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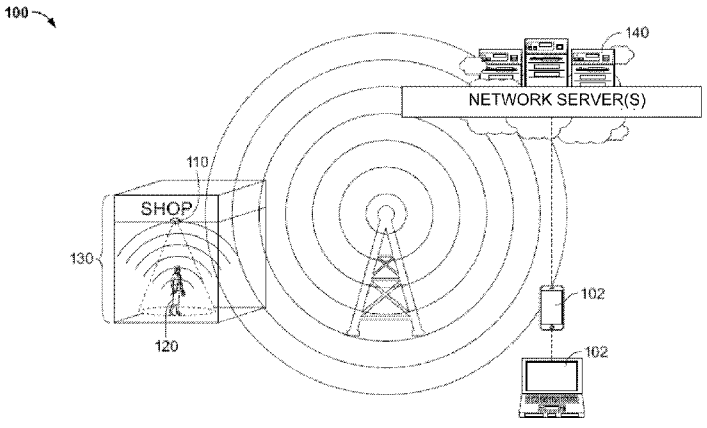


FIG. 1

(57) Abstract: A Customer Relationship Management (CRM) system detects the arrival of smartphones, portable music players, or other personal computing devices with wireless capability carried by customers in areas with installed scanners. The CRM system differentiates specific user devices by reading a Media Access Control (MAC) address of the Wi-Fi enabled mobile devices. Data regarding the user devices and the users is sent to a network server and stored on a database. A registration process links the user to their user device and gains their permission to track them for marketing and analytical purposes. One technique of registration provides the user with a message on a user downloaded smartphone app. The smartphone app optionally stores the user's personal information along with their record of registration. The storage, and later retrieval, of such identifiers and optional personal information makes it possible to gather data on the user devices passively in the future.

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# SYSTEM AND METHOD FOR LOCATION BASED CUSTOMER RELATIONSHIP MANAGEMENT

## CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** The present Application for Patent claims priority to the Provisional Application No. 61/595632, filed February 6, 2012, entitled "SYSTEM AND METHOD FOR LOCATION BASED CUSTOMER RELATIONSHIP MANAGEMENT"; which is assigned to the assignee hereof and hereby expressly incorporated in their entirety by reference herein.

## BACKGROUND

### Field

**[0002]** The present disclosure relates to the registration and location of user devices to enhance customer relationship management (CRM).

### Background

**[0003]** Wireless communication technologies and devices are widely deployed and used, including but not limited to voice calls and access to data on the Internet. As the number of deployed user devices, such as, for example, smartphones or the like, increases, there will be increased opportunities for stores, merchants, and other businesses to interact with customers, and thereby improve their customer relationship management (CRM). One known approach involves having customers download an application or "app" to their personal user device, wherein the app is specific for a given store or business. For example, the installation on an app the user device may allow the user to make payments or receive promotional emails or coupons. In order for apps to improve CRM, the customer has to in essence opt-in by downloading, installing, and using the app on his/her user device.

**[0004]** In the context of user devices for radio communication, which has become ubiquitous, there remains a need for improved utilization of such technologies to provide location-based CRM opportunities for businesses, regardless of whether customers decide to opt-in or not.

## SUMMARY

**[0005]** The following presents a simplified summary of one or more embodiments in order to provide a basic understanding of such embodiments. This summary is not an extensive overview of all contemplated embodiments, and is intended to neither identify key or critical elements of all embodiments nor delineate the scope of any or all embodiments. Its sole purpose is to present some concepts of one or more embodiments in a simplified form as a prelude to the more detailed description that is presented later.

**[0006]** In accordance with one or more aspects of the embodiments described herein, there is provided a system and method for location based customer relationship management (CRM). In one embodiment of a method for registration, a user device may receive a file from a network node and obtain an identifier for the user device based at least in part on file code associated with the file. The user device may receive user information via an input interface of the user device and send the identifier and the user information to a remote database.

**[0007]** In a second embodiment of a method for registration, an in-store device may scan an identifier for a user device, in response to detection of the user device. The in-store device may receive user information from the user device. The in-store device may process at least one of the identifier and the user information and send the processed identifier and the processed user information to a remote database.

**[0008]** In a third embodiment of a method for registration, a network server may send a file to a user device and receive user information and an identifier of the user device from an in-store device. The network server may process at least one of the user information and the identifier.

**[0009]** In a fourth embodiment of a method for customer relationship management (CRM), an in-store device may detect a user device in a defined area of a store and track at least one activity characteristic of a user of the user device in at least one section of the defined area. The in-store device may initiate at least one CRM activity for the user based on the at least one activity characteristic.

**[0010]** To the accomplishment of the foregoing and related ends, the one or more embodiments include the features hereinafter fully described and particularly pointed out in the claims. The following description and the annexed drawings set forth in detail certain illustrative aspects of the one or more embodiments. These aspects are indicative, however, of but a few of the various ways in which the principles of various

embodiments may be employed and the described embodiments are intended to include all such aspects and their equivalents.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0011]** Figure 1 illustrates features of a location-based CRM system.

**[0012]** Figures 2A-C illustrate the implementation and use of a location-based CRM system.

**[0013]** Figure 3A illustrates components of a location-based CRM system.

**[0014]** Figures 3B-C illustrate details regarding user device location determination by angle of arrival estimation.

**[0015]** Figure 4 illustrates aspects of a CRM platform in the context of location-based marketing.

**[0016]** Figure 5 illustrates an example registration methodology executable by a user.

**[0017]** Figure 6 shows an embodiment of an apparatus for registration, in accordance with the methodology Figure 5.

**[0018]** Figure 7 illustrates an example registration methodology executable by an in-store device.

**[0019]** Figure 8 shows an embodiment of an apparatus for registration, in accordance with the methodology Figure 7.

**[0020]** Figure 9 illustrates an example registration methodology executable by a network.

**[0021]** Figure 10 shows an embodiment of an apparatus for registration, in accordance with the methodology Figure 9.

**[0022]** Figure 11 illustrates an example CRM methodology executable by an in-store system/device.

**[0023]** Figure 12 shows an embodiment of an apparatus for CRM, in accordance with the methodology Figure 11.

## DETAILED DESCRIPTION

**[0024]** Techniques for supporting customer relationship management (CRM) with the registration and location of user devices are described herein. The techniques may be used for various wireless communication networks such as wireless wide area

networks (WWANs) and wireless local area networks (WLANs). The terms "network" and "system" are often used interchangeably. WWANs may implement a radio technology such as general packet radio service (GPRS), 3GPP Long Term Evolution (LTE), LTE-Advanced (LTE-A), or the like. WLANs may implement a radio technology such as IEEE 802.11 (Wi-Fi), Bluetooth or the like.

**[0025]** In accordance with one or more aspects of the embodiments described herein, there is provided a zonal coverage passive tracking technique. With reference to Figure 1, there is shown a Customer Relationship Management (CRM) system 100, wherein the arrival of user devices 102 (e.g., smartphones, portable music players, or other personal computing devices with wireless capability) carried by customers may be detected in areas with installed scanners (block 110). For example, the scanners 110 may accurately locate Wi-Fi enabled user devices 102 including mobile phones device to determine that a person 120 has entered a defined area (e.g. a room, shop, or building) 130. Specific user devices may be differentiated by reading a Media Access Control (MAC) address of the Wi-Fi enabled mobile devices 102. Data regarding the user devices 102 and the users of the user devices 102 may be sent to a network server(s) 140 and stored on a database by the scanner(s) 110 and/or device(s) 102 that are in operative communication with the scanner(s) 110, via a wired network such as a local area network (LAN) or a wide area network (WAN), or via a wireless network such as a general packet radio service (GPRS), 3GPP Long Term Evolution (LTE), LTE-Advanced (LTE-A), or the like.

**[0026]** In one approach, retailers may install and configure scanners 110 of the CRM system 100 in their desired locations (e.g. retail store, shopping center). In related aspects, a configuration application or "app" on a computing device (e.g., smartphone, tablet computer, personal computer, or laptop) may be used by an administrator to configure the scanner(s) 110. In further related aspects, the configuration app may show the administrator (e.g., by way of red, green, and/or yellow lights) whether or not any user devices 102 are being detected in the area at all (the color red signifying no detection), with a weak signal (yellow color), or with a strong signal (green color). The administrator may dial/adjust the "sensitivity" up or down to filter out reads/detections below a defined threshold level. Scanner(s) 110 of the CRM system 100 may passively locate the user devices 102 inside a defined area 130. The locations of the user devices 102 may be linked to anonymous or registered user devices 102 and logged.

**[0027]** Described herein are several example techniques of registration for linking the user to their user device 102 and gaining their permission to track them for marketing and analytical purposes.

**[0028]** In a first approach, there is provided a technique that involves providing the user with a digital coupon, email, short message service (SMS) message, or the like. For example, the digital coupon may come in the form of a message on a smartphone app that the user 120 downloads on to the user's user device 102. In order to activate the coupon, the user 120 may need to register his/her user device 102. A piece of software may be included on the app to get the MAC address or similar identifier from the user device 102, which may be gathered and stored in addition to optional personal details (e.g., phone number email address, etc.) along with their record of registering. The storage, and later retrieval, of such identifiers and optional personal information makes it possible to scan the user devices 102 passively in the future. In related aspects, the digital coupon, email, SMS message or the like may include an offer/promotion that is transferable or shareable with other customers or prospective customers. In further related aspects, the offer/promotion may be purchased, gifted, or shared via a social networking site (e.g., Facebook, Twitter, or Google+).

**[0029]** In a second approach, there is provided a technique that involves providing a kiosk or registration station with a very short range registration scanner or the like, that is linked to or includes a computing device (e.g., smartphone, tablet computer, personal computer, or laptop) with a user interface (e.g., a touch screen interface or keyboard/mouse). In one example, the user may place their user device 102 near the registration scanner so that a MAC address may be captured by the registration scanner. The MAC address may be captured at short range so it is unambiguously linked to the particular user device 102. In another example, a NFC reader may be used communicate with an NFC chip on the user device. The NFC chip may include or otherwise facilitate obtaining the user device's MAC address or other comparable identifier. The user 120 may be asked to enter his/her personal details to sign-up and/or opt-in to a retail customer loyalty program or the like. As per above, this allows the scanners 110 of the CRM system 100 in to detect the user devices 102 passively. For example, scanners 110 may detect the user device 102 at certain locations at a given retailer's store, which in turn can be used to automatically log the user's presence (e.g., without the user's involvement so long as the user has given permission to the CRM

system to do so), and optionally share (e.g. by "check-in") the user's location information with others via a social network site, email/SMS blast, or the like. For example, if the user agrees to be checked-in automatically each time they visit a given venue (e.g., via a social networking service), then the user 120 may be checked-in when his/her user device 102 is scanned at the given venue and/or any venue that implements or participates in the CRM service.

**[0030]** In a third approach, there is provided a technique that involves scanning non-registered or anonymous user devices 102 passively as per above without their user's personal information, simply to provide stores/businesses with data on the behavior of a larger subset of their customers. A non-privacy-invasive technique may involve hashing the MAC addressees of the user devices 102 so to generate identifiers that can never be linked back to the user 120 or their user device 102. A related technique, subject to governing privacy law, may log the activity of unregistered user devices 102, each identified by a MAC address, anonymously without their user's personal information. The CRM system will get location updates regarding the users, registered or not, each time their user devices 102 are detected by the scanner(s) 110.

**[0031]** Examples of the use the CRM systems and techniques may involve: tracking the movement of registered and unregistered/anonymous visitors 120; sending special offers and deals to customers 120 depending on their location; alerting staff via mobile phone (or monitor or other device) to move to an area where there is deemed to be a "queue" (i.e., a defined number of customers); and/or notifying staff via mobile phone (or monitor or other device) that an important/VIP registered customer 120 has entered the site, which may be accompanied by a photo or description of the VIP registered customer 120.

**[0032]** Benefits to retailers may include the ability to market products and services relevant to the location of the user 120, for registered users. With reference to Figure 2A, a customer 120 may download an application onto her smartphone 102 and may register to get a coupon. A unique identifier for her smartphone 102, such as, for example, the MAC address, may be detected and linked to her personal details. The customer 120 may agree to receive future offers from the smartphone application and/or its affiliates.

**[0033]** Another benefit to retailers may also include the ability to monitor, via the CRM system, the behavior of customers in response to promotional activity. As shown

in Figure 2B, the benefit to retailers may also include the ability to gain vital customer analytics for all customers 120 (for both registered and anonymous user devices), including but not limited to: (a) how often customers visit the store; (b) how long they spend in the store; (c) what they purchase (registered users); (d) whether the customer 120 has visited before and the average gap between visits; and/or (e) the measured success/profitability of a given promotional activity. However, customers 122 not carrying a locatable user device may be invisible to the CRM system.

**[0034]** Yet another benefit to retailers may also include the ability to alert staff in the shop/store in a number of scenarios. As shown in Figure 2C, the store staff may be alerted and dispatched to particular location in the store when, for example, the scanner 110 detects valuable/loyal customers 120 in the store, or when a checkout queue has formed in a particular location.

**[0035]** In accordance with one or more aspects of the embodiments described herein, with reference to the block diagram of Figure 3A, there is provided a CRM system 300 that may include at least one user device 102 (e.g., smartphone, tablet computer, personal computer, or laptop) in wireless communication (e.g., via Wi-Fi, Bluetooth or other suitable protocol) with at least one in-store device 320 (e.g., a kiosk with a short range registration scanner or the like), which in turn may be operative communication, wired and/or wireless, with at least one network server 140 (e.g., a cloud server or the like). As shown by Figure 3A, the user device 102 and the in-store device 320 may be located inside the store 302, while the network server 140 may be a cloud server located at a remote site.

**[0036]** In related aspects, the in-store device 320 may include or be in communication with an in-store computer 322 which may optionally be in communication with the network server 140. In further related aspects, the in-store device 320 may include or be in communication with one or more sensors 110. For example, the sensors 110 may comprise video cameras, motion detectors, or scanners for determining the location (e.g., via measurement of a phased array angle of arrival or received signals strength indicators (RSSIs)) and/or identifier information (e.g., a MAC address, a NFC chip, a RFID chip, etc.) on the user device 102.

**[0037]** In further related aspects, the location of the user device(s) 102 may be determined in numerous ways, including but not limited to: (a) proximity detection; (b) signal strength as an analogue of distance; and (c) direction or angle of arrival. For

proximity detection, multiple radio signal sensors need to be placed in the field of interest. Their sensitivities need to be adjusted so that their spheres of detection do not overlap and produce ambiguities. For signal strength as an analogue of distance, the signal strength received at the sensor 110 is considered to be an indicator of the distance of the user device 102 from that sensor 110. The user device 102 can then be considered to be anywhere on the surface of the sphere traced by a radius of that distance. If the person carrying the user device 102 is also considered to be walking on a floor, with the user device 102 assumed to be one meter from the floor, then this traces a surface. The intersection of that surface with the sphere traces an ellipse. The signal strength from a second sensor 110 may likewise trace a second ellipse, which will intersect with the first ellipse in two places, indicating an ambiguous location for the user device. A third sensor 110 is needed to remove that ambiguity.

**[0038]** For locating the user device 102 using direction or angle of arrival, a sensor 110 maybe placed above or below the field of interest which senses X and Y angles of arrival of the signal from the user device 102. If, as above, the person carrying the user device 102 is also considered to be walking on a floor, with the user device 102 at an assumed one meter from the floor, then this traces a surface. The combination of the X and Y angles of arrival trace a line from the sensor to the surface, to intersect at a single point on the surface that represents the location of the user device 102. The location of the user device 102 can therefore be unambiguously observed from one sensor 110.

**[0039]** Figure 3B shows a cross-sectional view of a 2x2 antenna array showing two of four antennas 350 receiving signals 304 from a user device 102. The four antennas 350 in a 2x2 phased array may operate at 2.45GHz, the center of the ISM band. The wavelength ($\lambda$) of the arriving signals 304 may be 12cm. Antenna 350a and antenna 350b of the 2x2 phased array may be separated by a distance of half a wavelength (d=6cm). The signal 304 received at antenna 350a may be assumed identical to the signal 304 received at antenna 350b with a phase shift caused by a difference in distance (phase delay distance) of each antenna 350 from the user device 102 signal source. The phase delay distance (D) may be obtained from a measurement of the phase difference ($\theta$) of the signals 304 arriving at antenna left 350a and antenna right 350b. This can be done at an intermediate frequency and translated back to the carrier frequency of 2.45GHz. If phase is measured in radians, then:

$$D = \frac{\theta}{2\pi}\lambda \qquad \text{(Equation 1).}$$

**[0040]** The X and Y angles of arrival (β) may each be obtained from:

$$\beta = \cos^{-1}\left(\frac{D}{\lambda/2}\right)$$ (Equation 2).

**[0041]** The system should capture the arriving signals 304 and post process them to determine their relative phase difference. With reference to the embodiment of Figure 3C, a local oscillator 355 provides a reference signal to each mixer 360 resulting in the phase of the carrier being translated to an intermediate frequency (IF). The IF signals may be passed through IF filters 370 then digitized by analog to digital converters 380 for further processing (i.e. by a digital signal processor 395) to determine an angle of arrival estimation 396. Further circuitry may be required to determine the identity (i.e. via a MAC address) of the user device 102, and provide the overall operating system.

**[0042]** In accordance with one or more aspects of the embodiments described herein, with reference to Figure 4, there is provided an example of how the CRM system 400 works in a location-based marketing context. Combining the registration process 420 with the location data 430 (e.g. via application programming interface (API) 490) allows retailers and/or shopping center owners to combine visitor data (obtained passively) with purchase data. Targeted marketing may then be sent to registered users (who have opted-in) via SMS, email, app message, or other such methods based on their detected location. Users who opt out 470 may still provide the CRM system 400 with valuable customer traffic information and analytics 460.

**[0043]** In one embodiment, the CRM system 400 may capture data from registered user(s) which is then used for location-based marketing. The retailer/marketer may enter campaign rules into a propriety system. Once the scanners 110 detect a given customer, the campaign rules are used to direct marketing to the given customer. For example, suppose the given customer is detected in a shopping center and has not received a marketing message within a pre-defined period of time. Suppose that the given customer is a regular customer of particular retailer and fits into a particular customer type. A message may be sent to the regular customer (e.g., via email/SMS/app message) based on the data captured regarding the regular customer. A unique ID (e.g., alpha numeric code, bar code, etc.) included with the message may be used in a number of ways, as explained in further detail below. In related aspects, if the user is a registered user, the location data 430 and identification data may be sent to a retailer CRM 450 to handle the messaging/CRM aspects.

**[0044]** In further related aspects, data gathered by the CRM system 400 may be used at the point of sale (POS) 440 of purchase, for example, by way of one of the following approaches. In a first approach, a unique ID or barcode in the message sent to the given user may be entered directly into a POS terminal (e.g., the hardware and/or software used for checkouts, the equivalent of an electronic cash register or the like), wherein an API to CRM feature of the POS terminal allows the retailer to get details regarding the offer and also allows the retailer CRM 450 to track the purchase/transaction and associated information about the purchase. In a second approach, the unique ID or barcode sent to the given user may be entered into a standalone device (e.g., tablet, PC, or other suitable computing device) at the POS 440 to access the network server 480 to obtain details regarding the offer (which, optionally, can then be entered into a POS terminal), thereby allowing the retailer CRM 450 to track the transaction.

**[0045]** In yet further related aspects, an NFC reader may be implemented at the POS 440 to read the unique ID or barcode directly into a POS terminal, wherein an API to CRM component of the POS terminal allows the retailer to get details about the offer/promotion and allows retailer CRM 450 to keep track of the purchase. In the alternative, the NFC reader may be used at the POS 440 to read the unique ID or barcode into a standalone device (e.g., tablet, PC, or the like) to access the network server 480 to get details about the offer (which can then be entered into the POS) and to allow the retailer CRM 450 to keep track of the purchase. It is noted that the information read by an NFC reader or the like into a standalone device may then be entered into a POS terminal or sent from the standalone device to the POS terminal via a wireless or wired communication link.

**[0046]** In still further related aspects, short range readers may be utilized to read the MAC address or the like of the user device 102 at the POS 440. For example, the MAC address may be entered either (a) directly into a POS terminal, such that an API to CRM component of the POS terminal obtains details of any offers for the retailer and allows retailer CRM 450 to keep track of the transaction, or (b) into a standalone device (e.g., tablet, PC, or the like) to access the network server 480 to get details of the offer (which may then be entered into or otherwise sent to the POS terminal) and to allow the retailer CRM 450 to keep track of the transaction.

**[0047]** In further related aspects, the CRM system 400 service may be integrated into the POS terminal such that (a) a customer at the POS may be detected by scanners 110 as being at that particular POS 440 and (b) details about the customer (profile information, loyalty program ID, etc.) and/or any coupons/promotions for the customer may be collected from network server 480 and displayed on a POS terminal (e.g,. via integration with one or more CRM system servers through an API).

**[0048]** The CRM system 400 of Figure 4 may incorporate approaches for incentivizing registration by customers with smartphones, such as, for example, including registration kiosks and/or POS terminals throughout a store. The CRM system 400 may include an offline marketing component 410 to drive registration, wherein marketers may also provide offers through the CRM system 400, and wherein the CRM system 400 may manage notifications to the customers. Even if a decentralized marketing campaign is adopted by the retailer, the registration of customers, follow-up communication with the customers, and/or retrieval of customer information by retailers may be handled through component(s) of the CRM system 400.

**[0049]** In view of exemplary systems shown and described herein, methodologies that may be implemented in accordance with the disclosed subject matter, will be better appreciated with reference to various flow charts. While, for purposes of simplicity of explanation, methodologies are shown and described as a series of acts/blocks, it is to be understood and appreciated that the claimed subject matter is not limited by the number or order of blocks, as some blocks may occur in different orders and/or at substantially the same time with other blocks from what is depicted and described herein. Moreover, not all illustrated blocks may be required to implement methodologies described herein. It is to be appreciated that functionality associated with blocks may be implemented by software, hardware, a combination thereof or any other suitable means (e.g., device, system, process, or component). Additionally, it should be further appreciated that methodologies disclosed throughout this specification are capable of being stored on an article of manufacture to facilitate transporting and transferring such methodologies to various devices. Those skilled in the art will understand and appreciate that a methodology could alternatively be represented as a series of interrelated states or events, such as in a state diagram.

**[0050]** In accordance with one or more aspects of the embodiments described herein, with reference to Figure 5, there is shown a methodology 500 for registration of

a user device 102 (e.g., a smartphone or the like) for a CRM system or service. The registration method 500, operable by the user device 102 or the like or component(s) thereof, may involve, at 510, receiving a file (e.g., a digital coupon and/or a smartphone app) from a network node (e.g., an in-store kiosk, a registration server, a marketing server, and another user device.). The method 500 may involve, at 520, obtaining an identifier (e.g., MAC address) for the user device 102 based at least in part on file code associated with the file. The method 500 may involve, at 530, receiving user information (e.g., name, age, gender, profile data, preference data, and/or behavior data for a user 120 of the user device 102) via an input interface of the user device 102. The method 500 may involve, at 540, sending the identifier and the user information to a remote database 140 (e.g., stored on a cloud server or the like). In related aspects, block 540 may involve sending the identifier and the user information to the cloud server 140 via an in-store kiosk. In further related aspects, the identifier may comprise or be generated from the MAC address or the like.

**[0051]** In accordance with one or more aspects of the embodiments described herein, there are provided devices and apparatuses for power control, as described above with reference to Figure 5. With reference to Figure 6, there is provided an exemplary apparatus 600 that may be configured as a user device 102 (e.g., a smartphone, mobile personal computing device, or the like) in a wireless network, or as a processor or similar device/component for use within the user device 102. The apparatus 600 may include functional blocks that can represent functions implemented by a processor, software, or combination thereof (e.g., firmware). For example, apparatus 600 may include an electrical component or module 612 for receiving a file from a network node. The apparatus 600 may include a component 614 for obtaining an identifier for the user device 102 based at least in part on file code associated with the file. The apparatus 600 may include a component 616 for receiving user information via an input interface of the user device 102. The apparatus 600 may also include a component 618 for sending the identifier and the user information to a remote database 140.

**[0052]** In related aspects, the apparatus 600 may optionally include a processor component 650 having at least one processor, in the case of the apparatus 600 configured as a user device 102 rather than as a processor. The processor 650, in such case, may be in operative communication with the components 612-618 via a bus 652 or

similar communication coupling. The processor 650 may effect initiation and scheduling of the processes or functions performed by electrical components 612-618.

**[0053]** In further related aspects, the apparatus 600 may include a transceiver component 654 for radio and/or wired communication. A stand-alone receiver and/or stand-alone transmitter may be used in lieu of or in conjunction with the transceiver 654. The apparatus 600 may optionally include a component for storing information, such as, for example, a memory device/component 656. The computer readable medium or the memory component 656 may be operatively coupled to the other components of the apparatus 600 via the bus 652 or the like. The memory component 656 may be adapted to store computer readable instructions and data for effecting the processes and behavior of the components 612-618, and subcomponents thereof, or the processor 650, or the methods disclosed herein. The memory component 656 may retain instructions for executing functions associated with the components 612-618. While shown as being external to the memory 656, it is to be understood that the components 612-618 can exist within the memory 656. It is further noted that the components in Figure 6 may comprise processors, electronic devices, hardware devices, electronic sub-components, logical circuits, memories, software codes, firmware codes, etc., or any combination thereof.

**[0054]** In accordance with one or more aspects of the embodiments described herein, with reference to Figure 7, there is provided a methodology 700 for user device registration operable by an in-store device (e.g., a kiosk with a short range registration reader or the like). The registration method 700 may involve, at 710, scanning an identifier (e.g., a MAC address or the like) for a user device 102 (e.g., a smartphone or the like), in response to detection of the user device 102. The method 700 may involve, at 720, receiving user information from the user device 102. The method 700 may involve, at 730, processing at least one of the identifier and the user information. The method 700 may involve, at 740, sending the processed identifier and the processed user information to a remote database 140.

**[0055]** In accordance with one or more aspects of the embodiments described herein, Figure 8 shows a design of an apparatus 800 (e.g., an in-store kiosk or component(s) thereof), as described above with reference to Figure 7. For example, the apparatus 800 may include an electrical component or module 812 for scanning an identifier for a user device 102, in response to detection of the user device 102. The

apparatus 800 may include a component 814 for receiving user information from the user device 102. The apparatus 800 may include a component 816 for processing at least one of the identifier and the user information. The apparatus 800 may also include a component 818 for sending the processed identifier and the processed user information to a remote database 140. For the sake of conciseness, the rest of the details regarding apparatus 800 are not further elaborated on; however, it is to be understood that the remaining features and aspects of the apparatus 800 are similar to those described above with respect to apparatus 600 of Figure 6.

**[0056]** In accordance with one or more aspects of the embodiments described herein, with reference to Figure 9, there is provided a methodology 900 for user device 102 registration operable by a network server (e.g., a cloud server or the like) 140. The registration method 900 may involve, at 910, sending a file to a user device 102. The registration method 900 may involve, at 920, receiving user information and an identifier of the user device 102 from an in-store device 320. The method 900 may involve, at 930, processing at least one of the user information and the identifier.

**[0057]** In accordance with one or more aspects of the embodiments described herein, Figure 10 shows a design of an apparatus 1000 (e.g., a network server or component(s) thereof), as described above with reference to Figure 9. For example, the apparatus 1000 may include an electrical component or module 1014 for sending a file to a user device 102. The apparatus 1000 may include an electrical component or module 1014 for receiving user information and an identifier of the user device 102 from an in-store device 320. The apparatus 1000 may include a component 1016 for processing at least one of the user information and the identifier. For the sake of conciseness, the rest of the details regarding apparatus 1000 are not further elaborated on; however, it is to be understood that the remaining features and aspects of the apparatus 1000 are similar to those described above with respect to apparatus 600 of Figure 6.

**[0058]** In accordance with one or more aspects of the embodiments described herein, with reference to Figure 11, there is provided a CRM methodology 1100 operable by an in-store system/device (e.g., a kiosk and/or in-store computer) or component(s) thereof. The CRM method 1100 that involve, at 1110, detecting a user device (e.g., a smartphone) in a defined area 130 of a store, such as, for example, via sensors (e.g., infrared, motion detection, etc.), video surveillance, or the like. The

method 1100 may involve, at 1120, tracking at least one activity characteristic of a user of the user device in at least one section of the defined area 130. The method 1100 may involve, at 1130, initiating at least one CRM activity for the user based on the at least one activity characteristic.

**[0059]** In related aspects, the method 1100 may further involve obtaining at least one of an identifier and user information associated with the user device 102, in response to the user being a registered user. In the alternative, the user may be an unregistered user or an anonymous visitor. In further related aspects, detecting may involve determining a location of the user device 102 within the defined store area 130. Determining the location may involve determining a phased array angle of arrival. In the alternative, or in addition, determining the location may involve receiving and measuring relative strengths (e.g., RSSIs) of wireless signals (e.g., Wi-Fi signals) 304 from the user device 102 (e.g., intercepting a Wi-Fi data packet in a restricted field).

**[0060]** In yet further related aspects, the identifier may be a MAC address of the user device 102, whereas the user information may be the name, age, gender, profile data, preference data, and/or behavior data of the user 120. In still related aspects, the at least one activity characteristic may include: movement of the user 120 between sections of the defined store area 130; an amount of time spent by the user 120 in at least one section of the defined store area 130; and/or updated location(s) of the user 120.

**[0061]** In related aspects, initiating may involve sending a special offer to the user 120 based at least in part on the updated location. In addition, or in the alternative, initiating may involve alerting store staff to move to a given section of the store area 130 when the user is in the given section 130. In addition, or in the alternative, initiating may involve alerting store staff to move to a given section of the store area 130 when a number of user devices 102 in the given section meets or exceeds a defined threshold value. In addition, or in the alternative, initiating may involve notifying store staff that the user has entered the at least one section of the store area 130, based at least in part on the identifier or the user information.

**[0062]** In yet further related aspects, detecting may involve scanning the user device 102 with a short range scanner, such as, for example, scanning an NFC chip or an RFID chip on the user device 102, thereby obtaining at least one of an identifier and user information based at least in part on data obtained via the short range scanning of the

user device 102. In one example, the user information may relate to user participation in a loyalty program of the store or affiliated business/service.

**[0063]** In accordance with one or more aspects of the embodiments described herein, Figure 12 shows a design of an apparatus 1200 (e.g., an in-store computing device, or component(s) thereof), as described above with reference to Figure 11. For example, the apparatus 1200 may include an electrical component or module 1212 for detecting a user device 102 in a defined area of a store 130. The apparatus 1200 may include a component 1214 for tracking at least one activity characteristic of a user of the user device 102 in at least one section of the defined area 130. The apparatus 1200 may include a component 1216 for initiating at least one CRM activity for the user 120 based on the at least one activity characteristic. For the sake of conciseness, the rest of the details regarding apparatus 1200 are not further elaborated on; however, it is to be understood that the remaining features and aspects of the apparatus 1200 are similar to those described above with respect to apparatus 600 of Figure 6.

**[0064]** In accordance with one or more aspects of the embodiments described herein, there is provided a process for location-based marketing and CRM. In one embodiment, a shopper 120 walks into shopping center. The shopper 120 sees a poster/digital sign advertising a "deal" and downloads a coupon app to get that deal, making them a registered user. The terms and conditions of the coupon app may provide the opt-in to provide specific location-based deals via email, sms, app messages, or the like. The shopper 120 may use the app to get the deal by going into the coupon app and selecting "redeem" while at a POS. A unique code/barcode may be generated which the cashier reads off the phone to enter into the POS system and obtain the deal. The next time the user 120 enters this or another location at which the CRM scanners 110 are present, an email, a sms, or a message within the app with a deal relevant to their location may be sent to the user 120 (which may be as specific as the aisle the user is in at a supermarket or the section of the shopping center the user 120 is in, or just the shopping center the user is in). The message may tell them to open the app and enter a code to receive the coupon. Once they do that, the coupon may appear in the app so that the user 120 can redeem it as the POS.

**[0065]** Those of skill in the art would understand that information and signals may be represented using any of a variety of different technologies and techniques. For example, data, instructions, commands, information, signals, bits, symbols, and chips

that may be referenced throughout the above description may be represented by voltages, currents, electromagnetic waves, magnetic fields or particles, optical fields or particles, or any combination thereof.

**[0066]** Those of skill would further appreciate that the various illustrative logical blocks, modules, circuits, and algorithm steps described in connection with the disclosure herein may be implemented as electronic hardware, computer software, or combinations of both. To clearly illustrate this interchangeability of hardware and software, various illustrative components, blocks, modules, circuits, and steps have been described above generally in terms of their functionality. Whether such functionality is implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system. Skilled artisans may implement the described functionality in varying ways for each particular application, but such implementation decisions should not be interpreted as causing a departure from the scope of the present disclosure.

**[0067]** The various illustrative logical blocks, modules, and circuits described in connection with the disclosure herein may be implemented or performed with a general-purpose processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array (FPGA) or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any combination thereof designed to perform the functions described herein. A general-purpose processor may be a microprocessor, but in the alternative, the processor may be any conventional processor, controller, microcontroller, or state machine. A processor may also be implemented as a combination of computing devices, e.g., a combination of a DSP and a microprocessor, a plurality of microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration.

**[0068]** The steps of a method or algorithm described in connection with the disclosure herein may be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. A software module may reside in RAM memory, flash memory, ROM memory, EPROM memory, EEPROM memory, registers, hard disk, a removable disk, a CD-ROM, or any other form of storage medium known in the art. An exemplary storage medium is coupled to the processor such that the processor can read information from, and write information to, the storage medium. In the alternative, the storage medium may be integral to the processor. The processor

and the storage medium may reside in an ASIC. The ASIC may reside in a user terminal. In the alternative, the processor and the storage medium may reside as discrete components in a user terminal.

**[0069]** In one or more exemplary designs, the functions described may be implemented in hardware, software, firmware, or any combination thereof. If implemented in software, the functions may be stored on or transmitted over as one or more instructions or code on a non-transitory computer-readable medium. Non-transitory computer-readable media includes both computer storage media and communication media including any medium that facilitates transfer of a computer program from one place to another. A storage media may be any available media that can be accessed by a general purpose or special purpose computer. By way of example, and not limitation, such computer-readable media can include RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium that can be used to carry or store desired program code means in the form of instructions or data structures and that can be accessed by a general-purpose or special-purpose computer, or a general-purpose or special-purpose processor. Disk and disc, as used herein, includes compact disc (CD), laser disc, optical disc, digital versatile disc (DVD), floppy disk and blu-ray disc where disks usually reproduce data magnetically, while discs reproduce data optically with lasers. Combinations of the above should also be included within the scope of non-transitory computer-readable media.

**[0070]** The previous description of the disclosure is provided to enable any person skilled in the art to make or use the disclosure. Various modifications to the disclosure will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other variations without departing from the spirit or scope of the disclosure. Thus, the disclosure is not intended to be limited to the examples and designs described herein but is to be accorded the widest scope consistent with the principles and novel features disclosed herein.

## CLAIMS

**WHAT IS CLAIMED IS:**

1. A method for registration operable by a user device, comprising:

receiving a file from a network node;

obtaining an identifier for the user device based at least in part on file code associated with the file;

receiving user information via an input interface of the user device; and

sending the identifier and the user information to a remote database.

2. The method of claim 1, wherein:

the user device comprises a smartphone; and

the file comprises at least one of a digital coupon and a smartphone app.

3. The method of claim 2, wherein the digital coupon may be purchased, gifted, or shared on a social networking site.

4. The method of claim 1, wherein the network node comprises one of an in-store kiosk, a registration server, a marketing server, and another user device.

5. The method of claim 1, wherein:

the identifier comprises or is generated from a Media Access Control (MAC) address of the user device; and

the user information comprises at least one of name, age, gender, profile data, preference data, and behavior data for a user of the user device.

6. The method of claim 1, wherein the remote database is stored on a cloud server.

7. The method of claim 6, wherein sending comprises sending the identifier and the user information to the cloud server via an in-store kiosk.

8. An apparatus for registration, comprising:

at least one processor configured to:

receive a file from a network node;

obtain an identifier for a user device based at least in part on file code associated with the file;

receive user information via an input interface of the user device; and

send the identifier and the user information to a remote database; and

a memory coupled to the at least one processor for storing data.

9. An apparatus for registration, comprising:

means for receiving a file from a network node;

means for obtaining an identifier for a user device based at least in part on file code associated with the file;

means for receiving user information via an input interface of the user device; and

means for sending the identifier and the user information to a remote database.

10. A computer program product, comprising:

a computer-readable medium comprising code for causing a computer to:

receive a file from a network node; and

obtain an identifier for a user device based at least in part on file code associated with the file;

receive user information via an input interface of the user device; and

send the identifier and the user information to a remote database.

11. A method for registration operable by an in-store device, comprising:

scanning an identifier for a user device, in response to detection of the user device;

receiving user information from the user device;

processing at least one of the identifier and the user information; and

sending the processed identifier and the processed user information to a remote database.

12. The method of claim 11, further comprising checking-in a user of the user device to share check-in information via a social networking service, in response to (a) the user authorizing automated check-in and (b) the detection of the user device.

13. The method of claim 11, wherein:

the in-store device comprises a kiosk with a short range registration scanner; and

the user device comprises a smartphone.

14. The method of claim 11, wherein:

the identifier comprises or is generated from a Media Access Control (MAC) address of the user device; and

the user information comprises at least one of name, age, gender, profile data, preference data, and behavior data for a user of the user device.

15. The method of claim 11, wherein the remote database comprises a cloud server.

16. An apparatus for registration, comprising:

at least one processor configured to:

scan an identifier for a user device, in response to detection of the user device;

receive user information from the user device; process at least one of the identifier and the user information; and

send the processed identifier and the processed user information to a remote database; and

a memory coupled to the at least one processor for storing data.

17. An apparatus for registration, comprising:

means for scanning an identifier for a user device, in response to detection of the user device;

means for receiving user information from the user device;

means for processing at least one of the identifier and the user information; and

means for sending the processed identifier and the processed user information to a remote database.

18. A computer program product, comprising:

a computer-readable medium comprising code for causing a computer to:

scan an identifier for a user device, in response to detection of the user device;

receive user information from the user device;

process at least one of the identifier and the user information; and

send the processed identifier and the processed user information to a remote database.

19. A method for registration operable by a network server, comprising:

sending a file to a user device;

receiving user information and an identifier of the user device from an in-store device; and

processing at least one of the user information and the identifier.

20. The method of claim 19, wherein:

the network server comprises a cloud server;

the user device comprises a smartphone; and

the file comprises at least one of a digital coupon and a smartphone app.

21. The method of claim 21, wherein the digital coupon may be purchased, gifted, or shared on a social networking site.

22. The method of claim 19, wherein:

the identifier comprises or is generated from a Media Access Control (MAC) address of the user device; and

the user information comprises at least one of name, age, gender, profile data, preference data, and behavior data for a user of the user device.

23. The method of claim 19, wherein processing comprises at least one of hashing and encrypting the user information and the identifier.

24. An apparatus for registration, comprising:

at least one processor configured to:

send a file to a user device;

receive user information and an identifier of the user device from an in-store device; and

process at least one of the user information and the identifier; and

a memory coupled to the at least one processor for storing data.

25. An apparatus for registration, comprising:

means for sending a file to a user device;

means for receiving user information and an identifier of the user device from an in-store device; and

means for processing at least one of the user information and the identifier.

26. A computer program product, comprising:

a computer-readable medium comprising code for causing a computer to:

send a file to a user device;

receive user information and an identifier of the user device from an in-store device; and

process at least one of the user information and the identifier.

27. A method for customer relationship management (CRM) operable by an in-store device, comprising:

detecting a user device in a defined area of a store;

tracking at least one activity characteristic of a user of the user device in at least one section of the defined area; and

initiating at least one CRM activity for the user based on the at least one activity characteristic.

28. The method of claim 27, further comprising checking-in a user of the user device to share check-in information via a social networking service, in response to (a) the user authorizing automated check-in and (b) detection of the user device.

29. The method of claim 27, further comprising obtaining at least one of an identifier and user information associated with the user device, in response to the user being a registered user.

30. The method of claim 27, wherein the user comprises an unregistered user or an anonymous visitor.

31. The method of claim 27, wherein detecting comprises determining a location the user device within the defined store area.

32. The method of claim 31, wherein determining the location comprises determining a phased array angle of arrival.

33. The method of claim 31, wherein determining the location comprises receiving wireless signals from the user device.

34. The method of claim 33, wherein the received wireless signals comprises at least one Wi-Fi signal from the user device.

35. The method of claim 34, wherein receiving the wireless signals comprises intercepting a Wi-Fi data packet in a restricted field.

36. The method of claim 33, further comprising measuring relative strengths of the received wireless signals.

37. The method of claim 36, wherein the measured relative strengths comprise received signals strength indicators (RSSIs).

38. The method of claim 27, wherein:

the in-store device comprises a kiosk with a short range registration scanner; and

the user device comprises a smartphone.

39. The method of claim 27, wherein:

the identifier comprises or is generated from a Media Access Control (MAC) address of the user device; and

the user information comprises at least one of name, age, gender, profile data, preference data, and behavior data of the user.

40. The method of claim 27, wherein the at least one activity characteristic comprises movement of the user between sections of the defined store area.

41. The method of claim 27, wherein the at least one activity characteristic comprises an amount of time spent by the user in at least one section of the defined store area.

42. The method of claim 27, wherein the at least one activity characteristic comprises an updated location of the user.

43. The method of claim 42, wherein initiating comprises sending a special offer to the user based at least in part on the updated location.

44. The method of claim 42, wherein initiating comprises alerting store staff to move to a given section of the store area when the user is in the given section.

45. The method of claim 42, wherein initiating comprises alerting store staff to move to a given section of the store area when a number of user devices in the given section meets or exceeds a defined threshold value.

46. The method of claim 42, wherein:

initiating comprises notifying store staff that the user has entered the at least one section of the defined area, based at least in part on an identifier or a user information associated with the user device, and

the user is a registered user.

47. The method of claim 27, wherein detecting comprises scanning the user device with a short range scanner.

48. The method of claim 47, wherein scanning comprises scanning a near field communication (NFC) chip on the user device.

49. The method of claim 47, wherein scanning comprises scanning a radio-frequency identification (RFID) chip on the user device.

50. The method of claim 47, further comprising obtaining at least one of an identifier and user information based at least in part on data obtained via the short range scanning of the user device.

51. The method of claim 50, wherein the user information relates to user participation in a loyalty program of the store.

52. An apparatus for customer relationship management (CRM), comprising:

at least one processor configured to:

detect a user device in a defined area of a store;

track at least one activity characteristic of a user of the user device in at least one section of the defined area; and

initiate at least one CRM activity for the user based on the at least one activity characteristic; and

a memory coupled to the at least one processor for storing data.

53. An apparatus for customer relationship management (CRM), comprising:

means for detecting a user device in a defined area of a store;

means for tracking at least one activity characteristic of a user of the user device in at least one section of the defined area; and

means for initiating at least one CRM activity for the user based on the at least one activity characteristic.

54. A computer program product, comprising:

a computer-readable medium comprising code for causing a computer to:

detect a user device in a defined area of a store;

track at least one activity characteristic of a user of the user device in at least one section of the defined area; and

initiate at least one CRM activity for the user based on the at least one activity characteristic.

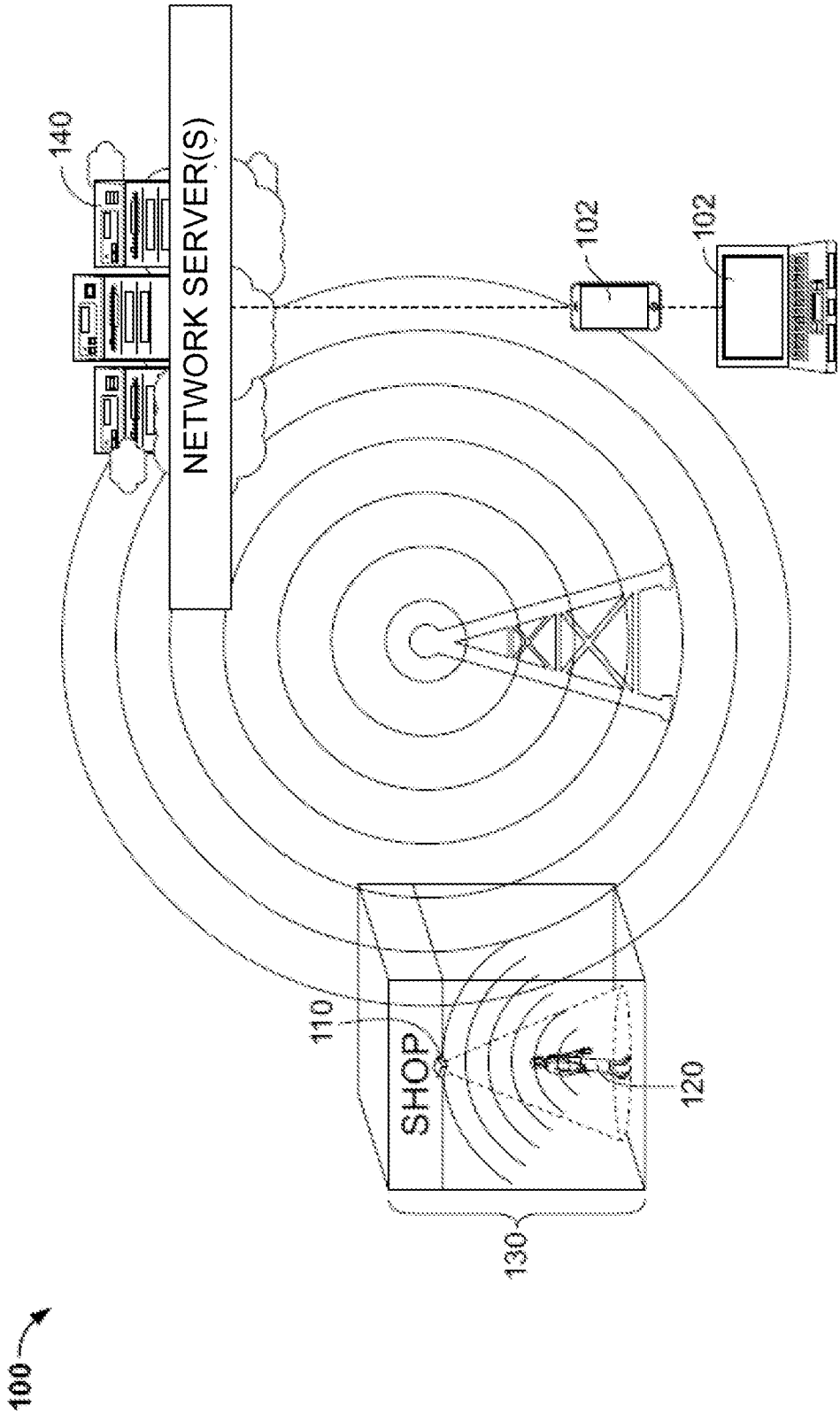


FIG. 1

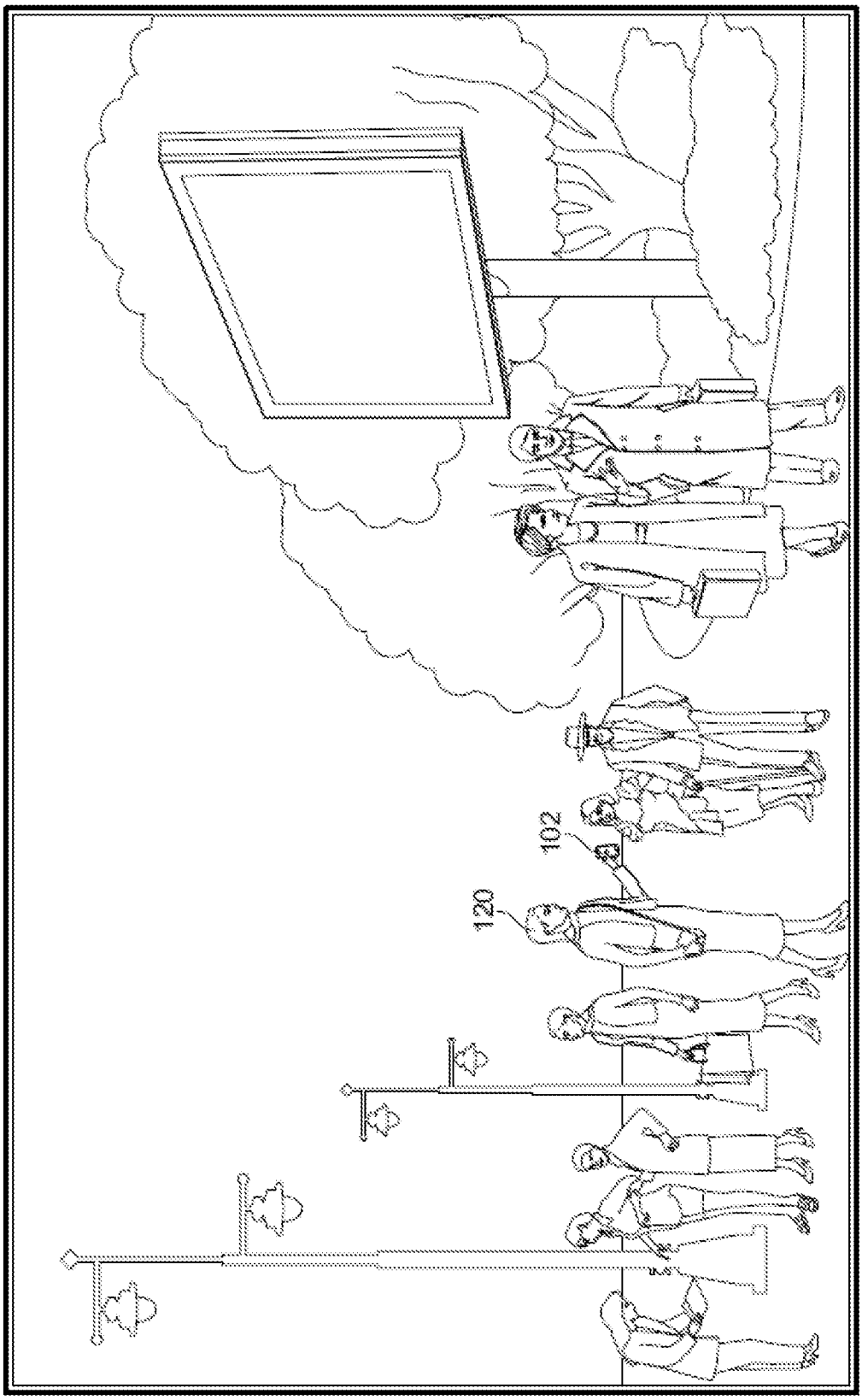


FIG. 2A

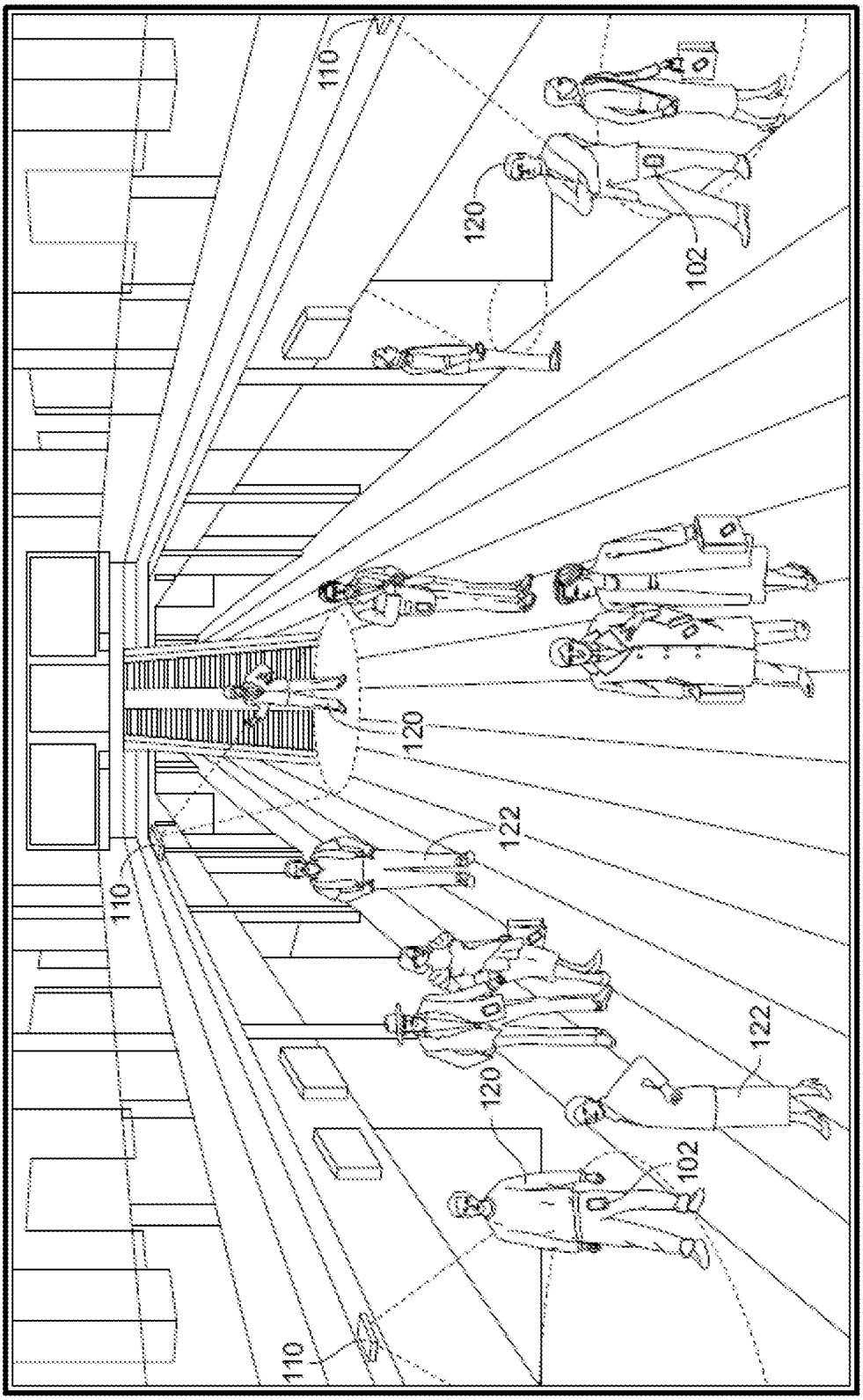


FIG. 2B

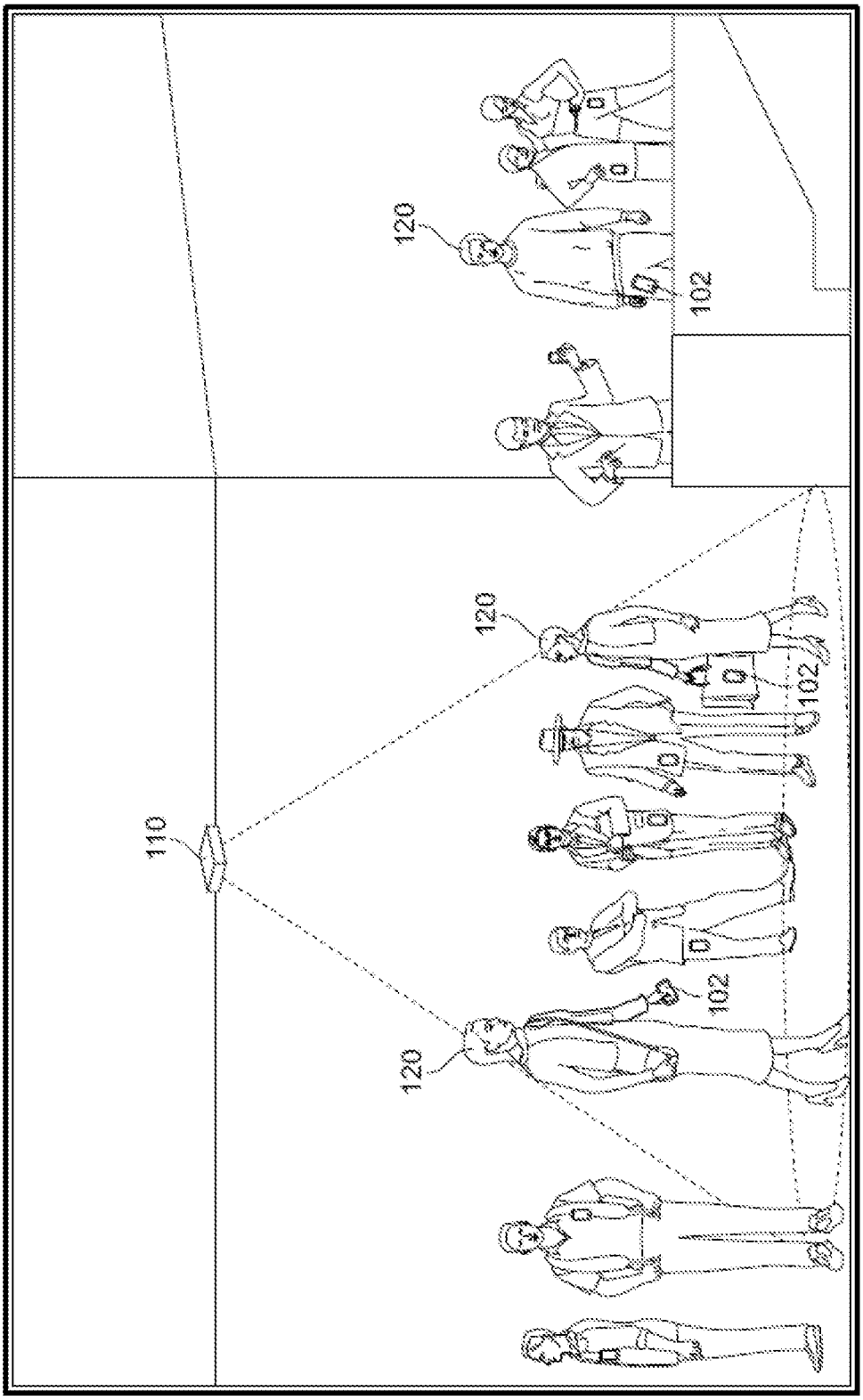


FIG. 2C

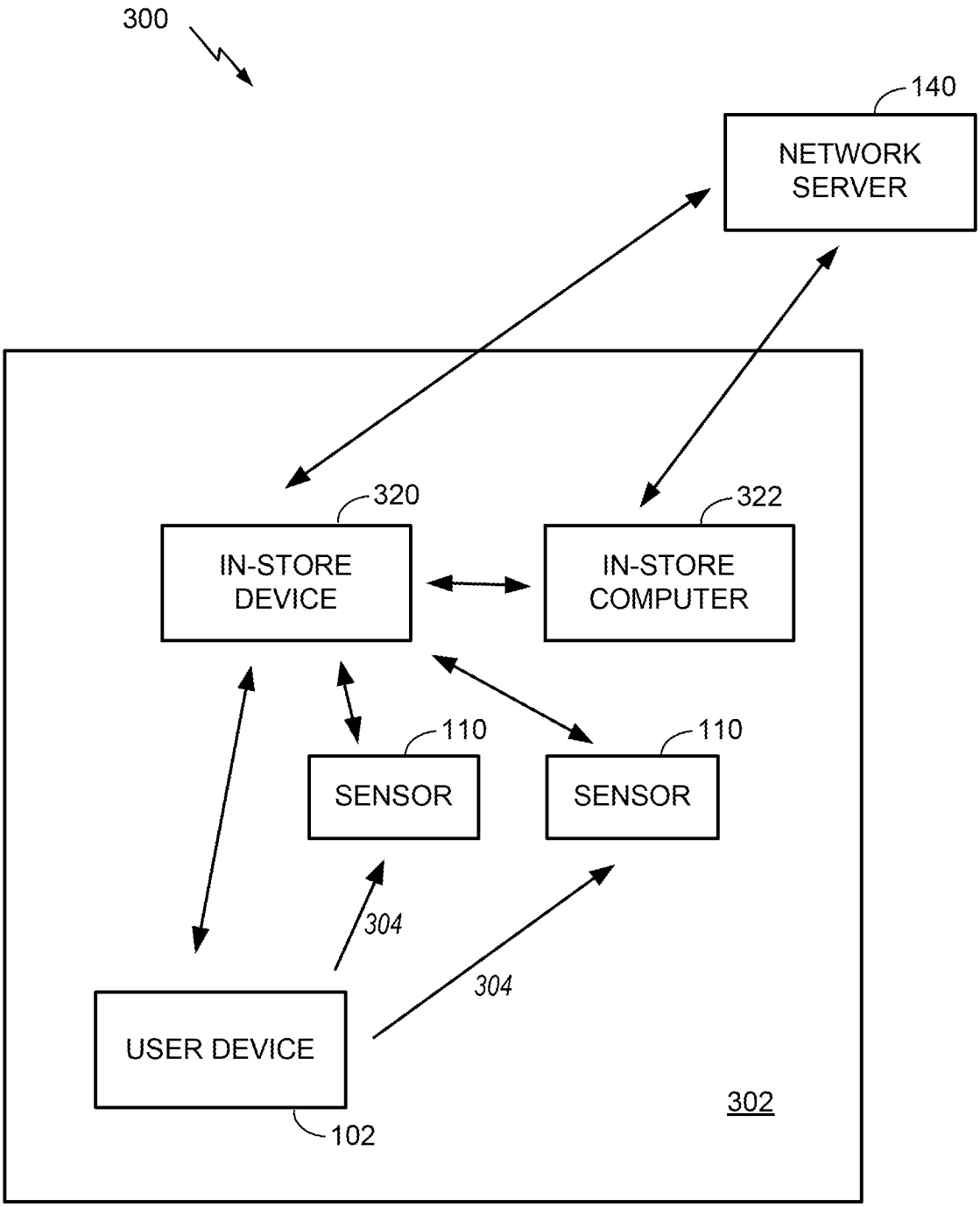
300
140
NETWORK SERVER
320
IN-STORE DEVICE
322
IN-STORE COMPUTER
110
SENSOR
110
SENSOR
304
304
USER DEVICE
102
302

FIG. 3A

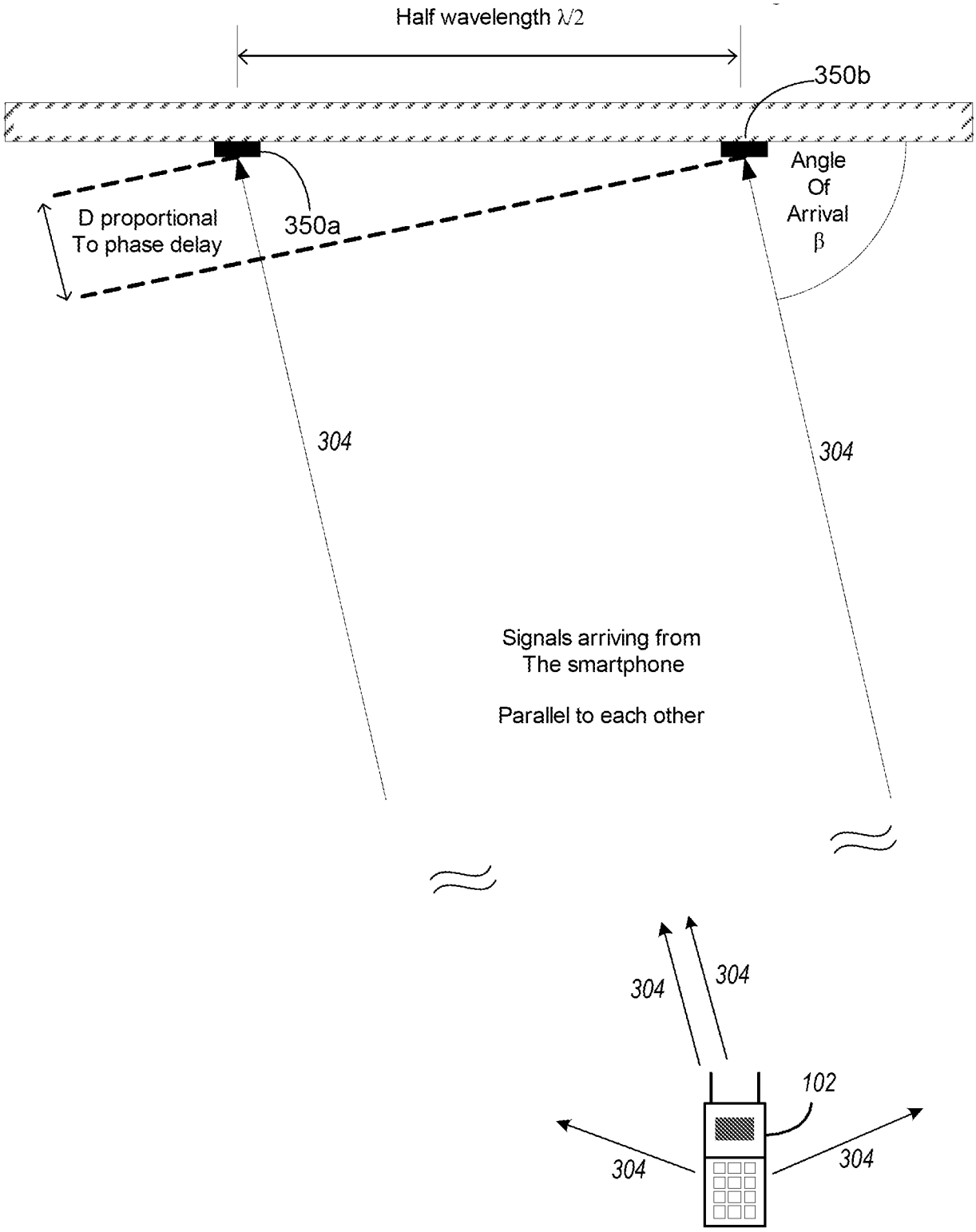
Half wavelength λ/2
350b
Angle
Of
Arrival
β
D proportional
To phase delay
350a
304
304
Signals arriving from
The smartphone
Parallel to each other
304
304
102
304
304

FIG. 3B

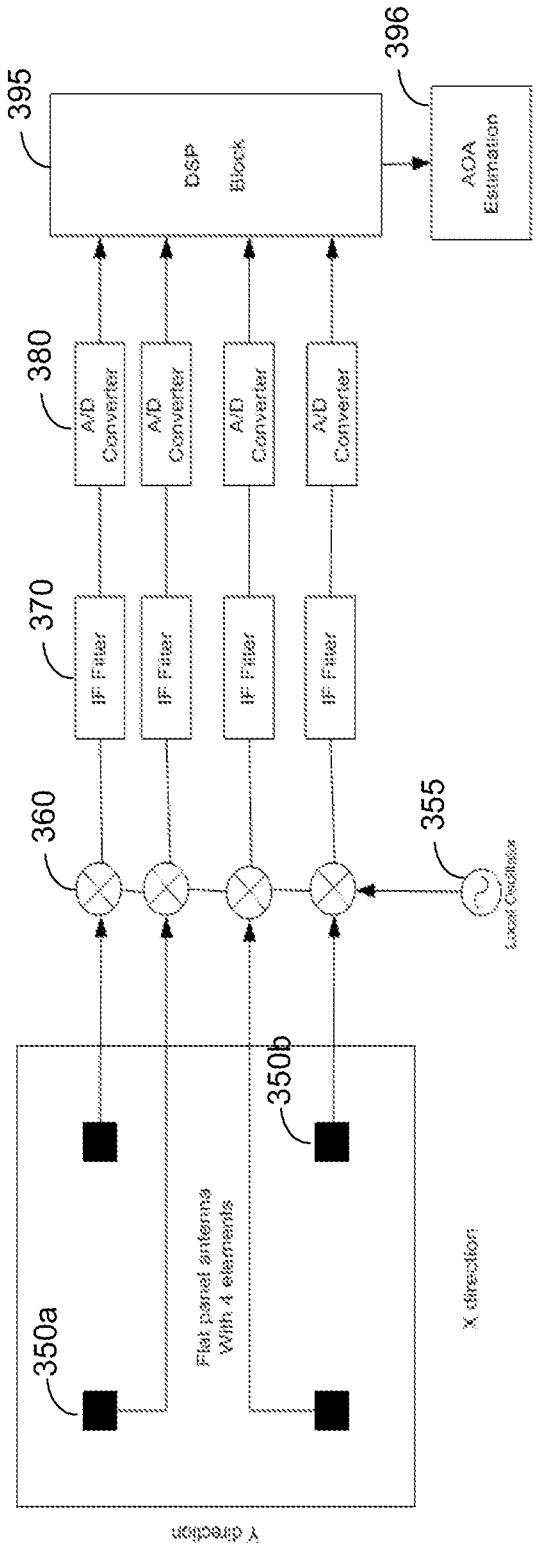
395
DSP
Block
396
AOA
Estimation
380
A/D
Converter
A/D
Converter
A/D
Converter
A/D
Converter
370
IF Filter
IF Filter
IF Filter
IF Filter
360
355
Local Oscillator
350b
350a
Flat panel antenna
With 4 elements
X direction
Y direction

FIG. 3C

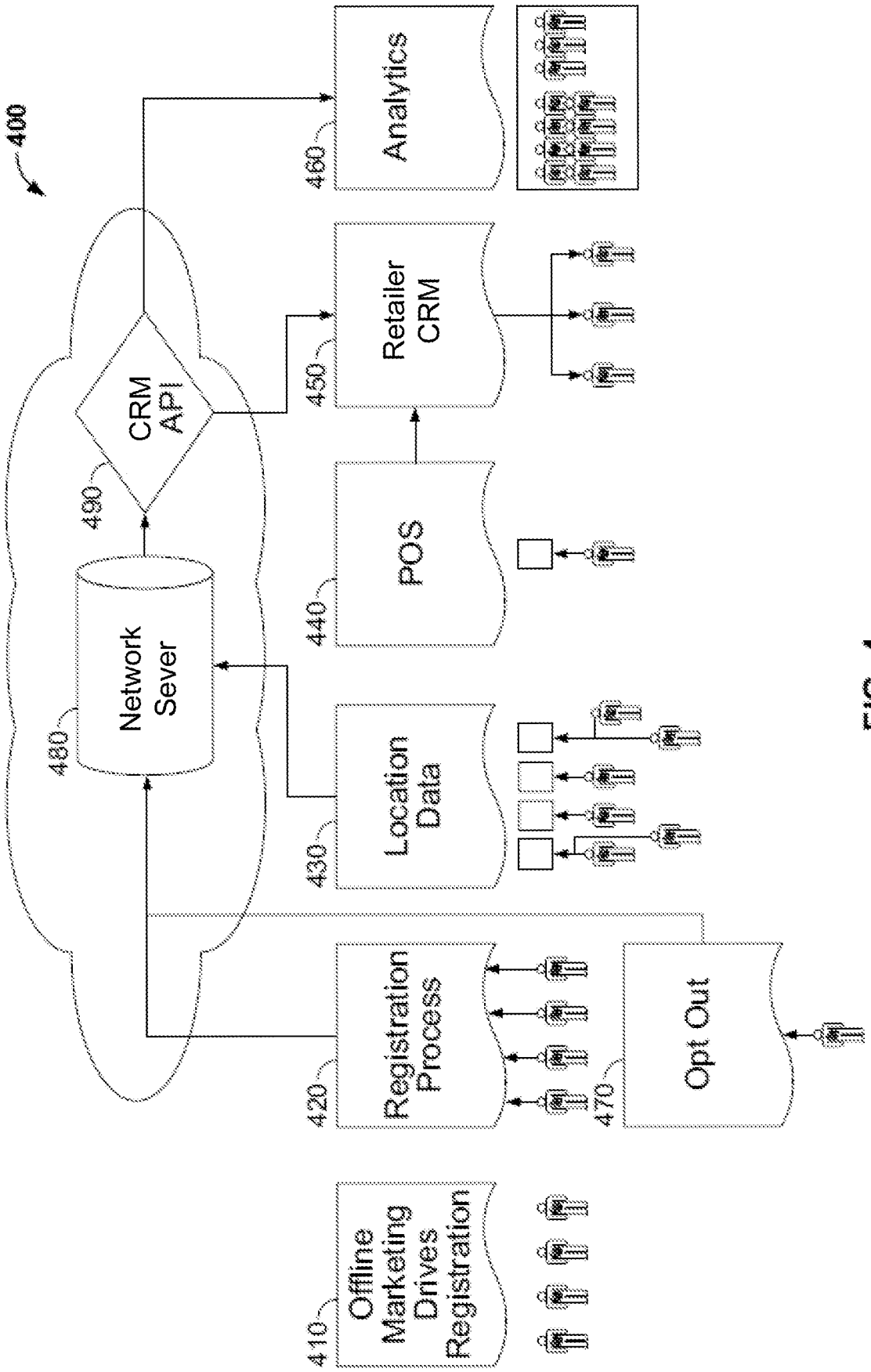
400
Offline Marketing Drives Registration
410
Registration Process
420
Location Data
430
POS
440
Retailer CRM
450
Analytics
460
Network Sever
480
CRM API
490
Opt Out
470

FIG. 4

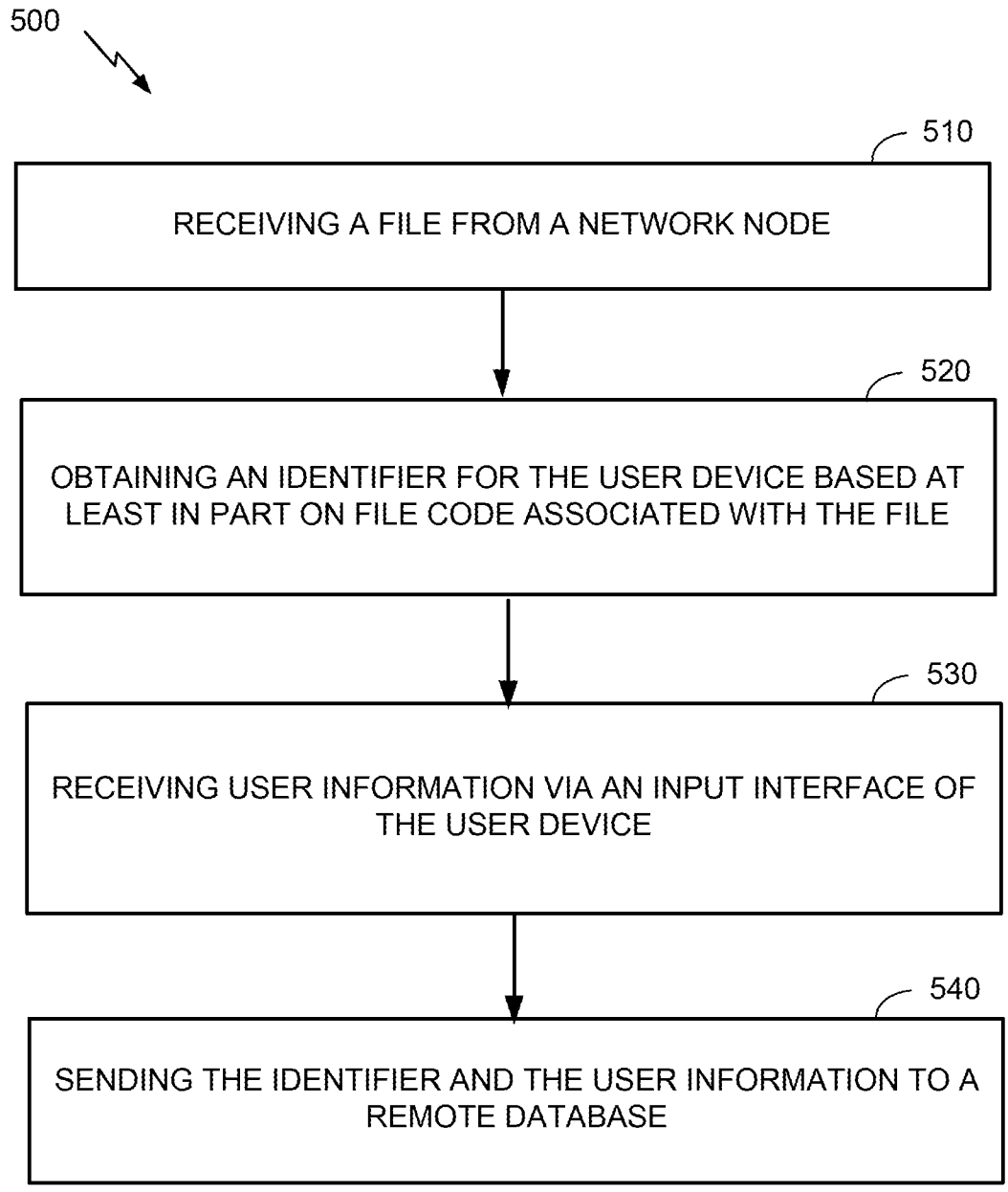
500
510
RECEIVING A FILE FROM A NETWORK NODE
520
OBTAINING AN IDENTIFIER FOR THE USER DEVICE BASED AT LEAST IN PART ON FILE CODE ASSOCIATED WITH THE FILE
530
RECEIVING USER INFORMATION VIA AN INPUT INTERFACE OF THE USER DEVICE
540
SENDING THE IDENTIFIER AND THE USER INFORMATION TO A REMOTE DATABASE

FIG. 5

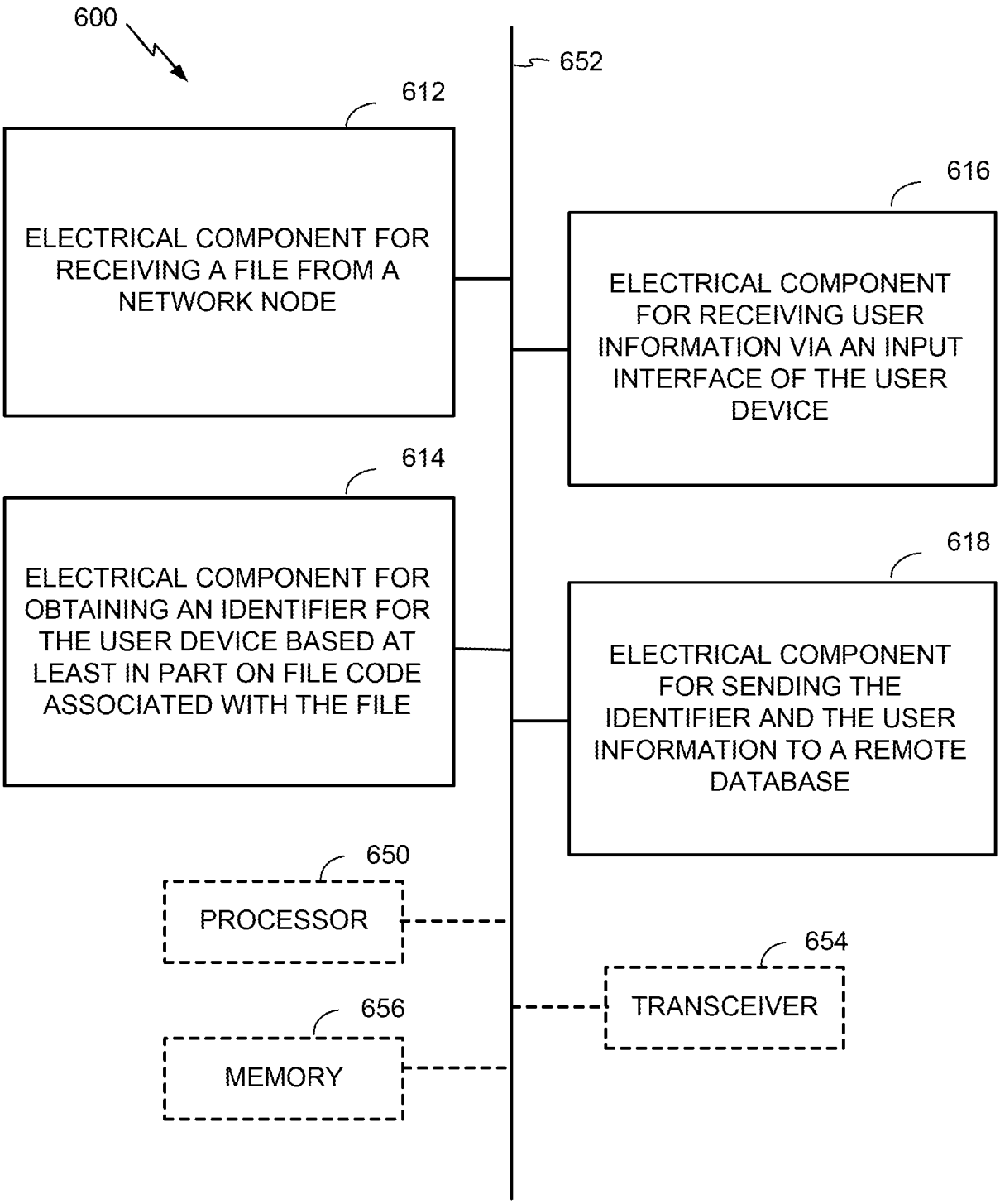
600
652
612
ELECTRICAL COMPONENT FOR RECEIVING A FILE FROM A NETWORK NODE
616
ELECTRICAL COMPONENT FOR RECEIVING USER INFORMATION VIA AN INPUT INTERFACE OF THE USER DEVICE
614
ELECTRICAL COMPONENT FOR OBTAINING AN IDENTIFIER FOR THE USER DEVICE BASED AT LEAST IN PART ON FILE CODE ASSOCIATED WITH THE FILE
618
ELECTRICAL COMPONENT FOR SENDING THE IDENTIFIER AND THE USER INFORMATION TO A REMOTE DATABASE
650
PROCESSOR
654
TRANSCEIVER
656
MEMORY

FIG. 6

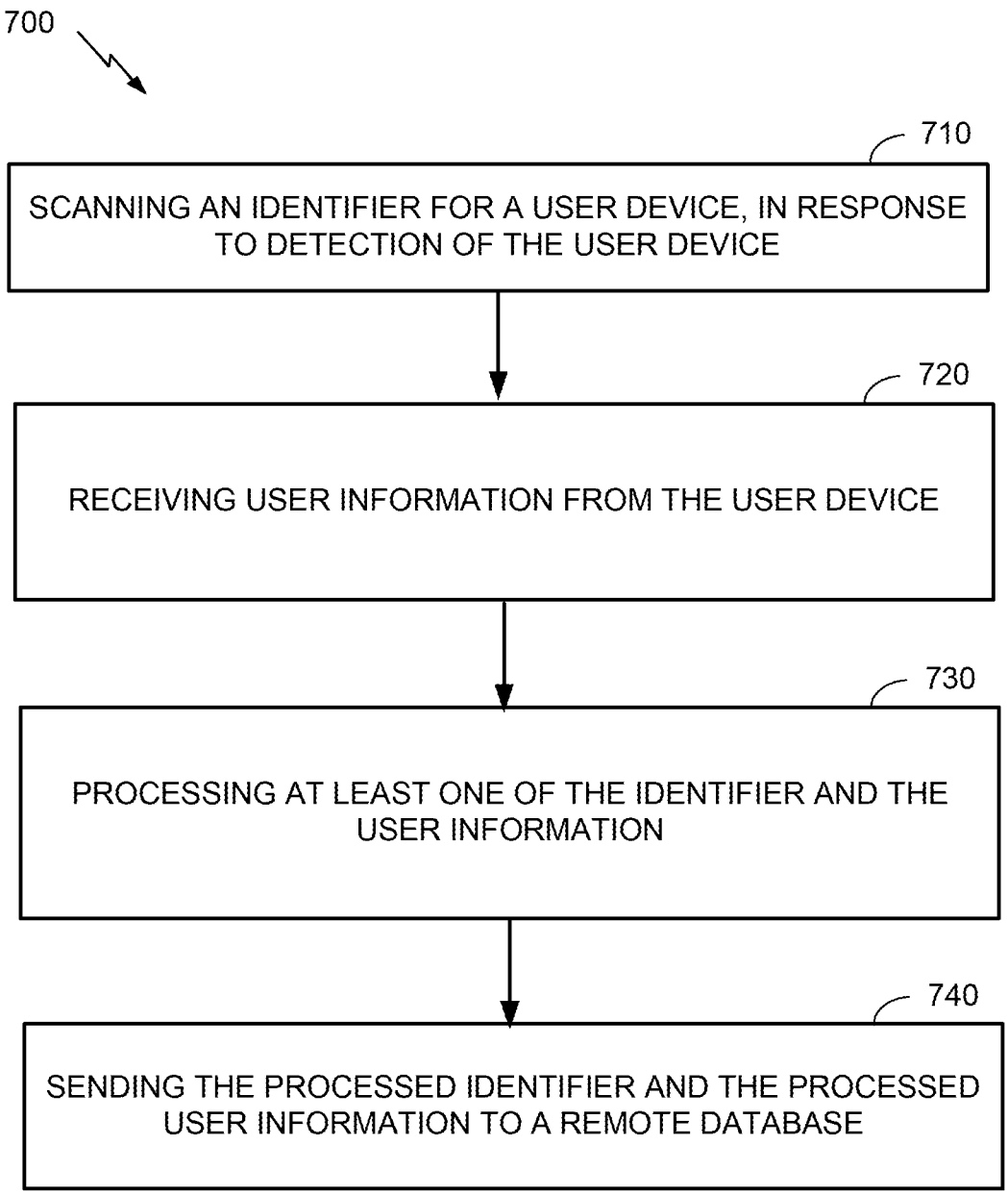
700
710
SCANNING AN IDENTIFIER FOR A USER DEVICE, IN RESPONSE TO DETECTION OF THE USER DEVICE
720
RECEIVING USER INFORMATION FROM THE USER DEVICE
730
PROCESSING AT LEAST ONE OF THE IDENTIFIER AND THE USER INFORMATION
740
SENDING THE PROCESSED IDENTIFIER AND THE PROCESSED USER INFORMATION TO A REMOTE DATABASE

FIG. 7

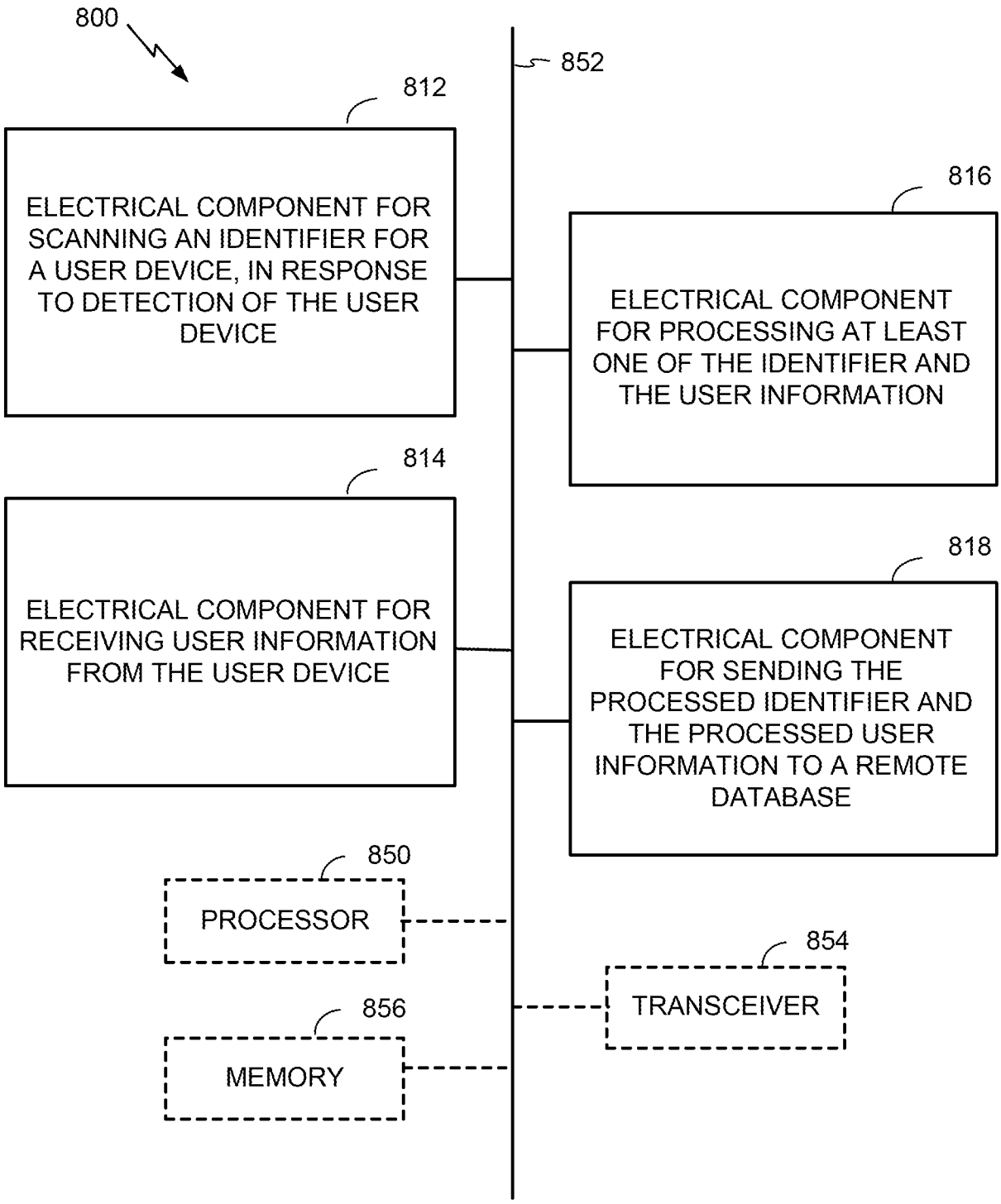
800
852
812
ELECTRICAL COMPONENT FOR SCANNING AN IDENTIFIER FOR A USER DEVICE, IN RESPONSE TO DETECTION OF THE USER DEVICE
816
ELECTRICAL COMPONENT FOR PROCESSING AT LEAST ONE OF THE IDENTIFIER AND THE USER INFORMATION
814
ELECTRICAL COMPONENT FOR RECEIVING USER INFORMATION FROM THE USER DEVICE
818
ELECTRICAL COMPONENT FOR SENDING THE PROCESSED IDENTIFIER AND THE PROCESSED USER INFORMATION TO A REMOTE DATABASE
850
PROCESSOR
854
TRANSCEIVER
856
MEMORY

FIG. 8

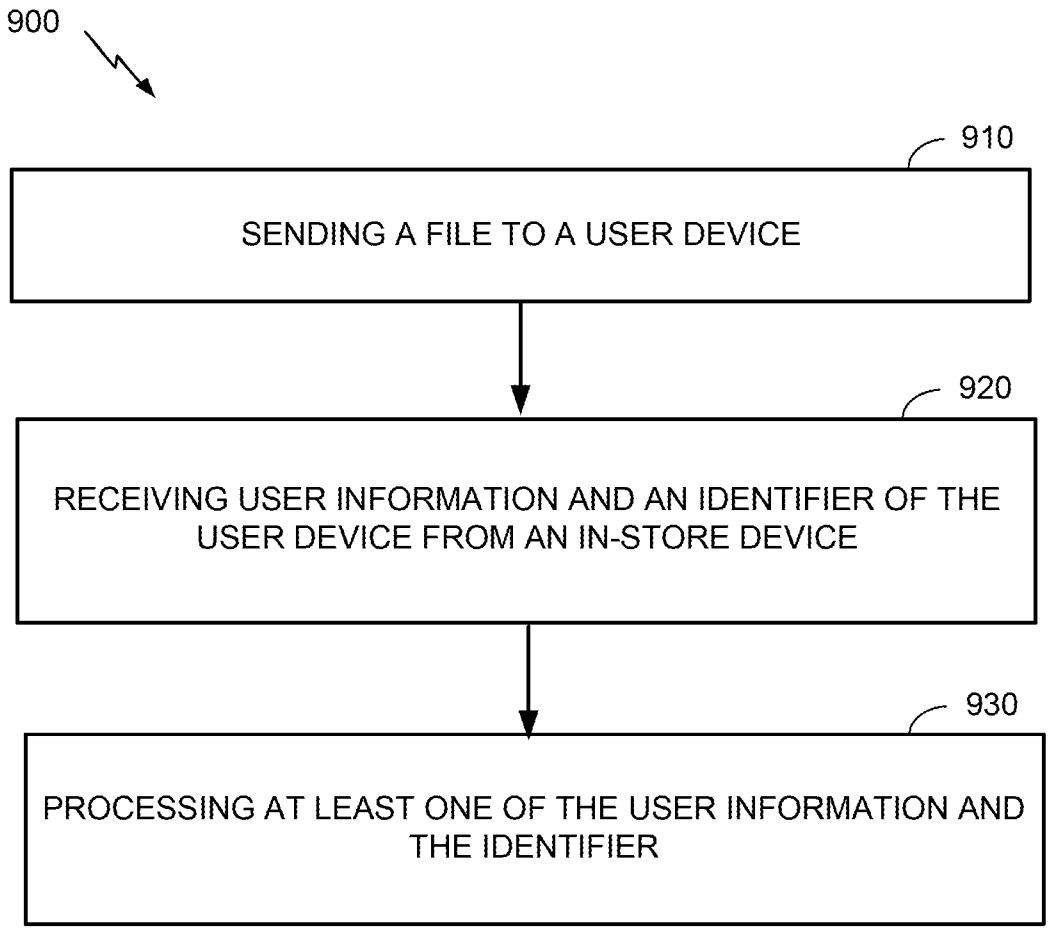
900
910
SENDING A FILE TO A USER DEVICE
920
RECEIVING USER INFORMATION AND AN IDENTIFIER OF THE USER DEVICE FROM AN IN-STORE DEVICE
930
PROCESSING AT LEAST ONE OF THE USER INFORMATION AND THE IDENTIFIER

FIG. 9

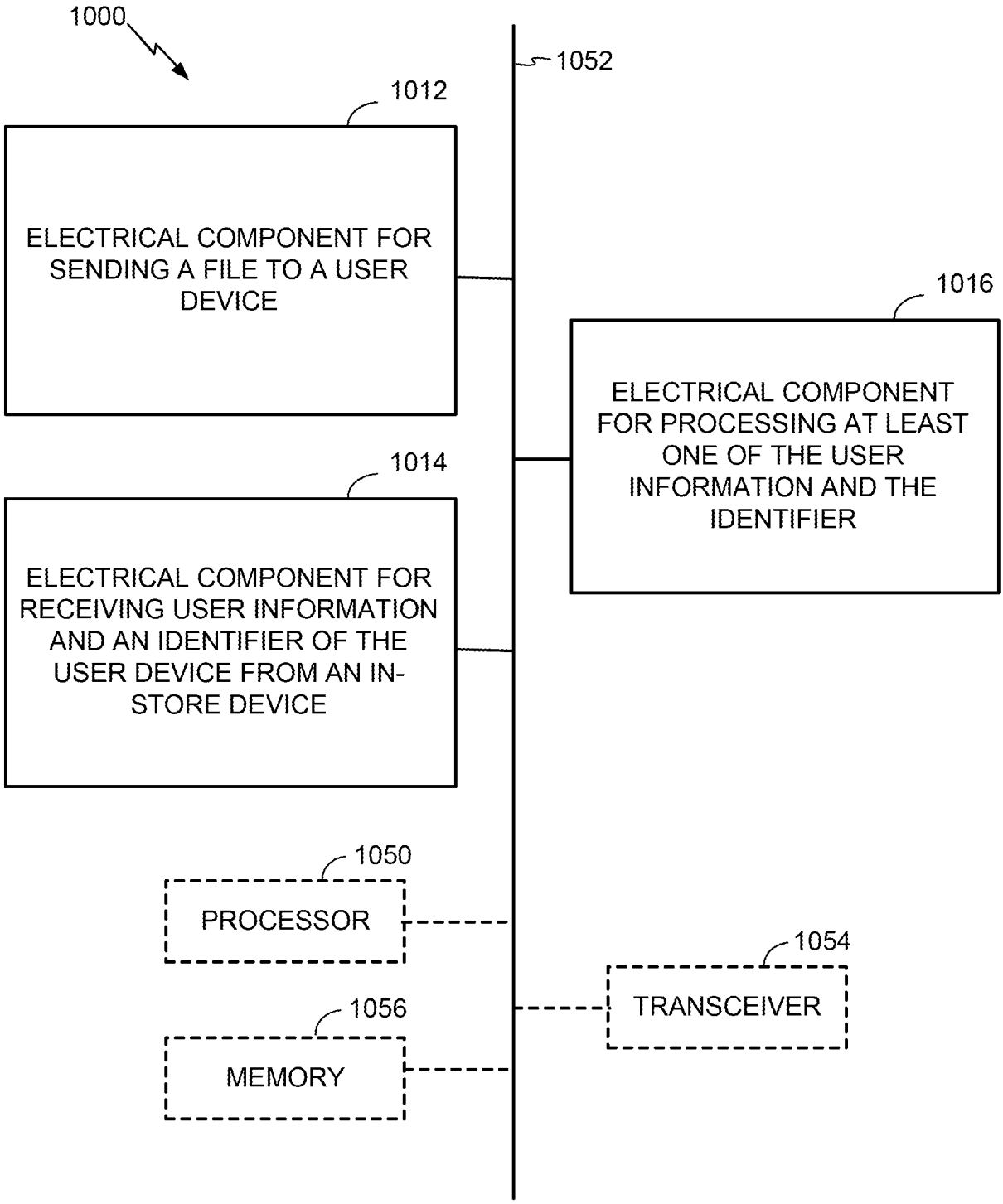
1000
1052
1012
ELECTRICAL COMPONENT FOR SENDING A FILE TO A USER DEVICE
1016
ELECTRICAL COMPONENT FOR PROCESSING AT LEAST ONE OF THE USER INFORMATION AND THE IDENTIFIER
1014
ELECTRICAL COMPONENT FOR RECEIVING USER INFORMATION AND AN IDENTIFIER OF THE USER DEVICE FROM AN IN-STORE DEVICE
1050
PROCESSOR
1054
TRANSCEIVER
1056
MEMORY

FIG. 10

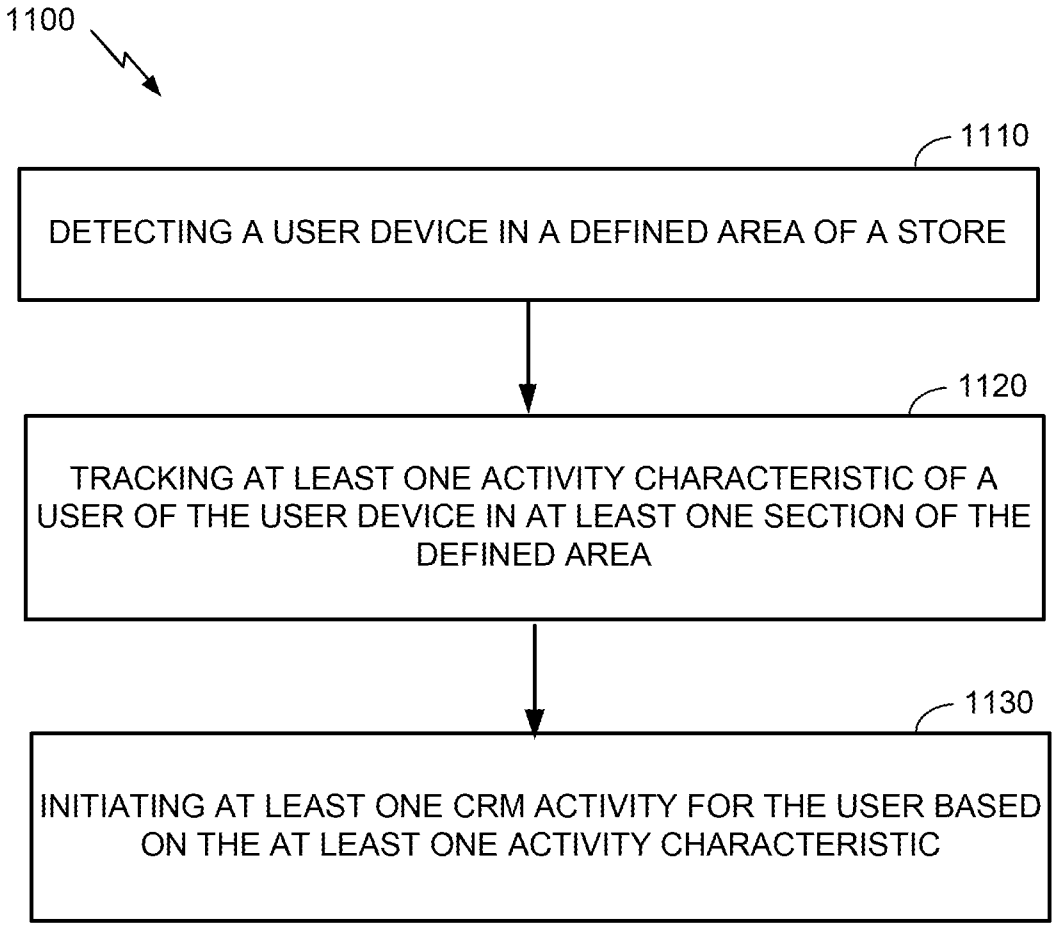
1100
1110
DETECTING A USER DEVICE IN A DEFINED AREA OF A STORE
1120
TRACKING AT LEAST ONE ACTIVITY CHARACTERISTIC OF A USER OF THE USER DEVICE IN AT LEAST ONE SECTION OF THE DEFINED AREA
1130
INITIATING AT LEAST ONE CRM ACTIVITY FOR THE USER BASED ON THE AT LEAST ONE ACTIVITY CHARACTERISTIC

FIG. 11

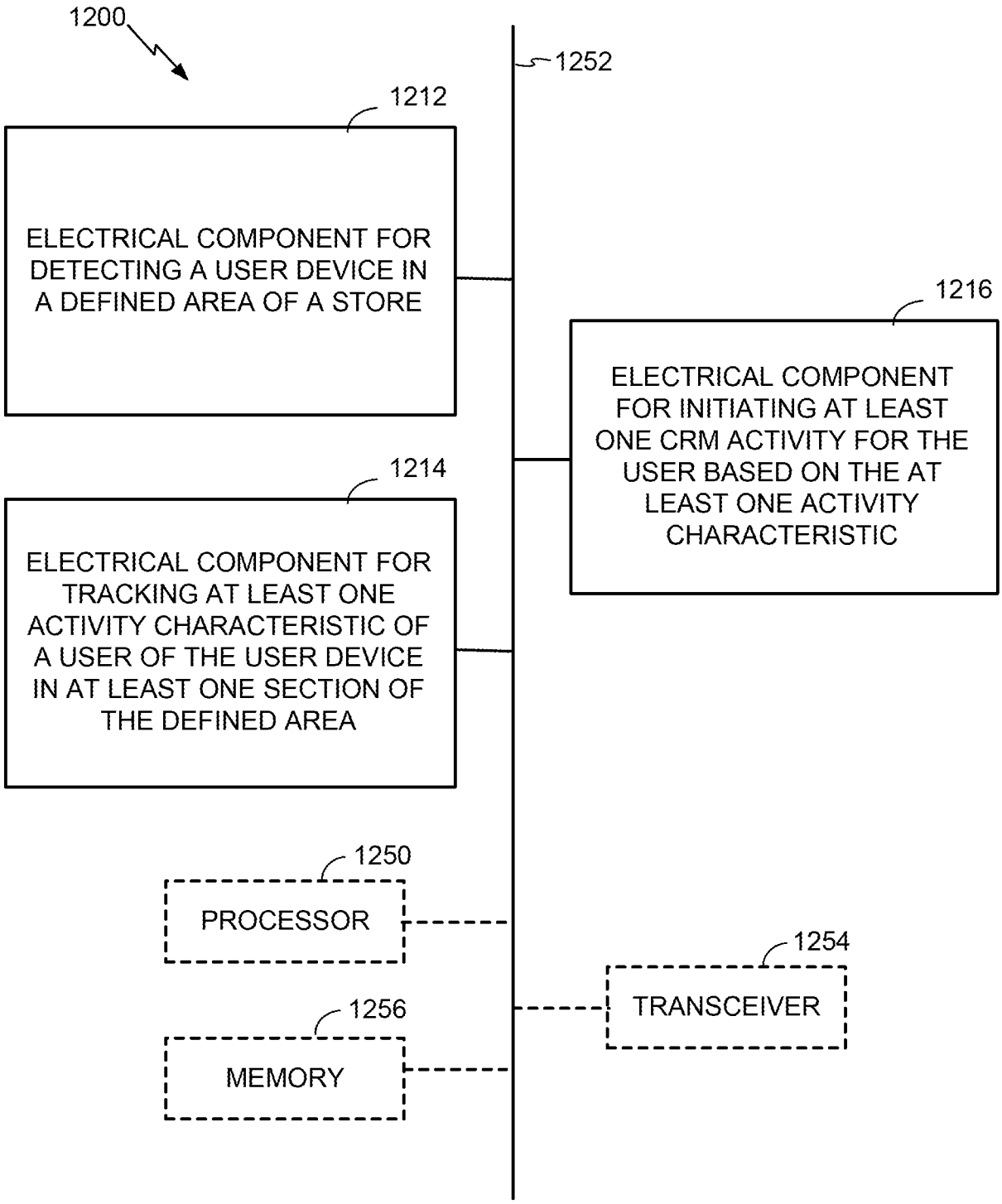
1200
1252
1212
ELECTRICAL COMPONENT FOR DETECTING A USER DEVICE IN A DEFINED AREA OF A STORE
1216
ELECTRICAL COMPONENT FOR INITIATING AT LEAST ONE CRM ACTIVITY FOR THE USER BASED ON THE AT LEAST ONE ACTIVITY CHARACTERISTIC
1214
ELECTRICAL COMPONENT FOR TRACKING AT LEAST ONE ACTIVITY CHARACTERISTIC OF A USER OF THE USER DEVICE IN AT LEAST ONE SECTION OF THE DEFINED AREA
1250
PROCESSOR
1254
TRANSCEIVER
1256
MEMORY

FIG. 12

**INTERNATIONAL SEARCH REPORT**

International application No.
**PCT/AU2013/000097**

A. CLASSIFICATION OF SUBJECT MATTER

***G06Q 30/02 (2012.01)***

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Internet (Google, Google Scholar), EPODOC, WPI using keywords such as: detect, monitor, track, scan, user device, phone, mobile, smartphone, PDA, register, enrol, subscribe, electronic coupon, voucher, RFID, NFC, retail, shop, CRM

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| | Documents are listed in the continuation of Box C | |

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 16 April 2013 | 16 April 2013 |

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**Authorised officer**

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Telephone No. 0399359618

| INTERNATIONAL SEARCH REPORT<br>C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | International application No.<br>PCT/AU2013/000097 |
|---|---|---|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | US 8086678 B2 (HEREDIA et al.) 27 December 2011<br>Whole document, in particular: Abstract; Column 7, Lines 13 - 15, 19 - 21; Column 7, Line 53 - Column 8, Line 20 | 1, 5, 6, 8 - 10, 19, 22, 23 |
| X | US 2010/0151821 A1 (SWEENEY et al.) 17 June 2010<br>Whole document, in particular: Abstract; Paras 0031, 0032 | 18 |
| X | US 2007/0235529 A1 (PETERS) 11 October 2007<br>Whole document, in particular: Abstract; Paras 0023, 0024, 0027, 0033 | 18 |
| X | US 7475813 B2 (SWANSON, SR) 13 January 2009<br>Whole document, in particular: Abstract; Column 4, Lines 41 - 55; Column 4, Line 61 - Column 5, Line 2; Column 5, Lines 11 - 32; Column 7, Lines 58 - 67; Column 8, Lines 21 - 39, 59 - 64 | 27, 29, 31, 33, 40 - 43, 47, 49, 50, 52 - 54 |
| X | US 2004/0093268 A1 (RAMCHANDANI et al.) 13 May 2004<br>Whole document, in particular: Abstract; Paras 0089, 0092 - 0093, 0136, 0138, 0146 - 0148, 0190 - 0193 | 27, 29, 31, 33, 40 - 43, 46, 47, 49 - 54 |
| X | US 2008/0147461 A1 (LEE et al.) 19 June 2008<br>Whole document, in particular: Abstract; Paras 0024, 0026, 0029, 0034, 0046, 0088 | 27, 29, 31, 33, 34, 36, 40, 42, 52 - 54 |
| X | US 2010/0023401 A1 (ARIYIBI) 28 January 2010<br>Whole document, in particular: Abstract; Fig 1B, Item 109; Paras 0014 - 0015, 0017, 0024, 0030 - 0031, 0033 | 27, 29, 31, 33, 40 - 42, 44 - 47, 49 - 54 |
| X | US 2011/0029359 A1 (ROEDING et al.) 03 February 2011<br>Whole document, in particular: Abstract; Paras 0020, 0030, 0031, 0033, 0050, 0053, 0055, 0063, 0067, 0070, 0077 - 0078, 0081 | 27 - 43, 47 - 54 |

**INTERNATIONAL SEARCH REPORT**

International application No.
**PCT/AU2013/000097**

**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

**See Supplemental Box for Details**

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

**Supplemental Box**

**Continuation** of: **Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1 - 26 are directed to a method for registration. The feature of sending an identifier for a user device and user information to a remote database is specific to this group of claims.

- Claims 27 - 54 are directed to a customer relationship management (CRM) method. The feature of initiating at least one CRM activity for a user based on at least one activity characteristic of the user, the activity characteristic being derived by means of tracking the user in a defined area of a store is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

| INTERNATIONAL SEARCH REPORT<br>Information on patent family members | International application No.<br>**PCT/AU2013/000097** |
|---|---|

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document/s Cited in Search Report | | Patent Family Member/s | |
|---|---|---|---|
| **Publication Number** | **Publication Date** | **Publication Number** | **Publication Date** |
| US 8086678 B2 | 27 Dec 2011 | US 2009083385 A1 | 26 Mar 2009 |
| | | US 8086678 B2 | 27 Dec 2011 |
| | | US 2012066325 A1 | 15 Mar 2012 |
| | | US 8190694 B2 | 29 May 2012 |
| | | US 2012191795 A1 | 26 Jul 2012 |
| US 2010/0151821 A1 | 17 Jun 2010 | US 2010151821 A1 | 17 Jun 2010 |
| US 2007/0235529 A1 | 11 Oct 2007 | CN 101051370 A | 10 Oct 2007 |
| | | US 2007235529 A1 | 11 Oct 2007 |
| US 7475813 B2 | 13 Jan 2009 | US 2005177423 A1 | 11 Aug 2005 |
| | | US 7475813 B2 | 13 Jan 2009 |
| | | WO 2005078645 A2 | 25 Aug 2005 |
| US 2004/0093268 A1 | 13 May 2004 | AU 2003287537 A1 | 03 Jun 2004 |
| | | US 2004093265 A1 | 13 May 2004 |
| | | US 7962361 B2 | 14 Jun 2011 |
| | | US 2011276382 A1 | 10 Nov 2011 |
| | | US 8229787 B2 | 24 Jul 2012 |
| | | US 2004093268 A1 | 13 May 2004 |
| | | US 2012265622 A1 | 18 Oct 2012 |
| | | WO 2004044688 A2 | 27 May 2004 |
| US 2008/0147461 A1 | 19 Jun 2008 | US 2008147461 A1 | 19 Jun 2008 |
| | | WO 2008076927 A2 | 26 Jun 2008 |
| US 2010/0023401 A1 | 28 Jan 2010 | US 2010023401 A1 | 28 Jan 2010 |
| | | US 8271322 B2 | 18 Sep 2012 |
| | | US 2013073405 A1 | 21 Mar 2013 |
| | | WO 2010011233 A1 | 28 Jan 2010 |
| US 2011/0029359 A1 | 03 Feb 2011 | CN 102713955 A | 03 Oct 2012 |
| | | EP 2460126 A1 | 06 Jun 2012 |
| | | JP 2013500538 A | 07 Jan 2013 |
| | | KR 20120049306 A | 16 May 2012 |
| | | US 2011028160 A1 | 03 Feb 2011 |
| | | US 2011029359 A1 | 03 Feb 2011 |
| | | US 2011029362 A1 | 03 Feb 2011 |
| | | US 2011029364 A1 | 03 Feb 2011 |

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

| INTERNATIONAL SEARCH REPORT<br>Information on patent family members | International application No.<br>**PCT/AU2013/000097** |
|---|---|

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document/s Cited in Search Report | | Patent Family Member/s | |
|---|---|---|---|
| **Publication Number** | **Publication Date** | **Publication Number** | **Publication Date** |
| | | US 2011029370 A1 | 03 Feb 2011 |
| | | WO 2011014292 A1 | 03 Feb 2011 |

**End of Annex**

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.