a lower threshold of motion is no longer occurring. As another example, a wearable sensor may detect from one or more physiologic parameters that an individual is going to sleep or waking up, and in response thereto, the LU 20 may

trigger certain activities (e.g. turning on or off lights and accessories, adjusting the temperature in a space, etc.). The wearable sensors may also detect real-time health measurements (e.g. heart rate, motion, blood pressure, etc.). The health measurements are communicated to the LU 20 which in turn passes the health measurements to an enterprise server 13 to inform staff of an individual's condition. When the health measurements exceed thresholds, a staff person may be alerted that an individual needs assistance, such as through lighting alerts, sounding alerts etc. The LU 20 may activate an alert within the space or send an alarm to a remote location, such as the enterprise server.

[0049] The system 2 interacts with third-party communications infrastructures 26 to communicate with SDs 10 that are beyond a local area network of the lodging establishment 40. For example, the 3rd party communication infrastructures 26 may include one or more cellular service providers 28 and/or one or more Wi-Fi hotspots 34. When SD's 10 leaves the range of the local area network for the lodging establishment 40, the host service 24 and SD's 10 communicate with one another through one or more service providers 28 and Wi-Fi hotspots 34. The SD 10 may inform the HS 24 when leaving the boundary 36. Alternatively, the computer 44 or HS 24 may determine that the SD 10 has left the boundary 36 based on SD 10 position information or a lack of communication.

[0050] The system 2 is configured to operate with a large number of smart handheld devices 10 (also referred to as SDs or mobile devices (MDs)) associated with numerous guest distributed over a wide geographic area. It is expected that the guest and their corresponding SD's 10 will stay at different lodging establishments 40 at various times. During each stay at an individual lodging establishment 40, the guest and SD 10 will leave and return to the guest space 8 one or more times. In accordance with embodiments herein, the user is able to manage the parameters for the environment within the guest space 8 while the guest and SD 10 are present within the guest space 8. In accordance with embodiments herein, the system 2 changes the parameters of the

environment when the guest and SD 10 leave the guest space 8 and again when the guest returns.

[0051] Additionally or alternatively, the SD 10 and LBU 20 are configured to communicate with one another, such as directly through one or more communications links (e.g. through a Bluetooth link, a Bluetooth low energy link, a Wi-Fi link and the like). The SDs 10 and LBUs 20 may communicate with one another and control RCDs 30 as explained in the patent application titled, "Entertainment Environment Remote Control and Audio/Video Streaming Method and System", published February 12, 2015 and having Publication number US-20 15-0042447, the entire subject matter of which is incorporated herein by reference. An administrative link may be maintained between the SD 10 and LBU 20, over which command related information is conveyed. Additionally or alternatively, a streaming link may be maintained between the SD 10 and LBU 20, over which audio/video content is streamed from/to the SD 10. Additionally or alternatively, the SD 10 and LBU 20 may communicate indirectly with one another through a local area network 45 maintained within the lodging establishment 40.

[0052] The SD 10 includes a user interface 52 having inputs and a display. The user interface 52 is configured to permit the user to enter commands to, among other things, control the RCDs 30. The SD 10 and/or LBU 20 may be configured to communicate, through a cellular network 28 over the Internet 3 with the host service 24, namely one or more of the cloud computing services 11 and/or dedicated enterprise server(s) 13.

[0053] The SD 10 may access, download information from and upload information to the CCS 11, ES 13 and data storage 15 through the Internet 3, as well as through a cellular network connection (e.g., cellular service provider 28), a WiFi network connection (e.g., WiFi hotspots 34) or otherwise. Similarly, the LBU 20 may access, download information from and upload information to the CCS 11, ES 13 and data storage 15 through a cellular network connection, a WiFi network connection (WiFi transceiver) 75 or otherwise. For example, the LBU 20 may be configured to include a

cellular chip set (e.g., cellular chip set 7) and assigned a cellular phone number in order to afford a cellular network connection with a subscription cellular network (e.g., ATT, Sprint, Verizon), similar to the cellular chip sets offered in iPad devices, iTouch devices, and the like. Optionally or in addition, the LBU 20 may include Internet connectivity components (ICC) 5, such as a chip set configured to operate as a gateway, router, a network access point and the like.

[0054] The SD 10 uploads and stores a guest environment control (GEC) application 16. The GEC app 16 enables the SD 10 to communicate with the local base unit 20 over communications links 12 and 14 that exhibit different basic characteristics. For example, one communications link 12, may be referred to as an administration link, and is configured to support unidirectional or bidirectional communication of non-streaming data content, while utilizing limited power, and affording quick or short connect and disconnect sequences to be followed in accordance with establishing a data connection session over one or more data channels. One example of a protocol that affords bi-directional, low power, quick connect/disconnect characteristics is the Bluetooth low-energy protocol.

[0055] The other communications link 14, may be referred to as a streaming link 14, and is configured to support at least unidirectional data streaming, with a level of power demand that may be higher than the level of power demand utilized by the administration link 12. The streaming link 14 may also exhibit a more involved connection sequence followed to establish a data connection session over one or more data channels, as compared to the connection sequence followed the administration link 12. The streaming link 14 also exhibits robust data transfer to allow reliable data streaming over mid-range distances. One example of a protocol that supports data streaming with the select network characteristics is the classic Bluetooth protocol.

[0056] The communications links 12 and 14 are utilized in connection with different types of data transmission between the SD 10 and LBU 20. For example, the SD 10 establishes a temporary low energy BLE administration link 12 with the LBU 20

in connection with conveying the remote control related command(s) to the LBU 20. The SD 10 establishes a classic Bluetooth streaming link 14 in connection with streaming audio and/or video content from the SD 10 to the LBU 20.

[0057] The LBU 20 includes at least one transceiver 22 that supports one or both of the administration and streaming links 12 and 14. For example, a Bluetooth transceiver 22 may be used to establish a BLE administration link 12 in connection with remote control related operations. For example, the Bluetooth transceiver 22 receives data packets over the link 12, and extracts data from the data packets. The Bluetooth transceiver 22 then passes the data to the microprocessor 25. The microprocessor 25 "unpacks" the data and determines whether the data includes remote control (RC) commands intended for the A/V RCDs 30. When the data includes RC commands intended for the A/V RCDs 30, the microprocessor converts the RC commands to a corresponding IR code designating a select IR pulse sequence.

[0058] In accordance with at least some embodiments herein, the LBU 20 includes, within an IR transmitter subsystem 26, an optical IR transmitter 35, such as single LED or an LED array. The optical IR transmitter 35 comprises LEDs arranged in at least one row and/or at least one column, as described in co-pending application, publication number US - 2015/0042447, published February 12, 2015, the complete subject matter of which is expressly incorporated herein by reference in its entirety. The IR code is conveyed from the microprocessor 25 to the IR transmitter subsystem 26. The IR transmitter subsystem 26 drives the optical IR transmitter 35 to cause the LEDs to generate IR signals including the corresponding IR pulse sequence. The optical IR transmitter 35 transmits a corresponding number of IR signals 36 as an IR cluster 34 having the common/same select IR pulse sequence. The IR signals 36 propagate in multiple directions and at multiple angles from the optical IR transmitter 35. The IR signals 36 may propagate in a direct line of sight to an IR receiver at one or more of the AV RCDs 30. Optionally, one or more of the IR signals 36 may contact other structures within the entertainment environment and be redirected or reflected in other directions

such that the IR signals 36 bounce off multiple structures in the entertainment environment before reaching an RCD 30. The redirection/reflection of the IR signals 36 increases the likelihood that one or more of the IR signals 36 is received by each of the AV RCDs 30. Optionally, the RCDs 30 may communicate through WiFi, Zigbee, Bluetooth, BLE, etc.

[0059] The LBU 20 also includes a stereo audio and/or video (A/V) output 28 that may be coupled to an audio and/or video system over an AV line. The audio/video system is coupled to one or more speakers and/or a television or other display.

[0060] The SD 10 conveys streaming audio and/or video content over the classic Bluetooth streaming link 14 to the Bluetooth transceiver 22. The Bluetooth transceiver 22 receives the streaming audio/video data and passes the A/V data to the microprocessor 25. The microprocessor 25 then unpacks and routes the audio/video data to the A/V output 28 that then passes the audio/video data to the system for presentation to the user.

[0061] When the GEC app 16 is loaded by the SD 10, the GEC app 16 enables the SD 10 to communicate the RC commands to the processor that directs the optical IR transmitter to transmit the IR pulse sequences to RC devices based on the RC commands. The GEC app 16 maintains, on the SD 10, a customized user configuration that includes user preference settings associated with the corresponding entertainment environment. The user configuration is set up by a user through the GEC app 16 based on an individual's preferences. The user configuration comprises user preference settings for parameters for the environment. The user configuration also comprises one or more sets of input indicia associated with select RC devices, at least a portion of the input indicia indicative of RC commands for the select RC devices. The RC commands identify IR pulse sequences to be transmitted from the optical IR transmitter to the RCD 30 to instruct the RCD 30 to perform one or more associated actions. A user-designated presentation of the input indicia is configured to be displayed on the user interface 52 of the SD 10.

[0062] The LBU 20 also includes an IR sensor 33 that is configured to sense IR signals. The GEC app 16 is configured to learn RC commands for a select RC device, when in a learn mode, by sensing, at the IR sensor, a new IR pulse sequence that is generated by a handheld remote control that is associated with the select RC device. The GEC app 16 receives an input indicating a new RC command, and stores the new IR pulse sequence with the new RC command.

[0063] The various devices herein, such as the SD 10, LBU 20, ES 13, hosting service 24, local computer 44 and the like include one or more processors. The various components herein such as the SD 10, LBU 20, ES 13, hosting service 24, local computer 44 and the like may also include a data store (or have access to separate data stores, such as data storage 15) that storing program instructions accessible by the processor wherein, responsive to execution of the program instructions, the processor is configured to perform the various methods, processes and operations described herein.

[0064] As explained herein, the HS 24, computer 44, LBU 20 or other component of the system 2 is further configured to receive an exit indicator, indicating that the guest is outside of a select proximity and in response thereto, the generate an instruction to change the parameter of the remotely controllable device to a reference baseline setting.

[0065] Figure 2 illustrates a process for managing an environment within a designated guest space in accordance with embodiments herein. At 202, the user is logged into the system 2 or registered with the HS 24 in connection with a particular lodging establishment. For example, when a guest registers at a hotel, the registration computer 44 at the hotel may inform the host service 24 that the user has arrived and is checking in. Additionally or alternatively, the registration process may occur when a user electronically books or otherwise makes a reservation at a lodging establishment 40 (which may occur well in advance of the actual check-in date).

[0066] As another example, the login/registration operation may occur automatically in response to the user activating the GEC app 16 on the SD 10, and

entering an indication that the user is registering. The user may activate the GEC app 16 to login/register before or after arriving at the lodging establishment 40, as well as before or after entering the user's individual room.

[0067] At 204, the method accesses the user account (such as in data storage 15) and obtains any prerecorded user configuration or other user profile information. The accessing operation maybe performed by the SD 10, LBU 20, computer 44 or HS 24. The user configuration may be preset by the user, and/or periodically updated as the user enters new parameter levels for a designated guest space 8. The user configuration may include, among other things, predetermined levels for parameters for the space 8 (e.g. temperature, light settings, alarm clock settings, television and audio equipment settings). For example, when the user activates the GEC app 16 and selects a registration input, the SD 10 may transmit certain user specific information to the host service 24, such as the user's name and location, a user configuration, updates to environment preferences and the like. Additionally or alternatively, when a user enters the user designated guest 8, the user may launch the GEC app 16, in response to which the GEC app 16 begin searching for a local base unit 20. Once a communications link is established between the GEC app 16 and the local base unit 20, the local base unit 20 may convey the LBU 20 ID, the user identification, date and room ID to the host service 24.

[0068] At 206, the method determines the user location information. The user location information may be determined by the SD 10, LBU 20, computer 44 or HS 24. The user location information may represent a particular position of the user, and/or a particular position of an SD 10 (presumably carried by the user). Additionally or alternatively, the user location information may represent a relative distance, such as a range between a reference point and the user and/or SD 10. By way of example, the user location information may represent GPS coordinates, an address, a position within a building (e.g. the floor and/or room) and the like. As other examples, the user location information may represent less specific position content, such as a general indication that an SD 10 is within a range of a local area network associated with a lodging

establishment 40, is within a range of a particular Wi-Fi hotspot, is within a range of a cellular tower proximate to a lodging establishment 40 and the like. As another example, the relative distance may be defined in terms of a physical distance (e.g. 3 blocks away from the hotel, 100 yards from the room, 1 mile away from the building) and/or in terms of a temporal distance (e.g. 15 minutes from the hotel).

[0069] At 208, the method determines whether the user has entered and/or is within the proximity boundary 36 for the lodging establishment 40. The determination may be made by the SD 10, LBU 20, computer 44 or HS 24, and based thereon provide the occupancy indicator. As another example, a detector 42 (Figure 1) may be located within the designated guest space 8. The detector senses a presence of the user through various manners. For example, the detector may represent a motion detector, an infrared detector, the heat detector, a sound detector and the like. When the detector 42 determines the presence of an individual, the detector 42 returns the occupancy indicator to the one or more of the SD 10, LBU 20, computer 44 and host service 24. The occupancy indicator indicates that the user is within a select boundary 36 of the designated guest space 8. When the user is within or is entering the proximity boundary 36, flow moves to 210; otherwise flow moves to 212.

[0070] At 210, the method conveys the user configuration to the corresponding remotely controlled devices 30. For example, the user configuration may be conveyed from the host service 24 through the Internet 3 to the local base unit 20. The local base unit 20 to each RCD 30, then transmits a level for each parameter within the user configuration, such as through a wireless local area network, a wired connection, infrared transmissions, or otherwise. Optionally, the user configuration may be conveyed from an SD 10 to the local base unit 20. The user configuration may originate within memory of the SD 10. Alternatively, when the user configuration are stored in the data storage 15, the enterprise server 13 may convey the user configuration directly to the local base unit 20 or to the smart device 10 which then may convey the user configuration to the local base unit 20. When the user configuration includes setting for more than one RCD 30,

the configuration preferences may be implemented in various manners. For example, the smart device 10 may sequentially steps through the configuration preferences, conveying each individual configuration preferences to the local base unit 20 separately and in a serial manner, such that the local base unit 20 simply rebroadcasts (i.e. through an IR link, wired link or otherwise) each associated setting. Alternatively, the configuration preferences may be passed to the local base unit 20 as a group or set, after which the local base unit 20 separately and serially steps through each parameter and transmits the corresponding level to the associated RCD 30.

[0071] At 212, the method determines whether the user and SD 10 are outside of the boundary 36 and/or are presently leaving the boundary 36. The operator may be made by the SD 10, LBU 20, computer 44 or HS 24. If so, flow advances to 214. When the user remains within the boundary 36, flow moves along 216 to return to 206.

[0072] At 214, the LBU 20, computer 44 or HS 24 conveys a baseline configuration to the corresponding remotely controlled devices 30. The baseline configuration may be obtained from the data storage 15 locally stored at the local base unit 20 or elsewhere (e.g., within the local computer 44 within the lodging establishment 40). The baseline configuration includes levels for the parameters for the RCDs 30 that are desired to be utilized when the guest designated space 8 is unoccupied. For example, when a guest leaves a hotel room, a baseline configuration may include turning off all of the lights, TV and radio, changing the room temperature to a more energy efficient level, and the like. Thereafter, flow returns along 216 to repeat the operations of 206 - 214.

[0073] The operation at 206 - 214 may be continuously repeated, repeated on a periodic basis, or in response to predetermined criteria. For example, the system may initiate the operations at 206 - 214 when a motion detector or other detector senses a user present in the space 8 (e.g., occupied state), when a detector determines that a door to the space 8 has opened and the like. Additionally or alternatively, the system may initiate the operations at 206 - 214 when the GEC app 16 is activated, or when the SD 10 connects to or disconnects from the local area network at the lodging establishment 40. For

example, when a user has completed business for a day and is returning to a hotel room, the user may activate the GEC app 16 and enter an indication that the user is returning to the hotel. As a further example, the system 2 may query the SD 10 continuously or periodically to obtain position information. As a further option, the GEC app 16 may periodically "wake up" (auto-activate) and transmit current location information to the HS 24, to the computer 44 and/or LBU 20 over the Internet 3.

[0074] Optionally, information from detector 42 and the local base unit 20 may be utilized in combination to determine when to adjust environmental parameters. For example, it may be desirable to provide confirmation of a change in the user occupancy/non-occupancy. As one example, the decision at 208 may determine whether two conditions exist, namely whether a detector 42 senses the presence of a user and whether the local base unit 20 has established a communications link with the SD 10. When both conditions exist, flow may move from 208 to 210. Optionally, other combinations of conditions may be utilized to validate whether to change the environmental parameters from setting associated with the occupied state or the non-occupied state.

[0075] The detector 42 and local base unit 20 may also be used to track the presence of a user for other reasons, such as in connection with emergencies and the like. For example, when a fire or other emergency occurs within a lodging establishment, it may become desirable to determine whether guests still remain within the building. When a fire or other emergency is declared, the host service 24 or a local terminal within the lodging establishment 40 may step through a "roll call" process by sending a query to each detector 42 and local base unit 20. In response to the queries, the detector 42 returns information indicating whether the detector 42 senses motion in the room. In response to the query, the local base unit 20 returns a communication link status to indicate whether the communications link can be maintained with the SD 10. The roll call process can be used to inform first responder personnel when guests remain in rooms.

[0076] Optionally, the operations at 202-214 may be performed without an SD 10. For example, in a hospital or ALC, detectors in rooms may be used to provide occupancy indicators at 208, while the LBU 20, computer 44 and/or HS 24 perform the operations at 202-206 and 210-214.

[0077] Optionally, active or passive tracking devices 43 may be provided as a pins, wristband, fitness or health bands, smart watch, or in other user-wearable structures. The tracking device 43 may maintain short-ranged communication with the detector 44 and/or LBU 20 when in the space 8 to provide the occupancy indicators. When a patient leaves a room the tracking device 43 would no longer communicate with the LBU 20 or detector 44, thereby providing an unoccupied indicator.

[0078] Figure 3 illustrates examples of some of the data that may be stored in connection with managing environments for designated guest spaces in accordance with embodiments herein. The data may be stored in one or more data storage 15, within the local base units 20, the SD's 10, within servers located at the lodging establishments and elsewhere. In Figure 3, a user profile 302 is stored that is assigned a unique user ID 304 associated with an individual user. The profile 302 includes, among other things, one or more user configurations 310-312 having settings 306 associated with environmental parameters 308. In the example of Figure 3, the user configuration 310 includes environmental parameters for temperature, lighting, an alarm and a television. The user profile 302 may include multiple sets of user configurations 310 - 312, such as associated with different lodging establishments. For example, one user configuration 310 may be defined for hotels within the Marriott chain, while other of user configurations 311 and 312 may be defined for hotels within the Hilton chain and/or specific types of hotels (e.g. Embassy suites, Holiday Inns etc.).

[0079] The settings associated with environmental parameters may include multiple values. One or more settings 306 may be associated with each environmental parameter 308. For example, a user may have different configuration preferences for a hotel room temperature during the summer and winter. Also, the user may have different

configuration preferences for the alarm setting time based upon whether the user is traveling to the East Coast, Midwest or the West Coast.

As explained herein, various RCDs may utilize different communications networks/protocols. For example, some RCDs (e.g. thermostats, water controllers, lighting, alarm clocks, etc.) may include a Wi-Fi communication interface, while other RCDs (A/V equipment, TVs, alarm clocks) may include an infrared receiver. RCDs that receive instructions through an infrared receiver have a corresponding set of IR codes associated with respective commands. The instructions may first be transmitting the SD to the LBU, where the instruction indicates a user preference setting for the parameter managed by the RCD. The LBU may then convey the instruction (e.g., formatted as parameter change data) from the LBU to the RCD in response to the instruction.

[0080] In embodiments herein, the user configurations 310 - 312 may include IR command sets that include one or more IR codes associated with individual commands for the corresponding RCD. In Figure 3, an IR command set 314 is provided in connection with a TV which represents one of the RCDs in the corresponding user profile. The IR command set 314 includes IR codes to be transmitted (from a local base unit 20) in connection with the commands for the corresponding RCD (e.g. volume control, channels change, source, etc. for a TV). Optionally, an IR command set may be defined that includes IR commands for an alarm/radio. For example, the user profile 310 may include alarm settings that define the time for an alarm, to define that music is to be played (instead of a buzzer), the volume setting, the channel and the like.

[0081] While the IR command set 314 is illustrated to be associated with the environmental parameters within a particular user profile, it is recognized that the information may be stored in alternative formats or configurations. For example, one or more IR command sets 314 may be stored independent of the user profiles 310 - 312. The IR command sets 314 may be stored in local memory of an SD 10, local memory of a local base unit 20, or elsewhere.

[0082] Figure 4 illustrates examples of baseline configurations that may be stored in connection with lodging establishments in accordance with embodiments herein. The baseline configurations may be stored in one or more data stores 15, the local base units 20, the SD's 10, at servers located at the lodging establishments and elsewhere. In Figure 4, a collection of baseline configurations 422 are stored where each lodging establishment, or type of lodging establishment, is assigned a unique ID 424. The baseline configuration 422 includes, among other things, user preference settings 428 associated with various environmental parameters 426. For example the environmental parameters may include temperature, lighting, an alarm, a television, etc. Multiple baseline configurations 450 - 452 are provided in connection with different lodging establishments.

[0083] The baseline configurations 422 also include condition information 430 related to when the baseline settings for the environmental parameter may be utilized. For example, the condition information 430 may set limits upon an extent to which a user may adjust environmental parameters (e.g. how low or high the temperature may be set, how high the television volume may be set). The condition information 430 may define circumstances under which the baseline settings are reinstated. For example, the condition information 430 may indicate that, when a user's presence is no longer detected in a room for at least 10 minutes, the baseline settings are reinstated. Alternatively, the condition information 430 may indicate that when the user's SD 10 loses the Wi-Fi connection, the baseline settings may be reinstated. As a further example, the condition information 430 may indicate that, when the user exits a proximity boundary 36 associated with the lodging establishment 40, the baseline settings are reinstated. As a further example, the condition information 430 may indicate that, when the local base unit 20 loses the communications links 12, 14 with the SD 10, (and is unable to reestablish the communications links 12, 14), the baseline settings are to be reinstated. Optionally, the condition information 430 may indicate that the user is to be prompted to determine whether it is acceptable to return the environmental parameters to the baseline settings.

[0084] As explained above, various RCDs may utilize different communications networks/protocols (e.g., a Wi-Fi communications interface, a IR interface). The RCDs that receive instructions (e.g., parameter change data) through an infrared sensor have a corresponding set of IR codes associated with respective commands. Accordingly, the baseline configurations 450 - 452 may include IR command sets 414, 416 for RCDs that receive instructions through an IR interface. The IR command sets 414, 416 include IR codes to be transmitted (from a local base unit 20) in connection with the commands for the corresponding RCD (e.g. television, stereo, radio, alarm). While the IR command set 414, 416 is illustrated to be associated with the environmental parameters within a baseline configuration, it is recognized that the IR command sets 414 - 416 may be stored in alternative formats or configurations, and may be stored separately from baseline configurations. The IR command sets 414, 416 may be stored in data storage 15 at the host service 24, within local memory of a local base unit 20, or elsewhere. When a user checks in or registers and the users SD 10 pairs with a local base unit 20 for the first time upon entering a space 8, the corresponding IR command sets 414, 416 may be uploaded to the SD 10 to be used in combination with one or more user configurations within the user's SD 10.

[0085] The baseline configurations 422 also include boundary definitions 432 that may establish a proximity boundary 36 for the lodging establishment 40. The boundary definitions 432 may represent a physical boundary, a distance, or some other predetermined criteria (e.g. loss of a Wi-Fi connection, loss of a Bluetooth link to the local base unit, etc.) that may be used to determine when a user is within or outside of the boundary.

[0086] As a further example, the baseline configurations 422 may include one or more profiles related to particular types of users, related to particular situations and the like. An example of a situation in which a unique baseline configuration may be utilized, represents when a user initially registers and enters a designated guest space 8 for the first time. In this example, a "welcome" profile may direct the television to turn on to present

a welcome screen, audio equipment to play predetermined music, the lights to turn on to a particular combination of lights and light intensity, inform the user of amenities offered by the lodging establishment, etc. When a user is a frequent guest, a "platinum" or "gold" profile may be utilized, such as to suggest restaurants, amenities within the lodging establishment, reminders for appreciation activities for frequent customers and the like.

[0087] The baseline configurations 422 also include special notifications 434 that may be activated when a user enters or leaves a designated guest space and/or enters or leaves a boundary 36 of the lodging establishment 40. For example, a special notification 434 may indicate that, when a user leaves a hotel room in the morning, the hotel desk or other service agent is provided an "unoccupied indicator" to inform the hotel management that the room may now be cleaned. As another example, when the user remains in the room and the detectors determined that the user is experiencing trouble, the system may provide a "need assistance" indication or other safety information to the hotel management terminal, a service agent terminal, a first responder network and the like providing an indication of the users condition and need for assistance.

[0088] The user configurations and baseline configurations described in connection with Figures 3 and 4 may be preconfigured and offered as remote profiles. For example, once a baseline configuration is set up for one hotel room arrangement, the same baseline configuration may be exported to all hotels within the same chain or otherwise that have the same remotely controllable device set up. Similarly, once a user configuration is defined, the user configuration can be offered as a remote profile that may be offered to various users, such as at the time they sign up for the services provided herein.

[0089] Alternatively or additionally, the data storage 15 may maintain pre-configuration kits that list various types of RCDs that may be utilized at lodging establishments, along with all of the necessary communications information needed to control such RCDs. For example, the pre-configuration kits may include a list of

different types of thermostat controllers, lighting controllers and configurations, multiple types of clocks and alarms, multiple types of televisions, stereos and other audio/video equipment that may be offered in one or more of the lodging establishments. When setting up a new baseline configuration, the pre-configuration kits may be accessed to draw upon the data, commands and other interface related information needed to communicate with the particular remotely controllable device.

[0090] Additionally or alternatively, the data storage 15 maintains a list of cable service providers and the corresponding channels for each local region. When a user desires to watch particular shows, the user need not learn the local regions channels. Instead, the user may simply open the GEC app 16, choose the TV control option, and select a desired service provider (e.g. ESPN, CBS, ABC, HBO, etc.). The host service 24 (Figure 1) may maintain a third-party channel guides 17 that include a list of the channels available in each geographic region in which a lodging establishment 40 is located. The channel guide 17 may also include a listing of the programs scheduled to be presented. The channel guide 17 may be uploaded to, and utilized by, the GEC app 16 when the user desires to control the television through the SD 10.

[0091] Figure 5A illustrate examples of windows presented on the user interface of the SD 10 in accordance with embodiments herein. When the user activates the GEC app 16, a main screen 502 is presented. The main screen 502 may present various general information 504 regarding the host service (e.g. the name of the hotel chain, address and phone number of the current lodging establishment, etc.). The main screen 502 may also present various tabs tied to the lodging establishment's reservation system, such as an option to make a "New Reservation" (at tab 506), an option to "Check In" for an existing reservation (tab 508) and the like. When the new reservation tab 506 or check-in tab 508 are selected, the host service 24 may open an Internet browser to redirect the user to the appropriate portion of the website of the corresponding lodging establishment.

[0092] The main screen 502 also includes a "Set Up My Room" tab 510 associated with setting up the designated space 8. When tab 510 is selected, the SD 10 may perform various actions depending upon the configuration of the particular lodging establishment. For example, when a user enters a room, the user may select tab 510. In response thereto, the SD 10 may search for the local base unit 20 and establish communications links there with. The GEC app 16 may also convey to the local base unit 20 configuration preferences, in response to which the local base unit 20 directs each of the RCDs 30 to adjust to the corresponding settings. Alternatively, the GEC app 16 may inform the host service 24 that the guest has selected the Set Up My Room tab 510, in response to which, the host service 24 directs the local base unit 20 to set the environmental parameters in accordance with the user's profile in the data store 15.

[0093] The main screen 502 also includes a "Create A New Profile" tab 512 that may be utilized when the user does not have, or wishes to reset the environmental parameters associated with a designated guest space 8. A new profile (user configuration) may be created in various manners. For example, upon selecting tab 512, the user may walk through a series of environmental parameters and enter preferences for each setting. Additionally or alternatively, when a user enters a room, the user may manually set the various environmental parameters to desired levels. For example, the user may manually adjust the lighting as desired, turn on or off the TV to a desired station/volume, adjust the temperature, set the alarm clock, and the like. After the environmental parameters are set to levels desired by the user, the user may select the "Create A New Profile" tab 512. Upon activation of the tab 512, the SD 10 may communicate with the local base unit 20 to determine current settings for each of the available environmental parameters and save the current settings as a new user configuration.

[0094] The main screen 502 may also include additional tabs to be used in connection with interactive controlling remotely controllable devices. For example, a "Control TV" tab 518 may be provided to enable the user to utilize the user's SD 10 as a

remote control for the television. Additionally or alternatively, the GEC app 16 may be used to control other audio/visual equipment, such as a stereo, DVD player, radio and the like. In accordance with embodiments herein, the GEC app 16 enables the smart handheld device to provide interactive control over audio/visual remotely controllable devices while the user is in the designated guest space 8. For example, the user may use the SD 10 and GEC app 16 as a remote control for the television, stereo, video player in a hotel room. The user may also use the SD 10 and GEC app 16 to set the alarm clock within the room.

[0095] The main screen 502 may also present a "Set Alarm" tab 520 to be used in connection with setting the alarm clock in the room. For example, when tab 520 is selected, the user may be presented with a secondary screen from which the user sets the alarm time/date. Upon entering the desired alarm time/date, the SD 10 conveys alarm set information to the local base unit 20. The local base unit 20 utilizes the alarm set information to convey corresponding remote control commands (e.g. through a wireless or infrared link) to an alarm clock in the room, thereby setting the alarm clock. By permitting the user to set the alarm clock through the SD 10 and GEC app 16, embodiments herein avoid the need for the user to learn the particular operation of the type of alarm clock in the room. Often, different lodging establishments have different types of alarm clocks in each room. Frequent business travelers experience the difficulty of needing to understand each different type of alarm clock and experience the anxiety, after setting the alarm clock, of whether the alarm clock is correctly set and will go off when desired. By utilizing the GEC app 16 and SD 10 in the manner described herein, the user need not learn each different type of alarm clock, but instead set the alarm clock within the room through a common GEC app 16 on the smart handheld device.

[0096] The main screen 502 may also include a "Restaurant Recommendation" tab 514 in connection with obtaining recommendations for restaurants in the area. Upon selecting tab 514, a list of recommended restaurants may be provided. Alternatively, a

web browser may be opened to another application that facilitates selection of local restaurants.

[0097] The main screen 502 may also provide a food delivery "Order Out" tab 516 to be used in connection with ordering out, such as room service or from third-party food providers that deliver. Upon selecting the tab 516, a list of recommended food delivery restaurants may be provided as well as information related to room service. For example, a menu may be provided for room service, as well as a list of restaurants that deliver. Further options may be provided such as, when selecting a restaurant that delivers, an additional window may be presented with a menu from the restaurant.

[0098] The main screen 502 also includes a "Guest Services" tab 522 that may be selected when the user is interested in learning additional services available through the lodging establishment. Upon selecting tab 522, one or more screens may be presented on the SD 10 to allow the user to search for additional services, such as the location and hours of the gymnasium, restaurants, spas and the like, as well as any organized activities such as conferences at a trade show, happy hour or customer appreciation events.

[0099] The main screen 502 may also include a "Change Room Settings" tab 524 that may be selected by the user when the user desires to adjust one or more of the environmental parameters associated with the designated guest space 8. For example, the user may find the room to cold or too hot and desire to only change the temperature. Alternatively, the user may wish to increase the light brightness or decreased the light brightness. The user may not be familiar with the individual controls associated with the various lighting options or thermostat control. To alleviate the need to search through the room to learn the positions and operations of the lighting and thermostat, embodiments herein allow the user to control individual select environmental parameters from their phone or other smart device 10.

[00100] Figure 5B illustrates example screenshots that may be presented on the SD 10 when the user desires to use the SD 10 to control a television. When the user selects

the "Control TV" tab 518, a TV control screen 530 may be presented on the SD 10. The control screen 530 may include various user controls associated with the functionality of the television and offered on a remote control. For example, the control screen 530 may include volume control buttons, channel changing buttons, a source changing option as well as numerous other features presented on remote controls. In addition, the control screen name 10 may offer a Station list tab 532 and a "My Programs" tab 534. When the user desires to choose a station based on the provider of the station, the user may select the station list tab 532. In response thereto, the station listing 536 is presented with the available stations offered within the lodging establishment. The stations may be listed by provider name, channel or a combination thereof.

[00101] When the user selects the control TV option 518, the GEC app 16 may upload the guide 17 (Figure 1) which includes the available service providers, and channels, as well as program names and times. Optionally, the guide 17 may be uploaded to the GEC app 16 during registration, upon checking into the hotel, when initially entering the grounds of the hotel or the guest individual room, or any time earlier or thereafter. As a further option, the guide 17 may be stored in local memory of the local base unit 20 and provided to the SD 10 upon request or may be pushed to the SD 10 upon initial pairing.

[00102] Returning to Figure 5B, when the user selects a station by name (e.g. ESPN), the GEC app 16 identifies the corresponding channel number from the guide 17 (locally saved in the SD 10 and/or local base unit 20). The GEC app 16 conveys, to the local base unit 20, the IR command corresponding to the channel associated with the selected station. The local base unit 20 transmits the associated IR code through the infrared emitters to the television to direct the television to change to the corresponding channel associated with ESPN. The foregoing process enables the user to pick channels based on service providers, without learning which individual channel in the local geographic region corresponds to the service provider of interest.

[00103] When the user desires to search for particular programs, the user may select the "My Programs" tab 534. In response thereto, a favorite programs window 538 may be presented to the user. The favorite programs window 538 list various programs of interest to the user based on the user's profile. The user may select a particular program without knowing which service provider or which station provides the program. In response thereto, the ECG app 16 searches programming information within the channel guide 17 to identify whether a service provider is presently showing the desired program or will show the program in the near future. When the program is presently being played, the ECG app 16 conveys an IR command to the local base unit 16, where the IR command represents an instruction for the television to change to the corresponding channel playing the desired program. Additionally or alternatively, when the program is presently not being played, the user may be informed of this information and provided a list of next available times at which the desired program will be shown.

[00104] In accordance with embodiments herein, the user is allowed to use their personal SD 10 to perform numerous features and functions without understanding the specific set up or configuration of remotely controlled devices within a designated guest space 8. For example, the user is afforded the ability to control the television and select stations without knowing individual local providers or program times. The user is afforded the ability to control the audio system within the room, regardless of whether the speakers are provided in the TV, radio or in a separate audio/video device. The user is afforded the ability to change the brightness or intensity of the lighting in a designated guest space 8 without knowing the particular locations of the light switches for which switch controls each light. The user is afforded the ability to change the temperature in the designated guest space 8 without knowing the location or the type of thermostat control. The user is afforded the ability to control the clock and set the alarm without knowing the location or type of clock/alarm provided in the room.

[00105] Figure 5C illustrates an example screenshot that may be presented when the user selects the "Change Room Settings" tab 524. Upon selecting tab 524, an

environment control window 540 is presented with control features associated with one or more environmental parameters. In the example of Figure 5C, a lighting control panel 542 and a temperature control panel 544 are presented. Within the lighting control panel 542, individual tabs or icons may be presented to allow the user to functionality. For example, the tabs 551 - 554 may permit the user to increase the light brightness, decrease the light brightness, turn on all of the light and/or turn off all of the lights in the room, respectively. As a further example, a thumbnail room footprint 546 may be presented illustrating the primary structures within the room, such as a bed, bathroom, desk and the like. Proximate to each of the structures, icon 548 may be presented to indicate the individual locations of lights within the room. The user may turn on or off individual lights by touching the corresponding light icons 548. Optionally, when the individual lights have more than in an off state, the lights may cycle through the various states each time the user touches the corresponding light icon 548.

[00106] Within the temperature control panel 544, individual tabs or icons may be presented to allow the user certain functionality. The tabs 556 - 559 may permit the user to increase the room temperature, decrease the room temperature, turn a fan to an on state, turning fan to an off state and the like. It is recognized that alternative or additional functionality may be provided in connection with temperature control and lighting control, as well as control of additional environmental parameters. The options presented in figure 5C are merely examples and are not limiting.

[00107] Figure 5D illustrates a process for adjusting individual environmental parameters implemented in accordance with an embodiment herein. By way of example, the process of Figure 5D may be implemented in connection with selecting the "Change Room Settings" tab 524. The operations of Figure 5D, are performed by the SD 10, LBU 20, computer 44 and/or HS 24. At 560, the GEC app 16 receives an input requesting a change in a corresponding environmental parameter. For example, the user may select the tab 551 to increase the brightness of the lighting, or turn off the fans operating the heating and air-conditioning. At 562, the GEC app 16 identifies which remotely

controllable device is to be adjusted based upon the input received at 560. As explained herein, some remotely controllable devices are controlled through infrared transmissions, while other remotely controllable devices are controlled through wireless communications. At 564, the method determines whether the corresponding RCD is controlled through the wireless local area network or through an infrared transmission. When the RCD is controlled through a wireless communications link, flow moves to 566. When the RCD is controlled through an infrared transmission, flow moves to 568.

[00108] At 566, the process obtains the address of the remotely controllable device. At 570, a change command is sent to the corresponding remotely controllable device based on the address of the RCD within the local area network. The operations at 566 and 570 may be performed by the SD 10, by the local base unit 20, or by a remote processor, such as at computer 44 or enterprise server 13.

[00109] Returning to 554, when the RCD is commanded through an infrared transmission, at 568 the SD 10 (and/or local base unit 20) determines the IR command associated with the input entered by the user. At 572, when the SD determines the IR command at 568, the SD 10 conveys the IR command to the local base unit 20. Optionally, when the local base unit 20 performs the operation at 568, the operation at 572 may be omitted. At 574, the local base unit 20 transmits an IR code associated with the IR command from the LED array and are received by an IR receiver at the corresponding remotely controllable device 30. Thereafter, the process of Figure 5D is completed. The operations of Figure 5D may be continuously repeated each time the user enters an input at the SD 10 to indicate a change in the room settings.

[00110] Figure 6 illustrates a method to enable interactive control over remotely controllable devices in accordance with embodiments herein. At 602, the method is initiated when the user activates the GEC app and selects the "Set Up My Room" tab 560 (Figure 5A) or "Create a New Profile" tab 562. At 602, the method may also be activated when the user selects the "Control TV" 568 or the "Set Alarm" tab 570.

[00111] Optionally, if a GEC app 16 has not yet been loaded onto the SD, then the method provides the GEC app 16 (e.g., through the wireless local network of the lodging establishment) to be loaded by smart handheld devices (SDs), where the GEC app enables the SDs to communicate remote control (RC) commands to corresponding local base units that transmit IR codes (or Wi-Fi wireless commands) to remotely controlled (RC) devices based on the RC commands.

[00112] At 604, upon activation of the GEC app 16, the SD 10 begins to search for advertisements on the advertising channels from an LBU 20 (e.g., over a Bluetooth communications link). When an advertisement is found, at 604, the SD and LBU pair with one another in accordance with existing networking protocols. Optionally, when the SD communicates with the LBU through a local area network, a pairing operation is performed based on the corresponding network protocol.

[00113] At 606, the SD and LBU pair with one another and perform a configuration check to determine whether the SD has the appropriate information and data stored therein in order to control the RCDs in the space 8. As noted herein, customized environment configurations may be set up by users, by the host service, by management of the lodging establishment and the like. The customized environment configurations are maintained in connection with corresponding designated guest spaces 8 and/or lodging establishments 40. The customized environment configuration may be maintained at the data storage 15 in the host service 24, within local memory in each local base unit 20 and/or within local memory of the SD's 10. By way of example, the customized environment configuration may relate to all or a subset of the RCDs available in a space 8.

[00114] The customized environment configuration may include various types of data, based on the nature of the RCD and the type of communication link supported by the RCDs. For example, some remotely controlled devices, such as thermostats and lights, may be controlled through Wi-Fi connections with the local area network and may be adjusted only periodically, such as when a user enters and leaves a hotel room. The

local base unit 20 may represent a local hub within the Wi-Fi network. Alternatively, the SD's 10 may communicate directly with routers distributed throughout the lodging establishment (and not necessarily within the individual space 8).

[00115] As another example, other types of remotely controlled devices, such as televisions and other audio/video equipment, may be controlled through an infrared connection with the local base unit 20. In connection with remotely controlled devices that communicate through an IR link, the environment configurations comprise, among other things, a set of input indicia indicative of IR commands for the RCD (e.g. television). More specifically, the environment configuration includes remote control (RC) commands associated with the input indicia identify IR codes to be transmitted from the local base unit to the RCD (television) to instruct the RCD to perform one or more associated actions (change panel, change the volume, etc.).

[00116] At 606, when the SD pairs with a local base unit, the SD and/or LBU exchange basic information regarding the designated guest space 8 and the RCDs therein.

[00117] At 608, the SD and/or LBU determined whether the SD has, stored therein, environment configuration information associated with the remotely controllable devices in the present user designated space 8. When the SD includes a environment configuration that will afford control of the remotely controllable devices in the present user designated space 8, flow moves to 612 where the environment configuration is used until the GEC app is closed or times out. At 608, when it is determined that the SD does not include the corresponding EC for the current LBU (and corresponding RCDs), flow moves to 614. At 614, the SD undertakes operations to obtain the environment configuration needed to control the RCDs in the present space 8. For example, the corresponding environment configuration may be saved in local memory on the LBU, in which case the LBU upload the environment configuration to the SD. Additionally or alternatively, when local memory on the LBU does not include the necessary environment configuration, the SD or LBU send a request to an appropriate destination, such as the host service 24. In response thereto, the host service 24 identifies the

combination of RCDs and the corresponding user designated space 8 and returns the related environment configuration information. Hence, when the UCs are saved on the Cloud or an enterprise server, the request is sent to server 13 and/or CCS 11. The request may include a unique ID for the requesting SD and the LBU (e.g., the LBU MAC address). Based on the LBU Mac address, the server 13 may identify the corresponding environment configuration which is loaded by the SD 10.

[00118] At 616, the method determines whether the host service 24 returns a EC corresponding to all of the RCDs in the space 8. When a EC is returned, flow moves to 618 where the EC is uploaded to the SD 10. However, in some circumstances, the host service 24 and the LBU 20 may partial configuration information (e.g. for the thermostat and lights), but not have configuration information for one or more RCDs in the space 8. For example, a particular type of TV may not have been programmed into the environment configuration yet. Accordingly, it may become desirable to enter a program mode to develop environment configuration information for the unknown RCD.

[00119] When an EC for the requesting LBU (and/or RCD) does not exist, flow moves along branch 620. At 620, the GEC app 16 enters a programming mode to permit the user to create a new environment configuration associated with one or more RCDs. At 622, once the new EC is created, the method forwards the UC, and LBU MAC address and SD ID, to the data storage for indexing and storage. Following 622, the method returns to the initial point where the method waits for the user to re-activate the GEC app 16.

[00120] Figure 7 illustrates a process for setting environmental preferences for a room of a lodging establishment in accordance with embodiments herein. By way of example, the process of Figure 7 may be implemented by one or more processors within an SD, a local base unit, the host service 24 or a combination thereof. The process of Figure 7 may be activated in various manners, such as automatically at the direction of hotel personnel at the time a guest in, when a user selects the "set up my room" tab 560 (Figure 5A) on the GEC app 16. At 702, when a user selects the tab 562 instruct the

GEC app 16 to set up the user's room, the SD 10 connects to the host service 24, such as through the local area network of the lodging establishment and/or independently through the Internet, through a cellular provider or otherwise. When the SD connects to the host service 24, the SD 10 provides identification information, such as the user ID. Optionally, the SD 10 may provide additional information in connection with a particular reservation, a geographic location of the user, or otherwise.

[00121] At 704, the host service 24 accesses reservation record associated with the user ID (e.g. from the data storage 15, data store 46). The host service 24 may identify, from the reservation record, the room assigned to the user. As one example, the operations of Figure 7 occur after a room has been assigned to the guest. Alternatively, an individual room may not yet be assigned. When an individual room is not yet assigned, the type or nature of the room (along with the corresponding collection of remotely controllable devices) may be determined from the reservation, and as such, the baseline configuration associated there with a be determined.

[00122] At 706, the host service 24 and/or terminal 44 obtain the baseline configuration and IR command codes associated with the room (or type of room) to which the guest has been assigned. Optionally, the host service 24 and/or terminal 44 may also obtain one or more user configurations associated with the user. The user configuration may be pushed to the host service 24 or terminal 44 from the SD 10 along with the user ID (at 702). Additionally or alternatively, the user configuration may be obtained from record saved in the data storage 15, local memory on an LBU 20 or data store 46, such as in a user account associated with the present guest.

[00123] At 708, one or more IR command sets are conveyed (e.g. by the host service 24 or terminal 44) to the LBU within the room assigned to the user/guest and/or the SD of the guest. The IR command sets are associated with RCDs in the room assigned to the user/guest.

[00124] At 710, the host service 24 and/or terminal 44 convey the baseline configuration to the local base unit in the room assigned to the user/guest. At 702, the user configuration may also be conveyed to the local base unit. Additionally or alternatively, the baseline and user configurations may be conveyed to the SD 10 carried by the user/guest.

[00125] At 712, the settings for the environmental parameters are conveyed to the corresponding RCDs. For example, the local base unit 20 in the room may convey the settings for the environmental parameters to each RCD, through a combination of the wireless network and through infrared transmission. Additionally or alternatively, the SD may transmit the settings for the environmental parameters to the RCDs. The SD may transmit the settings through the wireless network and/or through infrared transmission, via the local base unit.

[00126] It is recognized that the operations in Figure 7 may be performed in alternative orders and by various combinations of the host service 24, terminal 44, local base unit 20 and SD 10. For example, the host service 24 and/or terminal 44 may convey the settings associated with the baseline configuration directly to RCDs over a wireless communications link. As a further option, the host service 24 and/or terminal 44 may convey IR codes or IR commands directly to the local base unit 20, in response to which the local base unit 20 transmits IR codes to the corresponding local RCDs.

Ancillary Services

[00127] Next, the discussion turns to optional ancillary services that may be integrated within the GEC apps 16 to improve the guest experience at a lodging establishment 40. For example, business and vacation travelers may desire access to various services and information associated with the lodging establishment, as well as the general surrounding area. For example, guest may desire to order out for food delivery to restaurants within the lodging establishment, as well as third-party restaurants that offer delivery service. As another example, guest may desire to schedule activities within an area, such as ordering a cab or shuttle (e.g. to the airport, to a business meeting, etc.),

scheduling sightseeing tours, scheduling family activities, making meal reservations, and the like. As yet further examples, the guest may desire additional information about services made available through the lodging establishment, such as spa treatments, gymnasium and pool hours, happy hours, customer appreciation events, coupons, and the like.

[00128] Figure 8A illustrates example screenshots that may be presented on the SD 10 in connection with ordering delivery from a restaurant in accordance with an embodiment herein. In Figure 8A, the "Order Out" tab 566 (Figure 5A) is selected from the GEC app 16. In response thereto, the GEC app 16 present a restaurant selection window 810. The restaurant selection window includes various selection criteria 812 that may be utilized to select the restaurant, such as the type of food, the cost, the number of recommendations received by the restaurant and the like. When a user chooses a selection criteria 12, one or more associated restaurants are listed by the GEC app 16 in restaurant listing area 814. Additional information may be presented about each restaurant. When the user selects a restaurant, a menu window 820 may be presented, listing the items available on the menu for the corresponding restaurant, as well as the price, pictures, reviews and the like associated with each item. Once the user completes in order, the GEC app 16 may present a payment window 822 in which the user is prompted for different types of payment. For example, the user may choose to pay upon delivery, pay by credit card on file within the system, have the cost of the meal charge to their room and the like. It is recognized that additional screens and functionality may be provided in accordance with existing online food and beverage ordering services.

[00129] Figure 8B illustrates a process carried out in connection with completing an order for food delivery. At 830, the GEC app 16 steps through various screens, windows and functionality to present different food option content to the user. At 832, the GEC app 16 received the completed order for food products as well as the payment information. At 834, the GEC app 16 conveys the food order and payment information to the corresponding restaurant. At 834, the GEC app 16 also includes information

identifying the hotel and room to which the food is to be delivered, as well as a name or other identification information for the user placing the order. In accordance with the foregoing process, the GEC app 16 enables users to place orders for food to be delivered in a very easy and efficient manner. Optionally, the process of Figure 8B and the windows illustrated in Figure 8A be implemented in accordance with other services in addition to ordering carryout food. For example, a similar process may be implemented in connection with placing reservations at restaurants, ordering airport shuttles, ordering taxis, setting up sightseeing tours or other entertainment activities, ordering tickets to events and the like.

[00130] Figure 9 illustrates a method for managing a lodging establishment environment in accordance with embodiments herein. At 902, the method configures a remotely controllable device (RCD) to manage a parameter associated with an environment for the designated guest space. Optionally, a local base unit (LBU) to be provided in the designated guest space and configuring the LBU to communicate with the RCD.

[00131] At 904, the method receives an occupancy indicator indicative of at least one of an occupancy state for the designated guest space, or a relative position of a portable device to be carried by a user. The portable device may present an SD 10, or a less complex portable device that includes less functionality than a smart handheld device. At 906, the method generates an instruction for the RCD to adjust the parameter associated with the designated guest space in response to the occupancy indicator. For example, the instruction may direct the RCD to set the parameter to the baseline setting when the occupancy indicator indicates an unoccupied state. The instruction may direct the RCD to set the parameter to the user preference setting when the occupancy indicator indicates an occupied state. The instruction may direct the RCD to change at least one of a temperature or lighting for the designated guest space. As explained herein, the method maintains a baseline configuration that defines a baseline setting for the parameter of the RCD, and a user configuration that defines a user preference setting for the parameter for

the environment. The instruction may be generated based on the baseline and/or user preference settings.

[00132] Figure 10 illustrates a method for managing a lodging establishment environment. At 1002, the method configures a local base unit (LBU) to wirelessly communicate with a remotely controllable device (RCD) within a designated guest space to manage a parameter associated with an environment for the designated guest space. At 1004, the method establishing a wireless communications link between the LBU and a smart handheld device (SD). At 1006, the method transmits an instruction from the SD to the LBU. The instruction indicates a user preference setting for the parameter managed by the RCD. At 1008, the method conveys parameter change data from the LBU to the RCD in response to the instruction. The embodiments herein utilizing the RCD to manage the environment for the designated guest space based on the user preference setting for the parameter. When the RCD represents at least one of a lighting control, an alarm clock and a thermostat control, the user preference setting change at least one of a lighting, alarm setting and thermostat. When the RCD represents an audio/video device, embodiments herein provide remote control of the audio/video device through the SD and LBU.

[00133] The methods described herein may implement various techniques for analyzing the program information and viewing behavior related information, including but not limited to the techniques described in US Patent App. Pub. 2013/0061259 A1, titled Dynamic user interface rendering based on usage analytics data in a media content distribution system; US Patent App. Pub. 2013/006912 A1, titled Streaming-Content Analytics; USP 8549550 B2, titled Method and apparatus for passively monitoring online video viewing and viewer behavior; US Patent App. Pub. 2012/0304209 A1, titled System and method to increase efficiency and speed of analytics report generation in audience measurement systems; USP 8577996 B2, titled Method and apparatus for tracing users of online video web sites; USP 8457475 B2, titled Systems and methods for interactive program guides with personal video recording features; and US Patent App.

Pub. 2013/0014137 A1, titled User impression media analytics platform apparatuses and systems, all of which the complete subject matter is expressly incorporated herein by reference in their entireties.

[00134] Figure 11 illustrates a system to share and transfer configuration and remote control settings between one or more LBU 1120 and physical remote control devices 1122. The physical remote control device 1122 may represent a conventional remote control designed for, and sold with, an electronic device (e.g. television, audio/video equipment, ceiling fan, etc.). Optionally, the remote control device 1122 may represent a universal remote control that is configured to be used with numerous electronic devices. The electronic device and related remote control device 1122 may already be utilized within a space, before installation of the LBU 1120 and other components described herein. For example, the system of Figure 11 may be installed in a hotel/motel, assisted living center, hospital, or other lodging establishment after pre-existing electronic devices (and remote controls 1122) have already been installed and utilized for some time. Hence, an individual user may or may not already be familiar with the conventional operations offered by the physical remote control.

[00135] In the example of Figure 11, configuration file 1130s are maintained in a storage location, such as a cloud storage device 1115, on memory of the LBU 1120, on an enterprise server 13 or elsewhere. The LBU 1120 communicates with one or more SD 1110, the cloud storage device 1115 and the physical remote control 1122. In connection with certain implementations, a technician, manager or owner of a lodging establishment, or other individual or entity may wish to support control over electronic devices in the space/environment with a combination of one or more physical remote controls 1122 along with mobile applications (running on SD 1110). The system of Figure 11 provides users (e.g., guests, patients, elderly residents) access to basic control options through the physical remotes or through the SD 1110. In addition to basic control, the SD 1110 provides programmable interactive and detailed control options.

[00136] In accordance with some embodiments, the LBU 1120 acts as an intermediary to provide programmable functions that are activated by the selection of one or more keys/inputs on the physical remote control 1122. When a user enters a designated key or input on the remote control 1122, the LBU 1120 performs a corresponding programmed specific function. The remote control 1122 may continue to communicate directly with a remotely controlled device (e.g. television, stereo, fan), while in addition also directly communicating with the LBU 1120 over a wireless (e.g., Bluetooth) or infrared communications link.

[00137] The configuration files 1130 saved on the remote storage device 1115 may be varied from one another in connection with different environments or portions of one environment. For example, every room at a particular lodging establishment, or every apartment in an assisted living center may be given a common configuration. Alternatively, different types of rooms or apartments may be configured differently based upon the layout, the types of electronic devices therein, as well as the overall environment desired (e.g. a basic setup, a highly integrated set up, etc.). The LBU 1120 enables individual buttons or keys on the remote control 1122 to be defined in connection with different functions based upon the particular circumstances and environment. For instance, one environment (e.g., physical property, facility, floor, type of room set up) may be configured such that a button on the remote control 1122 controls lighting, whereas another environment may be configured such that the same button controls the television.

[00138] Embodiments herein allow flexible and automatic programming based on the remote cloud configuration specific to a particular environment. During implementation, the BLU 1120 can retrieve the appropriate remote configuration file 1130 by using a configuration ID that corresponds to a unique address for the file. The configuration ID can be saved in or entered directly to the LBU 1120. Optionally, the configuration ID can be entered by a user via a SD 1110. The configuration file 1130 in the remote storage 1115 will contain button mapping data to map select functions to

individual buttons/keys on the remote control 1122. The buttons/keys assigned to the LBU 1120 may represent special function keys. When a user selects a special function key on the remote control 1122, the remote control 1122 transmits a corresponding configuration ID signal or code. The LBU 1120 detects the configuration ID signal or code and references a locally stored copy of a current configuration file 1130 (now stored in the LBU 1120). Based on the local copy of the configuration file 1130, the LBU 1120 performs one or more functions, which includes conveying one or more commands to an associated remote control device. In the foregoing manner, the LBU 1120 converts the physical remote control button presses to the desired command associated with that button press and sends the command(s) to the appropriate remotely controlled device(s).

[00139] Figure 12 illustrates a system configured to remotely configure LBUs in connection with select environments. Figure 12 illustrates an enterprise server 1213 that communicates with a data storage 1215. The data storage 1215 stores configuration files 1216. Each configuration file has a unique identifier stored there with. The enterprise server 1213 communicates over the Internet 1203 with various lodging environment control systems 1202 (corresponding to the control system 2 described in more detail in connection with Figure 1) to develop, maintain and store configuration files associated with different guest spaces. As explained herein, each guest space within a lodging establishment may have an LBU installed therein. In accordance with the embodiment of Figure 12, one or more LBU is self-configurable for the particular guest space layout and combination of electronic devices within the guest space. The configuration files 1216 are developed to correspond to different types of lodging establishments, different space layouts, different overall environments and the like.

[00140] For example, one set of configuration files 1216 may be developed for a chain of hotels, where each configuration file is associated with a different room layout and different combination of remotely controllable devices offered by the hotel chain. For example, one hotel chain may have a set number of room layouts and certain combinations of electronic devices installed therein. Accordingly, a set of configuration

files may be defined for use with each of the available room layouts and possible electronic device combinations (e.g the audiovisual equipment, lighting configurations and type of lighting, HVAC system, switches). A different hotel chain will have different room layouts and electronic device combinations, which may also be utilized to establish a corresponding unique set of configuration files.

[00141] The enterprise server 1213 maintains, updates and provides access to various configuration files in connection with different lodging establishment control systems associated with different lodging establishments. For example, to maintain or update configuration files, a hotel chain, hospital or assisted living facility may provide a description of the various room layouts and electronic device combinations, in response to which corresponding configuration files may be defined at the enterprise server 1213. Optionally, one or more configurations may be defined on site at a hotel, hospital or assisted living facility. Once the configurations are defined, the configurations may be passed over the Internet from the control system 1202 to the enterprise server 213 for storage in the data storage 1215.

[00142] Another set of configuration files 1216 may be defined in connection with an elderly care facility, also with each configuration file corresponding to a particular type of room, particular combination of remotely controllable devices, and the like. Different configuration files may also be defined in connection with different types of users. For example, frequent travelers who are familiar with the overall system, may have a corresponding type of configuration file for an experienced traveler. As another example, different configuration files may be defined in connection with the needs of different types of elderly individuals. For example, guest spaces 8 (e.g., apartments, nursing home rooms) that are used by elderly individuals who are hard of hearing may be set up with one type of configuration file, while guest spaces 8 for individuals, who have poor eyesight, are physically handicapped, are wheelchair-bound, are unable to speak, and the like, are set up with a different configuration file.

[00143] During installation, the LBU 1220 is installed and turned on. A unique code (e.g., a configuration ID) may be entered through an SD or otherwise. Optionally, the LBU 1220 may have the unique code stored thereon. For example, the code may simply represent a number. Optionally, the code may identify the guest space, such as by designating a hotel chain, a room type, and one or more of the remotely controlled devices provided in the room. The LBU 1220 sends a request for a configuration file with a corresponding unique code through the control system 1202 over the Internet 1203 to access the enterprise server 1213. The enterprise server 1213 receives the request and uses the unique code to identify which configuration file is being requested. The enterprise server 1213 then returns the corresponding configuration file to the LBU.

TERMINOLOGY

[00144] The terms "IR code", and "IR pulse sequence" are used interchangeably throughout.

[00145] The terms "cloud" or "cloud computing" represent a model for delivering information technology services in which resources are retrieved from the Internet through web-based tools and applications, rather than a direct connection to a server and in which data and software packages are stored in one or more servers interconnected over the Internet.

[00146] The terms "audio/video" and "A/V" are not limited to content or devices that include both audio and video, but instead shall mean any audio only device, combined audio and video device, video only device, any audio only content, combined audio and video content, and video only content.

[00147] The term "audio/visual equipment" is used throughout this disclosure, and is intended to describe any audio and/or visual equipment for delivering audio and/or visual images to a user. Such equipment may include, merely by way of example, a television, image projection device, stereo, audio and/or visual receiver, satellite television receiver, cable television receiver, digital video recorder, digital video disc

(DVD) player/recorder, Blue-ray™ Disc player/recorder, video cassette player/recorder, entertainment device, multimedia or other computer, streaming media device, multimedia or other tablet, multimedia or other handheld device, multimedia or other personal data assistant, and/or multimedia or other mobile phone.

[00148] The transmitter may include any device that transmits signals remotely to audio/visual equipment. Merely by way of example, such transmitters may include RF transmission antennas/devices, infrared transmission devices, and/or any other non-wired data transmission device. The transmitter may transmit data representative of user input received by the input device, such that the audio/video equipment may act on such directions when received.

[00149] The transmitter may include any device that transmits signals remotely to audio/visual equipment. Merely by way of example, such transmitters may include RF transmission antennas/devices, infrared transmission devices, and/or any other non-wired data transmission device. The transmitter may transmit data representative of user input received by the input device, such that the audio/video equipment may act on such directions when received.

[00150] While the embodiments described herein refer to the BlueTooth and WiFi networks and protocols, it is understood that any network or protocol may be used therein including, but not limited to, 802.11a/b/g/n (WiFi); IEEE 1901, 1905 (Power line Networks); SONET; as well as Device to Device networks such as Wireless USB; Zigbee; Bluetooth; Wireless HD; as well as Mobile Networks such as LTE, GSM, HSPA, 2G/3G/4G and the like.

[00151] While the embodiments described herein relate to remote control of audio and/or video devices, optionally the LBUs, SDs, and GEC apps described herein may be used to describe any device that is remotely controllable through an IR pulse sequence. For example, the RC devices may include home appliances, heating and ventilation air conditioning systems, home security systems, door locks, window locks and the like.

[00152] It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-described embodiments (and/or aspects thereof) may be used in combination with each other. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from its scope. While the dimensions, types of materials and coatings described herein are intended to define the parameters of the embodiments, they are by no means limiting and are exemplary embodiments. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. In the appended claims, the terms "including" and "in which" are used as the plain-English equivalents of the respective terms "comprising" and "wherein." Moreover, in the following claims, the terms "first," "second," and "third," etc. are used merely as labels, and are not intended to impose numerical requirements on their objects. Further, the limitations of the following claims are not written in means - plus-function format and are not intended to be interpreted based on 35 U.S.C. § 112(f) unless and until such claim limitations expressly use the phrase "means for" followed by a statement of function void of further structure.

CLAIMS

WHAT IS CLAIMED IS:

1. A system for managing a lodging establishment environment based on guest specific preferences, the system comprising:

a local base unit to be positioned within a designated guest space, the local base unit comprising a communications interface to communicate with a remotely controllable device (RCD) within the designated guest space, the RCD managing a parameter associated with an environment for the designated guest space, the local base unit comprising at least one transceiver configured to maintain a wireless link with a smart handheld device (SD);

a processor;

a data store storing program instructions accessible by the processor;

wherein, responsive to execution of the program instructions, the processor is configured to:

receive a setting for the parameter;

generate an instruction for the remotely controllable device to adjust the parameter associated with the designated guest space based on the setting.

2. The system of claim 1, wherein the processor is provided within the LBU and the setting is received from the SD, the setting representing a user preference setting for the parameter.

3. The system of claim 1 wherein the processor is further configured to receive an occupancy indicator indicative of at least one of an occupancy state for the designated guest space, or a relative position of a portable device to be carried by a user, the processor generating the setting based on the occupancy indicator.

4. The system of claim 1, wherein the processor and data store are provided within at least one of the SD or the local base unit.

5. The system of claim 3, further comprising a detector located within the designated guest space, the detector sensing a presence of the guest and in response thereto, conveying the occupancy indicator to the processor.

6. The system of claim 1, wherein the detector includes a motion detector located in the designated guest space, the motion detector generating an un-occupied indicator when a lack of motion is sensed, the processor changing the instruction based on the un-occupied indicator.

7. The system of claim 1, further comprising one or more remotely controllable devices that represent at least one of entertainment equipment, a lighting control, a thermostat, a radio, a clock, or a water temperature control.

8. The system of claim 1, wherein the processor is further configured to receive an exit indicator, indicating that the guest is outside of a select proximity and in response thereto, the processor generating the instruction to change the parameter of the remotely controllable device to a reference baseline setting.

9. The system of claim 1, further comprising a remote enterprise server to track a location of the SD and generate the occupancy indicator when the SD is tracked to be within a predetermined distance of the designated guest space.

10. The system of claim 7, wherein the enterprise server conveys an exit indicator to a local computer to enable management of services related to the designated guest space.

11. The system of claim 1, wherein the processor monitors a presence of the SD through the link with the transceiver of the local base unit, wherein, when the processor no longer detects the presence of the SD, the processor generates the instruction to change the parameter.

12. A method for managing a lodging establishment environment, the method comprising:

configuring a remotely controllable device (RCD) to manage a parameter associated with an environment for the designated guest space;

receiving an occupancy indicator indicative of at least one of an occupancy state for the designated guest space, or a relative position of a portable device to be carried by a user; and

generating an instruction for the RCD to adjust the parameter associated with the designated guest space in response to the occupancy indicator.

13. The method of claim 12, further comprising configuring a local base unit (LBU) to be provided in the designated guest space and configuring the LBU to communicate with the RCD.

14. The method of claim 12, wherein the instruction directs the RCD to change at least one of a temperature or lighting for the designated guest space.

15. The method of claim 12, further comprising maintaining a baseline configuration that defines a baseline setting for the parameter of the RCD, and a user configuration that defines a user preference setting for the parameter for the environment.

16. The method of claim 15, wherein the instruction directs the RCD to set the parameter to the baseline setting when the occupancy indicator indicates an unoccupied state, and the instruction directs the RCD to set the parameter to the user preference setting when the occupancy indicator indicates an occupied state.

17. A method for managing a lodging establishment environment, the method comprising:

configuring a local base unit (LBU) to wirelessly communicate with a remotely controllable device (RCD) within a designated guest space to manage a parameter associated with an environment for the designated guest space;

establishing a wireless link between the LBU and a smart handheld device (SD);

transmitting an instruction from the SD to the LBU, the instruction indicating a user preference setting for the parameter managed by the RCD; and

conveying parameter change data from the LBU to the RCD in response to the instruction.

18. The method of claim 17, further comprising utilizing the RCD to manage the environment for the designated guest space based on the user preference setting for the parameter.

19. The method of claim 17, wherein the RCD represents at least one of a lighting control, an alarm clock and a thermostat control, the user preference setting changing at least one of a lighting, alarm setting and thermostat.

20. The method of claim 17, wherein the RCD represents an audio/video device, the method further comprising providing remote control of the audio/video device through the SD and LBU.

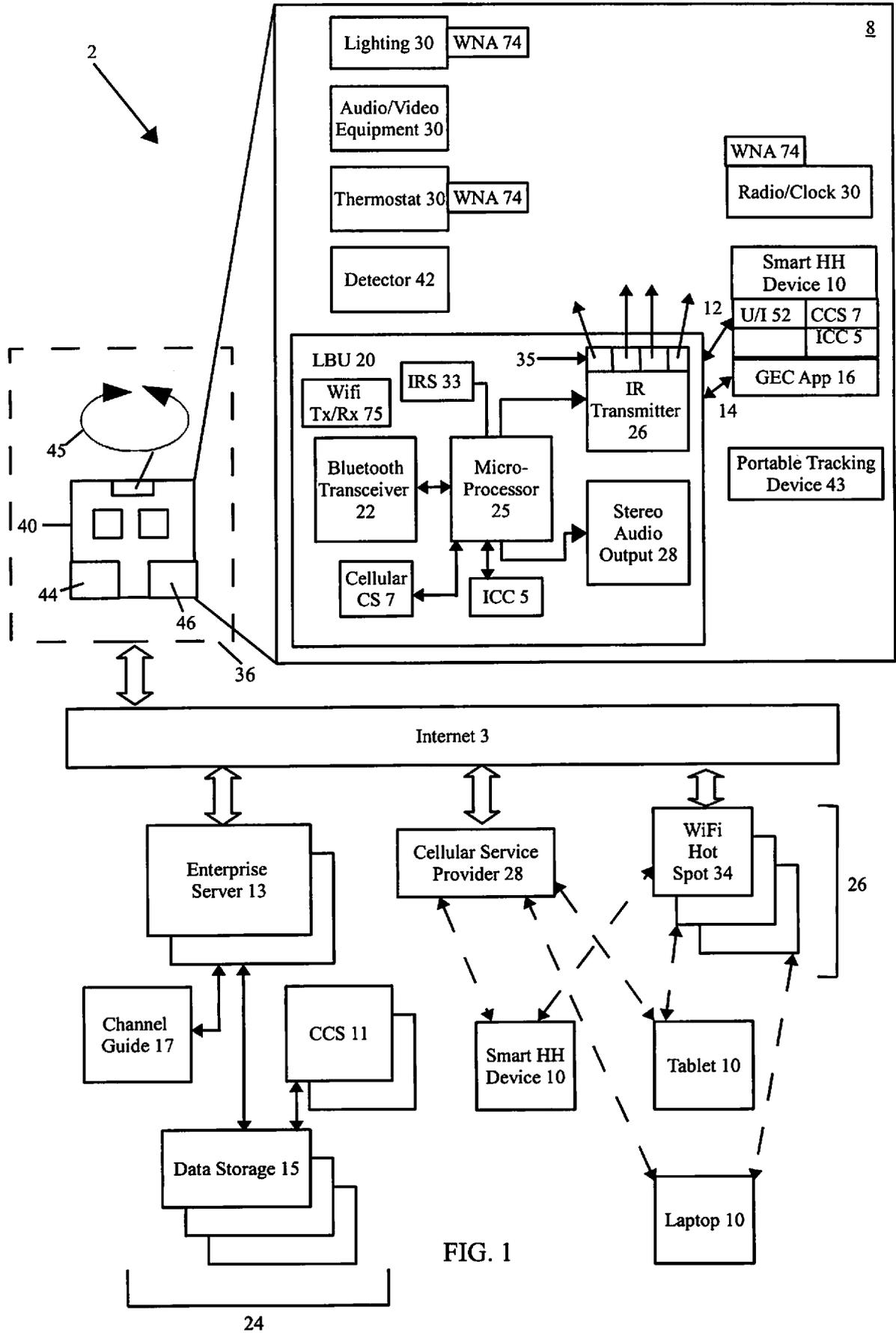


FIG. 1

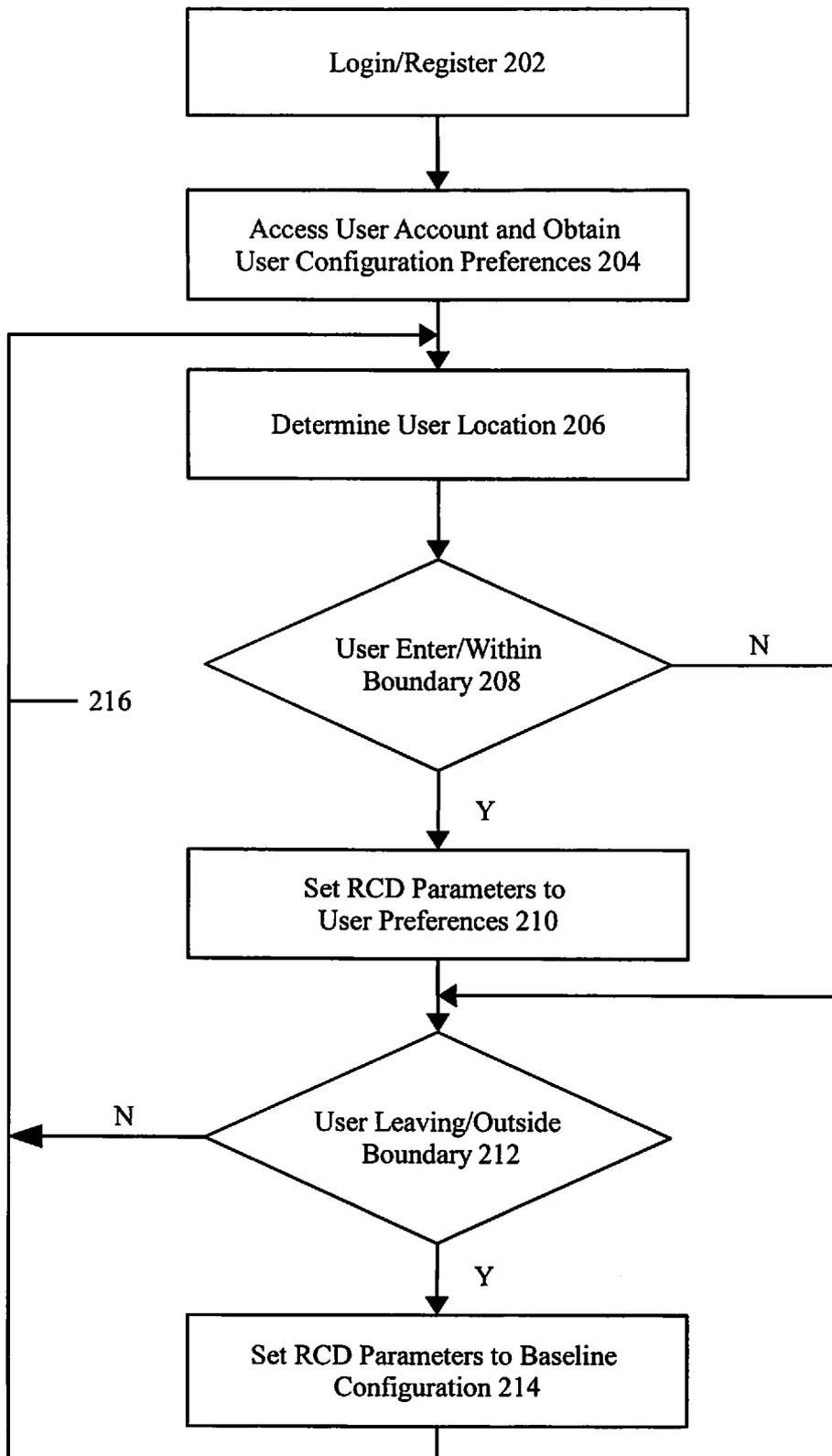


FIG. 2

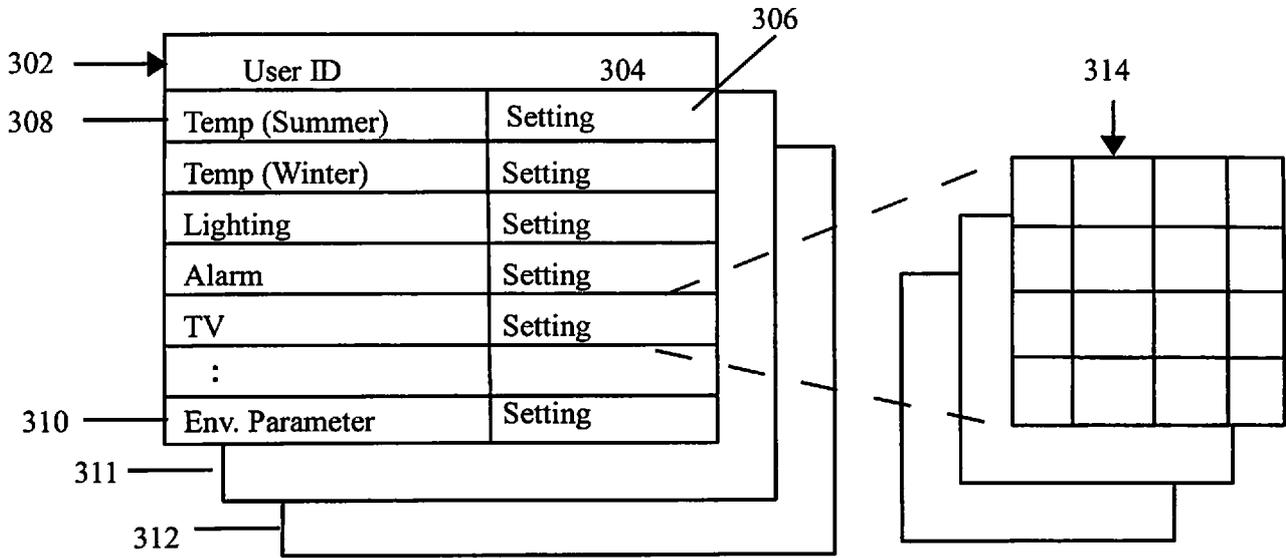


FIG. 3

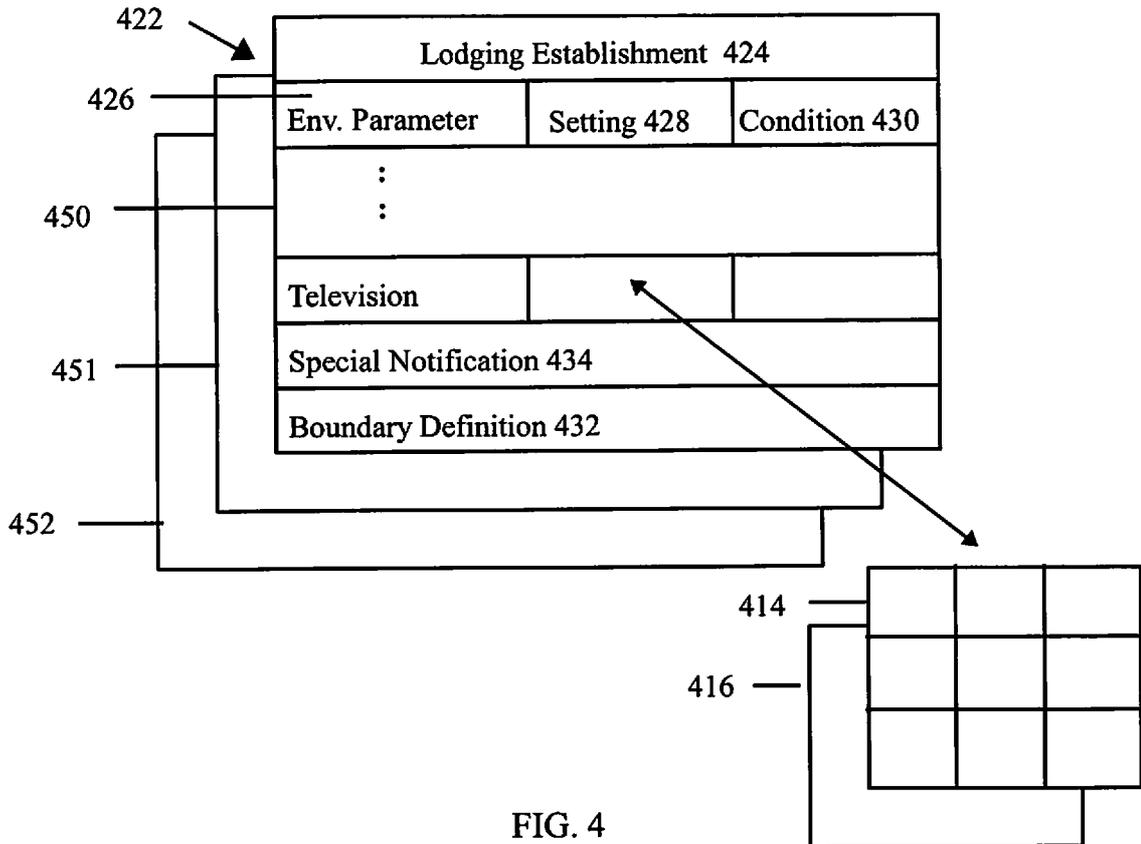


FIG. 4

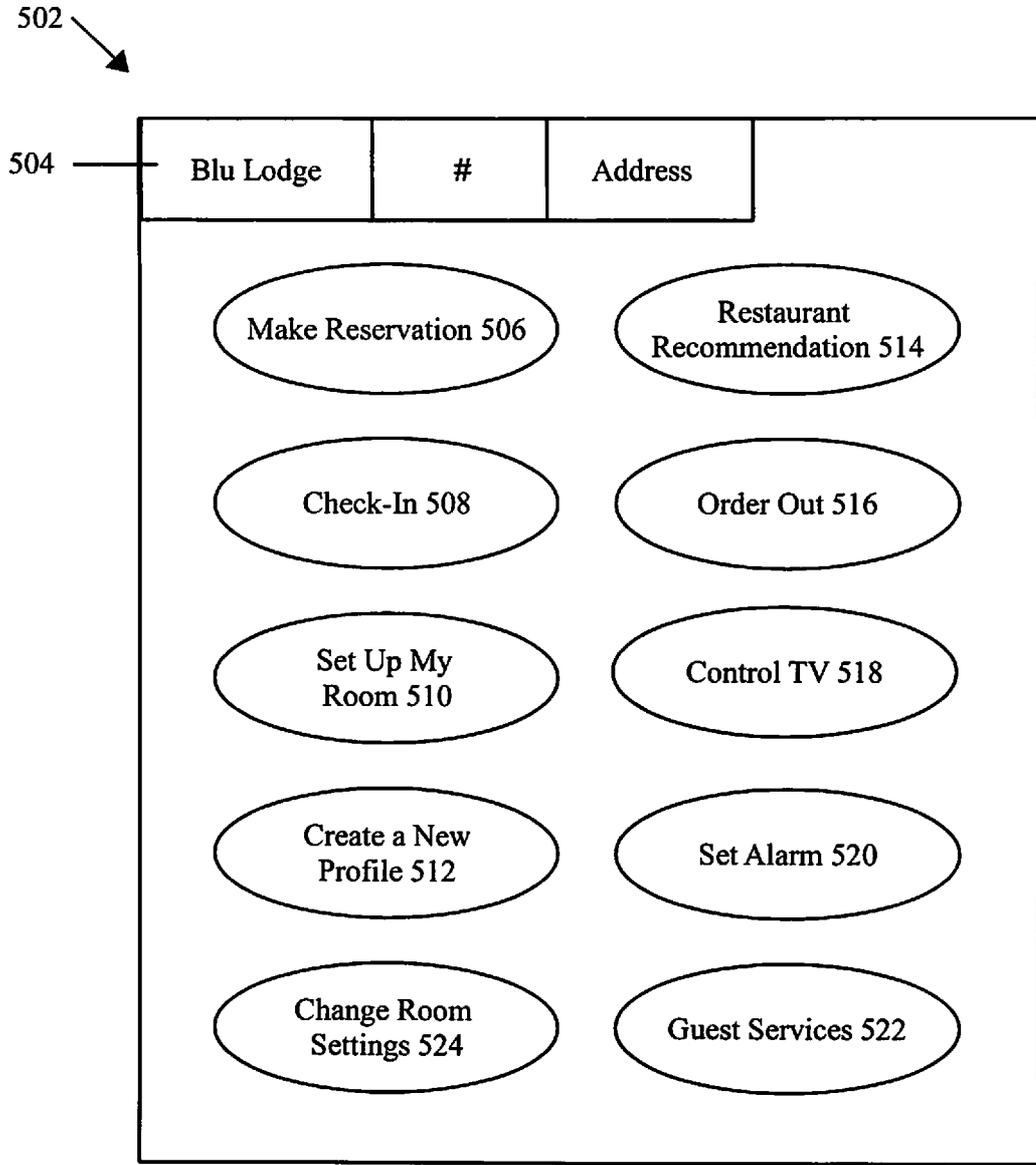


FIG. 5A

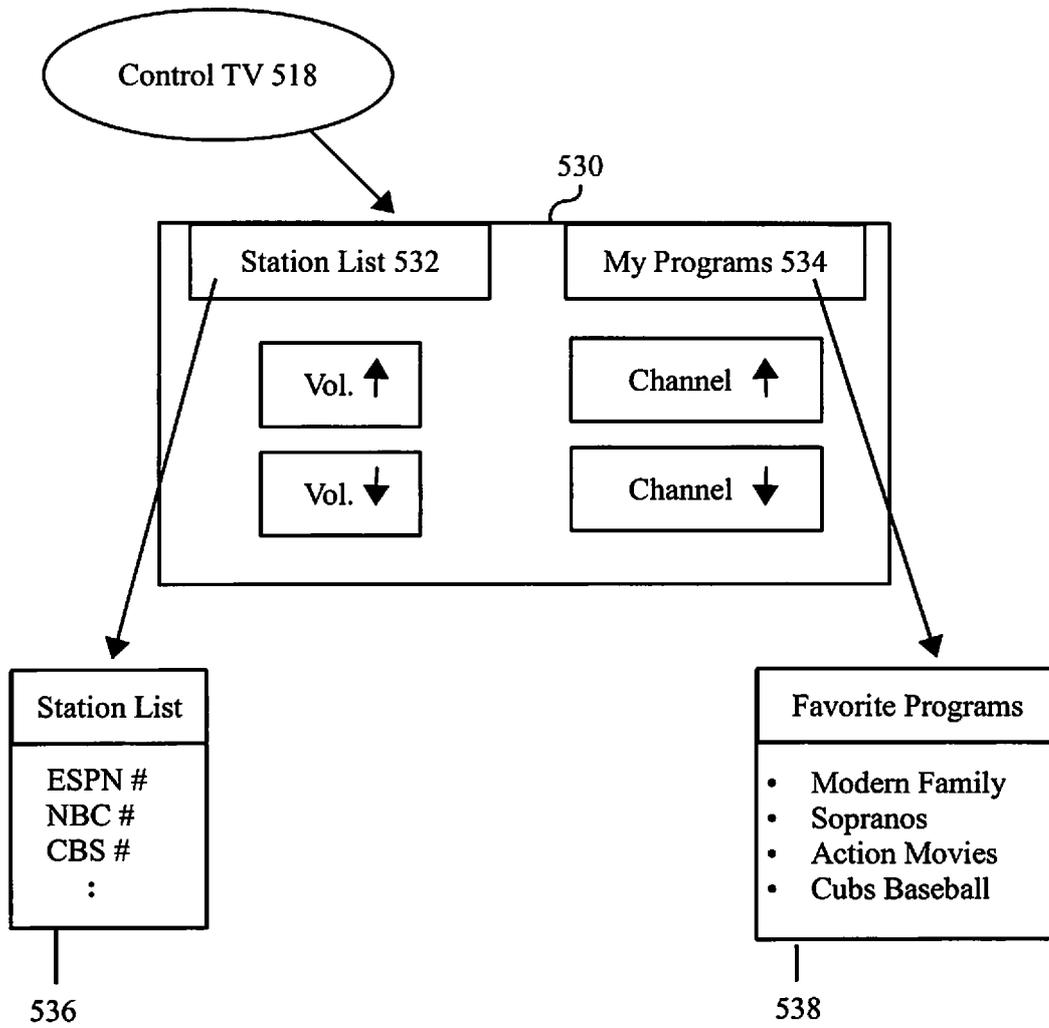


FIG. 5B

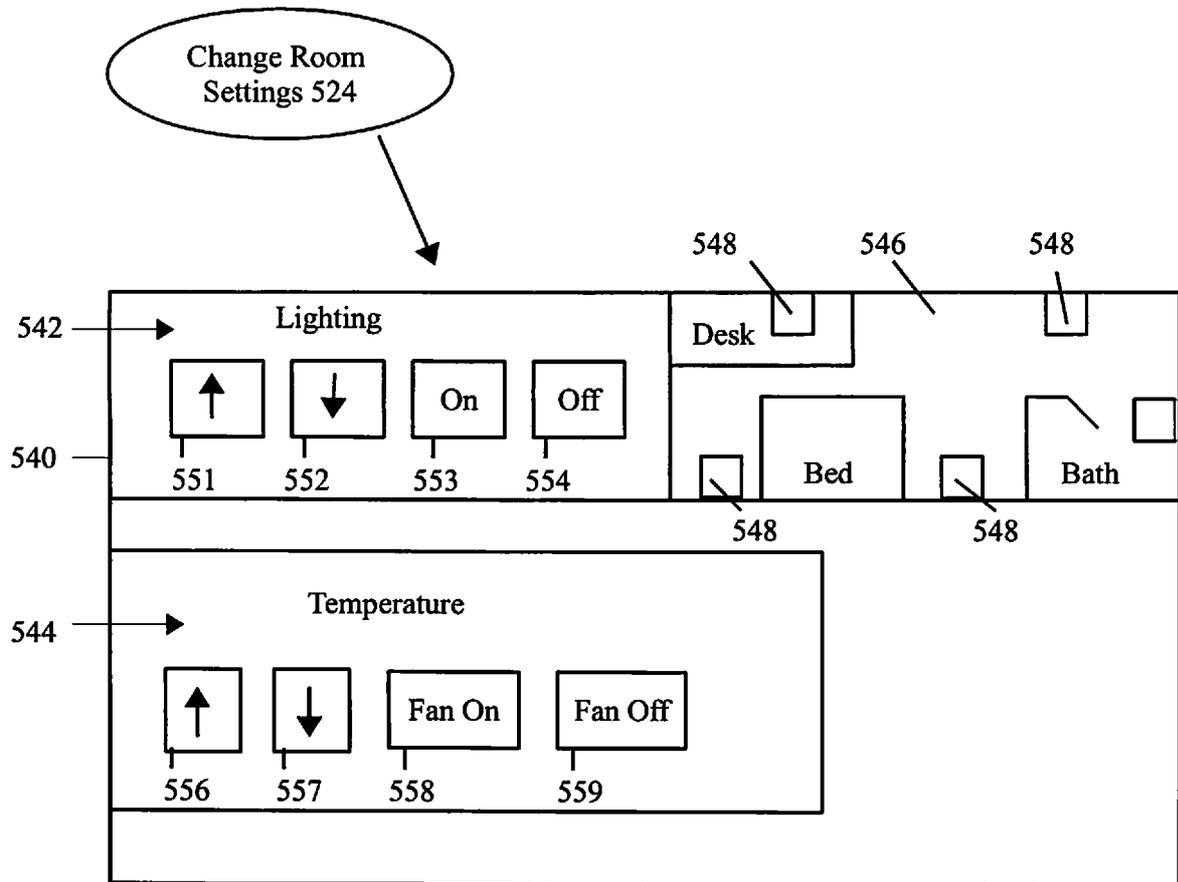


FIG. 5C

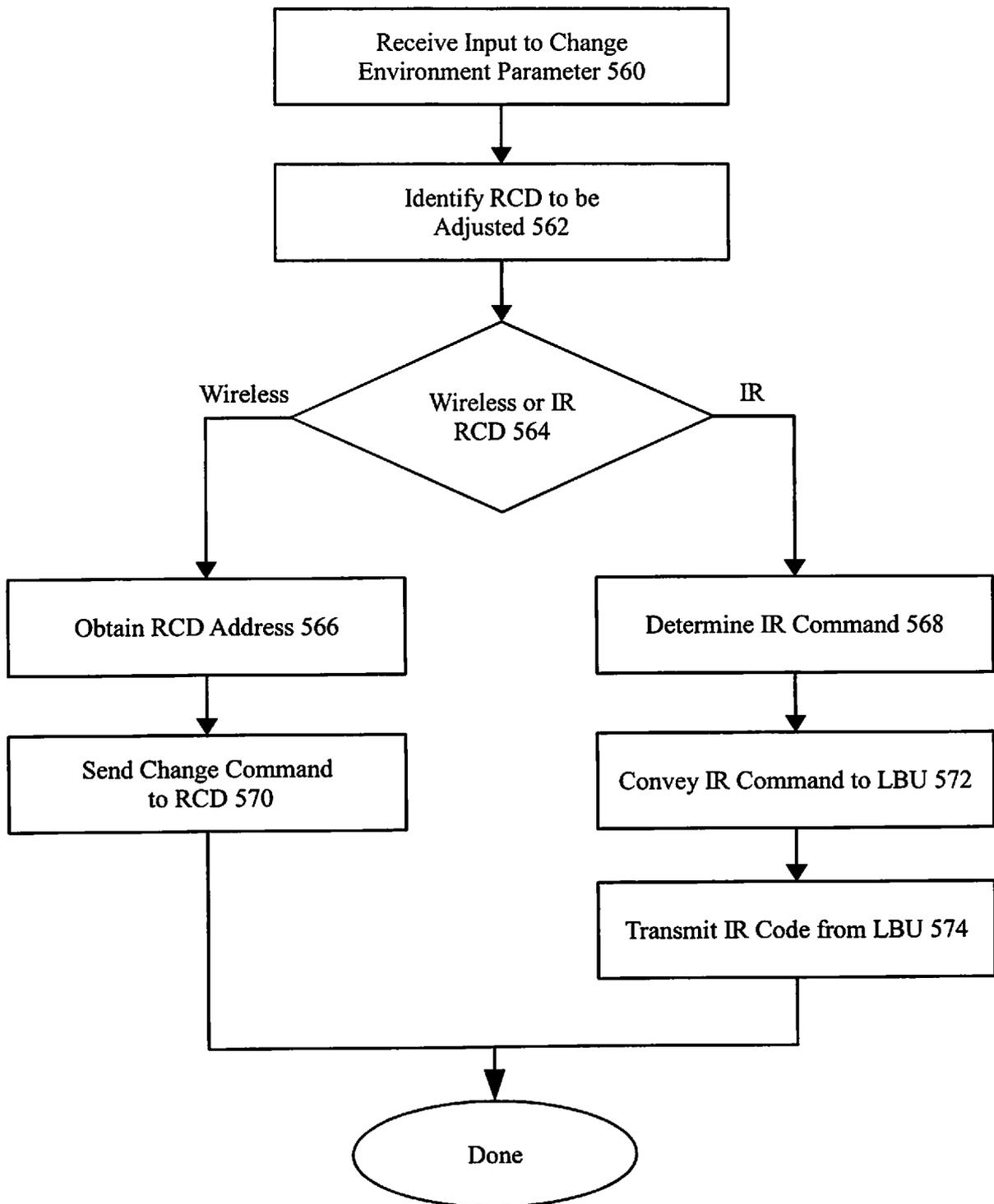


FIG. 5D

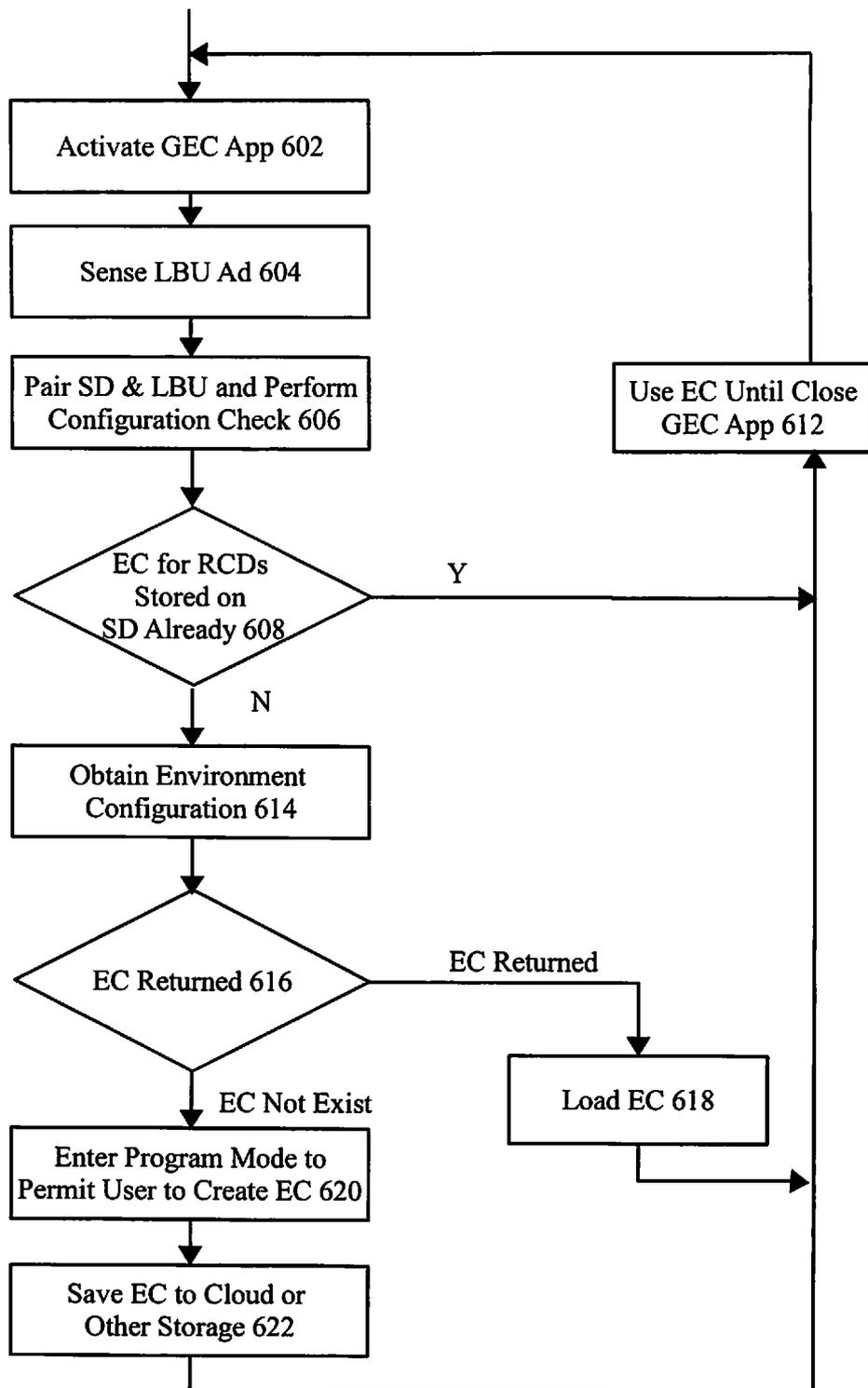


FIG. 6

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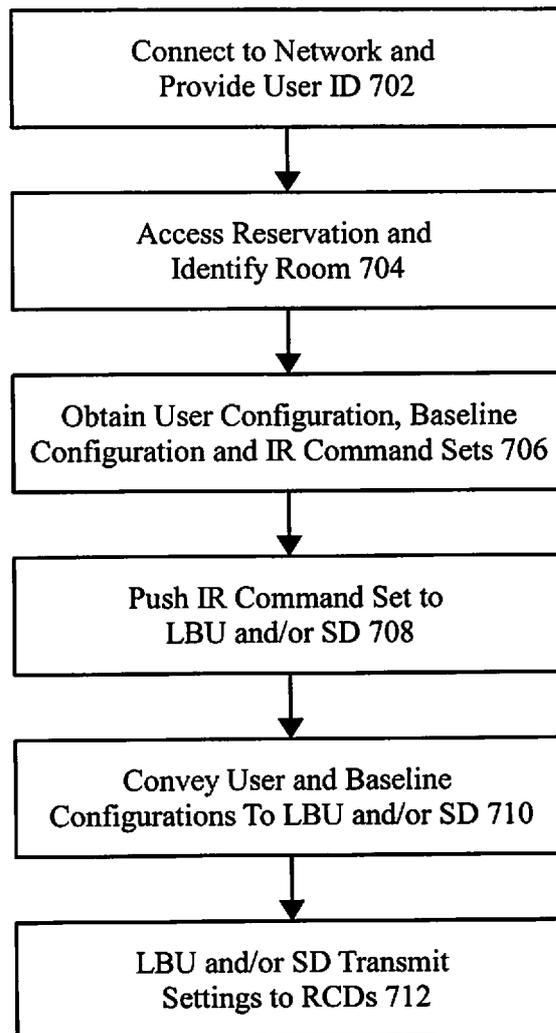


FIG. 7

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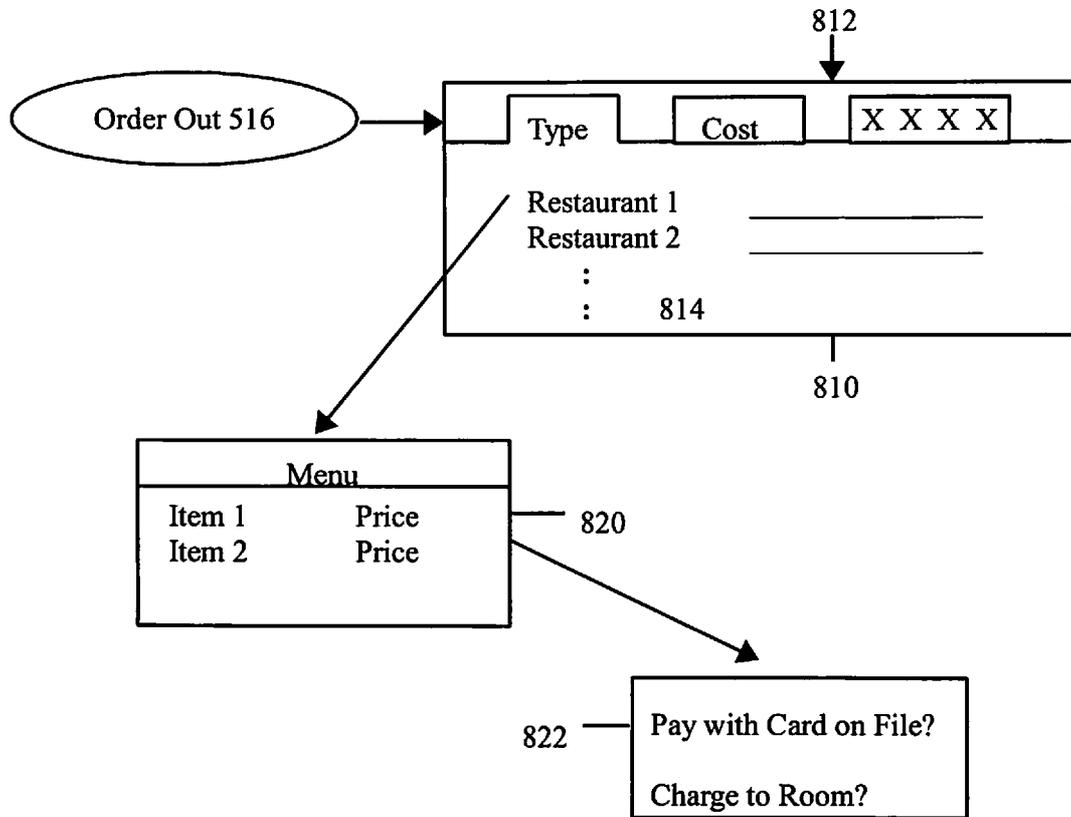


FIG. 8A

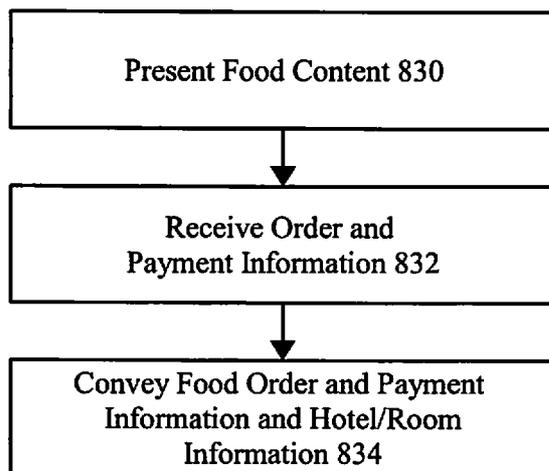


FIG. 8B

11/12

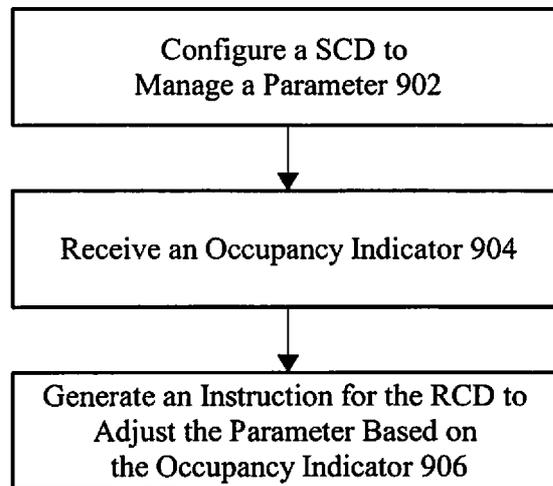


FIG. 9

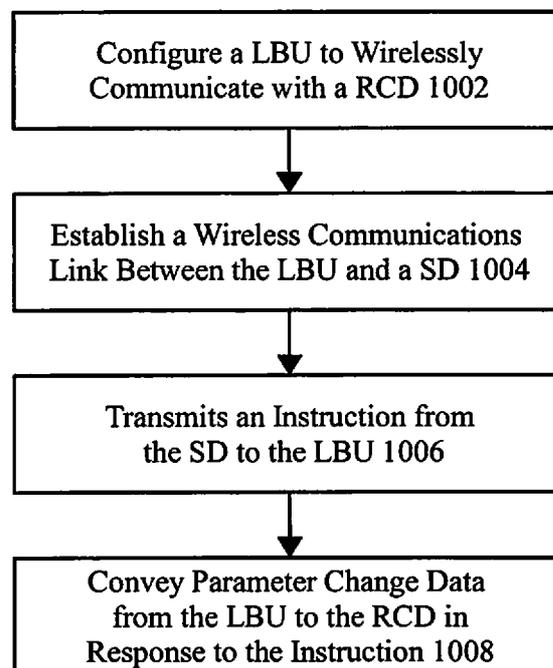


FIG. 10

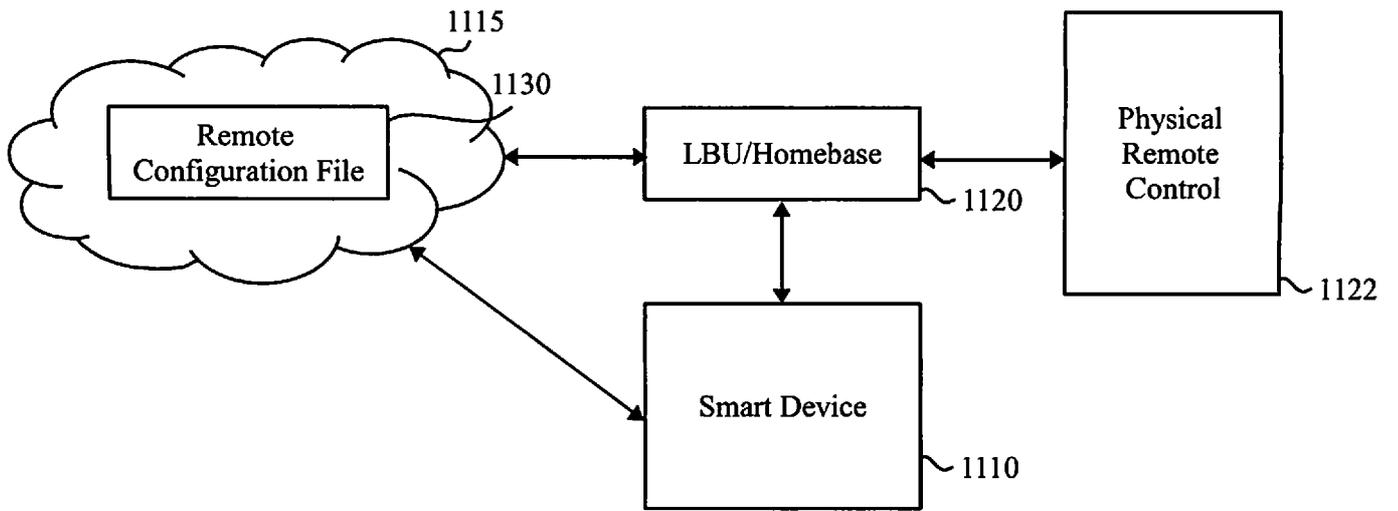


FIG. 11

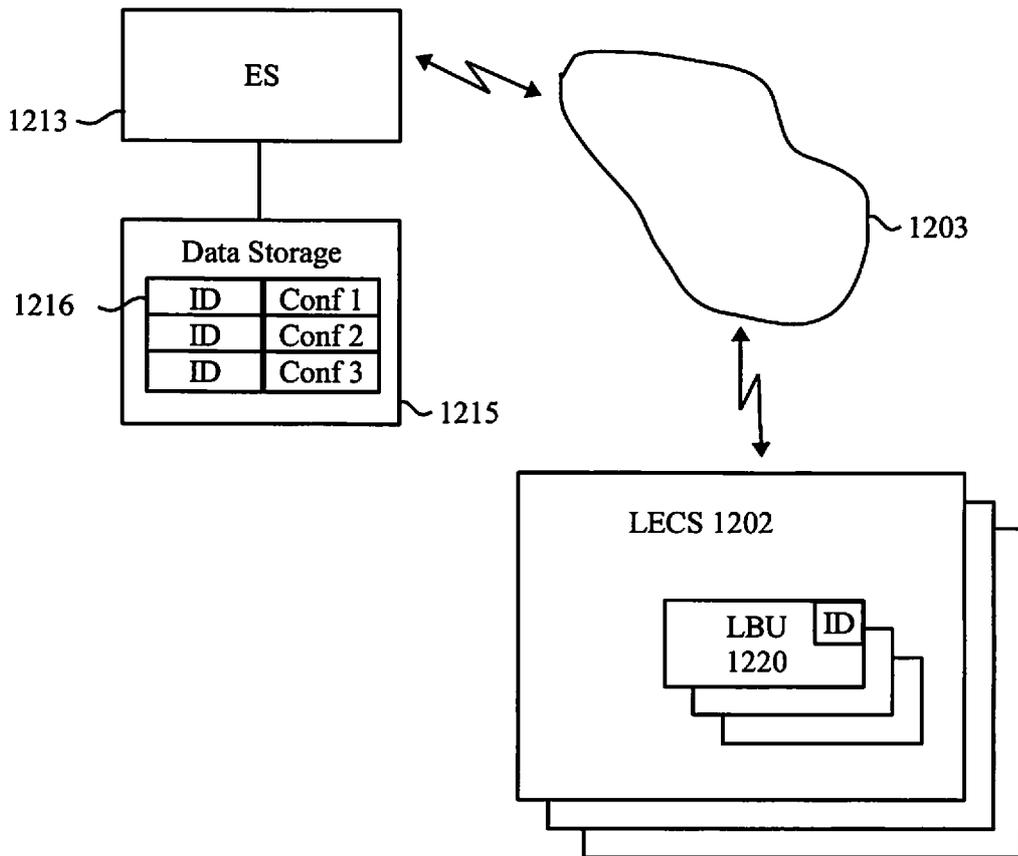


FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 16/32248

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - G08B 1/08 (2016.01) CPC - G08B25/10, B60R25/102, H04L29/08567, A61B5/0002, A61B5/1 113 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) IPC(8): G08B 1/08 (2016.01); CPC: G08B25/10, B60R25/102, H04L29/08567, A61B5/0002, A61B5/1 113 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC: 340/539.14, 340/539.1 1, 340/539.17, 340/4.3, 340/3.1 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PatBase, ProQuest Dialog, Google Web, Google Patents (Search terms: remote controllable device, motion, occupancy, unoccupied, exit, detect, adjust parameter, base unit, smart handheld, indicator, lack motion, entertainment, light, thermostat, radio, clock, alarm, water, temperature, enterprise server, reference baseline, user preference, etc.)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2015/0042447 A1 (Vogt et al.) 12 February 2015 (12.02.2015), para. [0028]-[0029], [0031]-[0034], [0038], [0058], [0077], [0093], [01 17], [01 19]-[0120], and [0122], and Figs. 1 and 10, and claim 1.	1-2, 4, 7, 17-18, 20 ----- 3, 5-6, 8-1 1, 19
X --- Y	US 2014/0266669 A1 (Fadell et al.) 18 September 2014 (18.09.2014), para. [0028], [0031], [0038], [0066], [0074], [0080], and [01 16], and Figs. 1 and 11.	12-16 ----- 3, 5-6, 8-1 1, 19
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
Date of the actual completion of the international search	Date of mailing of the international search report	
18 July 2016	18 AUG 2016	
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774	