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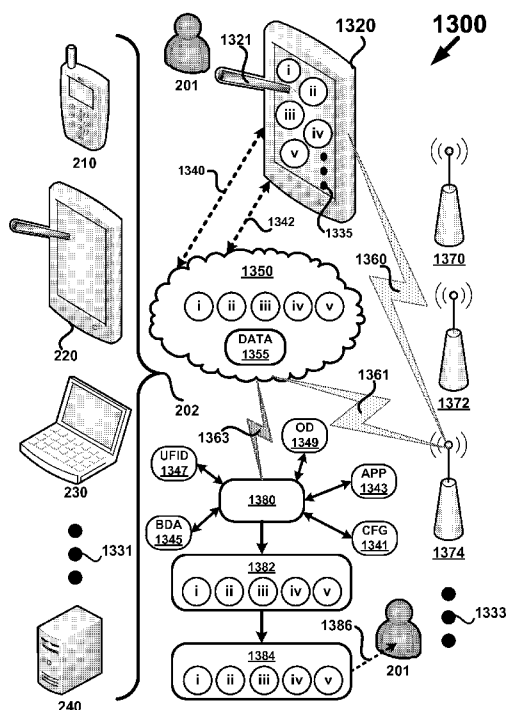
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(54) **Title:** CLOUD-BASED MEDIA DEVICE CONFIGURATION AND ECOSYSTEM SETUP

FIG. 13

(57) **Abstract:** Embodiments relate generally to electrical and electronic hardware, computer software, wired and wireless network communications, and portable and wearable media devices. Media devices may include a plurality of RF transceivers and an audio system. The RF transceivers and/or audio system may be used to wirelessly communicate between media devices and allow configuration and other data to be wirelessly transmitted from one media device to another media device. A user device may be used to Bluetooth® (BT) pair with a media device and to install a configuration on the media device. Other media devices may be configured using the configuration without breaking the BT pairing and without the other media device having to BT pair with the user device. Each media device may include at least one antenna and may include an antenna that is detunable.

CLOUD-BASED MEDIA DEVICE CONFIGURATION AND ECOSYSTEM SETUP

FIELD

Embodiments of the present application relate generally to electrical and electronic hardware, computer software, wired and wireless network communications, wearable, hand held, and portable computing devices for facilitating communication of information. More specifically, disclosed are an ecosystem of wirelessly interconnected media devices that configure and communicate with one another with no or minimal interaction from a user or a user's devices.

BACKGROUND

Conventional paradigms for media devices that wirelessly connect with and communicate with each other and/or a user device (e.g., a tablet or smartphone) typically require the user to configure each media device added to the users system of media devices. For example, Bluetooth® (BT) devices require the user to place a media device in BT pairing mode and a user device in BT discover mode. When the user device detects the BT radio of the media device, the two devices may "pair" with each other. Sometimes, a code must be entered before pairing may occur. After the devices are paired they may wirelessly communicate with each other and depending on the BT protocols, exchange data and control. Typically, when the user adds another BT device, the pairing between the user device and the prior BT device must be broken and the user must pair his/her device with the newly added BT device. For media devices that use other forms of wireless communications, such as WiFi, the process of adding and configuring devices may be more complicated. The user usually has to configure each new media device with information about the wireless network the device will communicate over, such as wireless network name, password, etc. Each wireless device added to the users system may be aware of the wireless network and other entities that are connected with the network; however, many of those devices may not be configured to work well with one another without effort on part of the user to make inter-operability possible.

Ideally, a user ought to be able to configure a first media device easily and with minimal effort on part of the user. Subsequently, as new media devices are added, previously configured media devices recognize newly added media devices and act on behalf of the user to configure the newly added devices. As an ecosystem of the user's media devices continues to grow (e.g., new and or different media devices are added), media devices in that ecosystem ideally will wirelessly interact with one another to manage device configuration and manage shifting roles of

each device by dynamically re-configuring/re-tasking devices as needed to make one or more devices serve a new roles according to the user's needs.

Thus, there is a need for devices, systems, methods, and software that allow a user to configure (e.g., wirelessly) a first media device and leverage that configuration with future media devices automatically or with minimal user intervention.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments or examples ("examples") of the present application are disclosed in the following detailed description and the accompanying drawings. The drawings are not necessarily to scale:

FIG. 1 depicts a block diagram of one example of a media device according to an embodiment of the present application;

FIG. 2A depicts one example of a configuration scenario for a user device and a media device according to an embodiment of the present application;

FIG. 2B depicts example scenarios for another media device being configured using a configuration from a previously configured media device according to an embodiment of the present application;

FIG. 3 depicts one example of a flow diagram of a process for installing an application on a user device and configuring a first media device using the application according to an embodiment of the present application;

FIGS. 4A and 4B depict example flow diagrams for processes for configuring an un-configured media device according to embodiments of the present application;

FIGS. 5A through 5D depict block diagrams of a plurality of media devices communicating over an Ad Hoc WiFi network and configuring un-configured media devices using the Ad Hoc WiFi network according to an embodiment of the present application;

FIGS. 6A through 6C depict block diagrams of a plurality of media devices wirelessly communicating using acoustic transducers to transmit and receive data respectively according to an embodiment of the present application;

FIGS. 7A – 7C depict block diagrams of a plurality of media devices communicating over an Ad Hoc WiFi network with at least some of the plurality of media devices communicating acoustically using transducers to transmit and receive data respectively according to an embodiment of the present application;

FIGS. 7D – 7E depict block diagrams of a plurality of media devices communicating over a wireless network with at least some of the plurality of media devices communicating

optically using an optical transceiver to optically transmit and receive data respectively according to an embodiment of the present application;

FIGS. 8A through 8B depict block diagrams of media devices including an antenna configured to be de-tuned according to an embodiment of the present application;

5 FIG. 9 depicts a flow diagram of one example of cloud-based configuration of media devices via a user purchase from an on-line seller according to an embodiment of the present application;

FIG. 10 depicts a flow diagram of another example of cloud-based configuration of media devices via a user purchase from a retailer according to an embodiment of the present application;

FIG. 11 depicts a flow diagram of one example of cloud-based configuration of one or more media devices with a unique family ID according to an embodiment of the present application;

FIG. 12 depicts a flow diagram of one example of cloud-based configuration of one or more media devices with a unique Bluetooth® Device Address (BDA) according to an embodiment of the present application;

FIG. 13 depicts one example of a diagram for media device purchase, cloud-based configuration, and media device delivery according to an embodiment of the present application; and

FIG. 14 depicts one example of a diagram for verifying configuration and wireless connectivity of delivered media devices according to an embodiment of the present application.

DETAILED DESCRIPTION

Various embodiments or examples may be implemented in numerous ways, including as a system, a process, a method, an apparatus, a user interface, or a series of program instructions on a non-transitory computer readable medium such as a computer readable storage medium or a computer network where the program instructions are sent over optical, electronic, or wireless communication links. In general, operations of disclosed processes may be performed in an arbitrary order, unless otherwise provided in the claims.

A detailed description of one or more examples is provided below along with accompanying figures. The detailed description is provided in connection with such examples, but is not limited to any particular example. The scope is limited only by the claims and numerous alternatives, modifications, and equivalents are encompassed. Numerous specific details are set forth in the following description in order to provide a thorough understanding.

These details are provided for the purpose of example and the described techniques may be practiced according to the claims without some or all of these specific details. For clarity, technical material that is known in the technical fields related to the examples has not been described in detail to avoid unnecessarily obscuring the description.

5 FIG. 1 depicts a block diagram of one embodiment of a media device 100 having systems including but not limited to a controller 101, a data storage (DS) system 103, a input/output (I/O) system 105, a radio frequency (RF) system 107, an audio/video (A/V) system 109, a power system 111, and a proximity sensing (PROX) system 113. A bus 110 enables electrical communication between the controller 101, DS system 103, I/O system 105, RF system 107, AV system 109, power system 111, and PROX system 113. Power bus 112 supplies electrical power from power system 111 to the controller 101, DS system 103, I/O system 105, RF system 107, AV system 109, and PROX system 113.

Power system 111 may include a power source internal to the media device 100 such as a battery (e.g., AAA or AA batteries) or a rechargeable battery (e.g., such as a lithium ion or nickel metal hydride type battery, etc.) denoted as BAT 135. Power system 111 may be electrically coupled with a port 114 for connecting an external power source (not shown) such as a power supply that connects with an external AC or DC power source. Examples include but are not limited to a wall wart type of power supply that converts AC power to DC power or AC power to AC power at a different voltage level. In other examples, port 114 may be a connector (e.g., an IEC connector) for a power cord that plugs into an AC outlet or other type of connector, such as a universal serial bus (USB) connector. Power system 111 provides DC power for the various systems of media device 100. Power system 111 may convert AC or DC power into a form usable by the various systems of media device 100. Power system 111 may provide the same or different voltages to the various systems of media device 100. In applications where a rechargeable battery is used for BAT 135, the external power source may be used to power the power system 111, recharge BAT 135, or both. Further, power system 111 on its own or under control or controller 101 may be configured for power management to reduce power consumption of media device 100, by for example, reducing or disconnecting power from one or more of the systems in media device 100 when those systems are not in use or are placed in a standby or idle mode. Power system 111 may also be configured to monitor power usage of the various systems in media device 100 and to report that usage to other systems in media device 100 and/or to other devices (e.g., including other media devices 100) using one or more of the I/O system 105, RF system 107, and AV system 109, for example. Operation and control of the

various functions of power system 111 may be externally controlled by other devices (e.g., including other media devices 100).

Controller 101 controls operation of media device 100 and may include a non-transitory computer readable medium, such as executable program code to enable control and operation of the various systems of media device 100. DS 103 may be used to store executable code used by controller 101 in one or more data storage mediums such as ROM, RAM, SRAM, RAM, SSD, Flash, etc., for example. Controller 101 may include but is not limited to one or more of a microprocessor (μ P), a microcontroller (μ P), a digital signal processor (DSP), a baseband processor, an application specific integrated circuit (ASIC), just to name a few. Processors used for controller 101 may include a single core or multiple cores (e.g., dual core, quad core, etc.). Port 116 may be used to electrically couple controller 101 to an external device (not shown).

DS system 103 may include but is not limited to non-volatile memory (e.g., Flash memory), SRAM, DRAM, ROM, SSD, just to name a few. In that the media device 100 in some applications is designed to be compact, portable, or to have a small size footprint, memory in DS 103 will typically be solid state memory (e.g., no moving or rotating components); however, in some application a hard disk drive (HDD) or hybrid HDD may be used for all or some of the memory in DS 103. In some examples, DS 103 may be electrically coupled with a port 128 for connecting an external memory source (e.g., USB Flash drive, SD, SDHC, SDXC, microSD, Memory Stick, CF, SSD, etc.). Port 128 may be a USB or mini USB port for a Flash drive or a card slot for a Flash memory card. In some examples as will be explained in greater detail below, DS 103 includes data storage for configuration data, denoted as CFG 125, used by controller 101 to control operation of media device 100 and its various systems. DS 103 may include memory designate for use by other systems in media device 100 (e.g., MAC addresses for WiFi 130, network passwords, data for settings and parameters for A/V 109, and other data for operation and/or control of media device 100, etc.). DS 103 may also store data used as an operating system (OS) for controller 101. If controller 101 includes a DSP, then DS 103 may store data, algorithms, program code, an OS, etc. for use by the DSP, for example. In some examples, one or more systems in media device 100 may include their own data storage systems.

I/O system 105 may be used to control input and output operations between the various systems of media device 100 via bus 110 and between systems external to media device 100 via port 118. Port 118 may be a connector (e.g., USB, HDMI, Ethernet, fiber optic, Toslink, Firewire, IEEE 1394, or other) or a hard wired (e.g., captive) connection that facilitates coupling I/O system 105 with external systems. In some examples port 118 may include one or more

switches, buttons, or the like, used to control functions of the media device 100 such as a power switch, a standby power mode switch, a button for wireless pairing, an audio muting button, an audio volume control, an audio mute button, a button for connecting/disconnecting from a WiFi network, an infrared (IR) transceiver, just to name a few. I/O system 105 may also control

5 indicator lights, audible signals, or the like (not shown) that give status information about the media device 100, such as a light to indicate the media device 100 is powered up, a light to indicate the media device 100 is in wireless communication (e.g., WiFi, Bluetooth®, WiMAX, cellular, etc.), a light to indicate the media device 100 is Bluetooth® paired, in Bluetooth® pairing mode, Bluetooth® communication is enabled, a light to indicate the audio and/or

10 microphone is muted, just to name a few. Audible signals may be generated by the I/O system 105 or via the AV system 107 to indicate status, etc. of the media device 100. Audible signals may be used to announce Bluetooth® status, powering up or down the media device 100, muting the audio or microphone, an incoming phone call, a new message such as a text, email, or SMS, just to name a few. In some examples, I/O system 105 may use optical technology to wirelessly

15 communicate with other media devices 100 or other devices. Examples include but are not limited to infrared (IR) transmitters, receivers, transceivers, an IR LED, and an IR detector, just to name a few. I/O system 105 may include an optical transceiver OPT 185 that includes an optical transmitter 185t (e.g., an IR LED) and an optical receiver 185r (e.g., a photo diode). OPT 185 may include the circuitry necessary to drive the optical transmitter 185t with encoded signals

20 and to receive and decode signals received by the optical receiver 185r. Bus 110 may be used to communicate signals to and from OPT 185. OPT 185 may be used to transmit and receive IR commands consistent with those used by infrared remote controls used to control AV equipment, televisions, computers, and other types of systems and consumer electronics devices. The IR commands may be used to control and configure the media device 100, or the media device 100

25 may use the IR commands to configure/re-configure and control other media devices or other user devices, for example.

RF system 107 includes at least one RF antenna 124 that is electrically coupled with a plurality of radios (e.g., RF transceivers) including but not limited to a Bluetooth® (BT) transceiver 120, a WiFi transceiver 130 (e.g., for wireless communications over a wireless and/or

30 WiMAX network), and a proprietary Ad Hoc (AH) transceiver 140 pre-configured (e.g., at the factory) to wirelessly communicate with a proprietary Ad Hoc wireless network (AH-WiFi) (not shown). AH 140 and AH-WiFi are configured to allow wireless communications between similarly configured media devices (e.g., an ecosystem comprised of a plurality of similarly

configured media devices) as will be explained in greater detail below. RF system 107 may include more or fewer radios than depicted in FIG. 1 and the number and type of radios will be application dependent. Furthermore, radios in RF system 107 need not be transceivers, RF system 107 may include radios that transmit only or receive only, for example. Optionally, RF system 107 may include a radio 150 configured for RF communications using a proprietary format, frequency band, or other existent now or to be implemented in the future. Radio 150 may be used for cellular communications (e.g., 3G, 4G, or other), for example. Antenna 124 may be configured to be a de-tunable antenna such that it may be de-tuned 129 over a wide range of RF frequencies including but not limited to licensed bands, unlicensed bands, WiFi, WiMAX, cellular bands, Bluetooth®, from about 2.0GHz to about 6.0GHz range, and broadband, just to name a few. As will be discussed below, PROX system 113 may use the de-tuning 129 capabilities of antenna 124 to sense proximity of the user, other people, the relative locations of other media devices 100, just to name a few. Radio 150 (e.g., a transceiver) or other transceiver in RF 107, may be used in conjunction with the de-tuning capabilities of antenna 124 to sense proximity, to detect and or spatially locate other RF sources such as those from other media devices 100, devices of a user, just to name a few. RF system 107 may include a port 123 configured to connect the RF system 107 with an external component or system, such as an external RF antenna, for example. The transceivers depicted in FIG. 1 are non-limiting examples of the type of transceivers that may be included in RF system 107. RF system 107 may include a first transceiver configured to wirelessly communicate using a first protocol, a second transceiver configured to wirelessly communicate using a second protocol, a third transceiver configured to wirelessly communicate using a third protocol, and so on. One of the transceivers in RF system 107 may be configured for short range RF communications, such as within a range from about 1 meter to about 15 meters, or less, for example. Another one of the transceivers in RF system 107 may be configured for long range RF communications, such any range up to about 50 meters or more, for example. Short range RF may include Bluetooth®; whereas, long range RF may include WiFi, WiMAX, cellular, and Ad Hoc wireless, for example.

AV system 109 includes at least one audio transducer, such as a loud speaker 160, a microphone 170, or both. AV system 109 further includes circuitry such as amplifiers, preamplifiers, or the like as necessary to drive or process signals to/from the audio transducers. Optionally, AV system 109 may include a display (DISP) 180, video device (VID) 190 (e.g., an image captured device or a web CAM, etc.), or both. DISP 180 may be a display and/or touch screen (e.g., a LCD, OLED, or flat panel display) for displaying video media, information

relating to operation of media device 100, content available to or operated on by the media device 100, playlists for media, date and/or time of day, alpha-numeric text and characters, caller ID, file/directory information, a GUI, just to name a few. A port 122 may be used to electrically couple AV system 109 with an external device and/or external signals. Port 122 may be a USB, 5 HDMI, Firewire/IEEE-1394, 3.5 mm audio jack, or other. For example, port 122 may be a 3.5mm audio jack for connecting an external speaker, headphones, earphones, etc. for listening to audio content being processed by media device 100. As another example, port 122 may be a 3.5mm audio jack for connecting an external microphone or the audio output from an external device. In some examples, SPK 160 may include but is not limited to one or more active or 10 passive audio transducers such as woofers, concentric drivers, tweeters, super tweeters, midrange drivers, sub-woofers, passive radiators, just to name a few. MIC 170 may include one or more microphones and the one or more microphones may have any polar pattern suitable for the intended application including but not limited to omni-directional, directional, bi-directional, uni-directional, bi-polar, uni-polar, any variety of cardioid pattern, and shotgun, for example. 15 MIC 170 may be configured for mono, stereo, or other. MIC 170 may be configured to be responsive (e.g., generate an electrical signal in response to sound) to any frequency range including but not limited to ultrasonic, infrasonic, from about 20Hz to about 20kHz, and any range within or outside of human hearing. In some applications, the audio transducer of AV system 109 may serve dual roles as both a speaker and a microphone.

20 Circuitry in AV system 109 may include but is not limited to a digital-to-analog converter (DAC) and algorithms for decoding and playback of media files such as MP3, FLAC, AIFF, ALAC, WAV, MPEG, QuickTime, AVI, compressed media files, uncompressed media files, and lossless media files, just to name a few, for example. A DAC may be used by AV system 109 to decode wireless data from a user device or from any of the radios in RF system 25 107. AV system 109 may also include an analog-to-digital converter (ADC) for converting analog signals, from MIC 170 for example, into digital signals for processing by one or more system in media device 100.

Media device 100 may be used for a variety of applications including but not limited to wirelessly communicating with other wireless devices, other media devices 100, wireless 30 networks, and the like for playback of media (e.g., streaming content), such as audio, for example. The actual source for the media need not be located on a user's device (e.g., smart phone, MP3 player, iPod, iPhone, iPad, Android, laptop, PC, etc.). For example, media files to be played back on media device 100 may be located on the Internet, a web site, or in the cloud,

and media device 100 may access (e.g., over a WiFi network via WiFi 130) the files, process data in the files, and initiate playback of the media files. Media device 100 may access or store in its memory a playlist or favorites list and playback content listed in those lists. In some applications, media device 100 will store content (e.g., files) to be played back on the media device 100 or on another media device 100.

Media device 100 may include a housing, a chassis, an enclosure or the like, denoted in FIG. 1 as 199. The actual shape, configuration, dimensions, materials, features, design, ornamentation, aesthetics, and the like of housing 199 will be application dependent and a matter of design choice. Therefore, housing 199 need not have the rectangular form depicted in FIG. 1 or the shape, configuration etc., depicted in the Drawings of the present application. Nothing precludes housing 199 from comprising one or more structural elements, that is, the housing 199 may be comprised of several housings that form media device 100. Housing 199 may be configured to be worn, mounted, or otherwise connected to or carried by a human being. For example, housing 199 may be configured as a wristband, an earpiece, a headband, a headphone, a headset, an earphone, a hand held device, a portable device, a desktop device, just to name a few.

In other examples, housing 199 may be configured as speaker, a subwoofer, a conference call speaker, an intercom, a media playback device, just to name a few. If configured as a speaker, then the housing 199 may be configured as a variety of speaker types including but not limited to a left channel speaker, a right channel speaker, a center channel speaker, a left rear channel speaker, a right rear channel speaker, a subwoofer, a left channel surround speaker, a right channel surround speaker, a left channel height speaker, a right channel height speaker, any speaker in a 3.1, 5.1, 7.1, 9.1 or other surround sound format including those having two or more subwoofers or having two or more center channels, for example. In other examples, housing 199 may be configured to include a display (e.g., DISP 180) for viewing video, serving as a touch screen interface for a user, providing an interface for a GUI, for example.

PROX system 113 may include one or more sensors denoted as SEN 195 that are configured to sense 197 an environment 198 external to the housing 199 of media device 100. Using SEN 195 and/or other systems in media device 100 (e.g., antenna 124, SPK 160, MIC 170, etc.), PROX system 113 senses 197 an environment 198 that is external to the media device 100 (e.g., external to housing 199). PROX system 113 may be used to sense one or more of proximity of the user or other persons to the media device 100 or other media devices 100. PROX system 113 may use a variety of sensor technologies for SEN 195 including but not

limited to ultrasound, infrared (IR), passive infrared (PIR), optical, acoustic, vibration, light, ambient light sensor (ALS), IR proximity sensors, LED emitters and detectors, RGB LED's, RF, temperature, capacitive, capacitive touch, inductive, just to name a few. PROX system 113 may be configured to sense location of users or other persons, user devices, and other media devices
5 100, without limitation. Output signals from PROX system 113 may be used to configure media device 100 or other media devices 100, to re-configure and/or re-purpose media device 100 or other media devices 100 (e.g., change a role the media device 100 plays for the user, based on a user profile or configuration data), just to name a few. A plurality of media devices 100 in an eco-system of media devices 100 may collectively use their respective PROX system 113 and/or
10 other systems (e.g., RF 107, de-tunable antenna 124, AV 109, etc.) to accomplish tasks including but not limited to changing configuration, re-configuring one or more media devices, implement user specified configurations and/or profiles, insertion and/or removal of one or more media devices in an eco-system, just to name a few.

Simple Out-Of-The-Box User Experience

15 Attention is now directed to FIG. 2A, where a scenario 200a depicts one example of a media device (e.g., media device 100 of FIG. 1 or a similarly provisioned media device) being configured for the first time by a user 201. For purposes of explanation, in FIG. 2A media device is denoted as 100a to illustrate that it is the first time the media device 100a is being configured. For example, the first configuration of media device 100a may be after it is
20 purchased, acquired, borrowed, or otherwise by user 201, that is, the first time may be the initial out-of-the-box configuration of media device 100a when it is new. Scenario 200a depicts a desirable user experience for user 201 to achieve the objective of making the configuring of media device 100a as easy, straight forward, and fast as possible.

To that end, in FIG. 2A, scenario 200a may include media device 100a to be configured,
25 for example, initially by user 201 using a variety of devices 202 including but not limited to a smartphone 210, a tablet 220, a laptop computer 230, a desktop PC or server 240, ... etc. For purposes of simplifying explanation, the following description will focus on tablet 220, although the description may apply to any of the other devices 202 as well. Upon initial power up of media device 100a, controller 101 may command RF system 107 to electrically couple 224,
30 transceiver BT 120 with antenna 124, and command BT 120 to begin listening 126 for a BT pairing signal from device 220. Here, user 201 as part of the initialization process may have already used a Bluetooth® menu on tablet 220 to activate the BT radio and associated software in tablet 220 to begin searching (e.g., via RF) for a BT device to pair with. Pairing may require a

code (e.g., a PIN number or code) be entered by the user 201 for the device being paired with, and the user 201 may enter a specific code or a default code such as "0000", for example.

Subsequently, after tablet 220 and media device 100a have successfully BT paired with one another, the process of configuring media device 100a to service the specific needs of user 201 may begin. In some examples, after successful BT pairing, BT 120 need not be used for wireless communication between media device 100a and the user's device (e.g., tablet 220 or other). Controller 101, after a successful BT pairing, may command RF system 107 to electrically couple 228, WiFi 130 with antenna 124 and wireless communications between tablet 220 and media device 100a (see 260, 226) may occur over a wireless network (e.g., WiFi or WiMAX) or other as denoted by wireless access point 270. Post-pairing, tablet 220 requires a non-transitory computer readable medium that includes data and/or executable code to form a configuration (CFG) 125 for media device 100a. For purposes of explanation, the non-transitory computer readable medium will be denoted as an application (APP) 225. APP 225 resides on or is otherwise accessible by tablet 220 or media device 100a. User 201 uses APP 225 (e.g., through a GUI, menu, drop down boxes, or the like) to make selections that comprise the data and/or executable code in the CFG 125.

APP 225 may be obtained by tablet 220 in a variety of ways. In one example, the media device 100a includes instructions (e.g., on its packaging or in a user manual) for a website on the Internet 250 where the APP 225 may be downloaded. Tablet 220 may use its WiFi or Cellular RF systems to communicate with wireless access point 270 (e.g., a cell tower or wireless router) to connect 271 with the website and download APP 225 which is stored on tablet 220 as APP 225. In another example, tablet 220 may scan or otherwise image a bar code or TAG operative to connect the tablet 220 with a location (e.g., on the Internet 250) where the APP 225 may be found and downloaded. Tablet 220 may have access to an applications store such as Google Play for Android devices, the Apple App Store for iOS devices, or the Windows 8 App Store for Windows 8 devices. The APP 225 may then be downloaded from the app store. In yet another example, after pairing, media device 100a may be preconfigured to either provide (e.g., over the BT 120 or WiFi 130) an address or other location that is communicated to tablet 220 and the tablet 220 uses the information to locate and download the APP 225. In another example, media device 100a may be preloaded with one or more versions of APP 225 for use in different device operating systems (OS), such as one version for Android, another for iOS, and yet another for Windows 8, etc. In that OS versions and/or APP 225 are periodically updated, media device 100a may use its wireless systems (e.g., BT 120 or WiFi 130) to determine if the preloaded

versions are out of date and need to be replaced with newer versions, which the media device 100a obtains, downloads, and subsequently makes available for download to tablet 220.

Regardless of how the APP 225 is obtained, once the APP 225 is installed on any of the devices 202, the user 201 may use the APP 225 to select various options, commands, settings, etc. for CFG 125 according to the user's preferences, needs, media device ecosystem, etc., for example. After the user 201 finalizes the configuration process, CFG 125 is downloaded (e.g., using BT 120 or WiFi 130) into DS system 103 in media device 100a. Controller 101 may use the CFG 125 and/or other executable code to control operation of media device 100a. In FIG. 2A, the source for APP 225 may be obtained from a variety of locations including but not limited to: the Internet 250; a file or the like stored in the Cloud; a web site; a server farm; a FTP site; a drop box; an app store; a manufactures web site; or the like, just to name a few. APP 225 may be installed using other processes including but not limited to: dragging and dropping the appropriate file into a directory, folder, desktop or the like on tablet 220; emailing the APP 225 as an attachment, a compressed or ZIP file; cutting and pasting the App 225, just to name a few.

CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications, data for configuring subsequently purchased devices 100, data to access media for playback, just to name a few. By using the APP 225, user 201 may update CFG 125 as the needs of the user 201 change over time, that is, APP 225 may be used to re-configure an existing CFG 125. Furthermore, APP 225 may be configured to check for updates and to query the user 201 to accept the updates such that if an update is accepted an updated version of the APP 225 may be installed on tablet 220 or on any of the other devices 202. Although the previous discussion has focused on installing the APP 225 and CFG 125, one skilled in the art will appreciate that other data may be installed on devices 202 and/or media device 100a using the process described above. As one example, APP 225 or some other program may be used to perform software, firmware, or data updates on device 100a. DS system 103 on device 100a may include storage set aside for executable code (e.g., an operating system) and data used by controller 101 and/or the other systems depicted in FIG. 1.

Moving on to FIG. 2B, where a several example scenarios of how a previously configured media device 100a that includes CFG 125 may be used to configure another media device 100b that is initially un-configured. In scenario 200b, media device 100a is already powered up or is turned on (e.g., by user 201) or is otherwise activated such that its RF system 107 is operational. Accordingly, at stage 290a, media device 100a is powered up and configured

to detect RF signatures from other powered up media devices using its RF system 107. At stage 290b another media device denoted as 100b is introduced into RF proximity of media device 100a and is powered up so that its RF system 107 is operational and configured to detect RF signatures from other powered up media devices (e.g., signature of media device 100a). Here RF proximity broadly means within adequate signal strength range of the BT transceivers 120, WiFi transceivers 130, or any other transceivers in RF system 107, RF systems in the users devices (e.g., 202, 220), and other wireless devices such as wireless routers, WiFi networks (e.g., 270), WiMAX networks, and cellular networks, for example. Adequate signal strength range is any range that allows for reliable RF communications between wireless devices. For BT enabled devices, adequate signal strength range may be determined by the BT specification, but is subject to change as the BT specification and technology evolve. For example, adequate signal strength range for BT 120 may be approximately 10 meters (e.g., ~ 30 feet). For WiFi 130, adequate signal strength range may vary based on parameters such as distance from and signal strength of the wireless network, and structures that interfere with the WiFi signal. However, in most typical wireless systems adequate signal strength range is usually greater than 10 meters.

At stage 290b, media device 100b is powered up and at stage 290c its BT 120 and the BT 120 of media device 100a recognize each other. For example, each media device (100a, 100b) may be pre-configured (e.g., at the factory) to broadcast a unique RF signature or other wireless signature (e.g., acoustic) at power up and/or when it detects the unique signature of another device. The unique RF signature may include status information including but not limited to the configuration state of a media device. Each BT 120 may be configured to allow communications with and control by another media device based on the information in the unique RF signature. Accordingly, at the stage 290c, media device 100b transmits RF information that includes data that informs other listening BT 120's (e.g., BT 120 in 100a) that media device 100b is un-configured (e.g., has no CFG 125).

At stage 290d, media devices 100a and 100b negotiate the necessary protocols and/or handshakes that allow media device 100a to gain access to DS 103 of media device 100b. At stage 290e, media device 100b is ready to receive CFG 125 from media device 100a, and at stage 290f the CFG 125 from media device 100a is transmitted to media device 100b and is replicated (e.g., copied, written, etc.) in the DS 103 of media device 100b, such that media device 100b becomes a configured media device.

Data in CFG 125 may include information on wireless network 270, including but not limited to wireless network name, wireless password, MAC addresses of other media devices,

media specific configuration such as speaker type (e.g., left, right, center channel), audio mute, microphone mute, etc. Some configuration data may be subservient to other data or dominant to other data. After the stage 290f, media device 100a, media device 100b, and user device 220 may wirelessly communicate 291 with one another over wireless network 270 using the WiFi systems of user device 220 and WiFi 130 of media devices 100a and 100b.

APP 225 may be used to input the above data into CFG 125, for example using a GUI included with the APP 225. User 201 enters data and makes menu selections (e.g., on a touch screen display) that will become part of the data for the CFG 125. APP 225 may also be used to update and/or re-configure an existing CFG 125 on a configured media device. Subsequent to the update and/or re-configuring, other configured or un-configured media devices in the user's ecosystem may be updated and/or re-configured by a previously updated and/or re-configured media device as described herein, thereby relieving the user 201 from having to perform the update and/or re-configure on several media devices. The APP 225 or a location provided by the APP 225 may be used to specify playlists, media sources, file locations, and the like. APP 225 may be installed on more than one user device 202 and changes to APP 225 on one user device may later be replicated on the APP 225 on other user devices by a synchronizing or update process, for example. APP 225 may be stored on the internet or in the cloud and any changes to APP 225 may be implemented in versions of the APP 225 on various user devices 202 by merely activating the APP 225 on that device and the APP 225 initiates a query process to see if any updates to the APP are available, and if so, then the APP 225 updates itself to make the version on the user device current with the latest version.

Media devices 100a and 100b having their respective WiFi 130 enabled to communicate with wireless network 270, tablet 220, or other wireless devices of user 201. FIG. 2B includes an alternate scenario 200b that may be used to configure a newly added media device, that is, an un-configured media device (e.g., 100b). For example, at stage 290d, media device 100a, which is assumed to already have its WiFi 130 configured for communications with wireless network 270, transmits over its BT 120 the necessary information for media device 100b to join wireless network 270. After stage 290d, media device 100b, media device 100a, and tablet 220 are connected 291 to wireless network 270 and may communicate wirelessly with one another via network 270. Furthermore, at stage 290d, media device 100b is still in an un-configured state. Next, at stage 290e, APP 225 is active on tablet 220 and wirelessly accesses the status of media devices 100a and 100b. APP 225 determines that media device 100b is un-configured and APP 225 acts to configure 100b by harvesting CFG 125 (e.g., getting a copy of) from configured

media device 100a by wirelessly 293a obtaining CFG 125 from media device 100a and wirelessly 293b transmitting the harvested CFG 125 to media device 100b. Media device 100b uses its copy of CFG 125 to configure itself thereby placing it in a configured state.

After all the devices 220, 100a, 100b, are enabled for wireless communications with one another, FIG. 2B depicts yet another example scenario where after stage 290d, the APP 225 or any one of the media devices 100a, 100b, may access 295 the CFG 125 for media device 100b from an external location, such as the Internet, the cloud, etc. as denoted by 250 where a copy of CFG 125 may be located and accessed for download into media device 100b. APP 255, media device 100b, or media device 100a, may access the copy of CFG 125 from 250 and wirelessly install it on media device 100b.

In the example scenarios depicted in FIG. 2B, it should be noted that after the pairing of media device 100a and tablet 220 in FIG. 2A, the configuration of media device 100b in FIG. 2B did not require tablet 220 to use its BT features to pair with media device 100b to effectuate the configuration of media device 100b. Moreover, there was no need for the BT pairing between tablet 220 and media device 100a to be broken in order to effectuate the configuration of media device 100b. Furthermore, there is no need for tablet 220 and media devices 100a and/or 100b to be BT paired at all with tablet 220 in order to configure media device 100b. Accordingly, from the standpoint of user 201, adding a new media device to his/her ecosystem of similarly provisioned media devices does not require un-pairing with one or more already configured devices and then pairing with the new device to be added to the ecosystem. Instead, one of the already configured devices (e.g., media device 100a having CFG 125 installed) may negotiate with the APP 225 and/or the new device to be added to handle the configuration of the new device (e.g., device 100b). Similarly provisioned media devices broadly means devices including some, all, or more of the systems depicted in FIG. 1 and designed (e.g., by the same manufacture or to the same specifications and/or standards) to operate with one another in a seamless manner as media devices are added to or removed from an ecosystem.

Reference is now made to FIG. 3 where a flow diagram 300 depicts one example of configuring a first media device using an application installed on a user device as was described above in regards to FIG. 2A. At a stage 302 a Bluetooth® (BT) discovery mode is activated on a user device such as the examples 202 of user devices depicted in FIG. 2A. Typically, a GUI on the user device includes a menu for activating BT discovery mode, after which, the user device waits to pick up a BT signal of a device seeking to pair with the user's device. At a stage 304 a first media device (e.g., 100a) is powered up (if not already powered up). At stage 306 a BT

pairing mode is activated on the first media device. Examples of activating BT pairing mode include but are not limited to pushing a button or activating a switch on the first media device that places the first media device in BT pairing mode such that its BT 120 is activated to generate a RF signal that the user's device may discover while in discovery mode. I/O system 105 of media device 100 may receive 118 as a signal the activation of BT pairing mode by actuation of the switch or button and that signal is processed by controller 101 to command RF system 107 to activate BT 120 in pairing mode. In other examples, after powering up the first media device, a display (e.g., DISP 180) may include a touch screen interface and/or GUI that guides a user to activate the BT pairing mode on the first media device.

At a stage 308 the user's device and the first media device negotiate the BT pairing process, and if BT pairing is successful, then the flow continues at stage 310. If BT pairing is not successful, then the flow repeats at the stage 206 until successful BT pairing is achieved. At stage 310 the user device is connected to a wireless network (if not already connected) such as a WiFi, WiMAX, or cellular (e.g., 3G or 4G) network. At a stage 312, the wireless network may be used to install an application (e.g., APP 225) on the user's device. The location of the APP (e.g., on the Internet or in the Cloud) may be provided with the media device or after successful BT pairing, the media device may use its BT 120 to transmit data to the user's device and that data includes a location (e.g., a URI or URL) for downloading or otherwise accessing the APP. At a stage 314, the user uses the APP to select settings for a configuration (e.g., CFG 125) for the first media device. After the user completes the configuration, at a stage 316 the user's device installs the APP on the first media device. The installation may occur in a variety of ways (see FIG. 2A) including but not limited to: using the BT capabilities of each device (e.g., 220 and 100a) to install the CFG; using the WiFi capabilities of each device to install the CFG; and having the first media device (e.g., 100a) fetch the CFG from an external source such as the Internet or Cloud using its WiFi 130; just to name a few. Optionally, at stages 318 - 324 a determination of whether or not the first media device is connected with a wireless network may be made at a stage 318. If the first media device is already connected with a wireless network the "YES" branch may be taken and the flow may terminate at stage 320. On the other hand, if the first media device is not connected with a wireless network the "NO" branch may be taken and the flow continues at a stage 322 where data in the CFG is used to connect WiFi 130 with a wireless network and the flow may terminate at a stage 324. The CFG may contain the information necessary for a successful connection between WiFi 130 and the wireless network, such as wireless network name and wireless network password, etc.

Now reference is made to FIG. 4A, where a flow diagram 400a depicts one example of a process for configuring an un-configured media device "B" (e.g., un-configured media device 100b at stage 290b of FIG. 2B) using a configured media device "A" (e.g., media device 100a having CFG 125 of FIG. 2B). At a stage 402 an already configured media device "A" is powered up. At a stage 404 the RF system (e.g., RF system 107 of FIG. 1) of configured media device "A" is activated. The RF system is configured to detect RF signals from other "powered up" media devices. At a stage 406, an un-configured media device "B" (e.g., un-configured media device 100b at stage 290b of FIG. 2B) is powered up. At a stage 408 the RF system of un-configured media device "B" is activated. At stage 408, the respective RF systems of the configured "A" and un-configured "B" media devices are configured to recognize each other (e.g., via their respective BT 120 transceivers or another transceiver in the RF system). At a stage 410, if the configured "A" and un-configured "B" media devices recognize each other, then a "YES" branch is taken to a stage 412 where the configured media device "A" transmits its configuration (e.g., CFG 125) to the un-configured media device "B" (e.g., see stages 290e and 290f in FIG. 2B). If the configured "A" and un-configured "B" media devices do not recognize each other, then a "NO" branch is taken and the flow may return to an earlier stage (e.g., stage 404 to retry the recognition process. Optionally, after being configured, media device "B" may be connected with a wireless network (e.g., via WiFi 130). At a stage 414 a determination is made as to whether or not media device "B" is connected to a wireless network. If already connected, then a "YES" branch is taken and the process may terminate at a stage 416. However, if not connected with a wireless network, then a "NO" branch is taken and media device "B" is connected to the wireless network at a stage 418. For example, the CFG 125 that was copied to media device "B" may include information such as wireless network name and password and WiFi 130 is configured to effectuate the connection with the wireless network based on that information. Alternatively, media device "A" may transmit the necessary information to media device "B" (e.g., using BT 120) at any stage of flow 400a, such as at the stage 408, for example. After the wireless network connection is made, the flow may terminate at a stage 420.

Attention is now directed to FIG. 4B, where a flow diagram 400b depicts another example of a process for configuring an un-configured media device "B" (e.g., un-configured media device 100b at stage 290b of FIG. 2B) using a configured media device "A" (e.g., media device 100a having CFG 125 of FIG. 2B). At a stage 422 an already configured media device "A" is powered up. At a stage 424 the RF system of configured media device "A" is activated

(e.g., RF system 107 of FIG. 1). The RF system is configured to detect RF signals from other “powered up” media devices. At a stage 426, an un-configured media device “B” (e.g., un-configured media device 100b at stage 290b of FIG. 2B) is powered up. At a stage 428 the RF system of un-configured media device “b” is activated (e.g., RF system 107 of FIG. 1). At the stage 428, the respective RF systems of the configured “A” and un-configured “B” media devices are configured to recognize each other (e.g., via their respective BT 120 transceivers or another transceiver in the RF system). At a stage 430, if the configured “A” and un-configured “B” media devices recognize each other, then a “YES” branch is taken to a stage 432 where the configured media device “A” transmits information for a wireless network to the un-configured media device “B” (e.g., see stage 290b in FIG. 2B) and that information is used by the un-configured media device “B” to connect with a wireless network as was described above in regards to FIGS. 2B and 4A. If the configured “A” and un-configured “B” media devices do not recognize each other, then a “NO” branch is taken and the flow may return to an earlier stage (e.g., stage 424 to retry the recognition process. At a stage 434, the information for the wireless network is used by the un-configured media device “B” to effectuate a connection to the wireless network. At a stage 436, a user device is connected with the wireless network and an application (APP) running on the user device (e.g., APP 225 in FIG. 2B) is activated. Stage 436 may be skipped if the user device is already connected to the wireless network. The APP is aware of un-configured media device “B” presence on the wireless network and at a stage 438 detects that media device “B” is presently in an un-configured state and therefore has a status of “un-configured.” Un-configured media device “B” may include registers, circuitry, data, program code, memory addresses, or the like that may be used to determine that the media device is un-configured. The un-configured status of media device “B” may be wirelessly broadcast using any of its wireless resources or other systems, such as RF 107 and/or AV 109. At a stage 440, the APP is aware of configured media device “A” presence on the wireless network and detects that media device “A” is presently in a configured state and therefore has a status of “configured.” The APP harvests the configuration (CFG) (e.g., CFG 125 of FIG. 2B) from configured media device “A”, and at a stage 442 copies (e.g., via a wireless transmission over the wireless network) the CFG to the un-configured media device “B.” At a stage 444, previously un-configured media device “B” becomes a configured media device “B” by virtue of having CFG resident in its system (e.g., CFG 125 in DS system 103 in FIG. 1). After media device “B” has been configured, the flow may terminate at a stage 446. In other examples, the APP may obtain the CFG from a location other than the configured media device “A”, such as the Internet

or the Cloud as depicted in FIG. 2B. Therefore, at the stage 440, the APP may download the CFG from a web site, from Cloud storage, or other locations on the Internet or an intranet for example.

In the examples depicted in FIGS. 2A – 4B, after one of the media devices is configured, additional media devices that are added by the user or are encountered by the user may be configured without the user (e.g., user 201) having to break a BT pairing with one media device and then establishing another BT pairing with a media device the user is adding to his/her media device ecosystem. Existing media devices that are configured (e.g., have CFG 125) may be used to configure a new media device using the wireless systems (e.g., acoustic, optical, RF) of the media devices in the ecosystem. If multiple configured media devices are present in the ecosystem when the user adds a new un-configured media device, configured media devices may be configured to arbitrate among themselves as to which of the configured devices will act to configure the newly added un-configured media device. For example, the existing media device that was configured last in time (e.g., by a date stamp on its CFG 125) may be the one selected to configure the newly added un-configured media device. Alternatively, the existing media device that was configured first in time (e.g., by a date stamp on its CFG 125) may be the one selected to configure the newly added un-configured media device. The APP 225 on the user device 220 or other, may be configured to make the configuration process as seamless as possible and may only prompt the user 201 that the APP 225 has detected an un-configured media device and query the user 201 as to whether or not the user 201 wants the APP 225 to configure the un-configured media device (e.g., media device 100b). If the user replies “YES”, then the APP 225 may handle the configuration process working wirelessly with the configured and un-configured media devices. If the user 201 replies “NO”, then the APP 225 may postpone the configuration for a later time when the user 201 is prepared to consummate the configuration of the un-configured media device. In other examples, the user 201 may want configuration of un-configured media devices to be automatic upon detection of the un-configured media device(s). Here the APP and/or configured media devices would automatically act to configure the un-configured media device(s).

APP 225 may be configured (e.g., by the user 201) to automatically configure any newly detected un-configured media devices that are added to the user’s 201 ecosystem and the APP 225 may merely inform the user 201 that it is configuring the un-configured media devices and inform the user 201 when configuration is completed, for example. Moreover, in other examples, once a user 201 configures a media device using the APP 225, subsequently added un-

configured media devices may be automatically configured by an existing configured media device by each media device recognizing other media devices (e.g., via wireless systems), determining the status (e.g., configured or un-configured) of each media device, and then using the wireless systems (e.g., RF 107, AV 109, I/O 105, OPT 185, PROX 113) of a configured media device to configure the un-configured media device without having to resort to the APP 225 on the user's device 220 to intervene in the configuration process. That is, the configured media devices and the un-configured media devices arbitrate and effectuate the configuring of un-configured media devices without the aid of APP 225 or user device 220. In this scenario, the controller 101 and/or CFG 125 may include instructions for configuring media devices in an ecosystem using one or more systems in the media devices themselves.

In at least some examples, the structures and/or functions of any of the above-described features may be implemented in software, hardware, firmware, circuitry, or in any combination thereof. Note that the structures and constituent elements above, as well as their functionality, may be aggregated with one or more other structures or elements. Alternatively, the elements and their functionality may be subdivided into constituent sub-elements, if any. As software, the above-described techniques may be implemented using various types of programming or formatting languages, frameworks, scripts, syntax, applications, protocols, objects, or techniques. As hardware and/or firmware, the above-described techniques may be implemented using various types of programming or integrated circuit design languages, including hardware description languages, such as any register transfer language ("RTL") configured to design field-programmable gate arrays ("FPGAs"), application-specific integrated circuits ("ASICs"), or any other type of integrated circuit. According to some embodiments, the term "module" may refer, for example, to an algorithm or a portion thereof, and/or logic implemented in either hardware circuitry or software, or a combination thereof. These may be varied and are not limited to the examples or descriptions provided. Software, firmware, algorithms, executable computer readable code, program instructions for execution on a computer, or the like may be embodied in a non-transitory computer readable medium.

Ad Hoc WiFi Network Configuration

FIGS. 5A through 5D depict block diagrams of a plurality of media devices configured to communicate over an Ad Hoc WiFi network. As will be described in greater detail below, un-configured media devices may also be configured using the Ad Hoc WiFi network. In FIG. 5A, a scenario 500a depicts a plurality of media devices 100i – 100v. Although only five media devices are depicted, there could be as few as two media devices or more than the five media

devices shown, as denoted by 511. Each of the media devices are pre-configured to communicate over an Ad Hoc WiFi network 501 using their respective Ad Hoc WiFi transceivers denoted as AH 140 (see FIG. 1). Here for purposes of explanation, other components of RF system 107, such as BT 120 are not depicted. In scenario 500a three of the

5 media devices 100i, 100iv, and 100v have already been configured as described above and include CFG 125. Further, media devices 100i, 100iv, and 100v are depicted in their “powered up” state and media devices 100i, 100iv, and 100v are in wireless communications with each other over Ad Hoc WiFi network 501. Media devices 100i, 100iv, and 100v have their respective AH 140 electrically coupled with antenna 124. Each media device depicted in FIG.

10 5A is pre-configured (e.g., at the factory or somewhere in the stream of commerce) to wirelessly communicate with one another over the Ad Hoc WiFi network 501 using their respective AH 140. Two additional media devices 100ii and 100iii are introduced into scenario 500a and are placed in the “powered up” state (e.g., they are turned on). Media devices 100ii and 100iii are initially in an un-configured state as denoted by UN-CFG 555. For example, media devices

15 100ii and 100iii may be newly purchased media devices to be added to the three device ecosystem of FIG. 5A. After being powered up, media devices 100ii and 100iii activate their respective AH 140 and begin broadcasting their status and listening for RF signals from other media devices that are broadcasting on the Ad Hoc WiFi network 501 as denoted by 503.

In FIG. 5B, scenario 500b depicts media devices 100ii and 100iii having successfully

20 joined the Ad Hoc WiFi network 501. Moreover, media devices 100ii and 100iii recognize each other and are recognized by the other media devices 100i, 100iv, and 100v. Therefore, all five of the media devices are able to wirelessly communicate with one another over the Ad Hoc WiFi network 501. Media devices 100ii and 100iii have already broadcast their status and that status includes the information that both devices are in an un-configured state UN-CFG 555.

25 One or more of the configured media devices (e.g., having CFG 125) communicate over 501 to the un-configured media devices and initiate pre-determined handshakes, protocols, or the like necessary to effectuate transmitting CFG 125 to the un-configured media devices. In one example, media device 100i transmits data representing its CFG 125 to un-configured media device 100ii as denoted by dashed line 505, and media device 100v transmits data representing

30 its CFG 125 to un-configured media device 100iii as denoted by dashed line 507. After the data is transmitted, media device 100ii has CFG 565 and media device 100iii has CFG 575. In this example, each un-configured media device received its configuration data from a different configured media device.

In another example, media device 100iv transmits data representing its CFG 125 to un-configured media device 100ii and 100iii as denoted by dashed lines 509 such that both un-configured media devices receive their configuration data (e.g., CFG 125) from the same configured media device.

5 After all the un-configured devices have received their respective CFG data (e.g., CFG 565, CFG 575), a scenario 500c in FIG. 5C depicts all five media devices 100i – 100v being configured media devices (e.g., CFG 125, CFG 565, CFG 575). In FIG. 5D, after all un-configured media devices have been configured using the Ad Hoc WiFi Network 501, in a scenario 500d, media devices 100i – 100v may be configured to switch from their respective AH
10 140 transceivers to their WiFi 130 transceivers and to communicate with one another over wireless network 521. In FIGS. 5A – 5D other systems in each media device including but not limited to the controller 101 and the I/O system 105 may be used to coordinate and control the Ad Hoc WiFi network 501, transceivers AH 140, transceivers WiFi 130, and the transmitting of CFG 125 to un-configured media devices.

15 FIGS. 5A – 5D depict another example of how un-configured media devices added to or introduced into an ecosystem of configured media devices may be configured with minimal user 201 intervention. The user 201 need not use BT to break and make BT pairing connections in order to configure media devices. Here, the only intervention on part of the user 201 may include just powering up the media devices 100i – 100v, or powering up at least one configured
20 media device and one or more un-configured media devices. An application such as APP 225 on a user device is not required to harvest the CFG 125 or intervene in any way to make the configuration of un-configured media devices happen. The scenarios depicted in FIGS. 5A – 5D may be used to re-configure already configured media devices. For example, user 201 may make changes/editions to APP 225 on a user device 202. The APP 225 may then act to re-
25 configure an already configured media device (e.g., media device 100v). Subsequently, the re-configured media device 100v may wirelessly transmit its new configuration to the other media devices in its ecosystem (e.g., using AH 140, BT 120, or WiFi 130, or other wireless systems). Any re-configured media device may act to wirelessly transmit its new configuration to other media devices as they are introduced into its ecosystem or become within its wireless range (e.g.,
30 RF range, acoustic range, or optical range). As one example, if an ecosystem includes configured media devices “A” and “B” and device “A” is re-configured, then after being re-configured, device “A” may act to re-configure device “B”. Upon introduction of a configured media devices “C” into the ecosystem, either device “A” or device “B” may act to re-configure

device “C”. One or more of the wireless systems may be used to effectuate a re-configuration of a media device.

Acoustic Signature Configuration

Reference is now made to FIGS. 6A – 6C where a plurality of media devices 100i – 100iv are depicted in acoustic proximity of one another. Acoustic proximity may include all of the media devices positioned in a space 660 in which acoustic sounds transmitted by any one of the media devices may be received by the other media devices without significant acoustic attenuation/degradation that would prevent each media device from accurately receiving data in acoustic signals transmitted by the other media devices. Significant acoustic attenuation may be caused by ambient noise, walls, sound absorbing materials, sound reflecting materials, or other structures that attenuate or completely block acoustic signals transmitted by the media devices such that those signals do not reach other media devices at all or at a sound pressure level that is below an acceptable level for the transducers (e.g., a microphone) to convert to a usable signal for processing in the media devices.

In FIG. 6A, a scenario 600a includes the plurality of media devices 100i – 100iv, each media device including an A/V system 109 that includes a plurality of audio transducers, including but not limited to loudspeaker 160 and microphone 170. Although four media devices are depicted, there may be more or fewer devices used as denoted by 611. For purposes of explanation, media devices 100i – 100iv are assumed to be “powered up” in FIG. 6A. Media devices 100i and 100iii are un-configured as denoted by UN-CFG 655; whereas, media devices 100ii and 100iv are configured as denoted by CFG 125. After being “powered up” each media device is configured to transmit a unique acoustic signature using its respective SPK 160 as denoted by acoustic waves 602 – 608 which include encoded information (e.g., data) that comprises the unique acoustic signature. For example, transmission of the acoustic waves 602 – 608 may be triggered by an event such as being “powered up”, a RF signal from the RF systems 107, the actuation of a button or switch, or a command from a user device (e.g., APP 225), just to name a few. The MIC 170 of each media device receives the acoustic waves 602 – 608 from the other media devices as denoted by 603 – 609. For example, media device 100i receives the acoustic waves 604 – 608 from the other media devices as acoustic wave 603. A/V system 109 may decode a signal generated by MIC 170 (e.g., using an ADC) to extract the information (e.g., data) contained in the unique acoustic signature of media devices 100ii – 100iv. For acoustic wave 603, media device 100i may decode the various unique acoustic signatures to determine that 100ii and 100iv are configured (CFG 125) and 100iii is un-configured (UN-CFG 655).

Other information may be included (e.g., encoded in) the unique acoustic signature of the media devices. Similarly, media devices 100ii, 100iii, and 100iv receive and decode their acoustic waves 605, 607, and 609 respectively. In order to prevent all media devices from transmitting their acoustic waves 602 – 608 at the same time, thereby creating possible confusion as to which devices signals are being received at a MIC 170 at any point in time, each media device may be configured to transmit its acoustic wave in response to a command, an event, or some other orderly sequence or pattern.

For example each media device may have a unique address that is pre-configured at the factory, set by a user, or used by some other system in the device (e.g., a unique MAC address for WiFi 130). After being “powered up” each device may simply transmit an acoustic wave that includes an encoded address. After a predetermined amount of time (e.g., approximately 10 seconds) if no additional acoustic transmission are received, then the media device with the highest address or the lowest address is the first media device to transmit its unique acoustic signature, followed by the next highest or next lowest address, and so on. After all of the media devices have finished transmitting their unique acoustic signatures (e.g., have spoken), media devices that are un-configured (e.g., UN-CFG 655) may be configured (e.g., CFG 125) using the data in one of the configured media devices.

Moving on to FIG. 6B, in scenario 600b all media devices 100i – 100iv have spoken and each device is apprised of the status of the other media devices. Each media device knows which media devices are configured and which are un-configured. Here, configured media device 100iv transmits an acoustic configuration signal 628 that is received by MIC’s 170 in all the devices. Signal 628 includes data for CFG 125. Un-configured media devices 100i and 100iii receive signal 628 at their respective MIC’s 170, decode the signal 628, and extract the data that comprises CFG 125. Un-configured media devices 100i and 100iii may decode signal 628 substantially at the same time or in a sequence. For example, if a sequence is used, the un-configured media device with the highest or lowest address may configure itself using the signal 628, followed by the next un-configured media device having the next highest or lowest address.

In FIG. 6C, in a post-configuration scenario 600c, media devices 100i and 100iii now include CFG 665 and CFG 675 and are configured media devices. Optionally, media devices 100i and 100iii may transmit audio signals 634 and 636 that broadcast that devices 100i and 100iii were successfully configured and those signals are received 637 by all the media devices. Furthermore, post-configuration, media devices 100ii – 100iv may activate their respective RF

systems 170 and wirelessly communicate 626 with each other or with user devices 202 using whatever systems are appropriate, such as BT 120, WiFi, 130, or AH 140, for example.

The frequency range of acoustic signals generated by SPK 160 and received by MIC 170 will be application dependent. In some examples, SPK 160 is configured to generate acoustic signals in a range from about 20 Hz to about 20 kHz which is within the hearing range of most human beings, and MIC 170 is configured to receive and produce an output signal for the acoustic signals generated by SPK 160. In another example, SPK 160 is configured to generate acoustic signals in a range greater than 20 kHz and MIC 170 is configured to receive and produce an output signal for the acoustic signals generated by SPK 160. Here the acoustic signals generated by SPK 160 may be ultrasonic in frequency. In yet another example, SPK 160 is configured to generate acoustic signals in a range less than 20 Hz and MIC 170 is configured to receive and produce an output signal for the acoustic signals generated by SPK 160. Here the acoustic signals generated by SPK 160 may be infrasonic in frequency. The ultrasonic and infrasonic acoustic signals may be inaudible to human beings. In other examples, media devices may include a sensor such as an accelerometer to detect the infrasonic acoustic signals generated by SPK 160 (e.g., as airborne or structure borne low frequency (LF) vibrations). Systems such as I/O 105 or PROX 113 may include the sensor for detecting LF vibrations, for example.

Hybrid Configuration

Attention is now directed to FIGS. 7A – 7C where a plurality of media devices 100i – 100iv are in wireless communications with one another over an Ad Hoc wireless network 501 as was described above in reference to FIGS. 5A – 5D where the media devices depicted in FIGS. 5A – 5D were part of the same ecosystem (e.g., the user 201 intends them to work in harmony with each other) and some of the media devices were un-configured. In FIG. 7A, scenario 700a depicts three of the media devices 100i – 100iii being part of an ecosystem in a space 760 (e.g., a living room of the user 201) and a totally unrelated media device 100iv in an adjacent space 770 that is within adequate RF signal strength range of the other media devices 100i – 100iii in space 760. Space 760 may include more or fewer media device as denoted by 711. Space 770 may include more media devices than depicted as denoted by 721. In space 760 media devices 100i and 100iii are un-configured (UN-CFG 755) and media device 100ii is configured (CFG 125). In space 770 media device 100iv is un-configured (UN-CFG 755). Therefore, scenario 700a depicts one example of a foreseeable scenario where the Ad Hoc wireless network 501 and AH 140 transceivers that are pre-provisioned (e.g., by the manufacturer) to recognize and communicate with one another may interact with media devices in un-related ecosystems (e.g.,

ecosystem in space 760 interacting with un-related ecosystem in space 770). For example, adjacent apartments in an apartment building, adjacent offices in an office complex, and adjacent homes in a neighborhood may all be within adequate signal strength range of each other. Unless distance (e.g., $1/R^2$), RF blocking obstructions or structures, prevents media devices in un-related ecosystems from wirelessly communicating with one another, each media device may be configured to ignore commands, configurations, etc. from media devices in an un-related ecosystem.

To that end, in FIG. 7A, media device 100iv in space 770 is un-related to the media devices in space 760, but is within adequate RF signal strength range of those devices and the Ad Hoc wireless network 501 they are connected in common with. In that one of the goals of device configuration is to have media device 100ii use its CFG 125 to configure un-configured media devices 100i and 100iii with minimal user 201 involvement, there is a risk that using the scenarios depicted in FIGS. 5A – 5D may result in media device 100ii configuring un-configured media device 100iv in space 770 because it has detected its presence on the Ad Hoc wireless network 501 and knows that its status is un-configured UN-CFG 755.

In FIG. 7A, a wall or other structure separates space 760 from 770 and may serve as an acoustic barrier 750 to sounds 708 and 709 that are generated by SPK 160 of media devices 100i – 100iii and 100iv. Therefore, even though the media devices are within adequate RF signal strength range as denoted by 501, the acoustic barrier 750 prevents signals 709 from SPK 160 of media devices 100i – 100iii from being received by MIC 170 of media device 100iv. Similarly, the barrier 750 prevents signals 708 from SPK 160 of media device 100iv from being received by the MIC's 170 of media devices 100i – 100iii. Accordingly, both acoustic signals and RF signals may be used in a hybrid Configuration scenario so that only those media devices that may receive via MIC 170 acoustic signals from other media devices in its ecosystem and is aware of and connected with those same media devices via the Ad Hoc wireless network 501 may be affected by or affect another media device in its ecosystem.

In FIG. 7A, for purposes of explanation it is assumed that all media devices are “powered up” and that media devices 100i – 100iii have sensed and recognized one another via wireless 501 and acoustic means (702 – 706) and (701 – 705). Further, media device 100iv in space 770 has sensed and recognized media devices 100i – 100iii in space 760 via wireless 501 and vice-versa. Therefore, media device 100ii is aware that media devices 100i, 100ii, and 100iv are un-configured.

Moving on to FIG. 7B, scenario 700b depicts media device 100ii transmitting acoustic configuration signal 733 that is received by MIC's 170 in all the media devices in the ecosystem of space 760. Acoustic barrier 750 blocks the acoustic configuration signal 733 and signal 733 is not received by MIC 170 of media device 100iv. Acoustic configuration signal 733 may include
5 encoded information for data in CFG 125 that will be decoded and used by un-configured media devices 100i and 100iii to configure themselves. Alternatively, acoustic configuration signal 733 may be operative to instruct the un-configured media devices 100i and 100iii to be ready to receive wireless transmission of its CFG 125 over the Ad Hoc wireless network 501. In some examples, a combination of an acoustic configuration signal and a wireless RF signal may be
10 used to transfer, copy, or write the CFG 125 to un-configured media devices.

In FIG. 7 a post-configuration scenario 700c depicts media devices 100i and 100iii as being configured with CFG 765 and 775, and media device 100iv remains un-configured UN-CFG 755. Configured media devices 100i and 100iii may wirelessly 501 and/or acoustically 771 and 772 broadcast that they have been successfully configured. Acoustic broadcast 771 and 772
15 are received 773 by all MIC's 170 in space 760 but not by MIC 170 in space 770. Post-configuration, RF systems 107 may switch from the Ad Hoc WiFi network 501 to the WiFi wireless network 521, or some other network such as Bluetooth®, for example.

In the examples depicted in FIGS. 6A – 7C, the media devices may be configured to use other information and/or systems native to each media device to arbitrate which media devices
20 may be configured, acted on, communicated with, etc. For example, each media device (e.g., in its DS 103 and/or RF system 107) may maintain a list of Media Access Control addresses (MAC addresses) for devices that have been established in its ecosystem. At configuration time or when other actions are taken that affect a media device, those media devices not listed in the list of MAC addresses will not be affected. Therefore, acoustic signals, wireless signals, and data
25 (e.g., MAC addresses), and other information or signals may be used to manage media devices in an ecosystem while preventing unintentional interaction with other media devices that are not part of the ecosystem. APP 225 may be used to make and update information such as MAC addresses for one or media devices. MAC addresses may be added to the list as media devices are added to an ecosystem and MAC addresses may be removed from the list as media devices
30 are removed from the ecosystem, for example.

In the examples depicted in FIGS. 6A – 7C or in other FIGS. herein, the media devices may be configured to use other wireless systems to manage media device configuration and operation. For example, in scenarios 700a – 700c the BT 120, WiFi 130 or other wireless

systems may be used in place of or in addition to the AH 140 and AV 109 to accomplish the configuration of un-configured media devices in space 760. Media devices may be equipped with an optical system for wireless communications (e.g., Infrared or other) and media device configuration and operation may be effectuated using optical communication solely or in
5 conjunction with the other systems such as RF 107 and/or AV 109. An optical transmitter, such as a LED or IR LED may be used to transmit encoded IR signals and an IR receiver such as a photo diode or the like may be used to receive the IR signals which are then decoded and communicated to a system such as controller 101, for example. As one example, the media devices 100 in an ecosystem, such as those depicted in FIGS. 2A – 2B, 5A – 8B may use OPT
10 185 in their respective I/O 105 systems to communicate with one another and to accomplish specific tasks such as configuration, re-configuration, and control, just to name a few.

As another example, in scenarios 700a – 700c, OPT 185 may be used in place of AV 109 such that acoustic communications between media devices (e.g., 100i, 100ii, and 100iii) is replaced with optical communications. Here, barrier 750 may act to prevent optical signals (e.g.,
15 from transmitter 185t) from being received and/or detected by receiver 185r in the OPT 185 of media device 100iv in space 770. Therefore, even though media device 100iv may be in RF communications (e.g., 501 or 521) with media devices 100i, 100ii, and 100iii in space 760, configuration of un-configured media devices 100i and 100iii may proceed using any combination of optical (e.g., in place of acoustic from AV 109) and RF (e.g., using RF 107)
20 systems of the 100i, 100ii, and 100iii. In that un-configured media device 100iv in space 770 does not receive the optical component of the configuration signal from media device 100ii in space 760 (e.g., due to barrier 750), media device 100iv is not configured and is not affected by the configuration activity in the un-related ecosystem of space 760.

Attention is now directed to FIGS. 7D – 7E, where scenarios 700d and 700e depict one
25 example of wireless communications between media devices in an ecosystem using optical and/or RF communications. In scenario 700d of FIG 7D, media devices 100i and 100iii in space 760 are un-configured (UN-CFG 755) as described above. Media devices in space 760 and 770 are aware of one another via their respective RF 107 systems and are depicted here in wireless communications 521 via WiFi 130, although other RF systems such as BT 120, AH 140, or other
30 (e.g., 150) may be used instead of or in addition to WiFi 130. Optical system OPT 185 in configured media device 100ii is aware of the un-configured states of media devices 100i, 100iii, and 100iv. OPT 185 uses its optical transmitter (e.g., 185t of FIG. 1) to send an optical configuration signal 780 that is received by the optical receivers (e.g., 185r of FIG. 1) in the OPT

185 of the un-configured media devices 100i and 100iii. Structure 750 blocks or otherwise attenuates optical configuration signal 780 such that un-configured media device 100iv in un-related ecosystem of space 770 does not receive the optical configuration signal 780 at its optical system OPT 185.

5 Continuing on at FIG. 7E, in scenario 700e un-configured media devices 100i and 100iii have been configured as denoted by CFG 765 and CFG 775. Media devices 100i and 100iii may optically signal that they have been successfully configured (e.g., status reporting) by transmitting optical signals 781 and 783 respectively that are received at OPT 185 of already configured media device 100ii. Structure 750 blocks or otherwise attenuates optical signals 781
10 and 783 such that un-configured media device 100iv in un-related ecosystem of space 770 does not receive optical signals 781 and 783 at its optical system OPT 185. The actual data comprising the CFG's 765 and 775 may be transmitted using the OPT 185 and/or RF 107 of media device 100ii. In some examples, other wireless systems such as AV 109 may be used in conjunction with OPT 185 and/or RF 107 to effectuate the configuration, re-configuration, status
15 reporting, etc. between media devices in an ecosystem. As is typical in some optical signaling systems, distance, optical noise, objects, people, surfaces, atmospheric conditions, and the like may block, reflect, refract, modulate, or attenuate optical signals such that successful optical signaling may not be practical or possible. To that end, media devices may be configured to detect and correct optical signaling problems by switching to other systems to effectuate
20 successful wireless communications. For example, in scenarios 700d and 700e, if media device 100i successfully receives optical configuration signal 780 and media device 100iii does not successfully receive optical configuration signal 780 (e.g., device 100iii is blocked by chair in space 760), then each un-configured media device (100i, 100iii) may wirelessly signal (e.g., using RF 107) a status report to media device 100ii and media device 100ii may then instruct one
25 or both of the un-configured media devices (100i, 100iii) to switch to AV system 107 for acoustic wireless communications as described in FIGS. 7A – 7C. Similarly, as another example, in FIGS. 7A – 7C, if one or more un-configured media device cannot successfully receive acoustic wireless communications for a configured media device, then the configured media device may instruct one or all of the un-configured media devices to switch to OPT 185
30 for optical wireless communications. When media devices switch from one wireless means to another wireless means to effectuate successful wireless communications, structure 750 or other may still be effective at preventing/blocking unintended configuration, re-configuration, or control of media devices in un-related ecosystems, such as media device 100iv in space 770. In

that the media devices described herein include a plurality of wireless communications systems, any of those systems may be used individually or in combination with other systems to effectuate wireless communications between media devices and/or user devices of the present application.

Configuration Using Co-location

5 Referring now to FIG. 8A, scenario 800a depicts one example of a media devices in which one or more of the media devices include a de-tunable antenna coupled with RF system 107. The de-tunable antenna may be de-tuned by the RF system 107 to determine proximity and location of other RF sources in range of the RF system 107. In a space 860 user 201 has a media device 800i including a RF system 107 having a de-tunable antenna 124 electrically coupled with
10 a transceiver TXRX 810. De-tunable antenna 124 may be de-tuned 129 over a wide range of RF frequencies including but not limited to licensed bands, unlicensed bands, WiFi, WiMAX, cellular, Bluetooth®, ~ 2.0GHz – 6.0GHz range, and broadband, just to name a few. In some examples, transceiver TXRX 810 may be one of the transceivers depicted in RF system 107 in FIG. 1 (e.g., BT 120, WiFi 130, AH 140, and 150). In other examples transceiver TXRX 810
15 may be a dedicated transceiver. In FIG. 8A, for purposes of explanation, it is assumed that media device 800i has already been configured as described herein and denoted by CFG 125a. Each media device may include a list MAC addresses MAC 803 that may be used to store a registry of MAC address for media devices associated with an ecosystem of user 201. For example, if user 201 has 12 media devices in his/her ecosystem, then there would be at least 12
20 specific MAC addresses pre-registered in MAC 803 of each media device that corresponds to twelve media devices in the users ecosystem. MAC 803 may also include MAC addresses for other wireless and network devices (e.g., Ethernet, WiFi routers, WiFi switches etc.). Those devices may be associated with wireless and other network components that the user's media devices may need to communicate with (e.g., for Internet or intranet access). MAC 803 may be
25 a portion of the data stored in DS 103 (e.g., stored in Flash memory, etc.).

In scenario 800a, the user 201 has other media devices in his/her ecosystem and the user 201 has configured (e.g., CFG 125a) media device 800i to playback music from a playlist using media files located on a computer system (not shown) that the media device 800i accesses via its RF system 107 (e.g., via WiFi 130). The user listens to playback in space 860 in mono (e.g., a
30 single SPK 160 producing music from the Left and Right channels of the audio stream) from the single media device 800i. However, through CFG 125a, user 201 has configured (e.g., using APP 225) media device 800i to wirelessly connect with another media device when those

devices are in co-located proximity to one another, to playback the audio stream in stereo where one media device produces the left channel and another media device produces the right channel.

For example, user 201 transports 830 media device 800i from the space 860 through a doorway 851 in a building wall 850 to a space 870. In space 870 the user 201 has another media device 800ii. Media device 800ii generates an RF field 837. When antenna 124 is de-tuned 129 by the RF system 107 of media device 800i, RF system 107 is configured to detect RF fields of other media devices (e.g., 837 of 800ii). Typically, there may also be other RF fields present that are not related to those generated by the media devices, such as RF field 839 that may be from a WiFi network, cellular phone, WiMAX network, etc. Media device 800i detects RF fields 839 and 837. Media device 800i determines that RF field 837 from media device 800ii is associated with a MAC address that is pre-registered in MAC 803 for device 800i. However, although RF field 839 may be associated with a MAC address, that MAC address is not pre-registered in MAC 803 of media device 800i. In some examples, the MAC address from devices other than media devices (e.g., 839) may not be detectable or otherwise unavailable, and in that case the media device may be configured to ignore that MAC address or assume that MAC address is not pre-registered in its MAC 803. In some examples, media device 800i may be generating its own RF field 835 and media devices 800i and 800ii may check their respective MAC 803 to see if each device has the MAC address of the other device pre-registered in its MAC 803.

Based on CFG 125a, the user 201 intends that media device 800i transmit a copy of its CFG 125a to media device 800ii which is currently storing CFG 125b which is different than CFG 125a. In some other examples, media device 800ii may be un-configured (not shown) as described above. Here, media devices 800i and 800ii may hand shake the necessary wireless signals (e.g., RF, acoustic, optical) to effectuate transfer of CFG 125a from 800i to 800ii. Recognition that each media device is listed in the MAC 803 of the other media device may be accomplished using any form of wireless signaling as described above. For example, in FIG. 8A, device 800i may acoustically signal 843a that device 800ii is pre-registered in its MAC 803 and device 800ii receives 843a the acoustic signal at its MIC 170. Similarly, device 800ii may acoustically signal 843b that device 800i is pre-registered in its MAC 803 and device 800i receives 843b the acoustic signal at its MIC 170. Those acoustic signals may serve as sufficient acknowledgement by devices 800i and 800ii for the transfer of CFG 125a from 800i to 800ii via wireless (e.g., AH 140, BT 120, or WiFi 130), acoustic, or optical (not shown) processes.

In FIG. 8B, transfer 880 of CFG 125 to 800ii has occurred as depicted by scenario 800b. Devices 800i and 800ii may acoustically acknowledge that the transfer 880 was successful via

signals 853 and 857. Post-configuration, media devices 800i and 800ii may switch to WiFi 130 for wireless communications 521 with each other. As before, there was no need for the user 201 to do anything to effectuate the re-configuration of 800ii other than bringing 800i and 800ii into co-location with each other. Furthermore, there is no need to make or break BT pairing connections between media devices and user devices.

Referring again to FIG. 8A, in an alternate example, RF system 107 using the de-tuned 129 antenna 124 on device 800i may detect that the RF fields 837 and 839 are WiFi signals and couple WiFi 130 (if not already coupled) with antenna 124 and switch to a WiFi monitor mode where RF system 107 sniffs for packets in the WiFi signals being received by WiFi 130. Each sniffed packet is analyzed for MAC addresses that are compared with the MAC addresses listed in MAC 803 of device 800i. MAC address for device 800ii is listed in the registry, but MAC address for whatever device is generating RF field 839 is not listed in the registry. Co-location of 800i in proximity with 800ii as detected by de-tuned 129 antenna 124 and the presence of the MAC address for 800ii in the registry of 800i allows for communication and/or interaction between 800i and 800ii for tasks such as wirelessly transferring CFG 125a to 800ii, media device re-configuration, media device control, or other tasks that may be configured into the hardware and/or software of media devices described herein.

In FIG. 8A, both media devices 800i and 800ii are depicted as including antennas 124 that may be de-tuned 129; however, in some examples, there may be media devices with antennas that are not de-tuned 129 such as antenna 124 sans de-tuning functionality. Although only two media devices 800i and 800ii are depicted in FIG. 8A more media devices may be used in scenario 800a as denoted by 821. MAC addresses in MAC 803 may be pre-registered by the APP 225 as described above. For example, each time a new media device is added to the user's ecosystem, the APP 225 may register a MAC address for each newly added device in the MAC 803 of other media devices in the ecosystem, thereby pre-registering the MAC address for future use. In other examples, optical wireless communications (e.g., using OPT 185) as described above in reference to FIGS. 7C – 7D may be used to in place of or in conjunction with the wireless communications between co-located media devices depicted in FIGS. 8A – 8B.

Cloud-Based Configuration of Media Devices

In some applications it may be desirable for a user to purchase on-line or through a retailer, one or more media devices. As part of the purchase process, the user (e.g., 201) provides the on-line website and/or retailer with information including but not limited to: how the user want's the media devices to be configured (e.g., CFG 125); how the media devices are to

operate with one another; the types of user devices (e.g., 202) that will interface with the media devices; user device specific applications to be installed on the user devices (e.g., APP 225); the number and types of media devices to be included in the user's ecosystem (e.g., 100i -- 100iv); wireless communications preferences for communications between media devices and/or
5 between media devices and user devices; wireless network/router SSID's and passwords; cellular and or wireless data plan information; notification preferences; content handling preferences; just to name a few. The purchaser (e.g., user 201) of the media devices may interact in person (e.g., face to face) with the retailer to provide the SSID's and other user specific information for configuring the media devices to be purchased.

10 For example, a GUI or the like on a website or other that the user orders the media devices from may be used to prompt or guide the user through a series of queries to divine the user's preferences, use models for the media devices, and any other information or user preference for configuring the media devices as part of the purchase process. Here, the website may be the manufactures website visited by the user and where the user places an order for one
15 or more media devices. As part of the order process, the website allows the user to input data/information that will be used by the manufacture to configure the media devices prior to shipping/delivering the media devices to the user. One advantage to configuring the media devices in the "cloud" is that the out-of-the-box experience for the user is optimized because the media devices are pre-configured to the user's design and optionally, the applications the user
20 may require for user devices may be installed and ready for use with the media devices. Installation of the applications may occur before or after the user receives the pre-configured media devices. In that the user devices may be diverse in type, the applications may be tailored to each user device (e.g., Android, iOS, Windows, etc.). The applications may be customized to suit the user's needs or may be standard for the type of user device. Applications may be
25 downloaded from the manufacturer's web page or from an application store (e.g., Google Play, Apple APP Store, cloud, or other) the Internet, a web page, from a medium such as a CD-ROM, DVD-ROM, Blu-ray disc, for example.

In other examples, a retailer such as a brick and mortar store (e.g., Best Buy, etc.), another on-line entity (e.g., Amazon.com), a service organization (e.g., Geek Squad), etc. may
30 take the user's order for media devices and work with the user to understand the user's needs and then act on behalf of the user to configure the media devices according to the user's need. The retailer may go to the manufactures web site and user a GUI or the like to effectuate the cloud-based configuration of the media devices. The manufacture may deliver the pre-configured

media devices directly to the user or drop ship them or otherwise to the retailer who then delivers the pre-configured media devices to the user. The retailer may be provided with software, tools, or the like necessary to configure the media devices and after taking the user's order and preferences, configure on-site the media devices and then deliver the pre-configured media devices to the user. An agent acting on behalf of the retailer or manufacture may perform the configuration of the media devices and may optionally ship or otherwise deliver the pre-configured media devices to the user or retailer. The agent may be an entity in privity of contract with the retailer and/or manufacturer or an entity in the chain of commerce through which the media devices are sold in commerce regardless of whether the sale is retail or wholesale.

Accordingly, attention is now directed to FIG. 9, where a flow 900 depicts one example of cloud-based configuration of one or more media devices. At a stage 902 a user (e.g., 201) purchases one or more media devices (e.g., 100i – 100v) from a cloud based seller, such as an on-line seller, the manufacturer, for example. For purposes of explanation, cloud based seller will be denoted as an "on-line seller." For example, the user may go to a URL for the on-line seller's web page and select the media devices the user wants, pay for the media devices ordered, provide shipping information, and then go through a process to configure the media devices as will be described in greater detail below. At a stage 904, the user provides the on-line seller with service set identifier (SSID) information for the wireless local area network(s) (WLAN) the user's media devices will be expected to wirelessly communicate with. Typically the SSID's are case sensitive unique identifiers associated with each WLAN of the user and typically comprise 32 alphanumeric characters. Optionally, the user may also provide wireless password information associated with the WLAN for each SSID. For example, the user may have a wireless network at home, at work, and have access to a WiMAX network. The user may enter the SSID and optionally the password information for all three of those wireless networks.

At a stage 905 the user may provide the on-line seller with user specific configuration information for each media device purchased. The user specific configuration information may be the same or different for some or all of the purchased media devices. For example, if one of the media devices comprises a subwoofer, then that media device may include user specific configuration data that is different than that of other purchased media devices that may serve as left, right, and center channel speakers, or as a speaker phone or conference phone. The user specific configuration information may comprise the data included in CFG 125 for each media device. Some of the media devices may include video capture and/or video display systems and those media devices may include user specific configuration information that is different than

that of non-video enabled media devices. The wide variety of information that may be included in the user specific configuration information is described in greater detail below in regard to FIG. 13.

At a stage 906, each media device purchased by the user is configured with the SSID and optionally the password information for the wireless networks. For example, the SSID and password information may be data included in the CFG 125 and be used by RF 107 of each media device for wireless communications between media devices and/or user devices using WiFi 130. At a stage 908, the user may optionally provide information on each user device (e.g., 202) the user intends to be used with the purchased media devices. Those purposes included but are not limited to control, communications, future configuring or re-configuring, and content serving with the purchased media devices. If the user wants to provide information on the user devices, a "YES" branch is taken and at a stage 910 the information is used to create an application APP (e.g., APP 225) that is specific to each of the user devices. At a stage 912 the APP is delivered to each user device and the flow 900 may resume at a stage 914. Delivery of the APP may take a variety of forms. As one example, the on-line seller may place a file for each APP created at a location (e.g., on the internet or an APP store) that the user may access with his devices and download and install the APP on the user device. The user may save or copy the APP (e.g., an executable file, etc.) on a memory media such as a USB thumb drive, an SD, microSD, or Memory Stick card that is inserted into the user device and installed on the user device, the APP may be emailed to the user as an attachment and then the user opens and saves the APP on the user device, just to name a few. The APP may be one that already exists for the user device and the user may go to an APP store or the like to download and install the APP. If the user prefers not to give information on user devices a "NO" branch is taken and the flow 900 may resume at the stage 914.

At the stage 914 pre-configured media devices are delivered. For example, delivery can be to an address specified by the user (e.g., via shipment by a carrier such as UPS®, FedEx®, or the USPS®) or delivery can be to a third party or agent specified by the user (e.g., as a gift, to an installer, to a retailer, etc.). At a stage 916 the pre-configured media devices are powered up in proximity to each wireless network defined by the user at the stage 904. Here, proximity means within sufficient RF range (e.g., distance) of the respective wireless networks such that the RF 107 of the media devices may reliably communicate with those wireless networks. If some of the wireless networks defined by the user at the stage 904 are not available at the time of power up (e.g., office wireless network or WiMAX network) then the user may re-power up the pre-

configured media devices when those media devices are positioned in proximity of the previously unavailable wireless networks.

At a stage 918, verification that each media device has wireless access to each wireless network occurs. As before, some wireless networks that are not in proximity of the powered up media devices may be verified later by user re-powering up the pre-configured media devices when those media devices are positioned in proximity of the previously unavailable wireless networks. At a stage 920, each user device has its respective APP installed on it, if the APP has not already been installed. At a stage 922 wireless access of each media device with each user device and with each wireless network is verified. Here, verification may not be possible for some user devices and some wireless networks if they are not in RF proximity to one another or are not powered up. To that end, verification at the stage 922 may occur at a later time as each user device and each wireless network is powered up or comes into RF proximity of the media devices such that the verification process can proceed for those user devices and wireless networks. At a stage 924, verification that each of the pre-configured media devices is in wireless communications with other pre-configured media devices may occur. Here, wireless communications may include but is not limited to WiFi, Bluetooth®, Ad Hoc, Acoustic, and Optical. For example, depending on the systems and configurations of each media device, the stage 924 may include verifying wireless communications using one or more systems such as WiFi 130, BT 120, Ad Hoc 140, AV 109, other 150, SEN 195, and OPT 185 (see FIG. 1).

Moving on now to FIG. 10, where a flow 1000 depicts another example of cloud-based configuration of one or more media devices. Many of the stages depicted in flow 1000 may be similar to or identical to those described above in reference to flow 900 of FIG. 9. Here, the user purchases one or more media devices from a retailer at a stage 1002. The retailer in some instances may be another on-line retailer other than the manufacturer and another on-line retailer may act as an agent for the retailer or the manufacture. At a stage 1004, the user provides the retailer with service set identifier (SSID) information for the wireless local area network(s) (WLAN) the user's media devices will be expected to wirelessly communicate with. Optionally, password information associated with each SSID may also be provided by the user.

At a stage 1005 the user may provide the retailer with user specific configuration information for each media device purchased. The user specific configuration information may be the same or different for some or all of the purchased media devices. For example, if one of the media devices comprises a subwoofer, then that media device may include user specific configuration data that is different than that of other purchased media devices that may serve as

left, right, and center channel speakers, or as a speaker phone or conference phone. The user specific configuration information may comprise the data included in CFG 125 for each media device. Some of the media devices may include video capture and/or video display systems and those media devices may include user specific configuration information that is different than that of non-video enabled media devices. The wide variety of information that may be included in the user specific configuration information is described in greater detail below in regard to FIG. 13.

At a stage 1006, each media device purchased by the user is configured with the SSID and optionally the password information for the wireless networks. For example, the SSID and password information may be data included in the CFG 125 and be used by RF 107 of each media device for wireless communications between media devices and/or user devices using WiFi 130. At a stage 1008, the user may optionally provide information on each user device (e.g., 202) the user intends to be used with the purchased media devices. If the "YES" branch is taken, then at a stage 1010 the information is used to create an application APP (e.g., APP 225) that is specific to each of the user devices. At a stage 1012 the APP is delivered to each user device and the flow 1000 may resume at a stage 1014. If the user prefers not to give information on user devices a "NO" branch is taken and the flow 1000 may resume at the stage 1014.

At the stage 1014 pre-configured media devices are delivered, for example, as describe above in reference to flow 900 of FIG 9. At a stage 1016 the pre-configured media devices are powered up in proximity to each wireless network defined by the user at the stage 1004. At a stage 1018, verification that each media device has wireless access to each wireless network occurs. At a stage 1020, each user device has its respective APP installed on it, if the APP has not already been installed. At a stage 1022 wireless access of each media device with each user device and with each wireless network is verified. At a stage 1024, verification that each of the pre-configured media devices is in wireless communications with other pre-configured media devices may occur. Here, wireless communications may include but is not limited to WiFi, Bluetooth®, Ad Hoc, Acoustic, and Optical. For example, depending on the systems and configurations of each media device, the stage 1024 may include verifying wireless communications using one or more systems such as WiFi 130, BT 120, Ad Hoc 140, AV 109, other 150, SEN 195, and OPT 185 (see FIG. 1).

Turning now to FIG. 11, at any stage prior to the stages 914 and 1014, for example, a flow 1100 may be performed by the on-line seller or retailer, as the case may be. In flow 1100 at a stage 1102 each media device purchased by the may be configured with a unique family

identification number (UFID) that is electronically stored in each media device (e.g., in DS 103 or CFG 125, etc.). If a “YES” branch is selected, then at a stage 1104 each device is configured with the UFID. If a “NO” branch is selected, then the flow may resume at a stage 1106. For example, the stage 1106 may resume the flow at a point prior to the stages 914 and 1014 of FIGS. 9 and 10. The on-line seller or retailer may retain the UFID associated with the user’s media devices for future purchases and/or acquisitions of media devices and configure the same UFID in those devices. For example, the user may initially purchase three media devices that are configured using the flows depicted in any one of FIGS. 9 – 12, and then may subsequently purchase an additional two more media devices. The two newly purchased media devices are configured with the same UFID as the three initially purchased media devices. Without limitation, the UFID may be used by itself or in conjunction with other data (e.g., MAC addresses) to control which media devices may communicate, control, or otherwise interact with one another in an ecosystem of media devices.

In FIG. 12, a flow 1200 may be performed at any stage prior to the stages 914 and 1014, for example. Here, at a stage 1202 a decision to configure each media device with a unique Bluetooth® Device Address (BDA) may be made. If a “YES” branch is taken, then at a stage 1204 each purchased media device is configured with a unique BDA. If a “NO” branch is selected, then the flow may resume at a stage 1206. For example, the stage 1206 may resume the flow at a point prior to the stages 914 and 1014 of FIGS. 9 and 10. The on-line seller or retailer may retain the unique BDA information for use in configuring future purchases and/or acquisitions of media devices by the user. Future media devices may be configured with BDA’s that are consistent with and/or otherwise compatible with the BDA’s of previously configured media devices. As one example, the BDA’s may be used to identify the network address of other media devices specific to the user’s ecosystem of media devices and may allow the devices in the user’s ecosystem to perform tasks such as paring with one another, wirelessly connecting with one another, controlling one another, activating/deactivating one another, handling content with one another, just to name a few.

In FIG. 13, a diagram 1300 depicts one example of media device purchase, cloud-based configuration, and media device delivery. Initially a user 201 decides to make a purchase of one or more media devices that the user 201 wishes to be configured to the user’s 201 needs. Diagram 1300 may be used in conjunction with the flows of FIGS. 9 – 12 to demonstrate media device purchase, cloud-based configuration, and delivery. In the example depicted the user 201 purchases five media devices denoted as i, ii, iii, iv, and v from an on-line seller (e.g., the

manufacturer) or a retailer (e.g., brick and mortar or on-line). In one example the user 201 has a plurality of user devices 202 and 1320 that are to be used in conjunction with the five media devices. There may be more or fewer user devices 202 than depicted as denoted by 1331. User 201 may use device 1320 to visit a web site of an on-line seller of the media devices. In some
5 examples the user 201 may log into the web site of the on-line seller using a user name and password, or the like. While on the web site the user 201 selects (e.g., using the stylus 1321) five media devices (i, ii, iii, iv, and v) for purchase. The user 201 may select more or fewer than five media devices as denoted by 1335. A GUI or the like on the on-line seller's web page may be accessed by the user 201 to make selections among the various types of media devices offered
10 by the on-line seller. After the user 201 has finalized the selections, the five media devices may be purchased (e.g., by adding to a cart) and paid for using a credit card or an on-line payment service such as PayPal™ or the like. At the time of purchase the user 201 may include other relevant information such as shipping information for delivering the media devices to the user 201 or other. The interchange of information between the user 201 and the on-line seller
15 necessary to make the selection, purchase, payment, and delivery of the media devices is denoted as 1342.

At some point during the purchase process the user 201 may input information on device 1320 that is used by the on-line seller to configure the media devices (e.g., user specific configuration information). The user 201 may input information including but not limited to:
20 the SSID's and optionally passwords for three wireless networks (1370, 1372, and 1374) the user 201 intends the purchased media devices to wirelessly communicate with; information on user devices 202 and 1302 to be used for wireless communications with the media devices; preferences for how the media devices are to operate individually or with one another (e.g., for CFG 125), preferences for how the media devices will handle content; how the media devices
25 will respond to changes in their surrounding environment (e.g., using PROX 113); how the media devices will respond with user devices 202; how the media devices will wirelessly communicate with one another and with user devices 202; power management for the media devices; just to name a few. The interchange of information between the user 201 and the on-line seller necessary to effectuate the configuring is denoted as 1340. In FIG. 13,
30 communications (1360, 1361) between the on-line seller and the user device 1320 are managed by one of the wireless networks 1374 the user 201 has access to. Although three wireless networks are depicted there may be more or fewer wireless networks as denoted by 1333.

Cloud environment 1350 (cloud 1350 hereinafter) may be without limitation any on-line, Internet, web based site, or other means through which the user 201 using a device such as 1320 may effectuate an on-line purchase and configuration of media devices using a communications medium such as a wired (e.g., Ethernet), wireless (e.g., WiFi or Cellular), or both. Cloud 1350
5 may be a web site for the manufacture, an on-line seller, an agent of the manufacture, or a value added reseller (VAR), for example.

The information (1340, 1342) is processed in cloud 1350 to create data 1355 that may be used to configure media devices (i, ii, iii, iv, and v) according to the specifications of user 201. Data 1355 may be communicated 1363 to an entity 1380 (e.g., the manufacturer) who has access
10 to the media devices (i, ii, iii, iv, and v) to be configured and has the systems (e.g., hardware and/or software) operative to configure the media devices. Data 1355 may include several different types of data including but not limited: to configuration data CFG 1341 that may be the same or different for each of the media devices; application data APP 1343 for each of the user devices (e.g., 202, 1320), the unique Bluetooth Device Addresses BDA 1345; the unique family
15 ID UFID 1347; and other data OD 1349. OD 1349 may comprise data including but not limited to: serial numbers for the media devices; model numbers for the media devices; purchase information for the media devices, warranty information for the media devices; phone numbers, email addresses or URL's for customer service and/or technical support for the media devices; just to name a few.

Entity 1380 compiles some or all of the types of data 1355 to configure each of the five media devices (i, ii, iii, iv, and v) purchased by user 201 so that the media devices are transformed from being un-configured 1382 to being pre-configured 1384. The five media devices may all be pre-configured the same or one or more of the five media devices may be pre-configured differently than other of the five media devices. The term "pre-configured" as used
25 herein may mean a media device that is configured by another on behalf of the user 201 prior to the user 201 taking delivery or otherwise taking possession of the media device.

The pre-configured media devices 1384 are delivered 1386 to the user by entity 1380 or by an agent acting on behalf of entity 1380. Delivery 1386 may comprise one or more of air, sea, ground, or drop shipment of the media devices to an address or other location specified by
30 the user 201. In some examples delivering the pre-configured media devices may be by drop shipment to a reseller, dealer, installer, service organization, or the like. Although the above description may be associated with the flow 900 of FIG. 9, it also applies to the flow 1000 of FIG. 10. However, instead of the user 201 using device 1320, a retailer uses the device 1320 to

enter the user's information (1340, 1342) to form the data 1355 in cloud 1350. Wireless network 1374 may be one used by the retailer to communicate (1360, 1361) with the cloud 1350. In some examples entity may be the retailer and the retailer may have inventory for the media devices purchased by the user 201. The retailer may also have the systems necessary to use the data
5 1355 to configure the un-configured media devices 1382 to transform them into pre-configured media devices 1384. Delivery 1386 by the retailer may include transporting or shipping the pre-configured media devices 1384 to user 201 or having the user 201 pick up the pre-configured media devices 1384.

The actual configuration process to transform the un-configured media devices 1382 into
10 pre-configured media devices 1384 may include using any wireless system that can communicate with the wireless systems of the media devices, such as WiFi 130, AH 140, BT 120, OPT 185, AV 109, for example. Wired systems such as Ethernet, USB, HDMI, IEEE 1394, or other wired systems may be used (e.g., I/O 105) to perform the configuration process. In some examples a Flash memory card or USB drive can be used to install the necessary configuration data in the
15 media devices (e.g., DS 103 or I/O 105).

Moving now to FIG. 14, a diagram 1400 depicts one example of verifying configuration and wireless connectivity of delivered media devices. Here, five pre-configured media devices 100i, 100ii, 100iii, 100iv, and 100v have been delivered (see 1386 in FIG. 13) to user 201. Each media device includes data D 1410 that comprises the information pre-configured into each
20 media device. D 1410 may be the same or may differ among the media devices. D 1410 may be stored as one or more files, data structures, tables, look up tables, hash tables or the like in DS 103 or other system in each memory device. D 1410 may include CFG 125 as described above. Although five media devices are depicted, more or fewer devices may be delivered as denoted by 1435. User 201 has access to three wireless networks (1370, 1372, and 1374) and five user
25 devices 202. Each of the user devices 202 may be enabled to wirelessly communicate with one or more of the three wireless networks (1370, 1372, and 1374).

After taking delivery 1386, user 201 powers up (e.g., turns on) the five pre-configured media devices 100i, 100ii, 100iii, 100iv, and 100v. Each media device may implement one or more of the verifying steps as described in flows 900 and 1000 in FIGS. 9 and 10 respectively.
30 Therefore, after power up (916, 1016) each media device may verify (918, 1018) that it has wireless access 1440 (e.g., via WiFi 130) to each wireless network for which the user 201 provided SSID and optionally password data for, such as one or more of wireless networks (1370, 1372, and 1374). Verification after power up may also comprise each user device 202

verifying (922, 1022) it is has wireless access (1440 and 1450) to each media device (100i, 100ii, 100iii, 100iv, and 100v) and to each wireless network (1370, 1372, and 1374). Verification after power up may also comprise each media device verifying (924, 1024) that it is in wireless communication 1460 with other media devices. Wireless communication 1460 may comprise
5 wireless communication using one or more of the wireless systems in the media devices (100i, 100ii, 100iii, 100iv, and 100v), such as BT 120, WiFi 130, AH 140, other 150, OPT 185, and AV 107. Therefore, wireless communication 1460 may include one or more of RF, acoustic or optical wireless communications.

Prior to or after power up (916, 1016), each of the user devices 202 may have its
10 respective APP installed (920, 1020). The APP may be APP 225 as described above. APP may be used for future configuration of newly added media devices to the ecosystem of user 201 or may be used to re-configure existing media devices in the ecosystem. APP may be used for operating system (OS) updates for an OS used by the media devices. APP may be used for firmware updates for the various systems of the media devices such as controller 101. APP may
15 be used to update and maintain a list of MAC addresses used by the media devices for wireless communications.

Although the foregoing examples have been described in some detail for purposes of clarity of understanding, the above-described conceptual techniques are not limited to the details provided. There are many alternative ways of implementing the above-described conceptual
20 techniques. The disclosed examples are illustrative and not restrictive.

What is Claimed Is:

1. A method for cloud-based device configuration, comprising:
purchasing on-line, one or more media devices from an on-line seller;
providing the on-line seller with a service set identifier (SSID) for each wireless network
5 to be accessed by the one or more media devices;
providing the on-line seller with user specific configuration information for each media device purchased;
configuring each media device purchased with the SSID for each wireless network to be accessed and with the user specific configuration information, wherein the configuring is
10 operative to transform each media device into a pre-configured media device; and
delivering each pre-configured media device.
2. The method of Claim 1 and further comprising:
providing the on-line seller with information on one or more user devices to be used with the one or more media devices;
15 creating an application for each user device; and
delivering the application.
3. The method of Claim 1 and further comprising:
configuring each media device purchased with a unique family identification number (UFID).
- 20 4. The method of Claim 1 and further comprising:
configuring each media device purchased with a unique Bluetooth device address (BDA).
5. The method of Claim 1, wherein the on-line seller is a manufacturer of the one or more media devices.
6. The method of Claim 1, wherein a selected one or more of the purchasing, the
25 configuring, the delivering, or any of the providing is done by a manufacturer of the one or more media devices or by an agent of the manufacturer.
7. The method of Claim 1, wherein the delivering comprises one or more forms of shipping selected from the group consisting of air, sea, ground, and drop shipping.
8. The method of Claim 1, wherein each media device purchased includes three different
30 types of wireless RF transceivers and one of the three types comprises an Ad Hoc (AH) RF transceiver specifically configured for wireless communication between other media devices that are purchased.

9. A method for cloud-based device configuration, comprising:
purchasing from a retailer, one or more media devices;
providing the retailer with a service set identifier (SSID) for each wireless network to be
accessed by the one or more media devices;
- 5 providing the retailer with user specific configuration information for each media device
purchased;
configuring each media device purchased with the SSID for each wireless network to be
accessed and with the user specific configuration information, wherein the configuring is
operative to transform each media device into a pre-configured media device; and
- 10 delivering each pre-configured media device.
10. The method of Claim 9 and further comprising:
providing the retailer with information on one or more user devices to be used with the
one or more media devices;
creating an application for each user device; and
- 15 delivering the application.
11. The method of Claim 9 and further comprising:
configuring each media device purchased with a unique family identification number
(UFID).
12. The method of Claim 9 and further comprising:
20 configuring each media device purchased with a unique Bluetooth device address (BDA).
13. The method of Claim 9, wherein a selected one or more of the configuring, the
delivering, or any of the providing is done by a manufacturer of the one or more media devices,
an agent of the manufacturer, or an agent of the retailer.
14. The method of Claim 9, wherein the delivering comprises one or more forms of shipping
25 selected from the group consisting of air, sea, ground, and drop shipping.
15. The method of Claim 9, wherein each media device purchased includes three different
types of wireless RF transceivers and one of the three types comprises an Ad Hoc (AH) RF
transceiver specifically configured for wireless communication between other media devices that
are purchased.
- 30 16. The method of Claim 9, wherein the purchasing and any of the providing includes the
retailer interacting in person with a purchaser of the one or more media devices.

17. The method of Claim 9, wherein the configuring is accomplished by the retailer or an agent of the retailer.

18. A system, comprising:

a plurality of pre-configured media devices,

5 each media device including a plurality of RF transceivers including an Ad Hoc (AH) RF transceiver specifically configured for wireless communication between the plurality of media devices,

each media device including a non-volatile data storage system including a distinct service set identifiers (SSID) for each distinct wireless network to be accessed by the plurality of
10 media devices and user specific configuration information that is specific to each of the plurality of media devices,

the plurality of RF transceivers including a WiFi RF transceiver configured upon initial power up of the media device to automatically wirelessly connect with and communicate with each distinct wireless network associated with one of the distinct SSID's, and

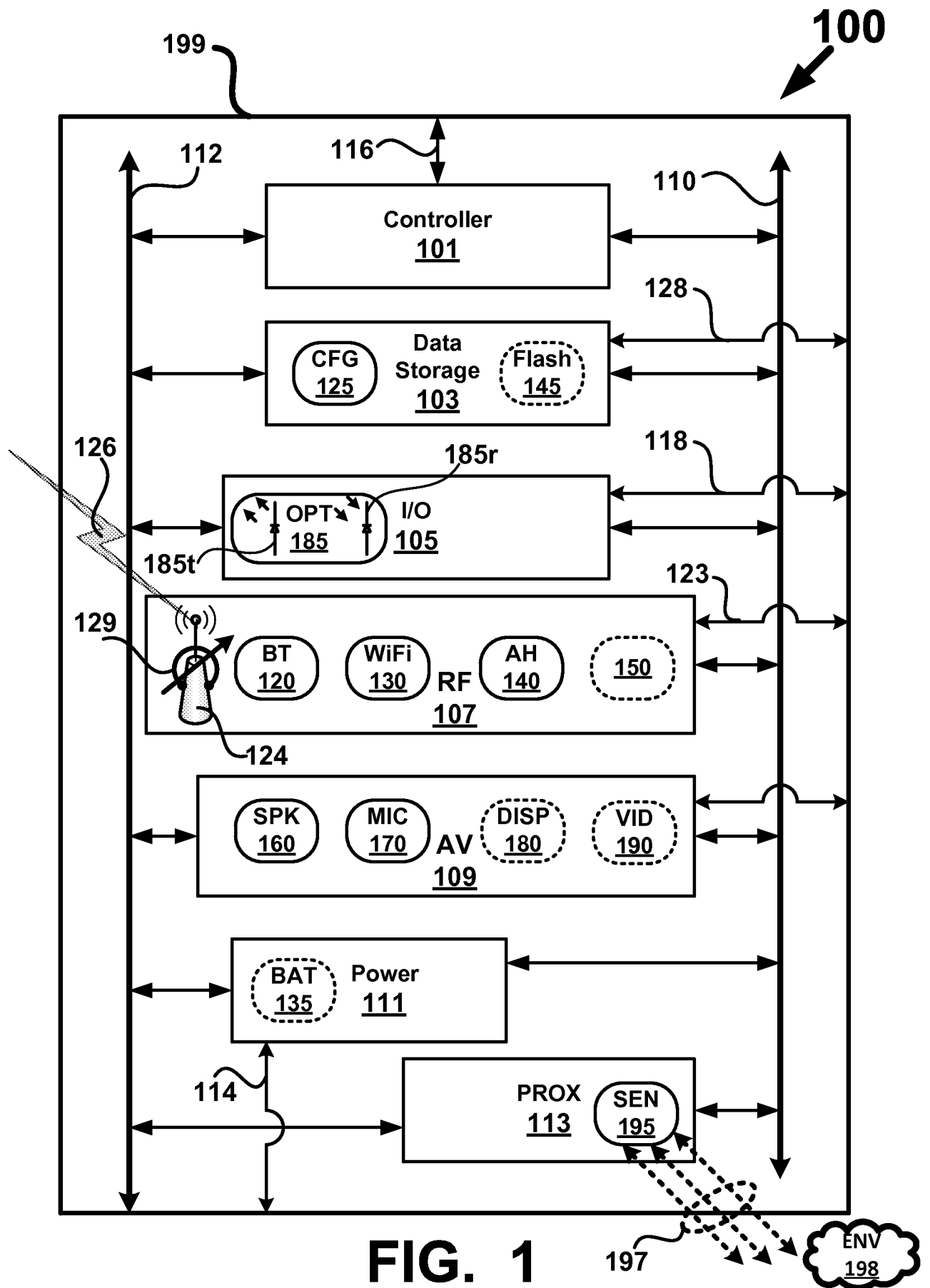
15 each media device configured upon initial power up to wirelessly communicate with other of the plurality of media devices using one or more of the plurality of RF transceivers.

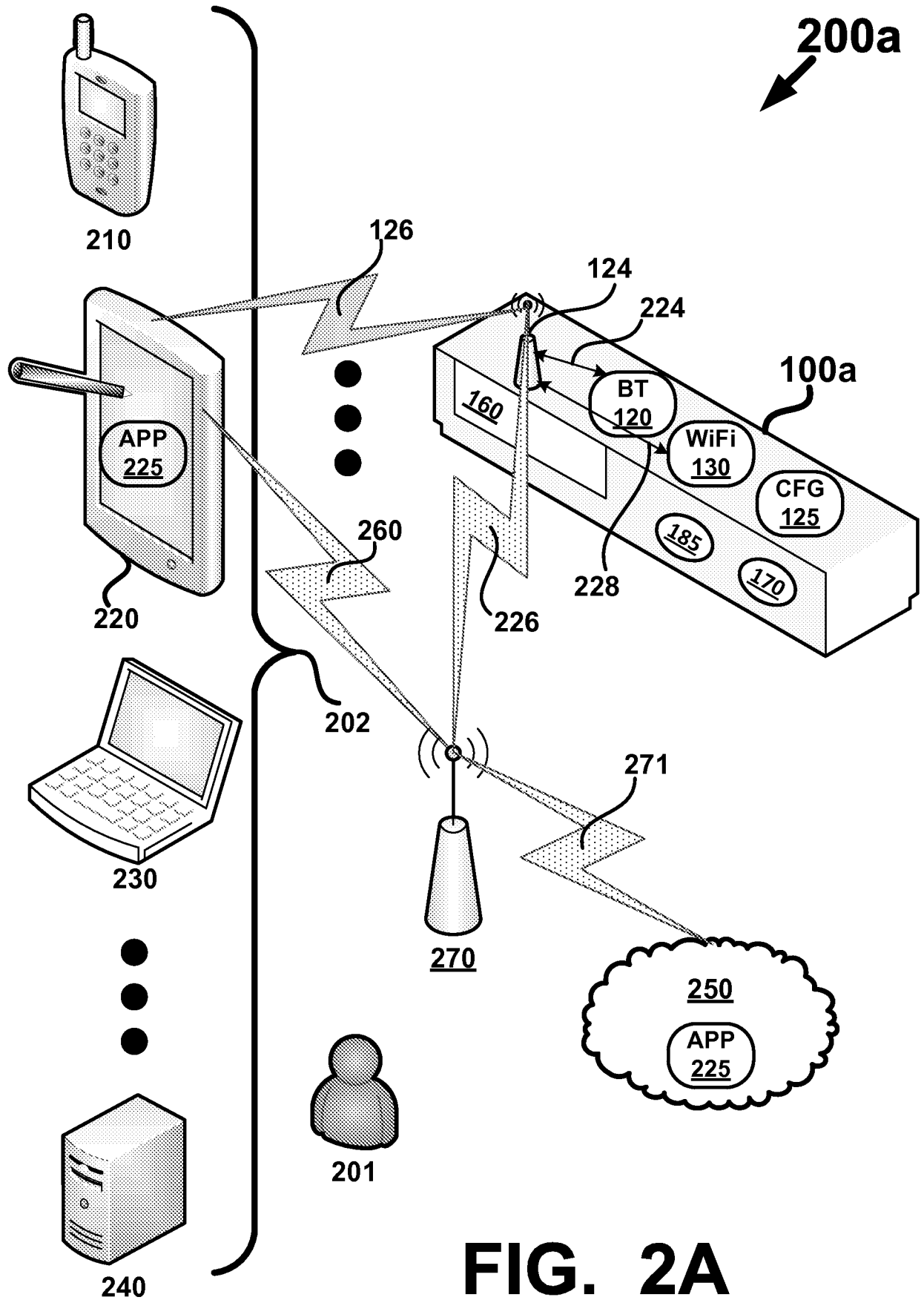
19. The system of Claim 18, wherein the plurality of RF transceivers includes a Bluetooth (BT) transceiver.

20. The system of Claim 19, wherein the non-volatile data storage system of each media
20 device includes a unique Bluetooth device address (BDA) for itself and a unique BDA for other of the plurality of media devices.

25

30





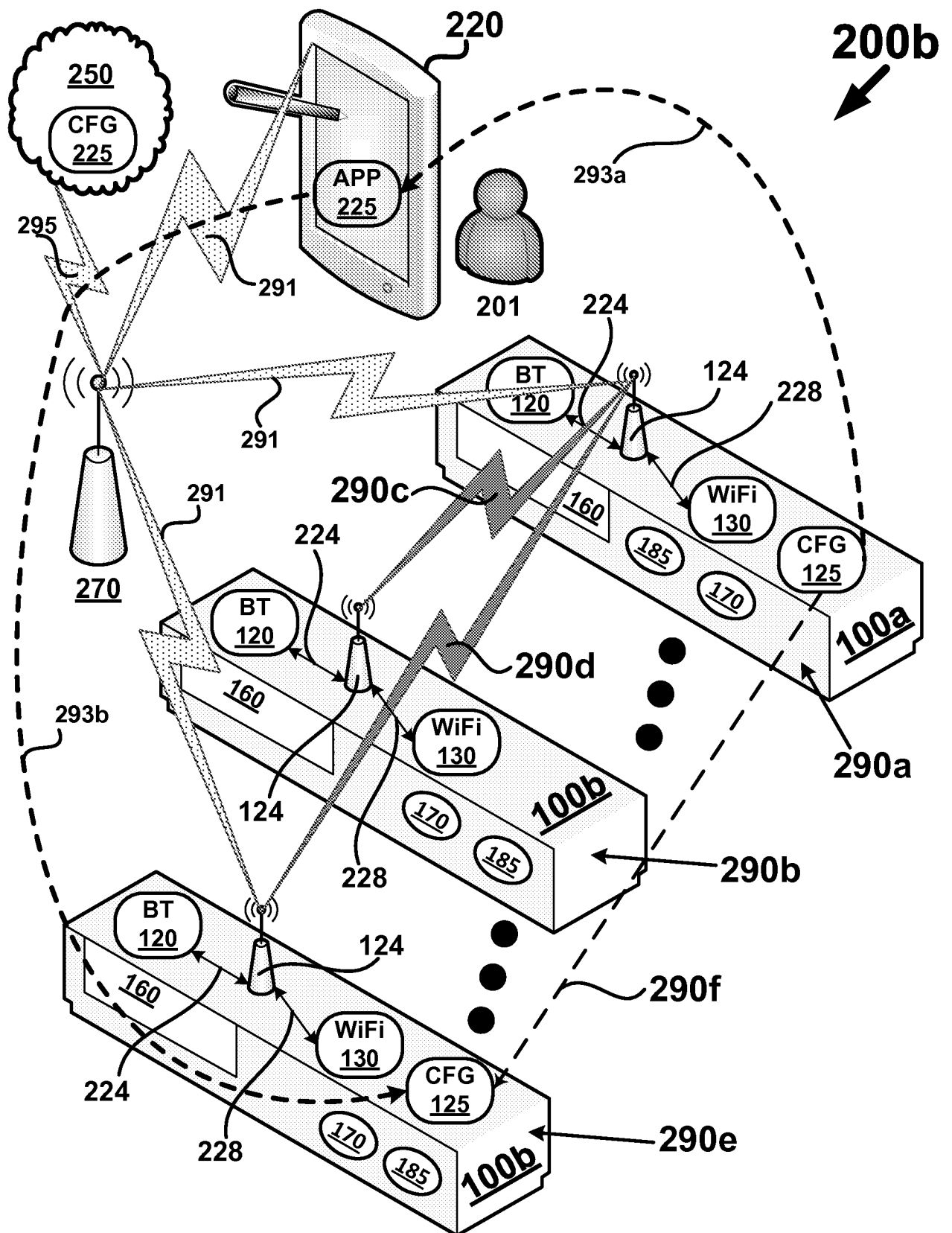
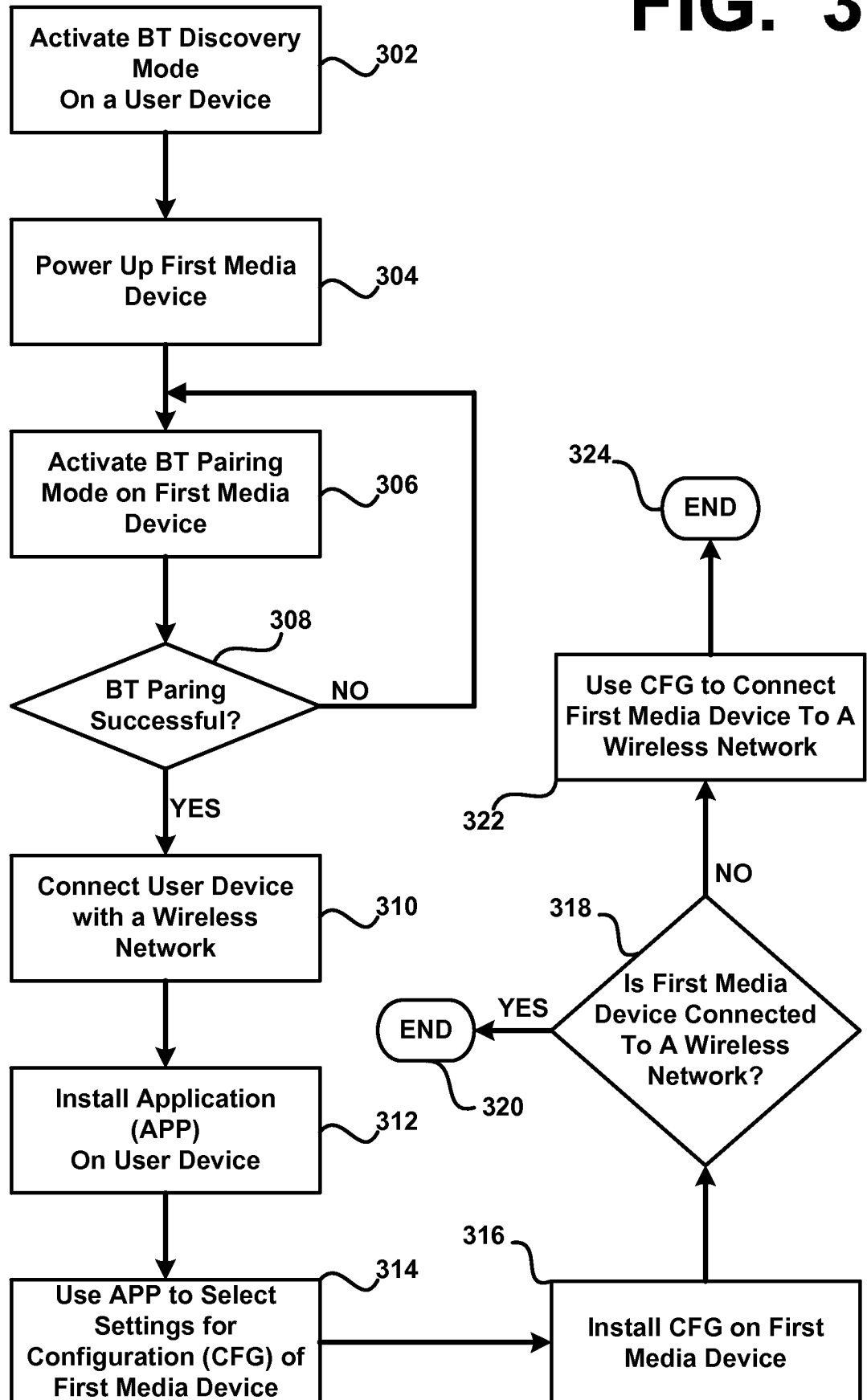
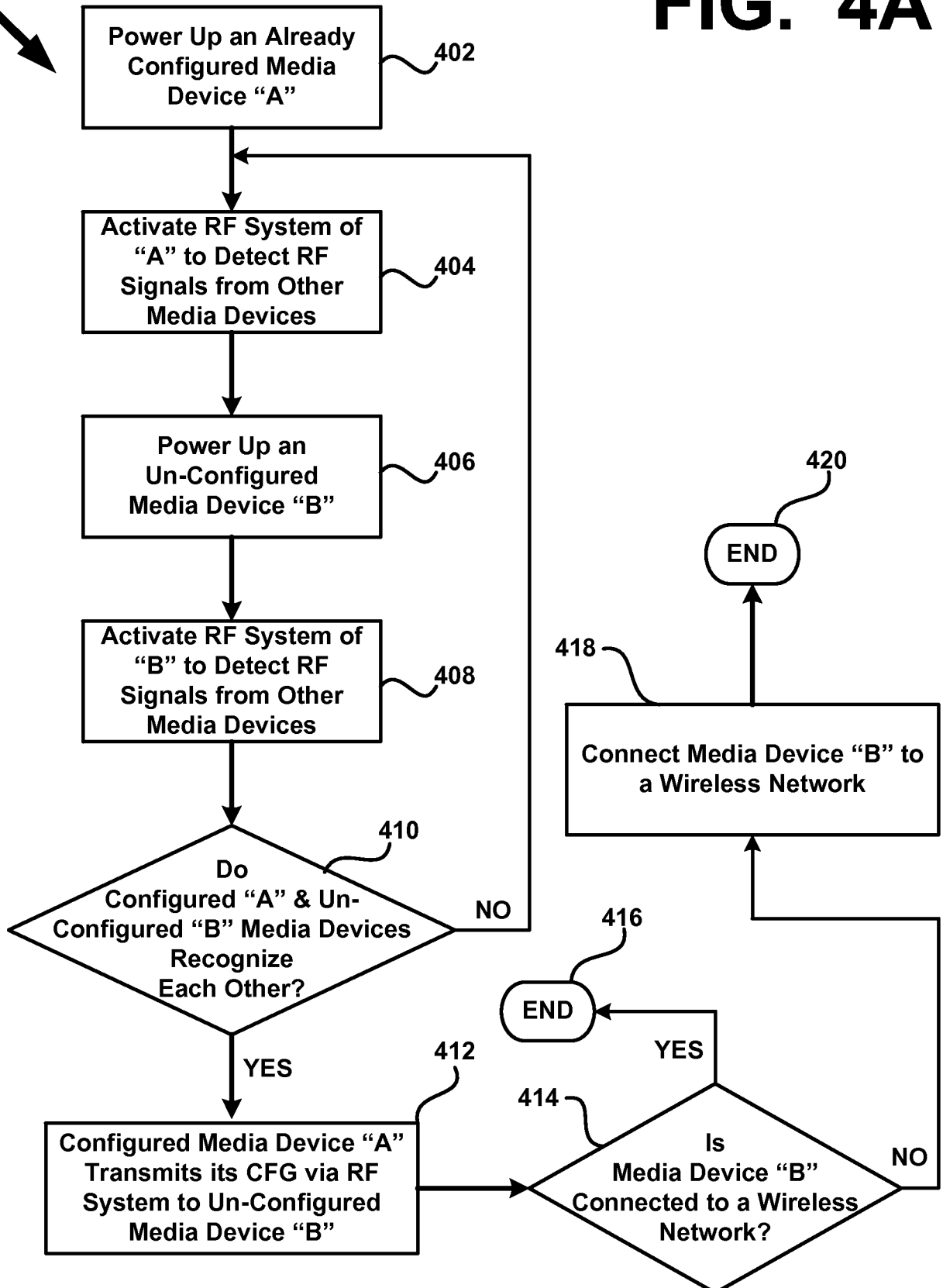


FIG. 2B

300**FIG. 3**

400a

400b

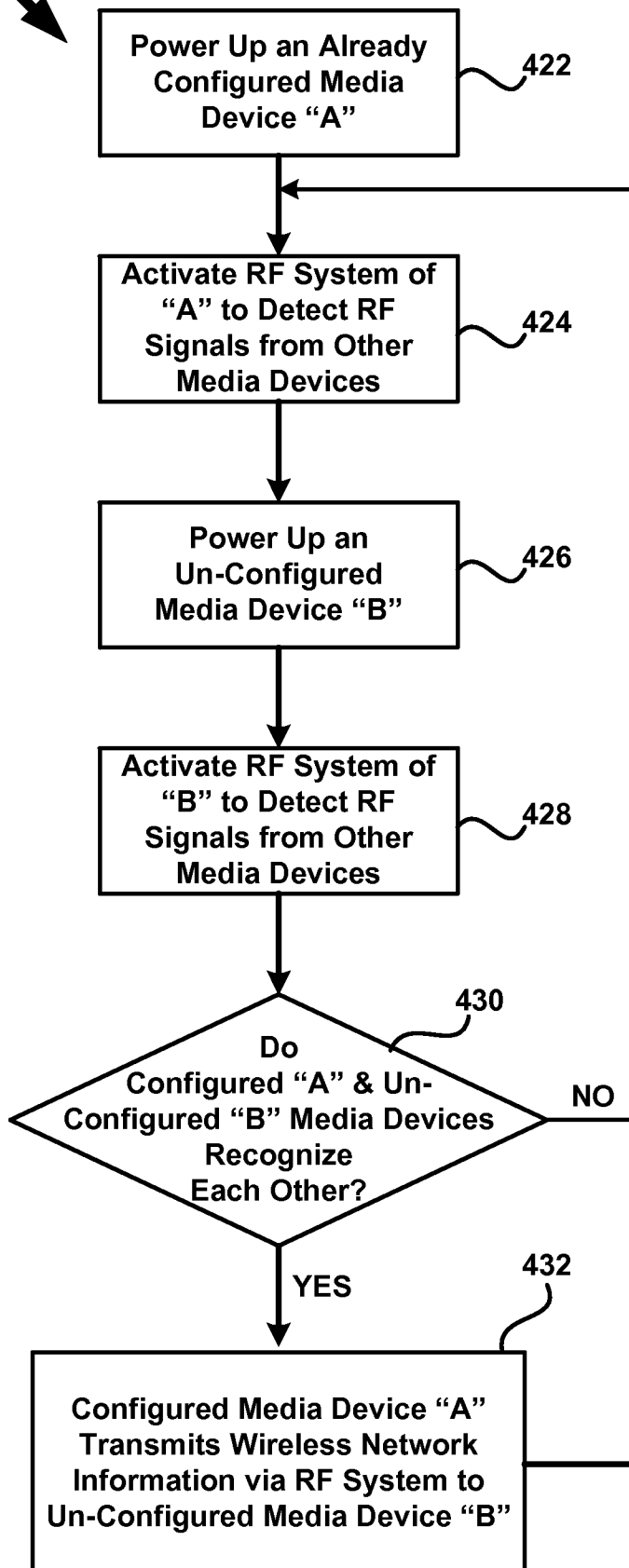
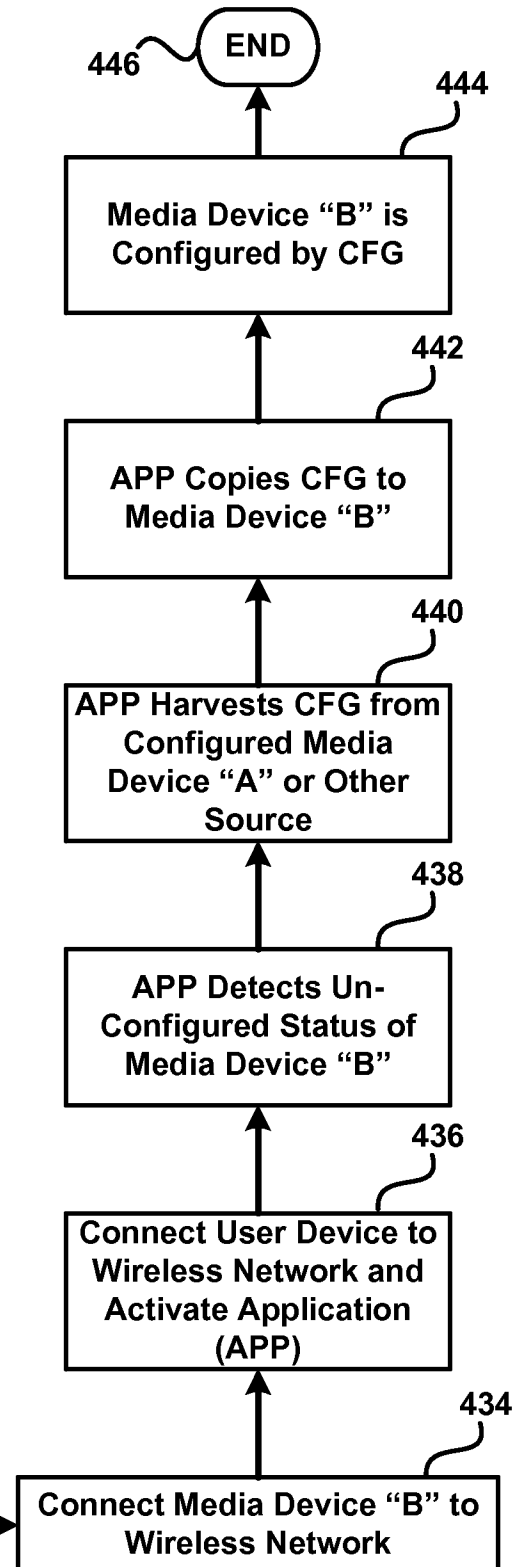
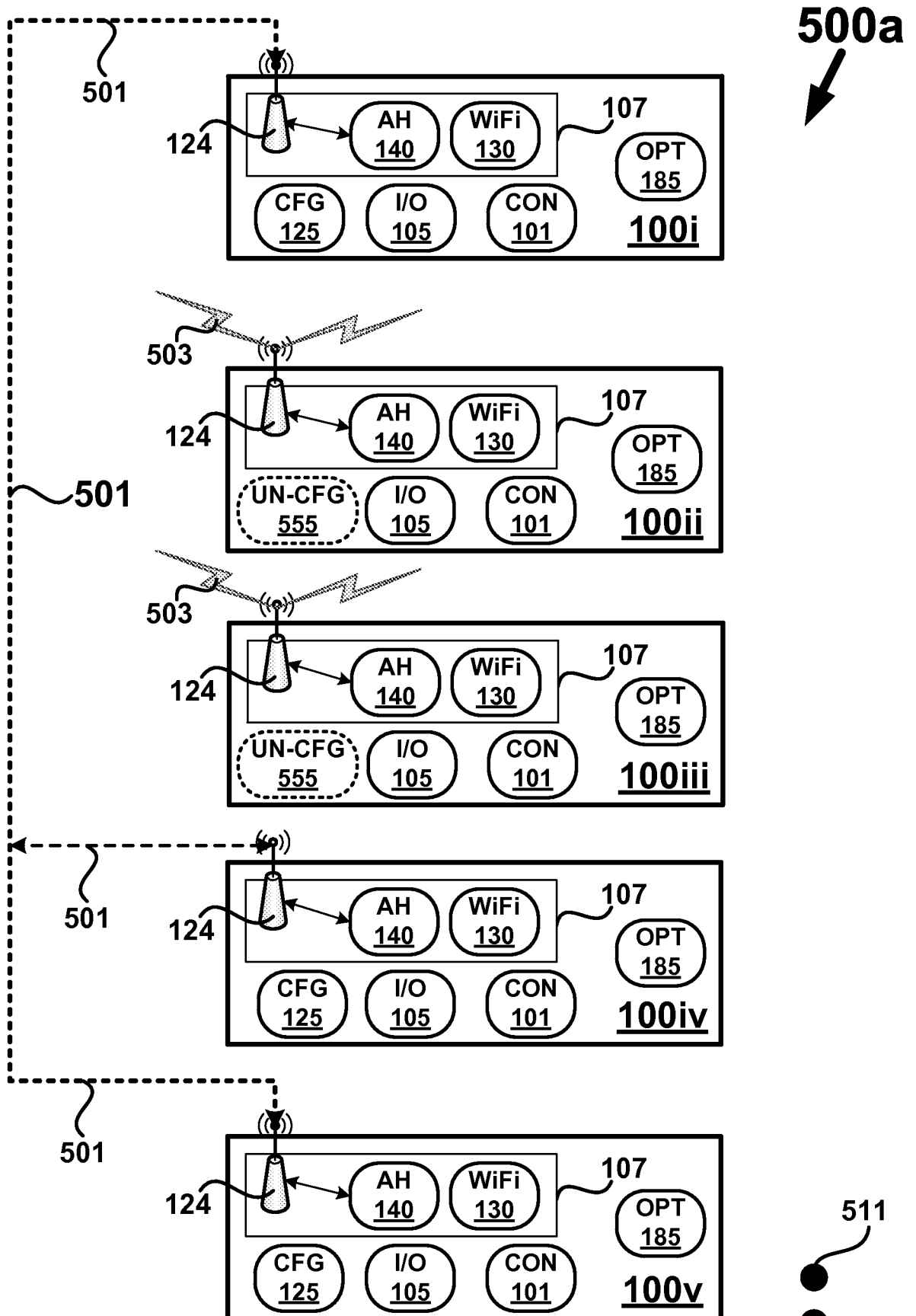
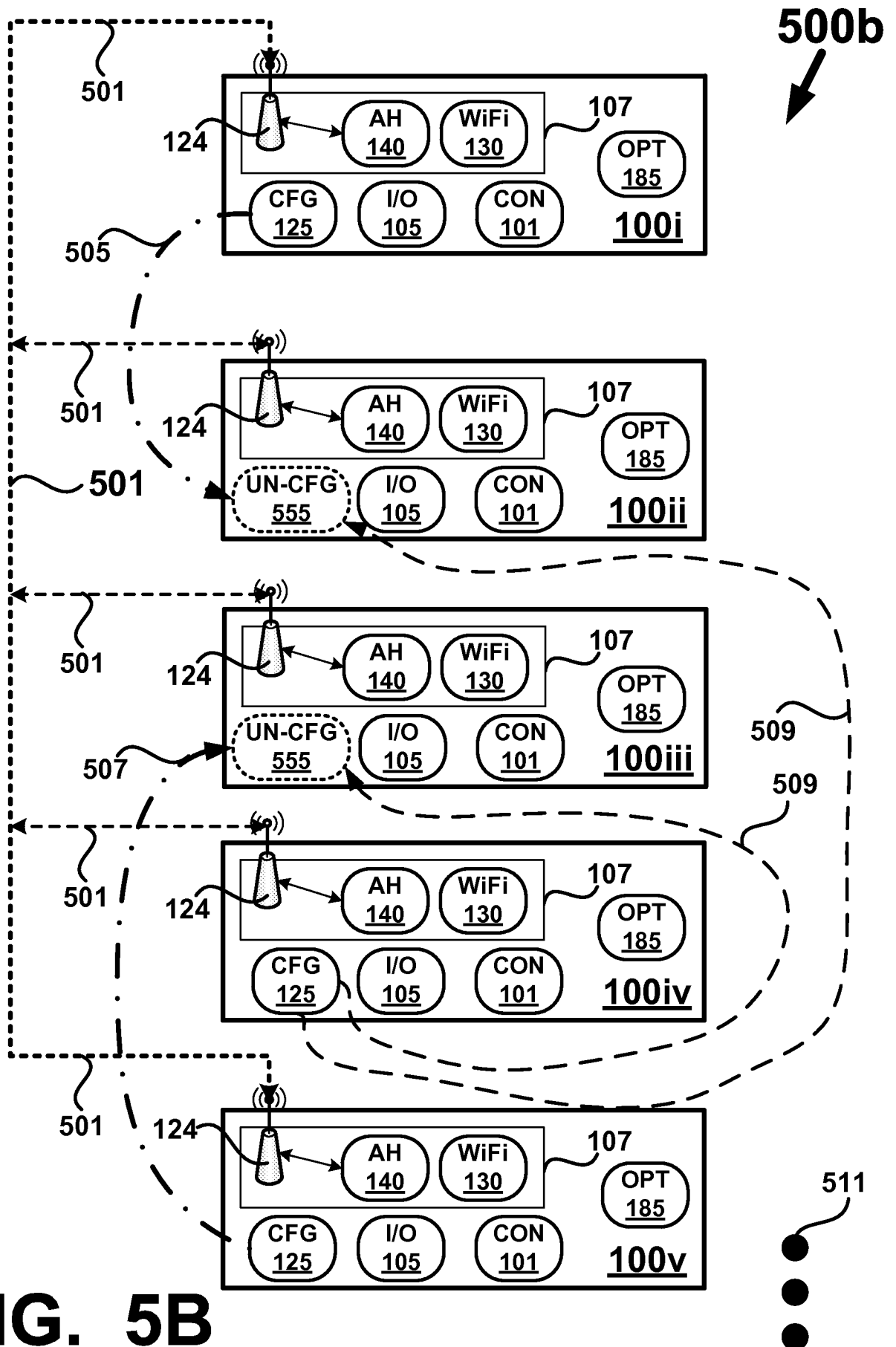
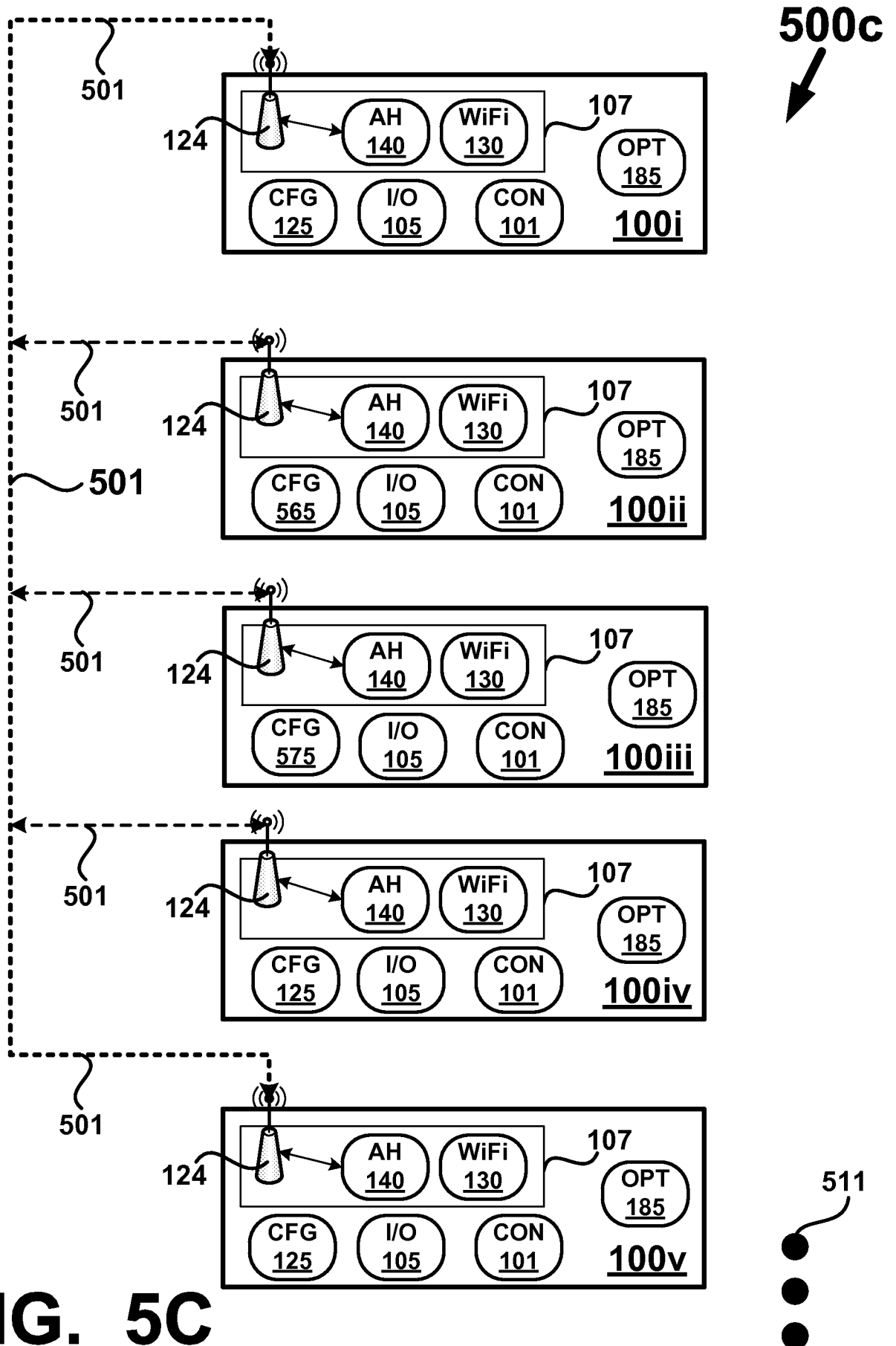


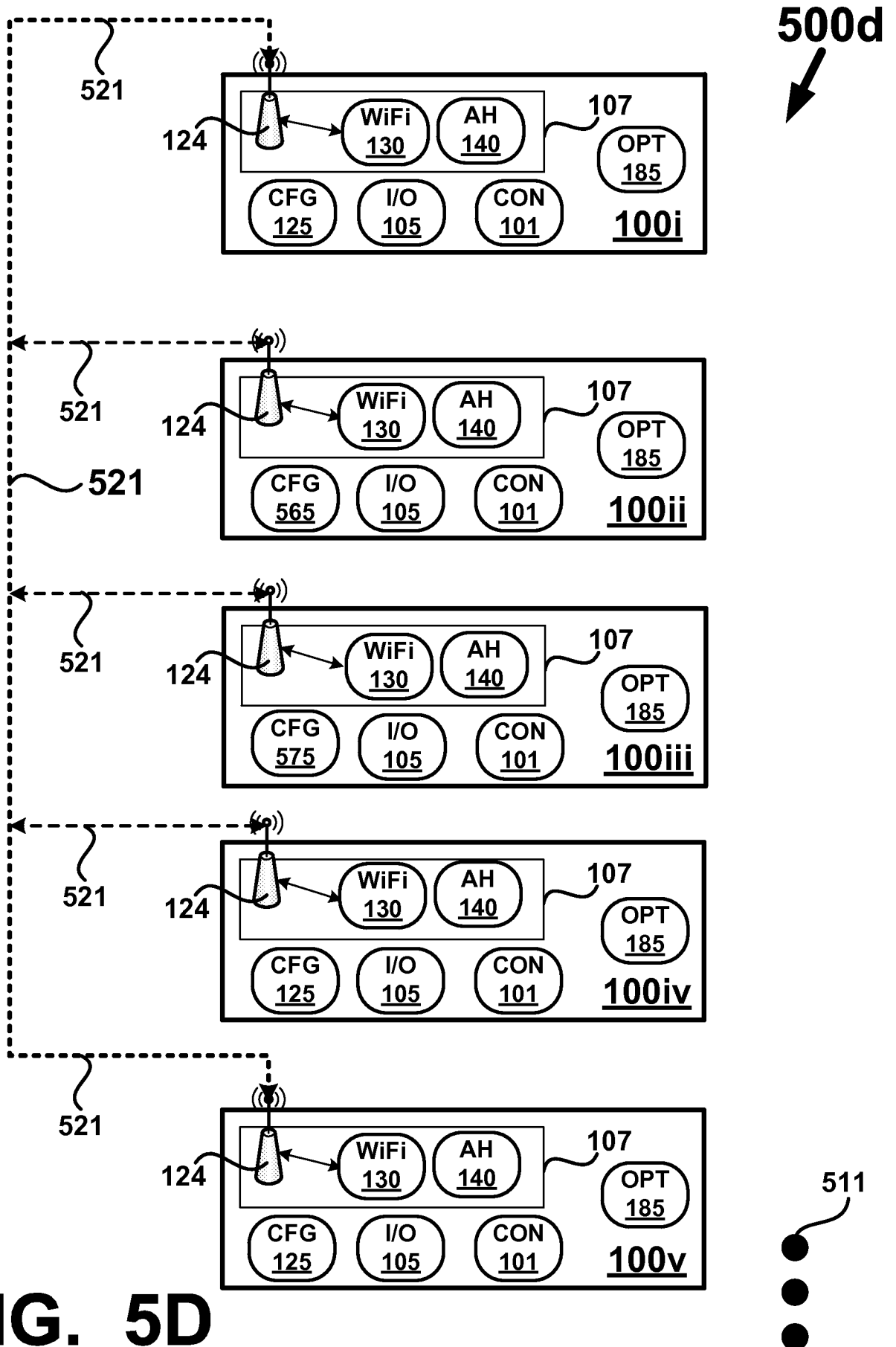
FIG. 4B

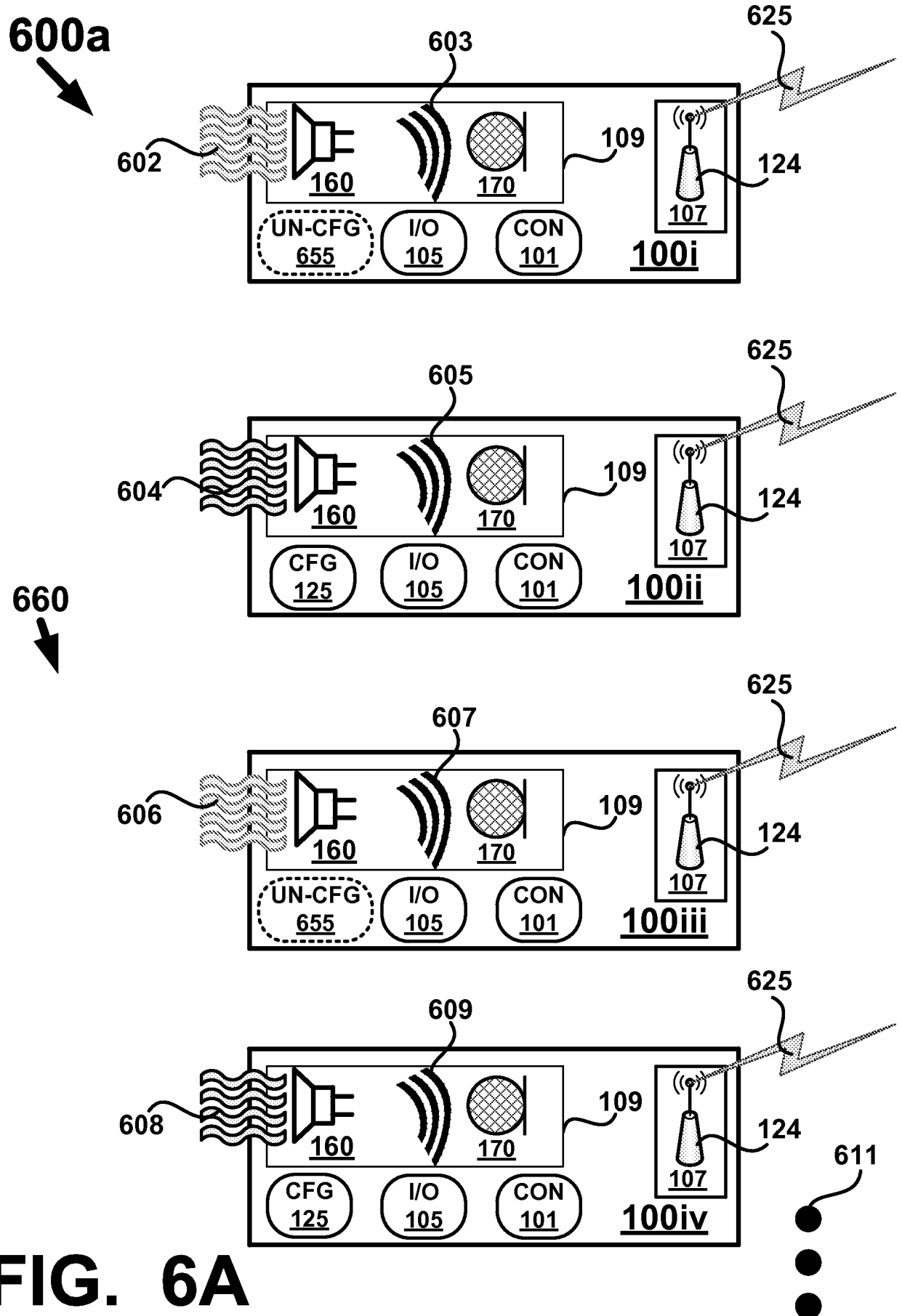


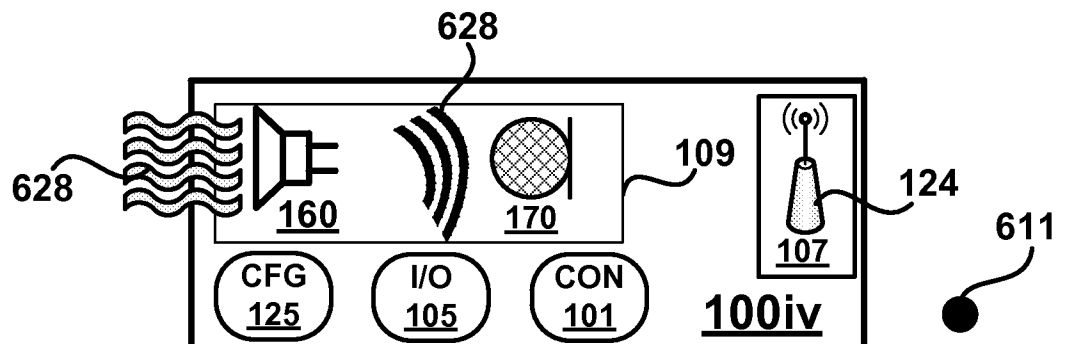
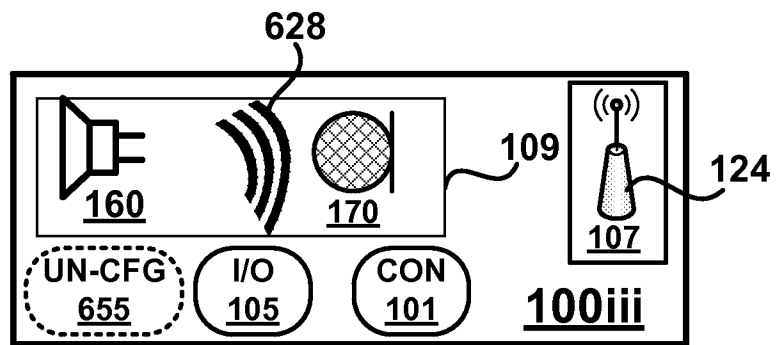
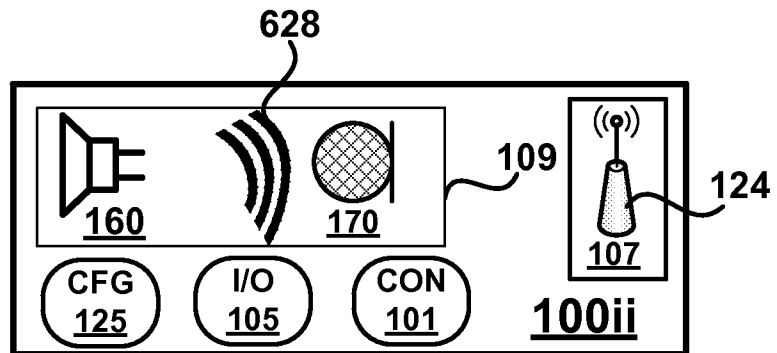
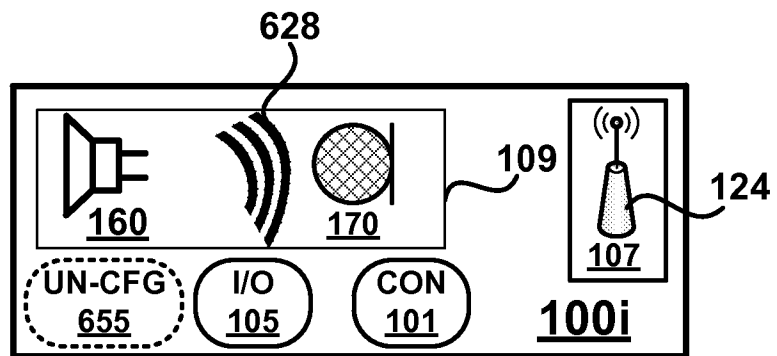
**FIG. 5A**

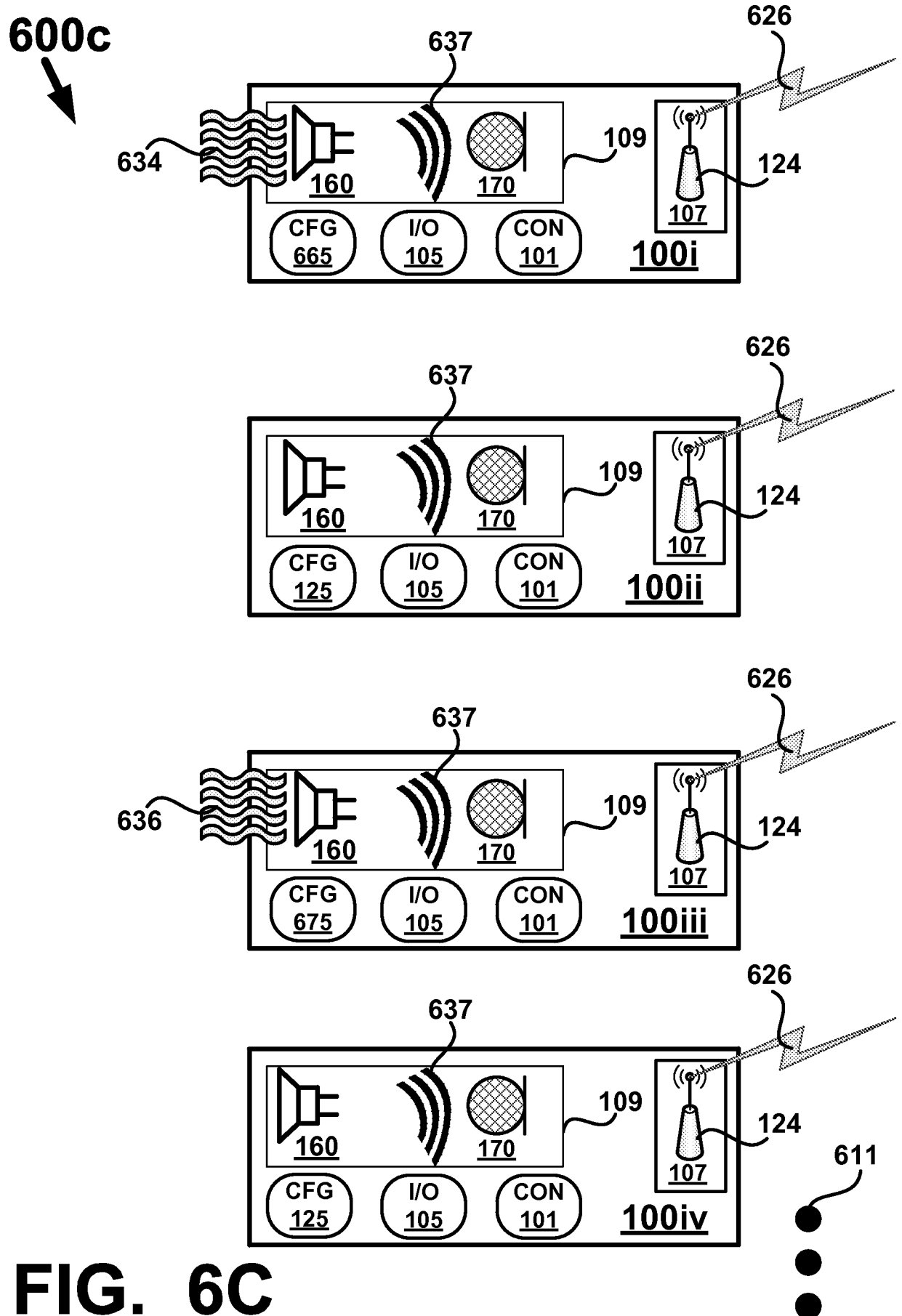
**FIG. 5B**

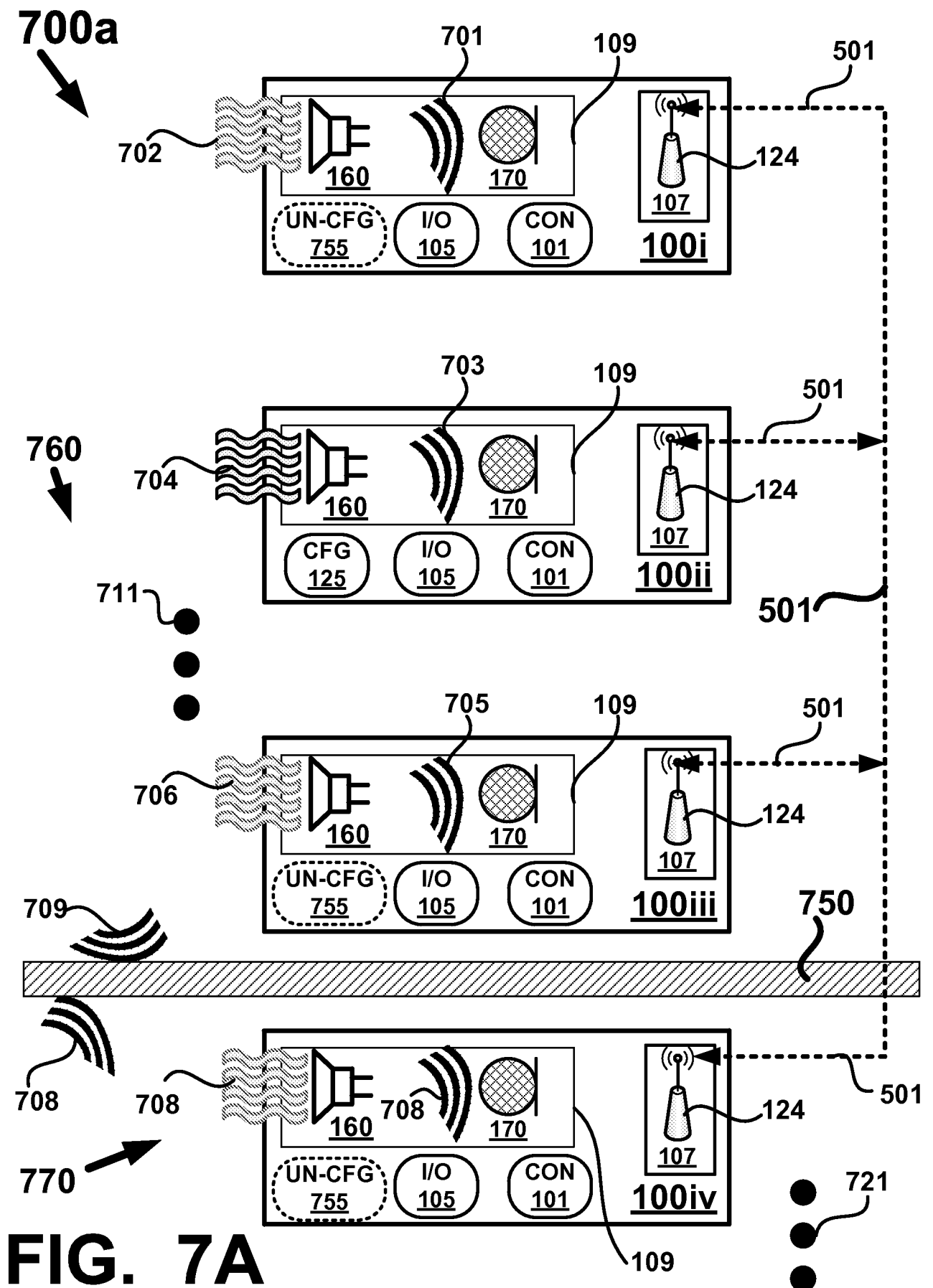


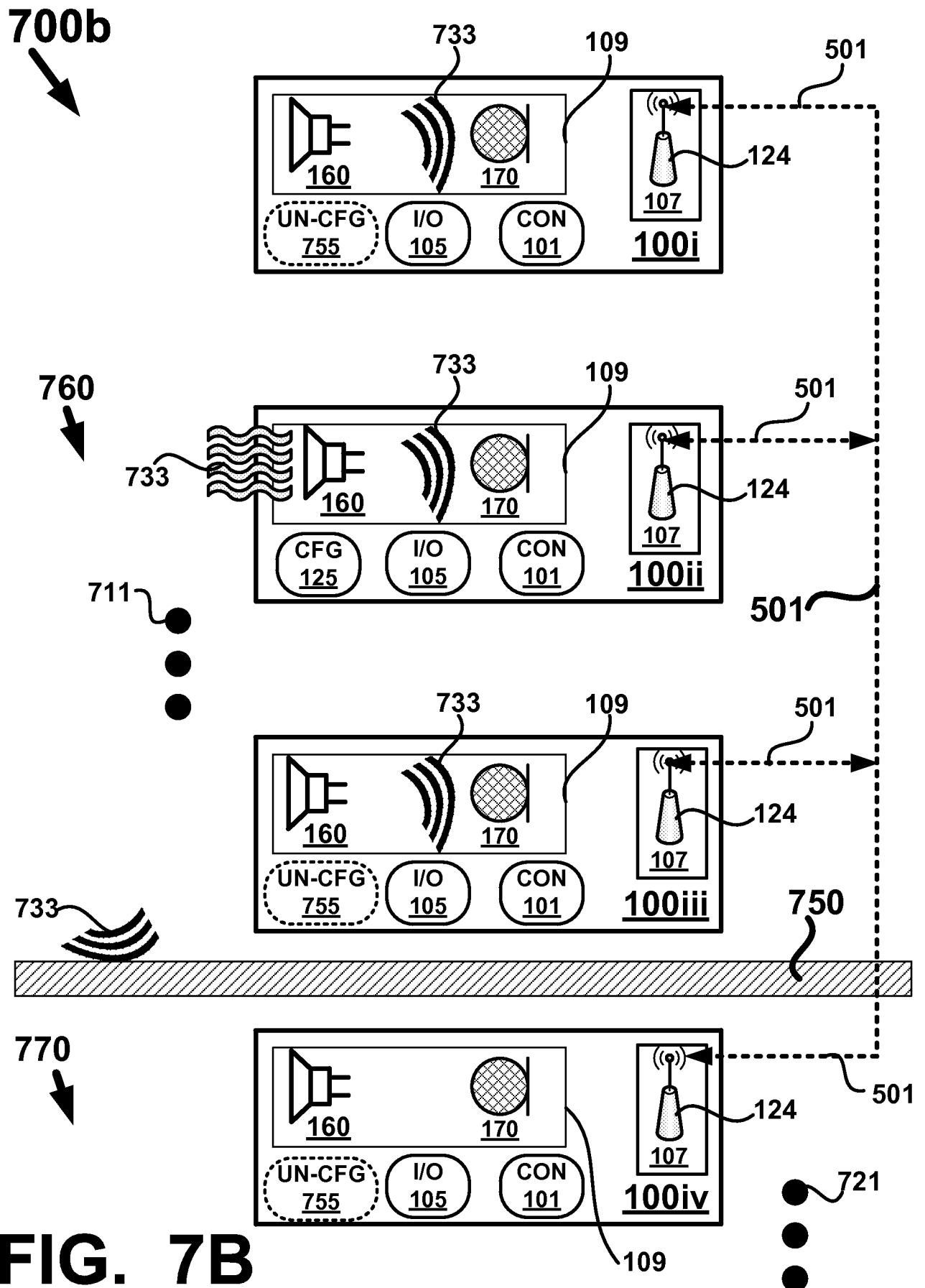
**FIG. 5D**

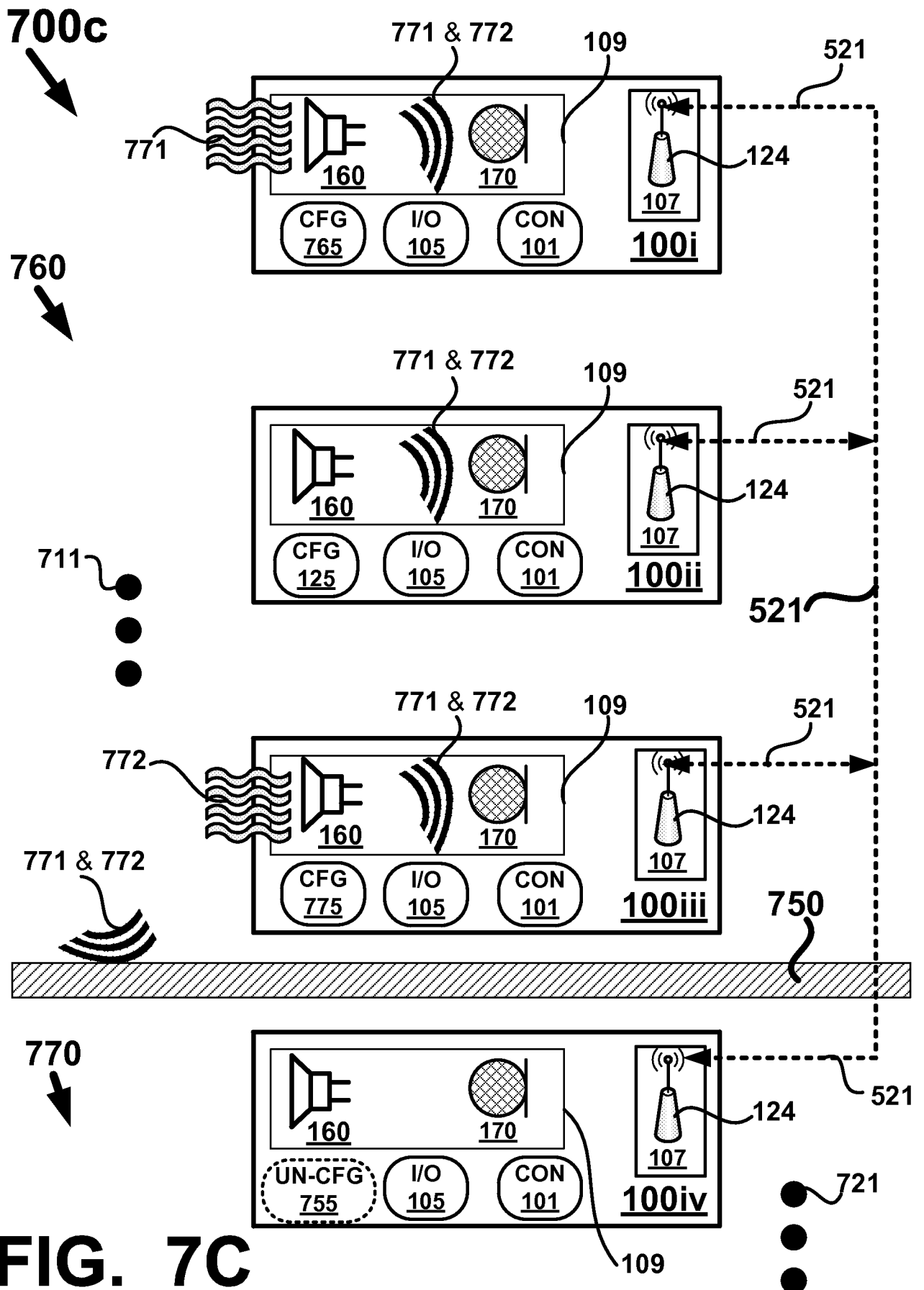


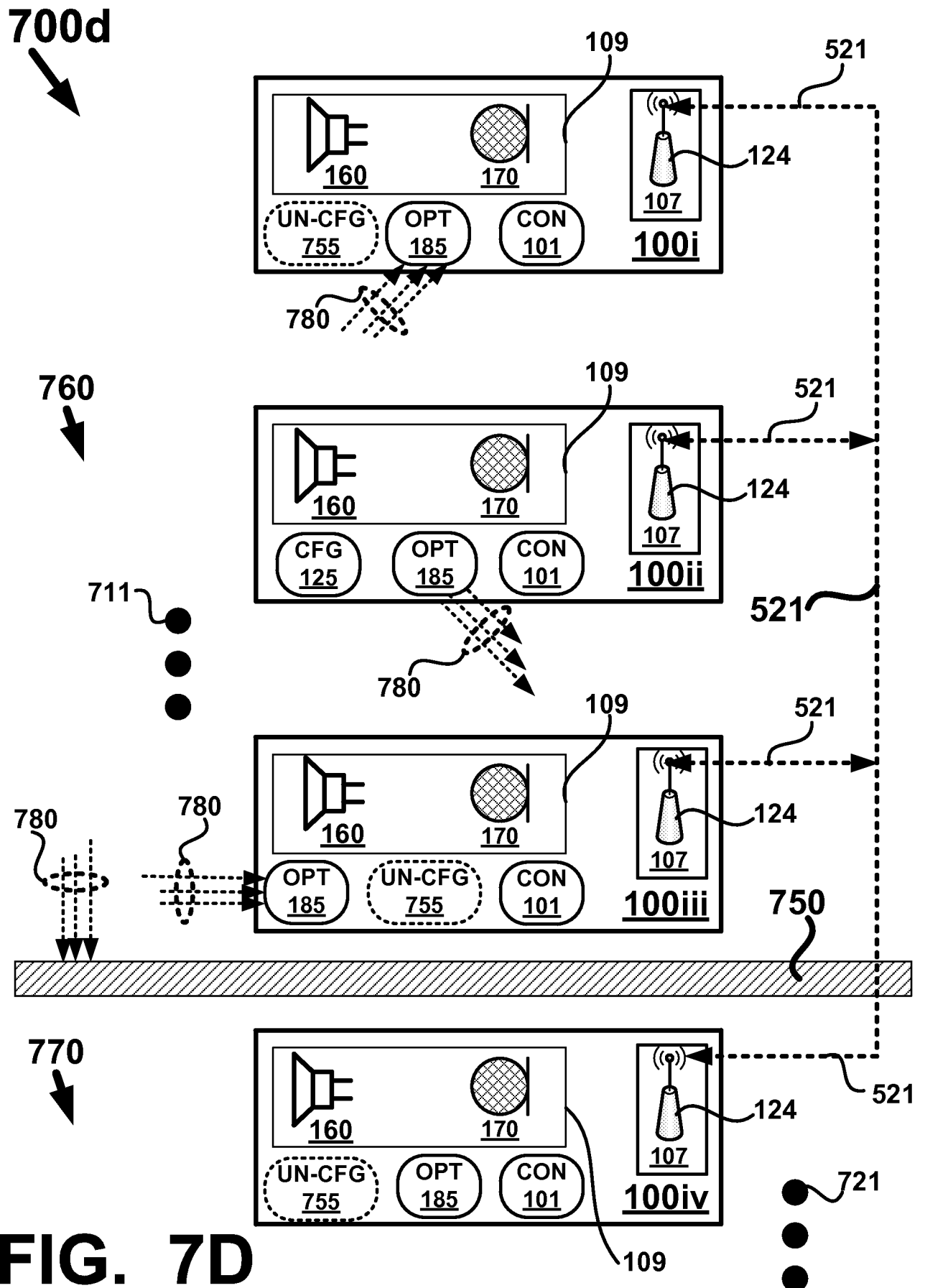
600b**FIG. 6B**

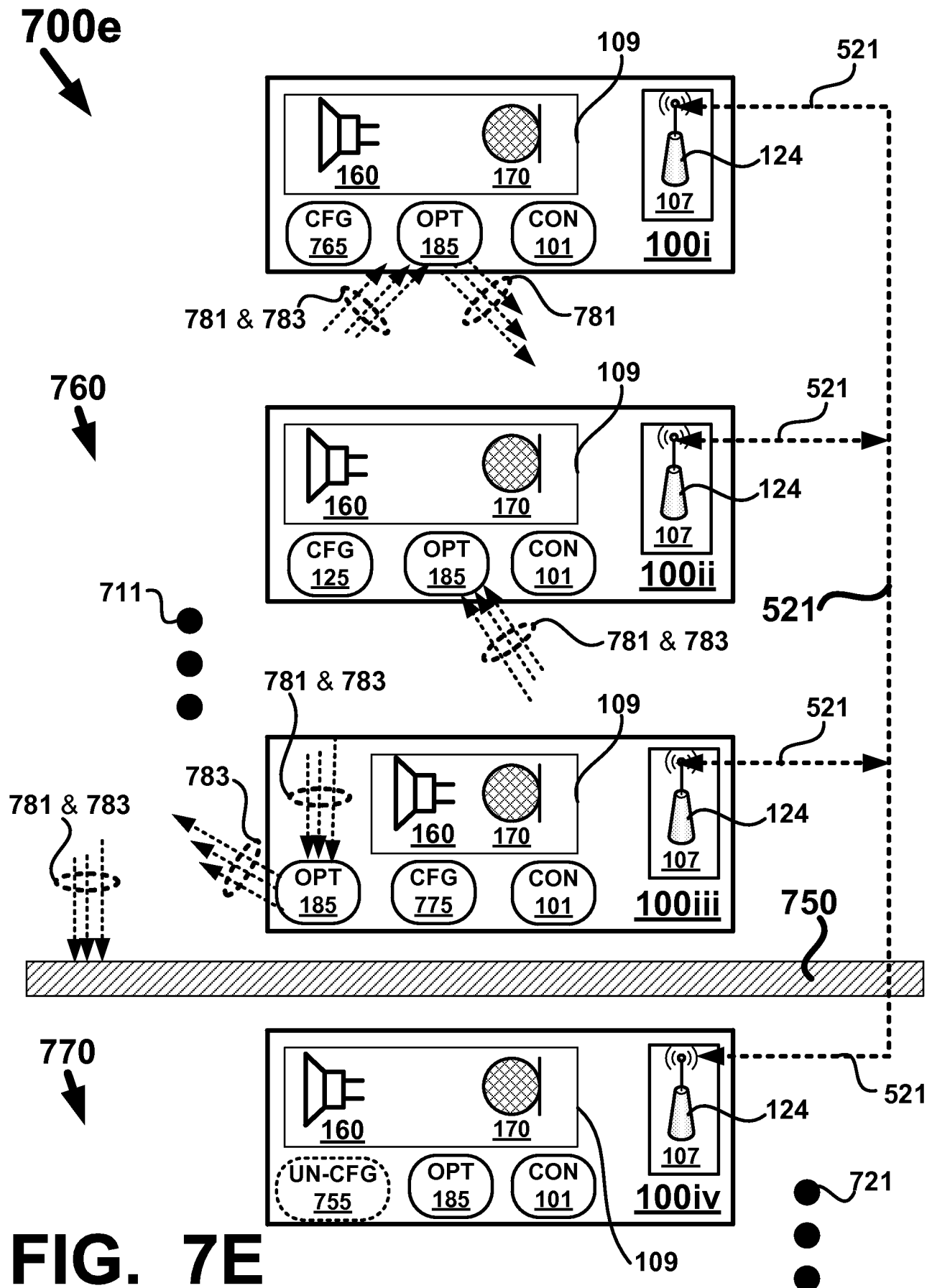


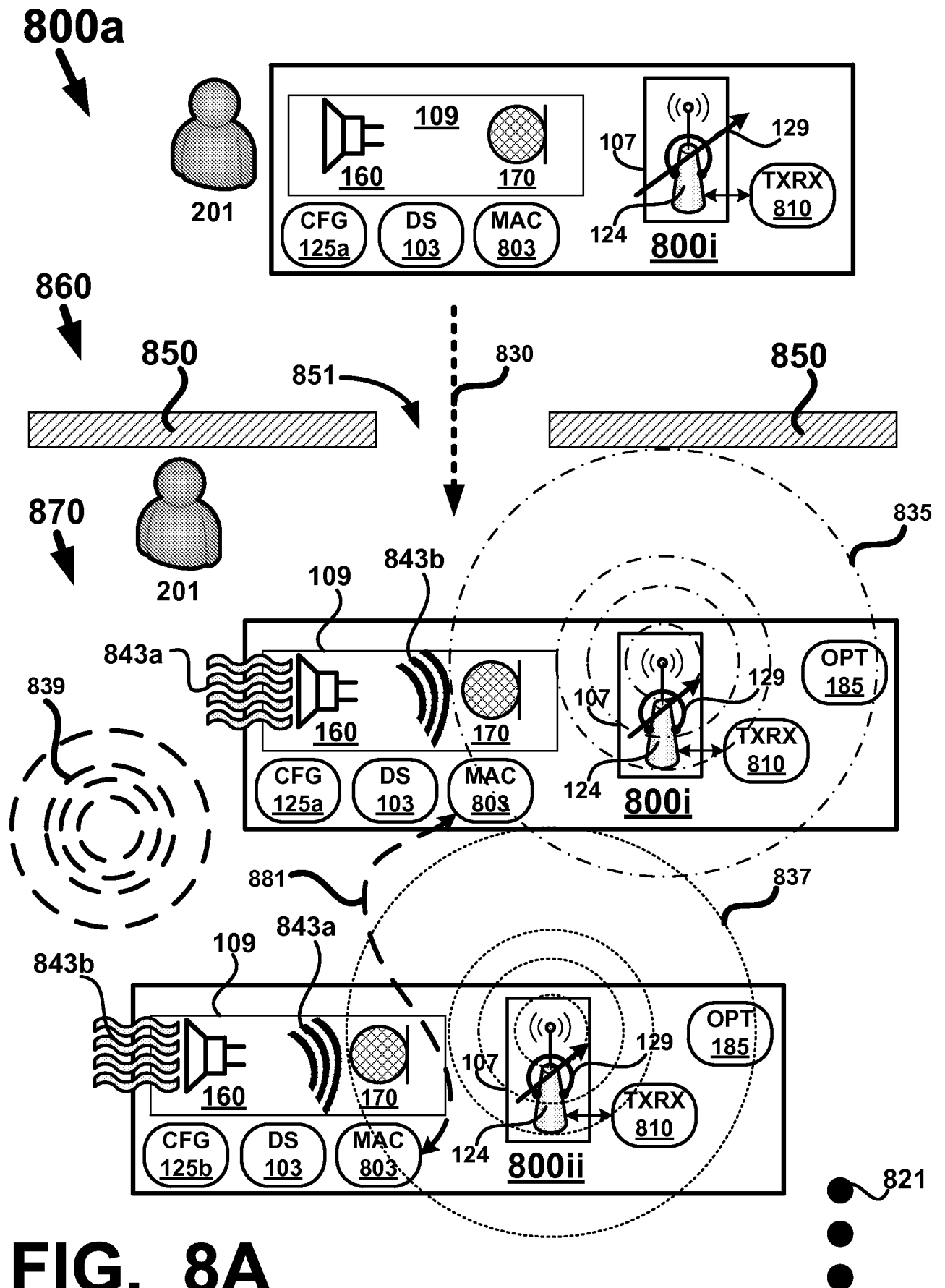


**FIG. 7B**









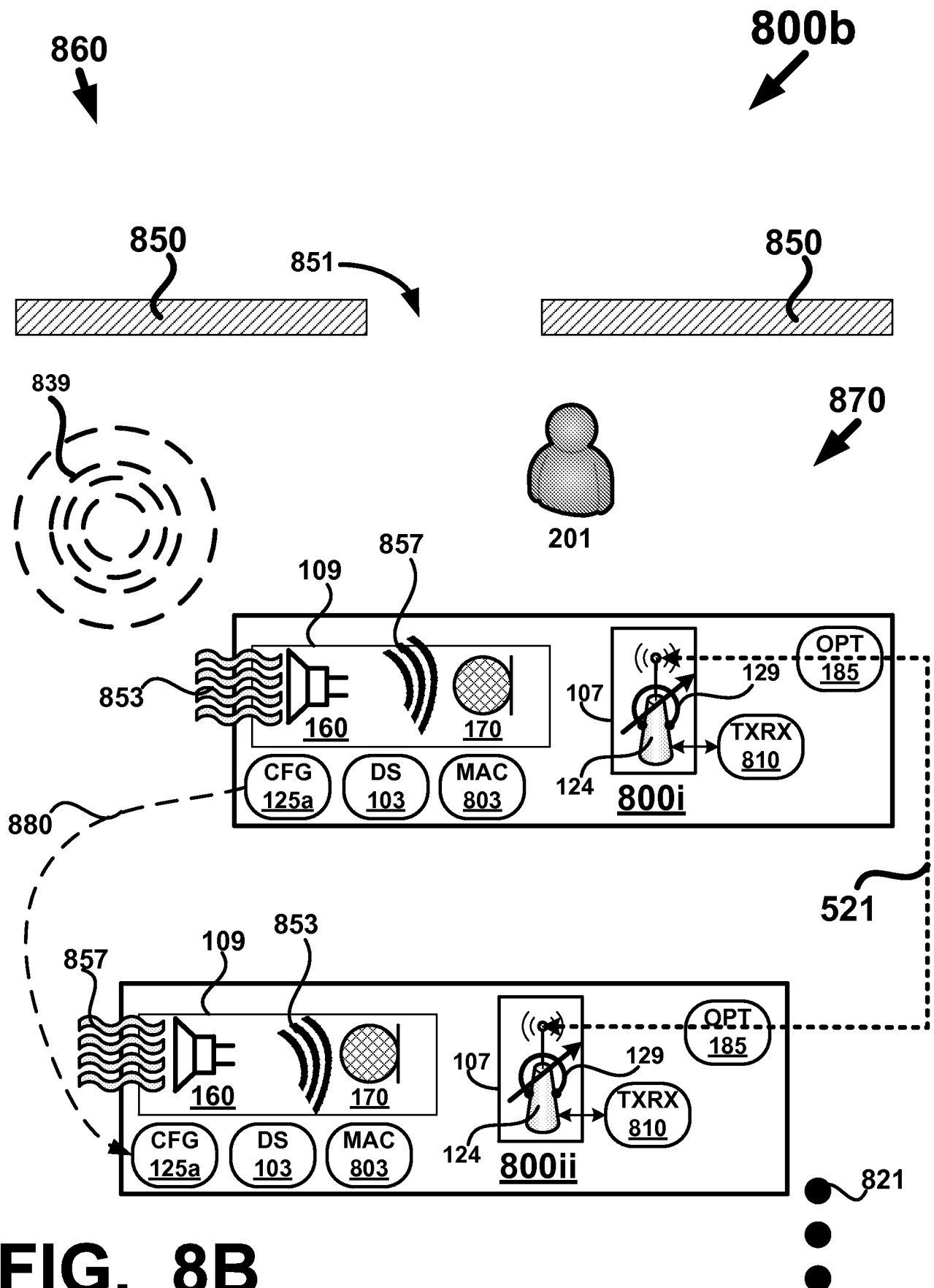
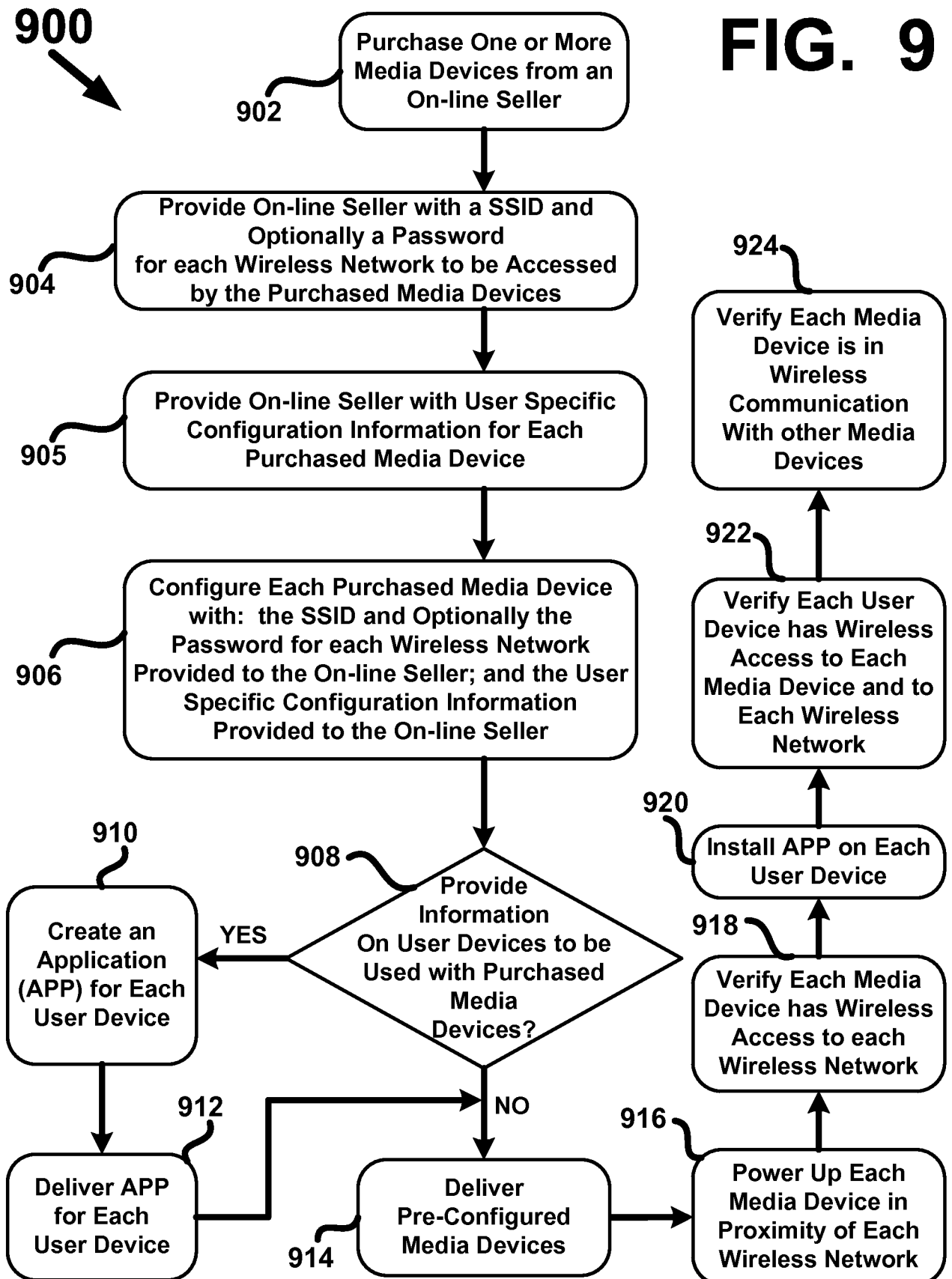
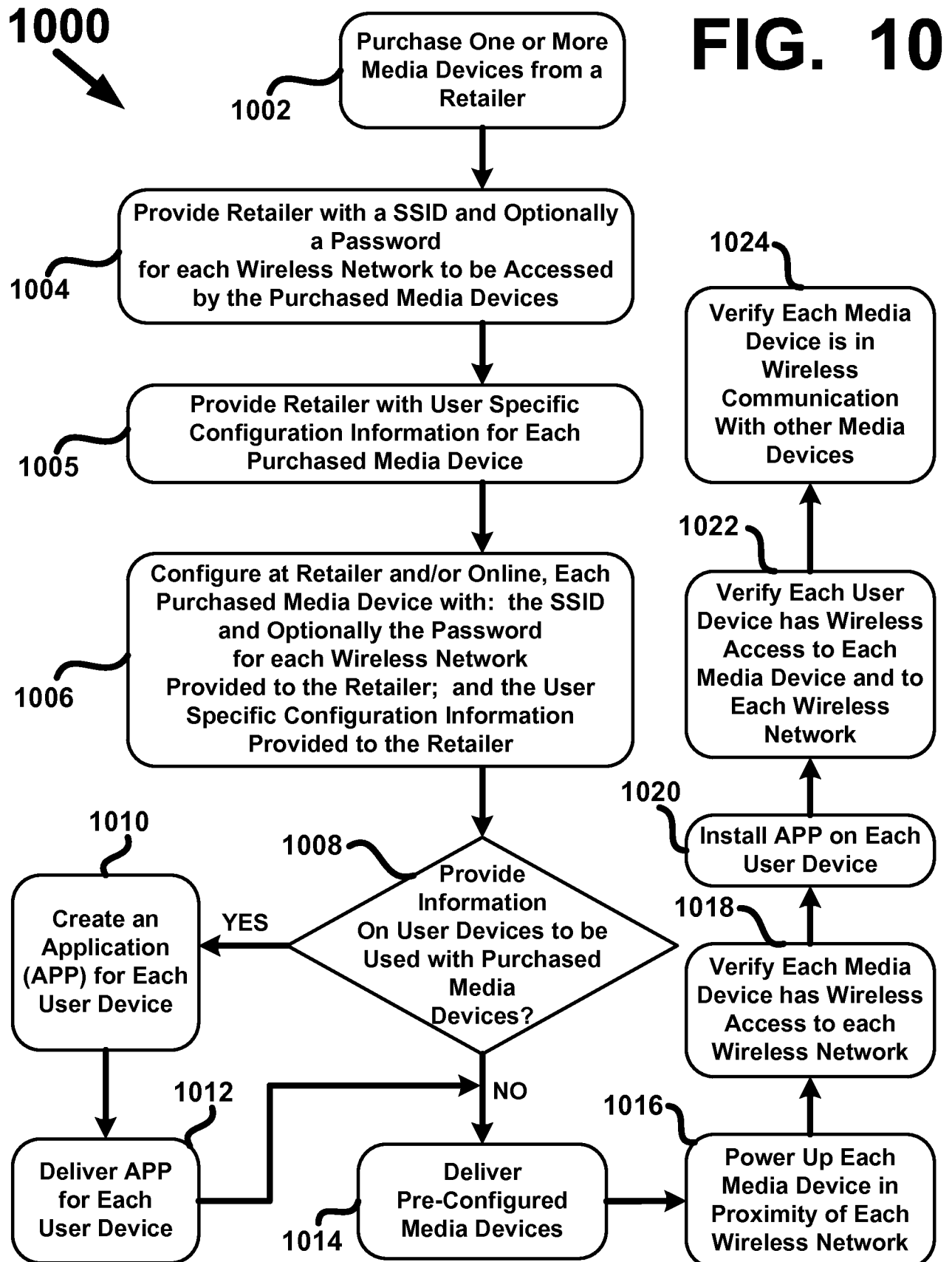


FIG. 8B





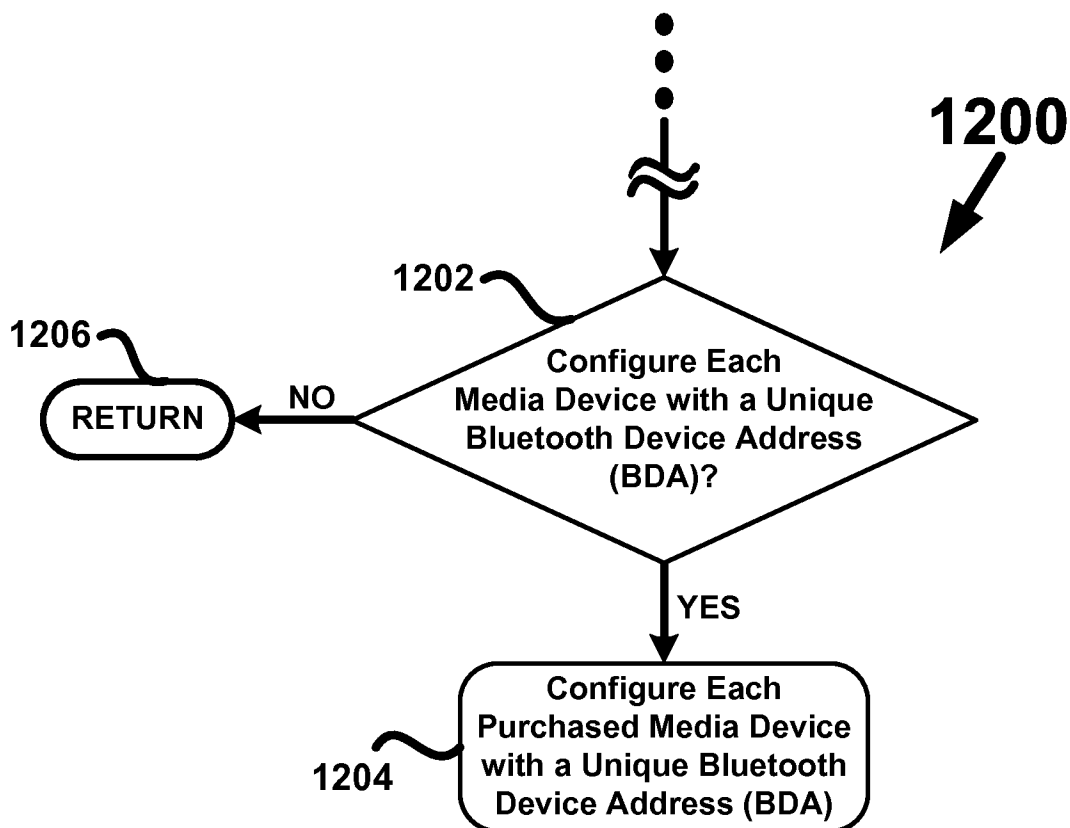
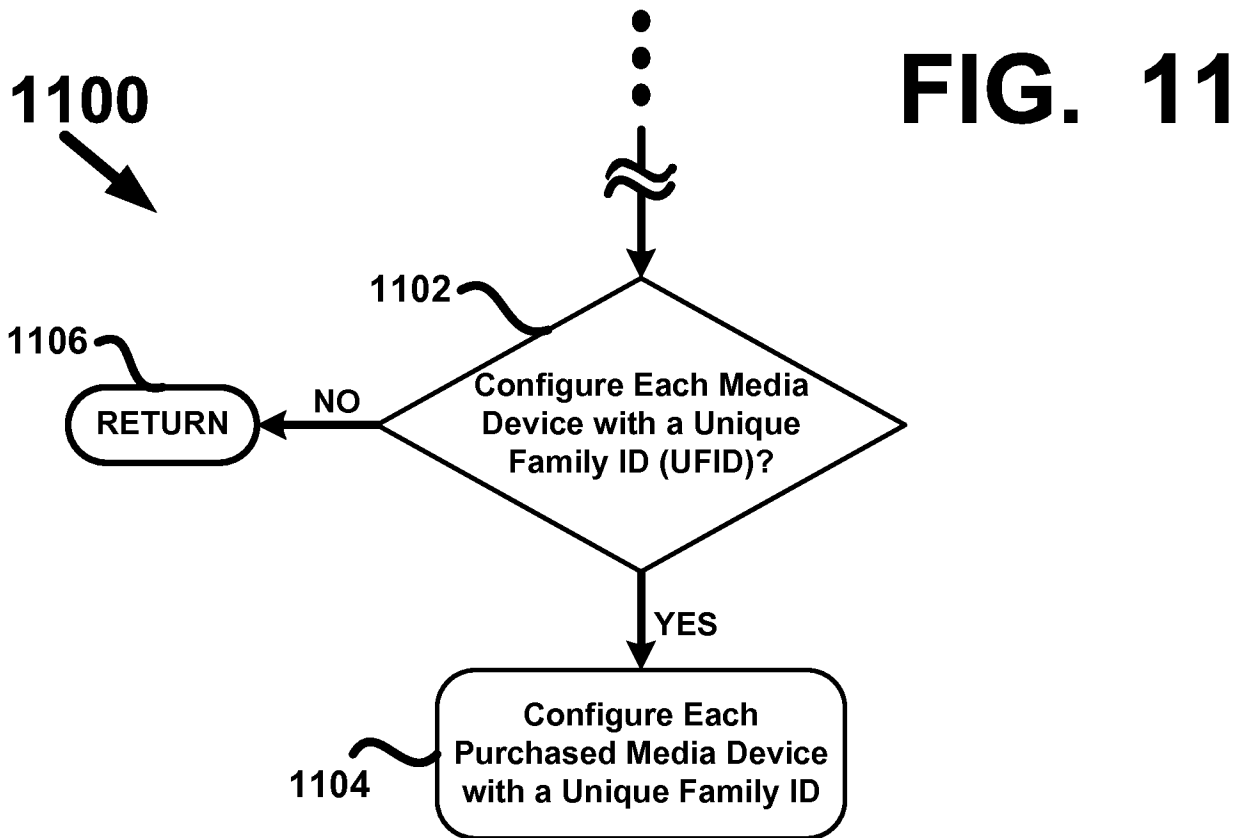


FIG. 12

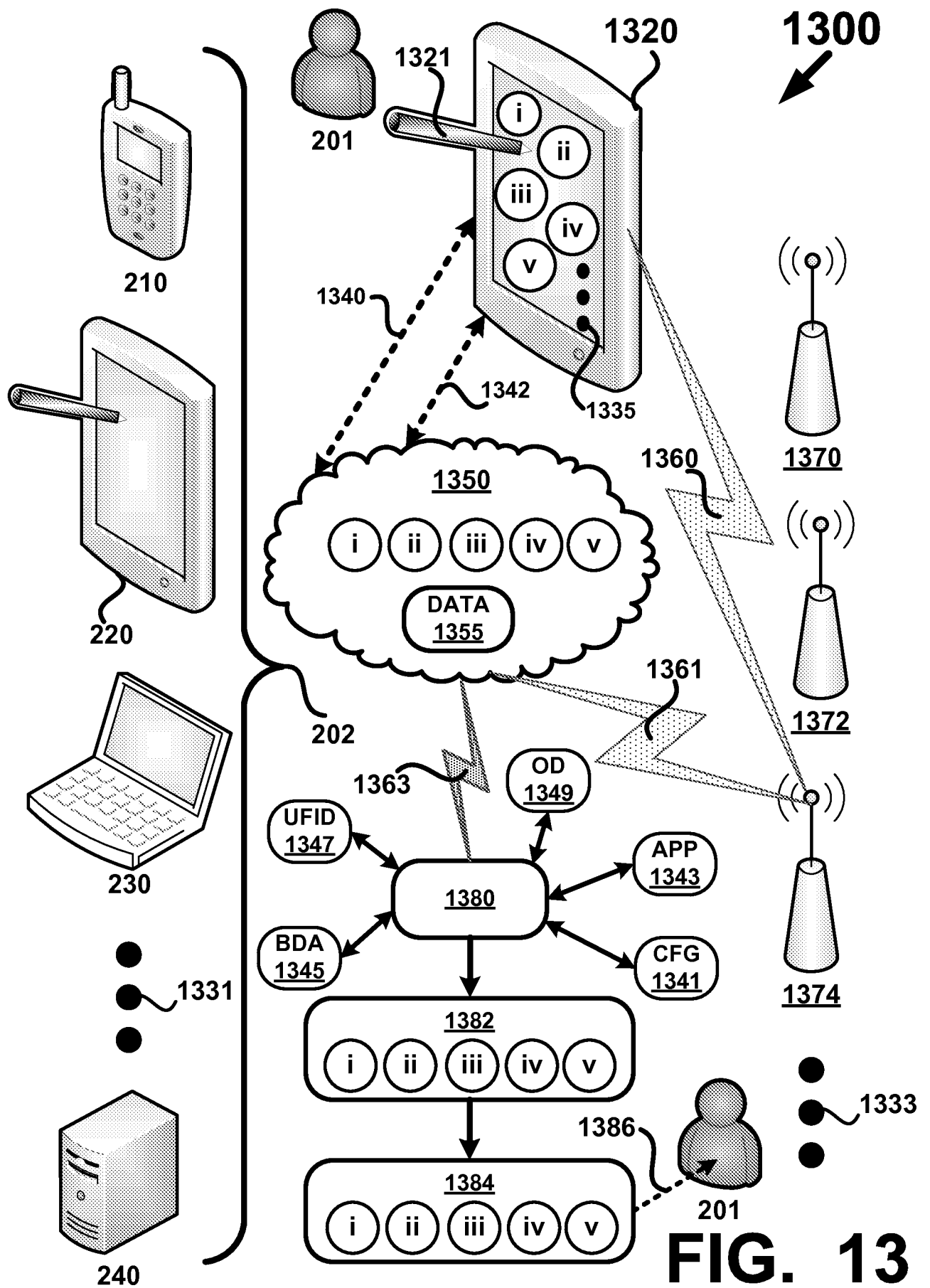


FIG. 13

