IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
James A. Proctor, Jr., et al.

Serial No.: Not yet assigned

Filed: Herewith

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Examiner: Not yet assigned

Art Unit: Not yet assigned

Confirmation No.: Not yet assigned

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September 21, 2016

CERTIFICATE OF TRANSMISSION

I hereby certify that the following paper is being electronically transmitted to the Patent and Trademark Office by EFS-Web on September 21, 2016.

/Stephany DeBlois/
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Sir/Madam:

INFORMATION DISCLOSURE STATEMENT

In keeping with the duty of candor and good faith owed to the Patent and Trademark Office, Applicant wishes to bring to the Examiner's attention the references listed on the accompanying form PTO-1449. Copies of cited art are not enclosed

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pursuant to 37 C.F.R. §1.98(d)(1) because they were submitted in the parent U.S. Patent Application Serial No. 14/861,563, filed September 22, 2015.

To the extent required by 37 C.F.R. §1.98(a)(3), Applicant has described what they consider to be the relevance, and/or provided an English translation, of any non-English-language documents, or portion thereof.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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CLAIMS

What is claimed is:

1. A mobile wireless device for facilitating the use of proximity beacons comprising:

a first radio for communicating with one or more servers and receiving identifier related information;

a second radio for receiving proximity beacon transmissions from a plurality of beacon transmitter devices and for providing proximity beacon information derived from the proximity beacon transmissions; and

a data processor for determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions from the plurality of beacon transmitter devices and identifies of each of the plurality of proximity beacon transmitter devices as being enabled with the proximity beacon service.

2. The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit number matching the format of a MAC address.

3. The mobile wireless device of Claim 2, wherein the MAC address is a Bluetooth BD_ADDR.

4. The wireless device of claim 3 wherein both the MAC address and the unique identifier received by the second radio occasionally change, for security reasons.

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5. The wireless device of claim 2 wherein both the MAC address and the unique identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more central server to access the identifier information.

6. The mobile wireless device of Claim 1, wherein at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices.

7. The mobile wireless device of Claim 6, wherein the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

8. The mobile wireless device of Claim 1, wherein the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers.

9. The mobile wireless device of Claim 1, wherein the data processor determines the proximity by comparing the proximity beacon information with the identifier related information.

10. The mobile wireless device of Claim 1, wherein the data processor determines the proximity by sending at least the unique identifier associated with the at least one beacon transmitter to at least one of the one or more servers using the first radio, and receives at least a portion of the identifier related information usable to make the proximity determination.

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11. The mobile wireless device of Claim 10, wherein the unique identifier associated with the at least one beacon transmitter is associated at the at least one of the one or more servers with being a broadcast device having a known location.

12. The mobile wireless device of Claim 1, wherein the data processor further determines, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a known location.

13. The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device, downloaded in reaction to the sending of a unique identifier by the mobile wireless device to the at least one server, wherein the mobile wireless device first received the unique identifier as part of the proximity beacon information.

14. The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device.

15. The mobile wireless device of Claim 1 wherein

the identifier related information comprises a list of contact information, and the data processor performs the proximity determination of a beacon transmitter device associated with an entity included within the list of contact information based upon comparing a contact information related unique identifier with at least the portion of the proximity beacon information, and wherein the mobile wireless device, upon determining there is a match, engages in further steps to allow further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio, and further

wherein the both the MAC address and the identifier associated with proximity beacon transmissions from the detected proximity beacon transmitter associated with entity included within the list of contact information change from time to time, but remains

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identifiable by the wireless mobile device, but anonymous to other devices not having required permissions to make such an identification.

16. The wireless device of claim 1 wherein the changing of the MAC address and the unique identifier associated with the at least one beacon transmitter is coordinated with the at least one of the one or more remote central servers.

17. The wireless device of claim 1 wherein the unique identifier of at least the portion of the proximity beacon transmissions changes over time based upon an algorithm in synchronization with at least one server of the one or more remote central servers.

18. The wireless device of claim 1 wherein the unique identifier associated with at least one beacon transmitter is associated with a single beacon transmitter and is generated algorithmically and only known to at least one the central servers and the one beacon transmitter, and updated based, at least in part, upon a clock interval within the beacon transmitter, and further

wherein the MAC address associated with the beacon transmitter is changed as well, so as to prevent the identity of the beacon transmitter from being determined by unauthorized devices.

19. The mobile wireless device of Claim 1, wherein the second radio is a Bluetooth based radio.

20. The mobile wireless device of Claim 1, wherein the second radio is a Wi-Fi based radio.

21. The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit BD_ADDR, wherein both the MAC address and the unique identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous

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over time to other devices or entities not having permissions at the one or more central server to access the identifier related information, and wherein at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices, wherein the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

22. The mobile wireless device of Claim 21, wherein the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers.

23. The mobile wireless device of Claim 1, wherein the proximity beacon service utilizes a standards based protocol derived from Bluetooth and including unsolicited automatically repetitive advertisements, and wherein the proximity beacon transmissions are transmitted within the format of the unsolicited automatically repetitive advertisements, and wherein the proximity beacon identification information is included within a configurable field of the unsolicited automatically repetitive advertisements while conforming to the standards based protocol and, wherein no connection is made between the mobile wireless device and the plurality of beacon transmitted receiving when receiving the unique identifier.

24. A wireless device for facilitating the use of proximity beacons comprising:

a short range radio for transmitting proximity beacon advertisements and receiving proximity beacon advertisement information; and

a data processor for providing the proximity beacon advertisement information to the short range radio,

wherein the data processor generates the proximity beacon advertisement information based, at least in part, upon configuration information provided by one or more remote central servers.

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wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions from the plurality of beacon transmitter devices and identifies of each of the plurality of proximity beacon transmitter devices as being enabled with the proximity beacon service.

25. A system for facilitating the use of proximity beacons comprising:

one or more central servers for communicating with a plurality of wireless devices;

software residing on a wireless device of the plurality of wireless devices for:

utilizing a first radio of the wireless device to communicate with at least one of the one or more servers and for receiving identifier related information; and for,

utilizing a respective second radio of the wireless device for receiving proximity beacon transmissions from a plurality of beacon transmitter devices and for providing received proximity beacon information derived from the proximity beacon transmissions; and for,

determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions from the plurality of beacon transmitter devices and

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identifies of each of the plurality of proximity beacon transmitter devices as being enabled with the proximity beacon service.

26. The system of Claim 25, wherein the identifier related information comprises application software for execution upon the mobile wireless device.

27. The system of Claim 25, wherein the identifier related information is received in response to the software residing on the wireless device sending at least one unique identifier determined from the proximity beacon information.

28. The system of Claim 27 wherein after determining the at least one beacon transmitter device is in proximity, at least one server of the plurality of servers provides an identifying picture of a consumer to at least one device for use by an operator of the device for confirming the picture matches an individual in proximity as a step in a multi-step electronic commerce transaction.

29. The system of Claim 28, wherein the MAC address and unique identifier of the proximity beacon transmissions from each of the at least one beacon transmitter devices change from time to time, and wherein at least the unique identifiers of the at least one of beacon transmitter devices remain associated with an account associated with the consumer.

30. The system of Claim 25, wherein the second radio is a Bluetooth compliant radio.

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CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	James A. Proctor, Jr.	Nonprovisional Application Number (if known):	Not Yet Assigned
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /David J Thibodeau Jr Reg No 31671/	Date September 21, 2016
Name (Print/Typed) David J. Thibodeau, Jr.	Practitioner Registration Number 31671

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Inventor(s): James Arthur Proctor, Jr. and James Arthur Proctor, III

Attorney's Docket No.: 111054-0001U4C7

EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

RELATED APPLICATION(S)

This application is a continuation of pending U.S. Patent Application No. 14/861,563, filed September 22, 2015 which is a continuation of pending U.S. Patent Application No. 14/472,477, filed August 29, 2014 which is a continuation of U.S. Patent Application No. 13/775,435, filed February 25, 2013, now issued as U.S. Patent No. 8,849,698 on September 30, 2014 which is a continuation of U.S. Patent Application No. 13/212,723, filed August 18, 2011, now issued as U.S. Patent No. 8,374,592 on February 12, 2013 which is a continuation of U.S. Application No. 12/364,828, filed February 3, 2009, now issued as U.S. Patent No. 8,090,359 on January 3, 2012 which claims the benefit of U.S. Provisional Application No. 61/095,001, entitled "Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios", filed on September 8, 2008 and U.S. Provisional Application No. 61/095,359, entitled "Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios", filed on September 9, 2008. The entire teachings of the above applications are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Several key internet applications have become increasingly popular in recent years. A current trend in internet usage involves social networking. Social networking involves making use of internet services which allow for the interaction and sharing of information between users of service.

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Recently, mobile wireless communication standards have progressed to the point where relatively high speed data connections are possible to the phone over the wireless wide area network (WWAN). These standards include 1xEV-DO, HSDPA, EDGE, GPRS, Wi-Max (IEEE802.16e) and the like. Some social networking sites have included interfaces to their web sites optimized to make use of such high data rate mobile services for use on a mobile phone. These services are referred to as mobile social networking. For the most part, these services are simply versions of the standard social networking, redesigned to be usable on a mobile phone, adding little in the way of increased capability.

With the common capability of global positioning system (GPS) receivers being incorporated into phones, some additional capabilities have been added to some mobile social networking interfaces by incorporating location information for the user and that of the individual they interact with.

These services are utilizing GPS to determine the location of one mobile wireless user and to another to facilitate mobile social networking. An example of an existing application utilizing this approach is Loopt (www.loopt.com), which coordinates location based social interaction. One problem with GPS based mobile application involves the GPS receiver not receiving sufficient signal strength in many indoor locations. As a result these enhanced capabilities have typically been targeted at either navigation to a specified location, or as in the case with Loopt, allowing a user to see where their friends are located in a relatively large geographic location, on a map.

Another popular application for the internet is electronic commerce. Just as with social network, e-commerce services have provided interfaces optimized for use on mobile phones which provide basically the same capabilities as the standard interfaces. Very little location or proximity information has been used to enhance the mobile e-commerce experience.

Some attempts have been made to utilize RFID (Radio Frequency Identification) chips to perform mobile payments. This approach requires the additional hardware on a

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phone in the form of a RFID chip, or other specialized features. As a result, mobile electronic commerce has mostly allowed users to perform transaction with a remote party, such as purchasing an item on ebay (www.ebay.com). To date mobile electronic payments for individuals who are in close proximity to each other have not been practical for a number of reasons. First there is a need for the individuals to have a third trusted party to help facilitate the electronic transaction. Secondly, there needs to be a convenient, electronically secure, personally secure and anonymous method for each of the individuals to specify the party with which they wish to engage in a transaction. Thirdly, there is a need to cross validate the identities of the individuals engaged in the transaction. Finally, this method must work in indoors locations.

Most mobile phones on the market today support at least two wireless standards; one for the cellular wireless wide area network connection (WWAN) and one for a wireless personal or local area network (WPAN, WLAN). The cellular connection or WWAN is utilized for voice and data and can adhere to many different standards such as CDMA (IS-2000), GSM, W-CDMA, WiMax, etc.. The WPAN or WLAN connection is typically for short range communications and is often used for wireless hands free devices, such as headsets, peripherals, or higher speed internet connections. The typical standards used for the sort range wireless communications include Bluetooth, Wi-Fi, and in some cases Ultra-Wide-Band (UWB).

In another approach to mobile social networking some services have attempted to utilize short range wireless capabilities often available on phones such as IEEE802.11 (Wi-Fi) or Bluetooth to facilitate peer to peer communications. These are also referred to a MANETs or Mobile Ad-hoc Networks. These services typically consist of a software application operating on a mobile phone using peer to peer networks to facilitate communication between wireless devices. Examples of such existing applications include Mobile-Cheddar, Peer-2-Me, and Flobbi. Published US Patent application US 2008/0182591 A1 filed December 13, 2007 describes one such peer to peer approach. One issue with these approaches is that one can not communicate with a peer once the devices are no longer in

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proximity. A further disadvantage is that all information to be exchanged must be stored locally on each of the peer devices as the communication occurs directly between the two devices and any policy for the delivery of locally stored content is difficult to enforce without the potential for fraud such as spoofing identities between the peers. Such fraud may lead to concerns of personal safety or privacy allowing the identity of an individual to be determined when it is not desired. Further this peer to peer model is inadequate for mobile electronic commerce in part due to the lack of an independent third party to facilitate the services required for a secure proximity based mobile electronic transaction as previously mentioned.

SUMMARY OF THE INVENTION

The present invention is generally concerned with facilitating the exchange of information and transactions between two entities associated with two wireless devices when the devices are in close proximity to each other utilizing both a short range and a long range wireless capability.

Preferred embodiments of the present invention are generally concerned with facilitating the exchange of information and transactions between two entities associated with two wireless devices when the devices are in close proximity to each other. In one embodiment, this can be accomplished by a first device using a first short range wireless capability to detect an identifier transmitted from a second device in proximity to the first device, ideally using existing short range radio communication standard capabilities such as Bluetooth (IEEE802.15.1-2002) or Wi-Fi (IEEE802.11). The detected identifier, being associated with the device, is also associated with an entity. Rather than directly exchanging application data flow between the two devices using the short range wireless capability, a second wireless capability then allows for one or more of the devices to communicate with a central server via the internet, and perform an exchange of application data flow. By using a central server to draw on stored information and content associated with the entity or entities, the server can broker the exchange of information between the entities and the devices. In a preferred embodiment, this exchange may be comprised of information stored on the server

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associated with a detected entity, and it may be comprised of information received from the detected device via the second wireless capability and facilitated by the server.

In addition, the server can also allow for a brokering service, ideally independent of the entities, to enable the application of policy based on the identity of the two entities for the disclosure of stored information associated with the entities, the flow in information between the devices and the entities, and the enablement of procedures such as security verification between the entities.

Applications running on a device may also interact with the server to perform various functions, for example retrieving information associated with an entity or device, by utilizing a detected identifier. Such information may include stored content associated with the entity's account record such as music, pictures, links to social networking sites, instant messaging addresses, advertising content, and even executable scripts or application such as in AJAX. An example of such an application may include the detection of a device's identifier in a fixed location allowing for tour guide like information to be provided for that location.

As the server may be running applications which perform more function than just the retrieval of content, a pre-defined interaction process may also be applied by the server to the devices such as allowing the approval to share private content with the entity associated with the detected device. This process may eventually allow or disallow the sharing of information and to facilitate the interacting with another entity.

As a more complex example, in other embodiments, the devices may utilize the server as a third party to provide for new capabilities such as a secure three way e-commerce transaction between two entities. In this more complex process, the server may require confirmation of each party's identity with visual cross verification of the parties using pictures or other unique identifiers. The server may use this visual cross verification in conjunction with detecting that the individuals are in proximity with each other. The server may verify the proximity using GPS or using the peer to peer detection process in another

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embodiment. Further, the server may facilitate a process requiring each party to perform a step by step confirmation during the transaction including the stages of: the request for purchase, the payment, the receipt of goods and services, and the providing of payment receipt.

This differs from the approaches employed by prior art location aware mobile social networking techniques in that no GPS is needed to determine when one device is in proximity to another. Many wireless devices in use are not GPS-capable, and even when they are, GPS will often not operate indoors or where the GPS signal is weak. Using a peer to peer detection process to locate nearby devices allows for the operation of proximity detection indoors.

Preferred embodiments of the present invention can also differ from known peer to peer based social networking in that the information flow between the devices running the applications are over the wide area network via a central server, rather than carried over the peer to peer network itself. An example of this is a service called Flobbi, as discussed previously, where community members can identify each other via Bluetooth transmissions, then interact with chat. The messaging in this case is carried over Bluetooth itself. A distinction from such peer to peer approaches is the use of a central server to "broker" the transactions between peers, enhancing the ability to manage security and information disclosure. Such use allows for the opportunity to customize delivered content to include elements such as advertising or other content customized to the recipient based on additional information such as known personal purchasing history, or interests.

A further distinction of the preferred embodiment is the use of a central server to determine identities of detected peer devices, which additionally allows for secure and fraud resistant application of policies for the disclosure of information and content. An issue with the existing pure peer to peer approaches is that they are not capable of enforcing policy associated with the disclosure of information to unknown entities in a secure and fraud resistant manor. One reason for this is that information related to a user's device must be disclosed in the process of detection in the form of a static identifier. By the nature of the

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identifier, it must be static or peers would not be able to directly determine the identity of a friend over time with the information stored on their device. By using a central server, the system may coordinate the change of the identifiers from time to time such that the disclosure of an identifier by one device to another does not compromise the identity of the device. In this case the identifier may be assigned from a central server and such server coordinate the identifier's change from time to time.

Reliance on a central server also allows the secure and fraud resistant application of disclosure policy. Such policy might include the verification of the identity of the party to which information (identity and presence for instance) or content (pictures of the account owner) is to be provided. Such verification is performed in an anonymous way such that in the process of verifying information associated with each party, no personal information is disclosed between the parties prior to satisfaction of some pre-set policy such as inclusion on a friend list or belonging to a specific group or organization. Another important policy required for such services would be the determination of any past negative feed back ratings by other past peers for behavior for the particular user to which the information is to be provided. An individual with significant poor ratings having detected a peer, may be denied access to personal information or even notification of arrival of the detected peer based on the server policy setting by the detected peer or the server in general.

A further distinction is to enable electronic payments for individuals who are in close proximity to each other. The central server can act as a third trusted party to help facilitate the electronic transaction between the individuals. Secondly, the server allows for a convenient, electronically secure, personally secure and anonymous method for each of the individuals to specify the party with which they wish to engage in a transaction. Thirdly, participants in a transaction can cross validate the identities of the individuals engaged in the transaction. Finally, because this method is proximity based it will also work indoors or in other situations where GPS location information is not available.

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BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing will be apparent from the following more particular description of example embodiments of the invention, as illustrated in the accompanying drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating embodiments of the present invention.

Figure 1 is a block diagram of two mobile devices utilizing a preferred embodiment.

Figure 2 is a block diagram of a fixed broadcast device and a mobile device.

Figure 3 is a flow diagram of the operation of an application on the mobile devices.

Figure 4 is a message sequence chart showing the Bluetooth discovery process using in one embodiment.

Figure 5 is a message sequence chart showing the Bluetooth Remote Name Request Process.

Figure 6 is a message sequence chart showing the IBSS beacon process.

Figure 7 is a message sequence chart showing the interaction between the server and two devices performing a detection and entering a chat application.

Figure 8A is a message sequence chart showing an E-commerce example.

Figure 8B is a continued example message sequence chart showing an E-commerce example.

Figure 9 is a message sequence chart showing an example of a mobile device and a fixed broadcast device interaction.

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Figure 10 is a flow diagram for the server processing associated with the detection process.

Figure 11 is an example individual account record stored in the server associated with an Entity.

Figure 12 illustrates a timing reference for intermittent active and dormant times.

Figure 13 shows a diagram of functional blocks associated with management of dynamically assigned device identifiers.

DETAILED DESCRIPTION OF THE INVENTION

A description of example embodiments of the invention follows.

The teachings of all patents, published applications and references cited herein are incorporated by reference in their entirety.

Figure 1 is a block diagram of two mobile devices utilizing a preferred embodiment.

Referring to Figure 1, a central server 100 is connected to devices 106 and 108 by an internet protocol (IP) based network, carried over a series of connections, at least one of which is a wireless connection. For example, the server 100 has a connection allowing IP based communications to a cellular network 102 using connection 101. The cellular network is connected to devices 106 and 108 by wide area wireless links 104 and 103 respectively, allowing for IP based communications between the devices (106 and 108) and the server 100.

Devices 106, 108 can be considered "client(s)" of the server 100. The clients 106, 108 and server 100 provide processing, storage, and input/output devices for executing wireless system protocols, interfaces, and application level programs according to the invention. Client devices 106, 108 can also be linked through various communications

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networks to other computing devices, including other client devices/processes and other server computer(s). Communications network(s) providing the connection 101 can typically be part of a remote access network, a global network (e.g., the Internet), a worldwide collection of computers, Local area or Wide area networks, and gateways that currently use respective protocols (TCP/IP, 3G Wireless, Bluetooth, etc.). Other electronic device/computer network architectures are suitable.

The internal structure of devices 106, 108 or server 100 includes one or more data processors (not shown in detail) that are well known in the art to include a system bus for data transfer among the other internal components of a computer system (e.g., processor, disk storage, memory, input/output ports, network ports, etc.). Attached to the bus are other input/output devices (e.g., keyboard, mouse, displays, printers, speakers, network interfaces, etc.). Network interfaces allow the computer to connect to various other devices attached to a network. Memory provides volatile storage for computer software instructions and data used to implement an embodiment of the present invention (e.g., applications programs and the like). Disk storage can provide non-volatile storage for computer software instructions and data used to implement an embodiment of the present invention.

In one embodiment, the invention may include a computer program product including a computer readable medium (e.g., a removable storage medium such as one or more DVD-ROM's, CD-ROM's, diskettes, tapes, etc.) that provides at least a portion of the software instructions for the invention system. Computer program product can be installed by any suitable software installation procedure, as is well known in the art. In another embodiment, at least a portion of the software instructions may also be downloaded over a cable, communication and/or wireless connection. In other embodiments, the invention programs are a computer program propagated signal product 107 embodied on a propagated signal on a propagation medium (e.g., a radio wave, an infrared wave, a laser wave, a sound wave, or an electrical wave propagated over a global network such as the Internet, or other network(s)). Such carrier medium or signals provide at least a portion of the software instructions for the present invention.

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More particularly, a given device 106, 108 uses a short range wireless link 107 such as a Bluetooth (IEEE802.15.1) or Wi-Fi (IEEE802.11) link to detect the presence of other devices such as device 108, and uses the wide area wireless network connections 103, 104 such as IS-2000, WCDMA, GPRS, EDGE, LTE, Wi-Max (IEEE802.16), or the like to perform communications to central server 100, and to perform the actual substantive communications between the wireless devices 106 and 108. Device 108 typically uses the short range wireless link 107 and wide area wireless link 103 in a similar manner to locate and initiate communicate with device 106. One distinction relative to prior art is that the short range wireless 107 is only used for the detection process, or to advertise a device's presence. In this embodiment, specific information called "wireless identifier" or simply "identify" (described in more detail below) is passed between devices 106 and 108 over the short range link 107. By transmitting a wireless identifier using the short range Wi-Fi, Bluetooth or other short range wireless link 107 and receiving wireless identifiers from other devices, this short range wireless link 107 will allow for a proximity detection process.

The support for IP based networking is standard for WWAN or 3G connections such as 1xEV-DO or HSPA, and as a result, communication between one device to another using the WWAN is currently supported in many devices with no modification. The use of simple detection of one or more identifiers requires significantly less resources in a phone than performing a complete peer to peer based communication network protocol, which accommodates dynamic configuration of nodes being added and dropped continuously. It is noted that the IP address on the WWAN interface is not location dependent in the present embodiment, but is addressing approaches are location dependent when true Peer to Peer topologies are used. The present embodiment has the advantage that communication between two devices may continue after the devices have left proximity of each other, but in the same manner as they had been communicating previously. As a result, a user who detects a short range transmission of an identifier, then begins a conversation or some other interaction with that device via the wireless wide area network may continue that conversation even in the case where the two devices move out of the proximity of the each other, and are no longer within the reception range of the short range wireless

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communication protocol. Further, since it is contemplated that the wireless identifiers transmitted on the short range wireless link from the devices would occasionally change, for security reasons, the present embodiment has the advantage that ongoing communications between mobile devices will not be interrupted despite a change in one of the device's identifier. In the case where the identifier is a MAC address of the short range wireless network adapter for one of the devices, it is not otherwise possible to change this address and easily maintain on going communications in a true peer to peer topology.

Referring to Figure 2, central server 100 is connected to the cellular network 101, and is able to communicate information to and from wireless device 202 using a wide area wireless link such as IS-2000, WCDMA, GPRS, EDGE, LTE, Wi-Max (IEEE802.16), or the like within structure 205. Device 204 does not have a wide area wireless or cellular link, but transmits identifying information using short range wireless link 203. Device 202 is capable of receiving the indentifying information and requesting information related to that device from server 100.

An example of an application using this infrastructure follows. The device 204 will simply broadcast an identifier, with no WWAN connection but may facilitate advertising or local information. For instance, an account associated with one or more identifiers may belong to a museum. As a museum patron walks to an exhibit, the patron's device 202 will receive an identifier sent from museum broadcast device 204 operated by the museum. The patron device 202 passes the identifier or museum device 204 to the central server 100, which in-turn recognizes it as being associated with that exhibit within that museum and passes relevant information back to the user's device 202. A distinguishing feature of this approach relative to prior art is that the patron device 202 in this example may move out of proximity of broadcast device 204, yet continue to view the content being provided by the server 100 related to the detected broadcast device 204. Content may include text, pictures, web pages, application software such as games, informative display applications, or other content such as audio or video to be offered to the user's device as well. Other examples

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might include electronic coupons (such as in a grocery store), menus or special offers in a restaurant.

Figure 3 is a block diagram with further detail of this operation. A device 106, 108, or 202 after performing a search (Fig 3, step 301) for identifiers on the WPAN or WLAN, will subsequently use the WWAN link to communicate with the central server 100. If the device does not find identifiers 302 it will either continue to search, or search at a later time 301. If identifiers are found in 302, the device may employ an action function 303, which would act as a filter that determines which of the detected identifiers should be passed to the server. This function may instead be omitted and all identifiers passed to the server 100. The idealized effect of the action function would be to reduce the number of requests to the server by not re-requesting recently requested identifiers which have already been passed to the server, for some period of time. In step 304, if no identifiers require server information, searching is continued in step 301.

Assuming there are identifiers which are new to the device, the device will pass along a list of currently detected identifiers and request 305 that the server return information related to any other local device. The server will return the information related to any identifier that meets certain policy requirements. For instance, information is returned which is 1) relevant to that device, and 2) that the device is authorized to receive.

As an example of the overall process, a detected identifier may be relevant to the receiving device if the user associated with the detected identifier is listed in a "friends list" for the owner of the receiving device. If the identifiers for the individuals within the friends list have been passed to the device, the action function 303 may make this determination. In the preferred embodiment, the server would determine the identity and the relevance of the detected identifiers, and the action function 303 would work to reduce frequency of re-requests to the server. Figure 7 describes an example of how to use this for messaging associated with the device and server interaction during the detection and identifier inquiry process, with a more detailed explanation to follow.

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To enable server 100 to associate an identifier with an entity, each device or entity (such as the museum) associated with an identifier has an account on server 100 or a related server as is common in information technology. The account is associated with the entity and the device and the current identifier.

As used herein, an "entity" may be a legal entity, such as an individual person or a business.

An "object" is intended to include a physical thing, such as a product that is being offered for sale, and may include a tangible article or intangible such as an electronic music or video file or photograph.

There is various information associated with each account. An example data record for an account is shown in Figure 11. When the account is associated with an individual or (other entity), there may be personal information such as the individual's name, contact information, information regarding allowed communication, such as chat or IM, links to their other social networking services, and the like. When the account is associated with a broadcast device 204 the account may contain content to be displayed to the detecting device 202. By utilizing the central server 100, broadcast devices may be tied to a location or product thereby providing relevant information about the location such as in the museum tour example previously discussed. In this situation, the content delivered to device 202 may be informative information about an exhibit including pictures, text, audio, or video and the like. In the case of a broadcast device being in a supermarket and near a specific product, advertisement or discounts with electronic coupons my be stored in the account and provided to device 202.

There can also be policy based permissions associated with each account and applied to any information associated with that account. The stored policy permissions can be used to determine what information and under which situations information may be disclosed to another device or user associated with another account. For example, the entity (person in this case) associated with device 202 may have set a policy in their account to not receive

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any unsolicited information from a broadcast device so as to not be disturbed. However, the person associated with 202 may see the broadcast device and a sign stating a discount is available, and provide input to their device to request any broadcast information on a one time exception basis. The messaging associated with an example mobile and broadcast device process will be described in more detail to follow associated with Figure 9.

As already mentioned above, in step 301 of Figure 3, each device performs a search function looking for identifiers sent from other devices utilizing a short range wireless capability. The following describes the process of devices detecting identifiers from other devices in more detail.

The identifiers themselves may be a hardware address such as the MAC address of the wireless device, or they may be another label such as the SSID for a IEEE802.11 device, or the device name for a Bluetooth device. Referring to Figure 4, in the case where a Bluetooth wireless personal area network device is utilized, a first device 401 transmits an inquiry (ID_Packet) message 404, and any proximal Bluetooth devices 402, 403 respond with messages identifying the MAC address, called BD_ADDR in IEEE802.15.1 of each device using a message referred to as an "Inquiry Response" FHS message 405 containing the BD_ADDR or Bluetooth device address of the detected device. In the Bluetooth standard all devices 402, 403 are required to respond in this manner assuming they are enabled to be discoverable. To enable this, an application on the mobile device ensures the Bluetooth device is set to discoverable mode. Device 1 (401) will attempt to locate Devices on different channels by scanning the channels and transmitting multiple Inquiry (ID_Packet) messages. Such an example is shown with inquiry exchange 406 and 407 to discover Device N (403).

In one embodiment the BD_ADDR or MAC address of the Bluetooth device can be used as the Identifier and no further Bluetooth interaction is required until the next scan process is performed.

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In another embodiment, the Bluetooth "Device Name" is used as the identifier. Figure 5 shows the process of a first device "Device 1" (501) determining another Bluetooth enabled device's (502) Bluetooth Device Name. Following the device discovery process completion from Figure 4, Device 1 501 sends a Page message 503 to another device (Device L 502). Message 504 is sent in response to create a temporary Asynchronous Connectionless Link (ACL) to be established between Device 1 501 and Device L 502, without an explicit connection request. Not having an explicit connection request indications the Entity associated with Device L would not have to provide explicit approval for a connection from their user input on the device, as would be the case if other services were requested from the device such as might be the case with a wireless headset or remotely connected GPS receiver to a phone. An ACL connection allows link management packets to be exchanged, and following interchanges of messages 505 and 506 to determine features of the devices, a temporary connection is established between the two devices. A name request message (507) is then sent by Device 1 to Device L, and Device L responds with at least one LMS_name_res message 508 containing the Bluetooth device name of Device L 502. If the name is longer than that allowed within the LMS_name_res message, additional messages follow to allow for the entire name to be delivered. Finally the connection is ended with message 509, LMP_detach.

The transmitted identifiers associated with any given device are only known to the central server and the device transmitting the identifiers. These identifiers may change from time to time, making a user's or a device's identity anonymous over time. The central server and any particular device must be coordinated such that the identifier and any device transmitting it, remains identifiable by the central server. This process is coordinated between the wireless device, and the central server utilizing the WWAN or cellular data link, carrying messaging between them and using an identifier manager 1303 to maintain a list of device identifiers 1302 in a central but secure location. This is shown in more detail in Figure 13.

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Referring to Figure 6, an example of using on IEEE802.11 link as the short range wireless capability is discussed. Generally, Wi-Fi devices operation in a so-called infrastructure mode which utilizes a BSS or basic service set. One component of a infrastructure network based wireless LAN is the use of a central access point or AP. In a mobile network the use of a central AP is not practical, as only the AP transmits an identifier, which does not meet the requirements of the preferred embodiment. The second topology for Wi-Fi networks is the so-called Ad-Hoc mode of operations, referred to as an independent basic service set or IBSS. In an IBSS all devices participating or advertising their interest in participating in an ad-hoc network transmit identifiers called beacons. These beacons contain the MAC address of the transmitting network adapter, the basic service set identifier (BSSID), and ad-hoc network name or service set identity (SSID). The BSSID in a typical ad-hoc network is generated by the first station to enter the BSSID and is locally administered, typically a randomly generated 48 bit number matching the format of a MAC address. In an ad-hoc network, each device 601, 602, 603 participating or desiring to participate transmits a beacon. There are several embodiments related using the IBSS beacons and the identifiers. First the identifier may be used as the MAC address of the station device or network adapter, and one or both the BSSID and the SSID may be used to indicate these particular beacons are associated with a service. In other embodiments, one or more of the BSSID and the SSID may be used as the identifier. In any of the embodiments for delivery of the identifier in an IBSS beacon, it is possible to coordinate the change of those identifiers with the server 100. As the MAC address is always broadcast in any operation of a Bluetooth or Wi-FI link, the use of a MAC address as an identifier provides for an additional level of security for the device 601, 602, 603, when identifier is changed from time to time as devices may be detected and identities tracked using a constant MAC address. In the preferred embodiment, where the MAC address is used for the identifier, all the devices participating would likely have the same network name and SSID to aid in the identification of the device as being enabled, although not necessarily required. Examples using an 802.11 network in ad-hoc mode transmitting beacons are showed as messages 604, 605, and 606.

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Chat Example between two mobile devices

Figure 7 shows an example of a message flow diagram for an embodiment where an individual is in a library for example, and a friend arrives. The individual is notified by their device receiving an identifier that their friend is present and they enter a chat session. Each person has a device (Figure 1, 106 and 108 respectively) that implements the preferred embodiments described above. The first individual associated with Device 1 (702) referred to as Entity 1 (EI1) performs a detection process as described in Figure 4, 5, and 6 previously (step 704) . The device identifier associated with Device 2 (703), DI2 is thereby detected. Device 1 (702) then transmits an inquiry message 705 using the WWAN (cellular data link such as GPRS, EDGE, 1xEV-DO, IS-2000, Wi-Max, LTE, or the like) to the server 701 inquiring if information related to the account and entity associated with DI2 is relevant, and available to the entity EI1 associated with Device 1 (702). The server 701 retrieves the account information related to EI1 and determines that EI2 is listed in a friends list in the account associated with EI1 and that EI1 should be notified when EI2 is detected. Next the server retrieves the account information associated with EI2 and determines that EI1 is on a list of entities which are allowed to be notified of EI2 being present and personal information such a the name of the individual, their phone number and the like. The server having determined that EI1 wants to be notified and is allowed to be notified responds in Step 706 to Device 1 (702) with a message indicating the DI2 is relevant to EI1 and including information such as Entity Identifier EI2 and associated details. A user application on Device 1 (702) notifies the user that the entity associated with Device 2 is in proximity in step 707. The user of Device 1 provides input to the device directing it to request a chat session with the entity associated with Device 2 (703), and a message 708 is sent the server 701 commanding "send 'Hello' to EI2". The server acknowledges reception of the message with a "ACK" message 709, in return. Next server 701 sends "Request Chat: 'Hello' from EI1" to Device 2 703. The user of Device 2 accepts the chat and returns a message "I'm by the front door" with message 711, sending it to the server to be relayed to device 1 (702).

E-commerce between two mobile devices

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Figures 8A and 8B show a message flow diagram for an embodiment where two individuals are performing a financial transaction on the street (for example, a customer and a street vendor). Each has a device (Figure 1, 106 and 108 respectively) enabled with the preferred embodiments described above. In this example, an individual's device would see a vendor and the vendor's device (enabled with the current invention) would notify them that the vendor was also enabled with a device supporting the identifier search and other protocols described above, as well as being capable of electronic payments. These steps are performed in the following way. In step 804 the customer's device 802 (Device 1) performs an identifier search process as previously described, and detects a device identifier 2 (DI2) sent from Device 2 (803) belonging to the merchant. Device 1 will send a message to the server 801 (also represented by 100 in Figure 1) using the WWAN (cellular data link such as GPRS, EDGE, 1xEV-DO, IS-2000, Wi-Max, LTE, or the like) 104 requesting information related to DI2 and its relevance to the entity related to device 1 802. The server 801 then determines the relevance of DI2 based on the account properties stored in the account associated with the consumer Device 1. In this case, the account settings only allow messages from or notifications of entities on a friends list stored in the account record (represented in Figure 10) associated with the consumer. Server 801 responds to device 802 with "no" indicating that DI2 is not relevant to the Consumer.

The customer, having an account enabled with electronic payments, and wanting an item the vendor has, would press a button or make other input to his phone (or other device) which would indicate they would like to make a purchase and pay using their device (808). In this case the input selection would be "search for merchants." The customer's device would then send a message (809) to the central server directing the server to perform a one time search for merchants, despite the current account settings. In one embodiment, the server would then direct the consumer's device 802 to initiate another search (809). Other embodiments may not include the server commanding Device 1 (802) to perform the search, but rather the search may be performed automatically, or use results from a recent search. In Step 811, Device 1 (802) performs another search and detects the identifier from Device 2 (803), DI2. Device 1 then sends a message 812 to the server again requesting information for

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all relevant devices detected, which will include at least DI2. In Step 813 the server, having received the request and list including DI2, looks up account information associated with DI2 and determines that the associated entity is a merchant. As the settings of the account associated Device 1 now allow for the notification of the user when a merchant is detected in proximity, DI2 is determined to be relevant to Device 1 and the Entity 1 (EI1) should be notified. The server then sends a message 814 to Device 1 (802) stating merchant services are available in proximity with a list of available merchant's information including information related to the entity (EI2). The user of device 1, Entity 1 (EI1) then provides input in step 815, (pressing a soft key on a touch screen for instance), selecting the specific merchant EI2 to engage with in a transaction. Device 1 (802) will then send a message (816) to the server requesting a transaction with EI2 associated with Device 2 (803). The server (801) will then respond in this embodiment with a message 817 to Device 1 confirming receipt of the requested transaction and providing information to allow the EI1 associated with Device 1 to independently confirm the identity of EI2 associated with Device 2 (803). In this embodiment the identifying information can include the name of the merchant, the merchant's logo, a picture of the vendor, or their mobile shopping cart. In other embodiments, the picture may be of a specific unattended vending machine in the location it is currently operating. It may also include other information such as the address of the merchant in cases where a fixed store location is provided. As this particular merchant in this example is a street vendor, an address may not be used. GPS information stored in the account associated with Device 2 may be used as further confirmation in some instances. However, in this example, GPS coordinates are not be available on Device 2 due to lack of capability, or Device 2 being indoors and without sufficient signal to determine a location. Further GPS information from Device 1 (802) may be used to provide further confirmation information. In this embodiment the photograph sent in message 817 shows a picture of the particular merchant and also his city issued business license in text and as a picture of where it is displayed on the cart. The consumer entity EI1 provides input to Device 1 in step 818 confirming the identity of EI2, the merchant entity associated with Device 2 (803). Device 1 then sends a message 819 to the server 801 confirming the identity of the merchant.

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Server 801 then sends a message 820 to the merchant's device 803 notifying them of the request for a transaction with EI1. Device 2 (803) then indicates to the merchant that a customer with the capability and desire to pay electronically is in proximity. In step 821 the customer associated with Device 1 (802) places an order with the merchant associated with Device 2 (803) and a list of products to be purchased is generated and the merchant provides input to Device 2 (803) to proceed with a electronic transaction. In step 822 Device 2 performs a scan of identifiers and DI1 associated with device 1 (802) and the Consumer is detected. A request is sent to the server 801 with a list of identifiers which were detected to determine if any of them are relevant to the merchant. Note that while the merchant device 803, (and the merchant) have now been notified of the desire for EI1 to enter a transaction, they do not necessarily know the identifier for EI1 yet. In other embodiments, the identifier associated with EI1 and Device 1 (802) may be sent in message 819, and a confirmation that this identifier is detected during the scan process 821 may be performed at the device. In the preferred embodiment, further security may be provided by the having the server perform this function independently. The server performs this confirmation in step 824 may matching the device 1 identifier DI1 with the information stored in the account associated with Entity 1 (EI1) also referred to as the Consumer.

The server than generates a message 825 to Device 2 (803) indicating that EI1 is relevant, and the transaction participant is present. The message in the preferred embodiment can also include a picture of the Consumer. Additionally, the message could also include other pictures of other individuals allowed to use this device for purchases. If more than one identifier was detected in step 822 and matched in step 824 to entities having requested transactions previously which are pending for that merchant, a list of information for each entity involved with a pending transaction request can be provided in message 825. The merchant then selects the correct consumer using the picture of that consumer, confirming the identity of the part to the transaction in step 826. The consumer information provided in message 825 in another embodiment may simply be the name of the customer and the merchant may either ask their name, or request identification such as a driver's license. In the preferred embodiment, where a picture is passed in message 825, it is not necessary that

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the individual's name be passed to the merchant for the merchant to be able to provide confirmation of the identity of the Consumer thus providing a level of anonymity to the transaction such as may be present when cash is used.

Following the confirmation by the merchant of the identity of the Consumer participating in the current transaction in step 826, Device 2 sends a message 827 to the server confirming the identity of the Consumer as Entity 1 (E1), and with information required for the transaction including the list of products to be purchased, their prices, the total price, and a request to charge E1 this total amount. Server 801 then confirms receipt of this message in step 828. The server then sends a message 829 to Device 1 requesting the Consumer to confirm the list of goods to be purchased and the total price to be paid. In step 830, the Consumer (Entity 1) reviews the list and amount to be paid and provides input to device 1 confirming the accuracy of the information and they the authorizing the server to pay. In step 832 the server charges E1 utilizing stored preferred charge card information, stored credit, or other payment methiod such as a PalPal™ user name (PayPal is a trademark of Ebay, Inc.) and password stored in the account associated with E1, and charges the consumer. In the case where a stored credit is used, the Consumer's account can be debited, and the credits not applied to the merchants account until a later step. In the case of a credit card, or PalPal™ transaction, the server provides payment to E2 (the merchant) utilizing information stored in the account associated with Device 2. The server then indicates payment is made to the merchant, and instructing the merchant to deliver the goods with message 833. E2 (the Merchant) then provides the goods and provides input to Device 2 that the goods have been delivered in step 834. Message 835 is generated by Device 2 (803) to the server confirming product delivery, and acknowledging the receipt of the payment confirmation message 833. The server can then send message 836 requesting the Consumer to confirm they received the goods. If a confirmation is not received in response to this request, this information may later be used to settle any dispute that might arise. In step 837 the consumer confirms receipt of the products, and message 838 is generated to the server confirming the receipt of goods by the consumer. In Step 839 the server concludes the transaction by completing any steps required to credit the Merchant with the payment amount

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from the Consumer, if required. The server then sends a message 840 to the Merchant indication the transaction is complete, which is acknowledges in message 841. The Consumer is notified of the completed transaction with message 842, which is acknowledged with message 843.

Finally, the transaction details may be stored by the server, or sent to a thirdly party server for tracking spending habits of that account holder, or customers of that merchant allowing the merchant to track that specific customer's behavior and cater to them in the future with various specials delivered via email, or during their next visit via their device in the form of an electronic coupon. This process can be performed with a goal to help the merchant expose the customer to other products or services the merchant believes the customer might find desirable.

The present invention can be extended to facilitate other types of transactions as well. In one specific application, consider use of the invention to facilitate a transaction such as the rental of an automobile. A well known business called ZipCar ™, presently operating in several major urban areas in the United States, makes available a fleet of vehicles for shared use by their club members who pay a monthly fee plus a per use charge. Using the present invention, the club member would have a wireless device that serves as the "Consumer device" (Device 1) and the ZipCar vehicle would be equipped with a wireless device serving as the "Merchant" device (Device 2). The consumer would walk up to an available ZipCar vehicle and, using their wireless device, start an initial exchange of identifiers with the desired Merchant device, for example, using the short range local wireless network. The Consumer device and/or Merchant device would send a message to an application running on the Server requesting that a person associated with an account for the Consumer be granted access to a specific vehicle (e.g., an "object") that is in the vicinity of and associated with the Merchant device. A set of confirmatory messages (such as to exchange access codes, to confirm the location of the vehicle, the per-use fee due, and payment for the same, etc.), are then typically also exchanged between the Consumer and the Merchant device with the assistance of the Server and the long range wireless network. Upon confirmation of the

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necessary transaction information, the Server sends a message to the Merchant device to unlock the vehicle requested (which may be sent over the second long range wireless network or a yet another network, such as a satellite network).

Example of a Mobile Device and a Broadcast Device.

Figure 9 shows a message flow diagram for an embodiment where an individual is in the presence of a broadcast device, such as for the museum example of Figure 2. As with Figure 2, the individual device 202 and the broadcast device 204 are present and enabled. In this example, an individual 902 is in a grocery store and their device 902 (Device 1) performs a scan for identifiers in step 904, as described previously. DI2 is detected having been transmitted from device 2 (903). Device 1 (902) sends a message to server 901 inquiring if DI2 is relevant to the entity associated with Device 1 and if the information associated with that device identifier (DI2) is available to be returned. In step 906, the server retrieves the accounts associated with both DI2 and Device 1 (EI1). The server detects that the entity associated with DI2 is an advertisement company, and that this device is a broadcast device only, and that there is an electronic coupon available for download to Device 1, and multimedia content available to be played if desired. Additionally, the account settings associated with EI1 allow for the notification of broadcast devices in proximity.

Server 901 then transmits a Response message 907 indicated the presence of the detected device and the content available. The device 902 requests input from the entity associated with the device 901 for permission to download the coupon, and the availability to play content such as video about how to prepare a recipe using the vendors product. In this case the individual associated with Device 1 accepts the content, and a message 909 is sent to the server accepting the content. Response message 910 begins the delivery of the content.

As previously mentioned, several key distinctions of this embodiment include that the user of device 902 may walk away out of range form the broadcast device 903 and continue to receive the content using their cellular link, or may choose to play the content at a later

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time having stored the detected like in a favorites list. Additionally, the content stored in the account associated with the broadcast device 2 (903) is relevant to the placement of the device and the products near it. Further, as the content is stored in the server 901 rather than in the broadcast device 903, the content may be updated, modified, or deleted at anytime. For example the server 901 knowing that the consumer has never been detected previously, may customize the electronic coupon to provide a deeper discount than a regularly detected consumer. In the case where the devices are used for electronic commerce as in Figure 8, knowledge of the user's past purchases may be used to induce the consumer to try a new product. Alternatively if the consumer is a regular purchaser a loyalty program may provide a coupon upon a particular number of repeated purchases.

Figure 10 is a processing flow chart performed by the server receiving a request from a device inquiring about the relevant and availability of information associated with detected device identifiers. In step 1001 the server is waiting for a request from a device. When a request is received in decision 1002, step 1003 is performed. In this step the account information associated with the requesting device is retrieved. In step 1004 the information associated with the accounts for each of the detected device identifiers is retrieved. In step 1005 the server performs a matching process between the policies of the requesting account and each of the policies for each account associated with each detected device identifier. In step 1006 the information related to the matched policies for the associated entities will be sent to the requesting mobile device.

Just as in the previous example of an identifier being deemed relevant to a user based on a friends list, permission for disclosing a device's presence may require being on a friends list as well. For example, when a server receives an inquiry from a device with a list of identifiers, it may only respond with information for users associated with the identifiers that are on that device's friends list, and on each of the individual's friend lists as well. These friends' lists and policies can be stored within a user account which allows for disclosure of a user's presence only to individuals on this list, such as described in Figure 11 (to be described below.)

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It is contemplated that the permissions not be an "all or nothing" decision, but that different classes of information may be assigned different permissions and mechanisms. An example of this might be a user's presence, identity, and cart services being made available to only one set of other accounts (or users), while the presence of an anonymous individual being made available to anyone, but with other classes services available such as multi-player games being treated differently. Additionally multiple contacts may be included in the account, each given customized permissions. An example can be that any user may be notified of an anonymous user or other information based on additional policies.

As only the server contains personal information, and performs the association of an account with a particular identifier, it can inherently enforce the security of the policies as a distinct advantage relative to true peer to peer services. In this way, the central server controls the process of passing information related to an account to a particular requesting device.

Figure 11 shows an example account record to be associated with an entity and at least one device. The columns of the account record can consist of a Record Index which will be used to described the account, a Field which is a descriptive name for the contents stored in the record, and a Field Information Group Disclosure Policy Assignment List (PAL). The PAL provides rules for the disclosure of the information in the associated row in the Field column. The following list are possible PAL entries:

ALL:	may be disclosed to any requesting entity
EXPLICIT APPROVAL:	the Entity associated with the account must provide input approving the disclosure of the information
NONE:	Do not disclose this information to any other entity

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M:	where M is a integer from 1 to N indicating a Information Group Disclosure Policy which may consist of a list of contacts, friends, groups, characteristics, and the like.

Most of the fields in Figure 11 are self explanatory and typical in the industry such as the account number, however a few fields are worth a clarifying discussion. The Device identifier is in record index 2, with a Identifier type in record 4. The identifier type can define what type of identifier the device associated with this account would use. Record index 10 is the Entity Type Field. This describes is the entity is a Merchant, Individual, or if the device associated with this account is a broadcast only device.

Referring now to Figure 12 a timing map reference for scanning times and dormant times for devices is shown. In one embodiment, it is desired that the power consumption and scan timing for the devices in a cellular network be reduced. Since the server and the WWAN is involved with all mobile devices, coordination of the broadcasting periods and the searching periods for the short range radios is possible. This can be based on a common reference time such as that provided by most cellular systems, any the time of day clocks inherently within mobile devices. This allows for reduced power consumption and other resource consumption in the devices. If no coordination is achieved, then the short range receivers in each device must be scanning for transmitted identifiers much more often and for longer durations. Utilizing a common timing base, and the central server to notify the devices of a coordination approach for "active times" and "non-active times" and will allow for the devices to minimize the power consumption in the transmission of and scanning for identifiers. This approach also allows for synchronizing the update of each device's identifier (as described previously) to enhance anonymity and security, coordinated with the central server. The "non-active times" may be used as "boundaries" over which the changing identifiers may be updated. This update may be based on either direct communication with the server, or rule and algorithm based updates previously coordinated with the central server so as to minimize server messaging, but allowing the updates to remain synchronized to the

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server such that the device and the server are always associating the same identifier between them.

As will be recognized by an individual skilled in the area of information technology, the concept of a central server may well be implemented as a collection of servers to allow for load balancing, redundancy, and the like in a manor common to the information technology industry.

Figure 13 shows a diagram of functional blocks associated with the management of dynamically assigned device identifiers. The Server 1301 has an application agent called an Identifier Manager (1303) which has access to a pool of device identifiers (1302). The Identifier Manager monitors timing information and determines when it is time to update a particular device's identifier. This time may be a regular interval, or a random generated time period by an algorithm such as a pseudo-random sequence generator, or a combination of both. When it is time to update a device identifier, Manager 1303 retrieves a new identifier form the pool 1302. The pool of identifiers may be a list or range of identifiers, or generated algorithmically. The new identifier is stored in the account associated with the entity determined to require updating and a message sent to the device 1305 associated with that account commanding it to update its device identifier with the new one. This messge is sent over the WWAN Data network 1304 such as IS-2000, HSPA, GPRS, IS-95, Edge, Wi-Max, and the like. All devices 1305 to 1307 will eventually all be updated in a similar manner. This update process does not disrupt ongoing communication and interaction between devices despite the update as the communications are preformed based on the identity of the entities following the detection of the device identifiers which are no longer utilized. This unique capability allows for the updating process to be implemented and not impact the applications being utilized concurrently.

Other example applications utilizing still other embodiments follow below.

Requiring the brokering of the communication via a central server can also allow a mobile device to receive information associated with a "broadcast only" device, such as in

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the museum example discussed previously. This is important, as such broadcast devices can enable a vast set of new applications built upon the infrastructure developed in this application, beyond the museum application. Some of these applications may involve an electronic commerce aspect, for example.

Electronic Commerce Applications

Ecommerce between a fixed broadcast device and a mobile device

Football stadium example

An embodiment of a transaction model, enabled by the infrastructure described above can be an event such as a concert, or sporting event (particularly when it is an indoor venue where no GPS is available). A number of the broadcast only devices are placed through out the seating areas. The devices are very short range, and only transmit intermittently and as a result may be battery powered and to remain active over a very long time period. Each device can be placed in a known location, in a predicable manner.

An attendee at the event has his or her device enabled with the identifier protocol and other embodiments described above. The device detects a broadcast device, and interacts over the internet with the server via the WWAN connection (as already described above). The server receives an indication of the broadcast device's identifier and the identifier of the account associated with the device which detected the broadcast device. The server retrieves content associated with the service provider's account and provide that content to the application on the requesting mobile device. The content may indicate that the venue has a product delivery service. The user may then press an indication on their device that they would like to see a menu or list of items for sale from the merchant(s) in the venue. The application on the user's device would then allow them to see a menu, for instance, and select items to purchase. The user then would be asked to confirm the purchase. The server would then indicate to the merchant that a user located near a specific broadcast device has ordered something. In this case, it is expected that a delivery fee could also be charged for the

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enhanced service. The server would facilitate the purchasing of the goods or services from the merchant and payment from customer's account, and provide confirmation to each. Such confirmation can include an electronic receipt provided to the customer, for user upon arrival of the delivery person of the good or service. The customer can then select an indication on their device confirming receipt of the good or service via the mobile device, thereby completing the transfer of funds and the transition. Optionally, the delivery person of the good or service may have an enabled mobile device as well. In this case the identifiers may be detected by the customer's device and reported to the server to confirm that the provider's delivery person was present. Further, the delivery person's device can be able to detect the broadcast device's identifier and reported to the server confirming the delivery person was in the correct area independently. Even further proximity confirmation may be achieved by the customer's device's transmitted identifier being detected by the delivery person's device and reported to the central server further confirming the physical proximity of the parties involved in the transaction. Upon arrival of the delivery person, the customer may be notified that the delivery person is looking for them, and has arrived. These cross confirmations can allow for the central server evidence to justify payments both in completed transactions and in disputed or failed transactions. Further, the delivery person may receive a picture of the requesting customer assisting to identify the customer to whom the food is to be delivered. Once the customer is found, the delivery person can confirm the delivery of the good or service to the customer via the user input on their mobile device, and that confirmation being reported to the central server. The customer can have the option to report confirmation or denial of the reception of the product or service as well, as in the last example.

In another embodiment, the merchant device may be fixed, but have an internet connection (wireless or otherwise). Further, in some embodiments, the merchant may be an automated device such as a vending machine. In such a model, a customer may use their enabled cell phone to purchase an item such as a beverage from the machine without the need to insert currency into the machine. This can be accomplished by the customer's cell phone detecting the vending machine transmission of the identifier or visa-versa. Following the

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detection of either the customer's identifier by the vending machine, or the customer detecting the vending machine identifier, the respective device notifies the server, which in turn provides notification (assuming the account settings allow for notification) to the potential customer via their device. Assuming the customer selects to purchase an item from the vending machine using their account associated with their device, the customer may be presented a menu as in the example above. The customer may further be presented information to ensure the identity of the vending machine, such as a description of the machine, a machine identification number, or a (most likely) a picture of the machine where it is located. The customer can then confirm this is the machine they are interfacing with, and select to pay via their account. The customer may in one model select the item to dispense by input to their phone, or they may simply select to provide payment to the machine allowing them to make the selection manually as is the typical mode of operation today. The vending machine can then interact with the server via its own internet connection, and participate in the transaction in a manner similar to the mode described above allowing for step by step confirmation as previously described.

Electronic opinion polling, tied to a known location.

In a much simpler example, such a capability might be used to tie a survey to a known location in such a way as to provide an e-coupon to the survey taker on their device in return for completion of the survey. Alternatively, this type of interaction can enable a very large crowd to interact with a Jumbo-Tron like display to provide input to polls or to participate in group activities. Users at different locations in a audience may form teams and interact with other teams for group activities.

Feature Summary of Preferred Embodiments

1. In a first embodiment:

One device is transmitting a wireless identifier using a wireless protocol capable of peer to peer communication;

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The wireless identifier being associated with a specific account on a server connected to the internet;

A second device receiving the wireless identifier

The second device capable of communicating with the server over an internet connection;

The second device requesting information from the service associated with the first identifier

- The second device having a second identifier associated with a second account on the server; and/or
- The server providing different amounts of information related to the first account based on the parameters associated with one or both of the first and second accounts

The identifiers associated with the accounts being updated such that the identifiers would no longer be recognized as being associated with specific accounts without past or current interaction with the server;

Using one or more of Cellular network timing information, and information form the central server to coordinate the broadcast and search times amongst the devices. (to reduce power and resource consumption); and/or

Data necessary to engage in an E-commerce transaction may be exchanged as well such as the identity verification such as via a picture and/or mutual identifier detection.

2. In a second embodiment,

A device is capable of operating two wireless protocols simultaneously, utilizing a first wireless protocol in the device to detect the proximity of another wireless device and using the second wireless protocol to communicate with a remote server, where:

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a. One or more of the devices are mobile devices;
b. Where the first wireless protocol is a local, or personal area network wireless protocol such as 802.11, Bluetooth, UWB or other local connectivity protocol;
c. Where the first wireless capability used for detecting the presence of another device, or advertising the presence or a device;
d. Utilizing a wireless wide area data link from one or more of the wireless devices to, optionally:
    i. Connect to a central server;
    ii. Perform user authorization functions;
    iii. Perform download of information associated with account identifiers utilizing the short range wireless capability;
    iv. Request forwarding of messages / packets to the other active account;
e. Utilizing the messaging with a mobile proximity based social networking capability; and optionally,
    i. The messaging being performed via the WWAN; and/or
f. The server providing a centrally assigned user identity, with relationship brokering or identification capability.

3. In another embodiment,

A central serving capability is provided to mobile devices utilizing a wireless WAN connection to provide and exchange information between one or more application on one or more wireless devices and the central server where

- the information passed to the central server is collected by one wireless device from another wireless device via a separate local wireless reception from the other wireless device;

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- the separate local wireless reception from the second wireless device contains information directly assigned by, derived from, or known to the central server associated with the identity of the second wireless device;
- this identity is related to certain information and preferences of an account holder associated with an application operating on the second wireless device;
- the application is operating on both wireless devices;
- the application operating on the first device also provides its own identifying information to the central server as well as detected identifiers from devices with applications on them;
- The central server contains account information registered to the applications running on each wireless device;
- The preferences associated with the account information also contain policies related to the disclosure of one account's stored information to other accounts and hence to their application on their devices;
- These policies including a classification of other accounts each classification having different policies some of these policies being one of:
    - no not allow notification of my presence
    - allow notification of my presence
    - disclose my name/ do not disclose my name
    - disclose age / do not disclose age
    - disclose personal details;
- Where an application running on each device can optionally perform point of sale transitions coordinated via the central server, over the WWAN, utilizing user input on each device as confirmation of successive steps in the transition;
- Further, where at least one of the confirmation steps additionally involves displaying an identifying picture related to one of the devices, on the other device;
- Additionally the server performing an authorization for the transition to a third party;

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- Or, optionally, a device is interacting with a point of sale device to associate an itemized list of items with a detected second device;
- The service performing a confirmation with the application on the second device requiring user input that the bill of goods list is correct; and/or
- The server storing the information related to the second devices detected account identity and inventory in a database for later use

4. In still other embodiments, a device in the present invention has a wireless capability with no WWAN capability, but only with the ability to broadcast a unique identifier, and

- A central server stores having the broadcast device's details;
- And when the first device provides these detail to the server, authorized and current information about the broadcast device are provided to the first wireless device;
- Where this information optionally includes advertising information or information related to "e-coupons" for special offers for products or services; and/or
    - Where the content of the e-coupons might be customized based on the identity of the requesting device or account holder;
        - Where the content is further customized based on other information known by the server related to the user's account ; or
        - Where the other information is related to the user's past purchasing practices or previous requests; and/or
- A mobile device, upon detecting a broadcast device and if enabled to do so, will report that broadcast Id to the server over a WWAN, and retrieve the current content from the server associated with that device and:
    - Display it to the user on their device; or

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- Execute instructions associated with the information retrieved from the server.

5. In still further embodiments, a good or service delivery model utilizing the above described broadcast device, is placed in a known location, and further

a. A mobile device is for detecting the fixed device's identifier via the WPAM/WLAN;
b. The mobile device reporting this identifier and passing an identifier associated with itself, or the account associated with the user utilizing the device;
c. The server determining that the detected broadcast device is associated with the broadcast device with a known location;
d. The server further determining that the identifier is associated with a service, and further associated with an account or that service;
e. The server retrieving content associated with the service provider's account and providing that content to the application on the requesting mobile device;
f. Where that content may be a list of items for sale, services for sale, a opinion pole, food menu, or other menu style content which allows for user selection of items, which can be implemented in java code, xml, simple text, or other for example optionally including active code elements;
g. The application on the mobile device displaying the content to the user display with the itemized list of goods, services, or other selection items;
h. A user providing selection of one or more of the items, and confirming they wish to purchase said items, and take delivery at or near the location of the fixed broadcast device;
i. The server facilitating the purchasing of the goods or services from the merchant's account and the customer's account, and providing confirmation to each. Such confirmation including an electronic receipt provided to the customer, for user upon arrival of the deliverer of the good to or service;

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j. The customer confirming receipt of the good or service via the mobile device, thereby completing the transfer of funds and the transition; and/or

k. The deliverer of the good or service optionally having a mobile device and optionally:

   i. such that identifiers from that device may be detected by the customers device and reported to the server to confirm that the provider's delivery person was present;

   ii. such that the broadcast devices identifier is detected by the delivery person's mobile device and reported to the server confirming the deliver person was in the correct area

   iii. such that the customer's device's transmitted identifier is detected by the delivery persons device and reported to the central server further confirming the physical proximity of the parties involved in the transaction; and/or

   iv. The delivery person confirming the delivery of the good or service to the customer via the user input on their mobile device, and that confirmation being reported to the central server.

6. In another embodiment, a software program is arranged to operate at the application layer on a mobile device, which interfaces to a device driver interface:

- Using wi-fi 802.11 to perform a WLAN local connection protocol; or
- Using Bluetooth to perform the WLAN local connection;
- Where the device driver interface is an NDIS driver or the like;
- Using 1xEVDO, HSDPA, GPRS, EDGE or the like for a wide area WWAN interface;
- The application then providing the reported identifiers to a server, which will make decisions regarding a users interest in these detected identifiers, and policy regard privacy other identifiers;

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- The decision process optionally based on priority of the identifier, the class an identifier belongs to, a list the identifier is, or is not included on;

- Based on the result of the action function,
- Sending at least one detected identifier to the network, potentially with additional information from the action function, and retrieving information back from the server related to that identifiers' account information stored on that server;
- The server then receiving a request from a device's application, with a detected identifier
    - The server examining both the requesting and the requested identifier's identity and making a policy decision regarding the release of the requested identifiers information related to their account;
    - The server in some cases providing a continuously or periodically changing account or device identifier to a specific application on a device to enhance the privacy of the identity of that device;
        - The changing of the identifier may be effected by a rule based generation local to the application, or may be downloaded from the server directly; and/or
        - The update of the identifier being synchronized to such that it is coordinated with predetermined scanning and broadcasting periods allowing for a known update boundary;

7. In still another embodiment, a method uses the mobile device's time of day derived from the network or other reference for

synchronizing a PAN/WLAN discovery and advertisement times to save battery life; doing the same in a synchronized way among multiple devices;

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while coordinating the timing information utilizing the WWAN and a central server available commonly to the devices, such as by

- Synchronizing identifier transmission timing to save power from WWAN network parameters obtained for the server;
- Coordinating any identifier updates to this same timing source; and/or
- Using a pool of identifiers available to the central server to assign identifiers to devices changing the identifiers at some time interval derived for the common time reference

8. In another embodiment,

A central server uses an identity manager to assign identifiers to devices using a WWAN cellular data link, and wherein

identifiers are occasionally changed

identifiers are assigned from a pool of identifiers available to the servers;

identifiers are used as 48 bit media access control (MAC) addresses of the short range wireless network adapter

identifiers are optionally used as

an SSID in a IBSS in IEEE-802.11 network beacons

a BSSID of the IEEE802.11 network adapter;

in a IEEE802.15.1 Inquiry Response Message as the BD_ADDR

a device name in a Bluetooth name response packet ; or

listed in a services list as provided in a LMP_features_req message or LMP_features_req_ext message for a Bluetooth device

While this invention has been particularly shown and described with references to example embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the scope of the invention encompassed by the appended claims.

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ABSTRACT OF THE DISCLOSURE

A server exchanges information between one or more wireless devices to complete a transaction. The server receives second device identifier information from a first wireless device using a wide area network. The second device identifier information was previously provided to the first wireless device using short range wireless communication. The server then uses the second device identifier information to determine additional information concerning an entity or object located in proximity to the second device, and then the server delivers information to the first wireless device based at least in part upon both (a) the second device identifier and (b) a current step in a multiple step process for an ongoing electronic commerce transaction.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111054-0001U4C7
	Application Number	
Title of Invention	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

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Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

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Attorney Docket Number	111054-0001U4C7	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	14	**Suggested Figure for Publication (if any)**	

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
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Title of Invention	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	14861563	2015-09-22
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
14861563	Continuation of	14472477	2014-08-29
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14472477	Continuation of	13775435	2013-02-25	8849698	2014-09-30

Prior Application Status	Patented	Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13775435	Continuation of	13212723	2011-08-18	8374592	2013-02-12

Prior Application Status	Patented	Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13212723	Continuation of	12364828	2009-02-03	8090359	2012-01-03

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12364828	Claims benefit of provisional	61095001	2008-09-08
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12364828	Claims benefit of provisional	61095359	2008-09-09

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	Application Number	
Title of Invention	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED	

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Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111054-0001U4C7
	Application Number	
Title of Invention	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED	

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	Proxicom Wireless, LLC		
Mailing Address Information For Applicant:			
Address 1	1680 N. Riverside Dr.		
Address 2			
City	Indialantic	**State/Province**	FA
Country	US	Postal Code	32903
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

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Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

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Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/David J Thibodeau Jr Reg No 31671/			Date (YYYY-MM-DD)	2016-09-21
First Name	David J.	Last Name	Thibodeau, Jr.	Registration Number	31671

Additional Signature may be generated within this form by selecting the Add button. Add

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent C o o p eration Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner Samsung Ex-1004, 0058

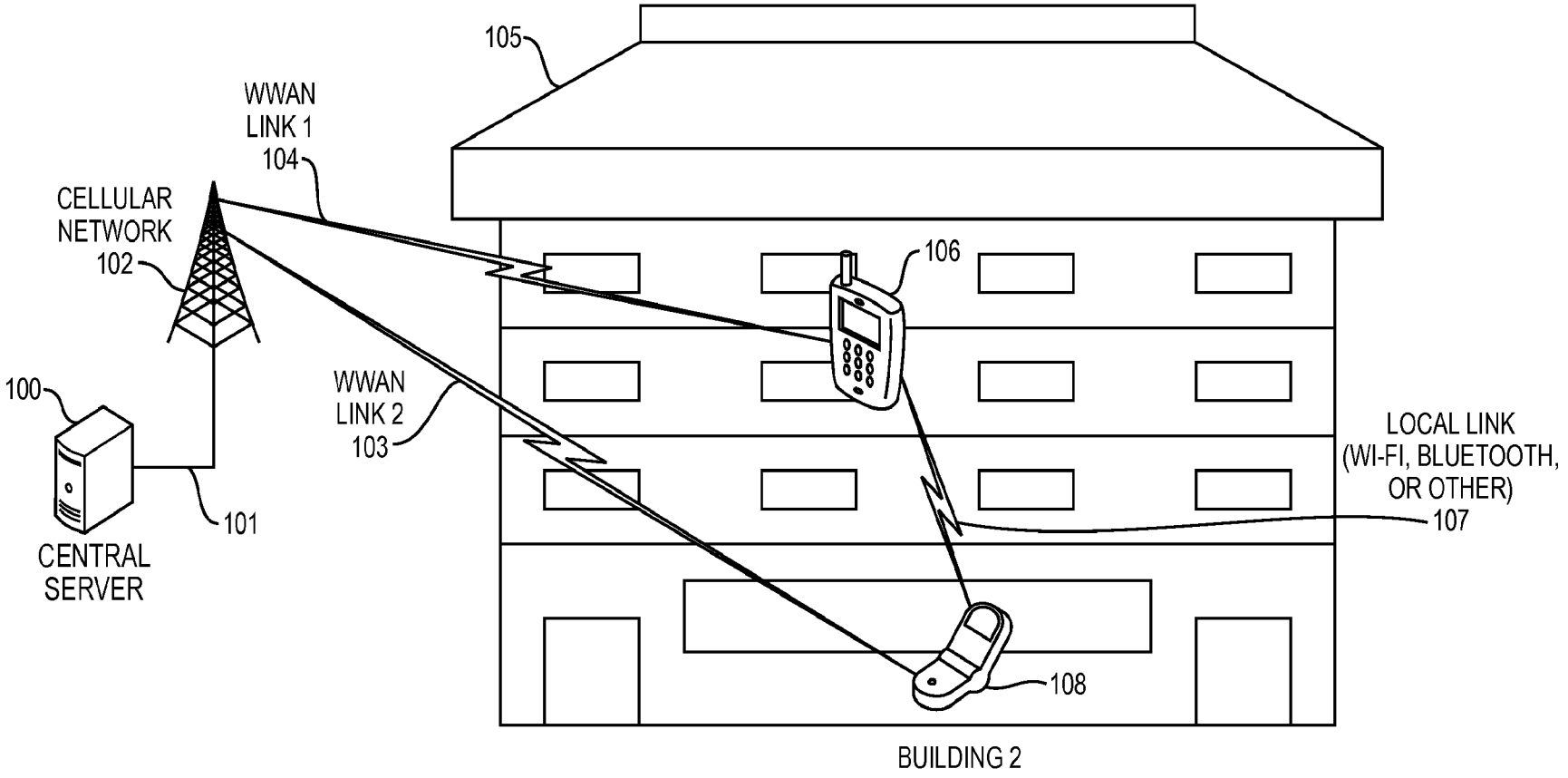


Figure 1

Petitioner Samsung Ex-1004, 0059

Figure 2

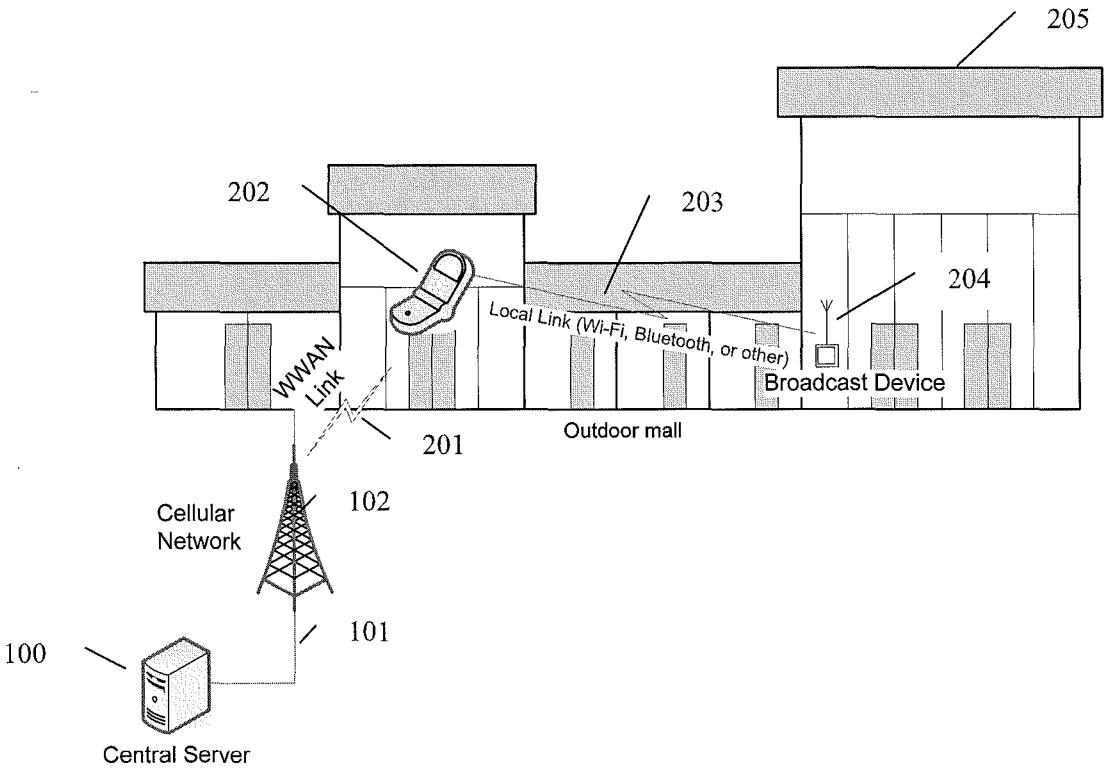
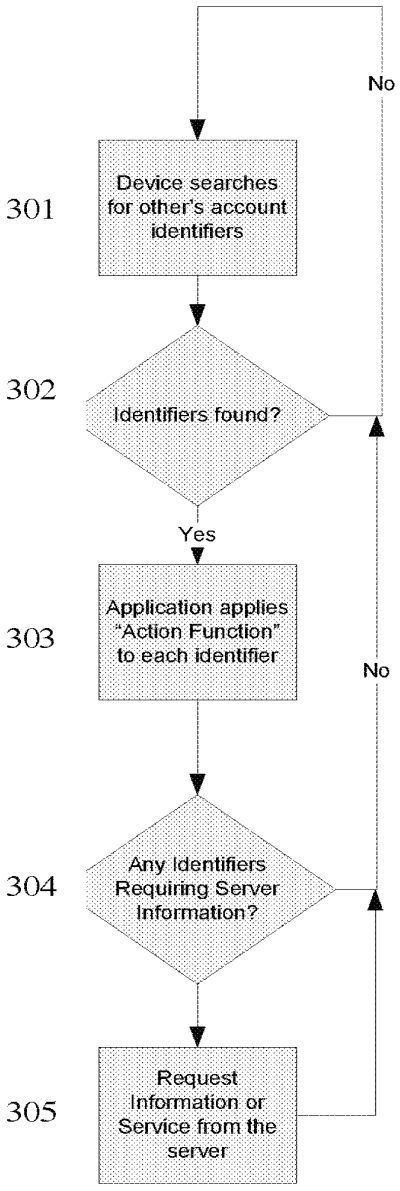

205
202
203
204
Local Link (Wi-Fi, Bluetooth, or other)
WWAN Link
Broadcast Device
201
Outdoor mall
Cellular Network
102
101
100
Central Server

Figure 3


No
301
Device searches for other's account identifiers
302
Identifiers found?
Yes
303
Application applies "Action Function" to each identifier
No
304
Any Identifiers Requiring Server Information?
305
Request Information or Service from the server

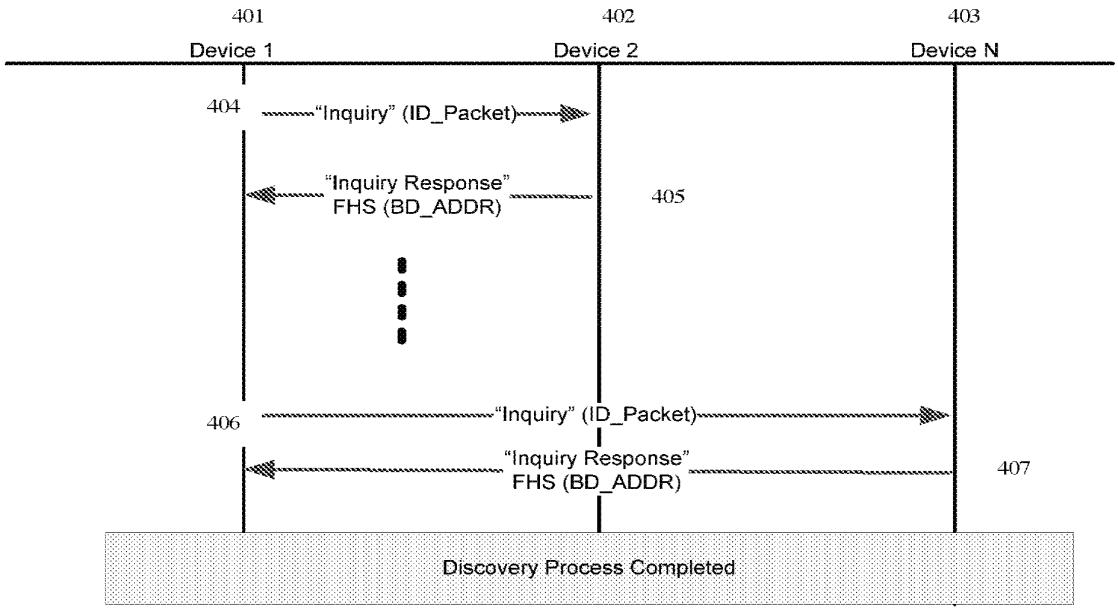


Figure 4 – 802.15.1-2002 (Bluetooth V1.2) Device Discovery

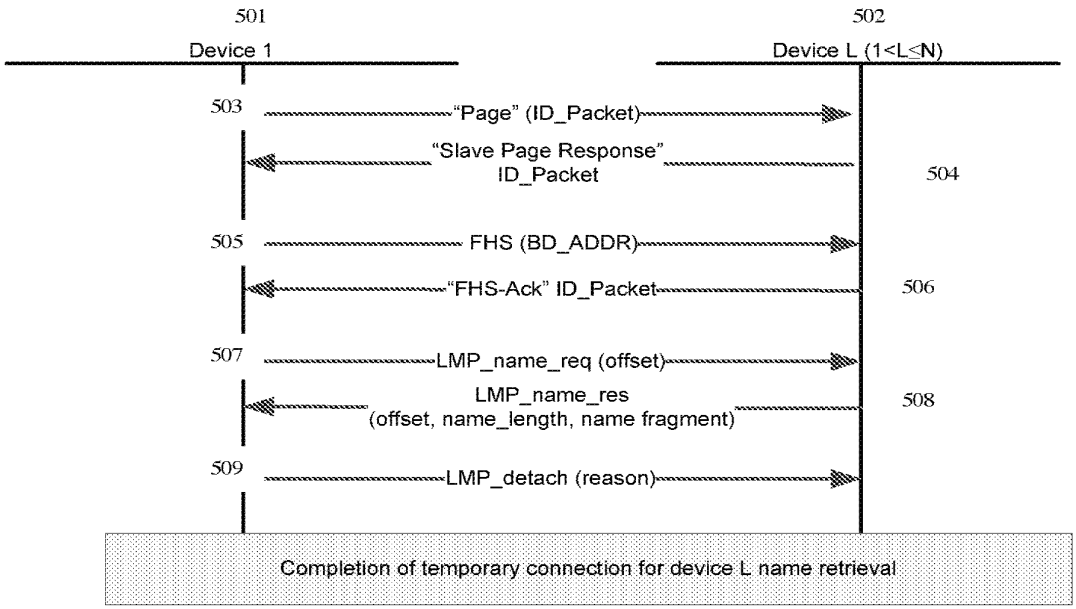


Figure 5 – 802.15.1-2002 (Bluetooth V1.2) Remote Name Request

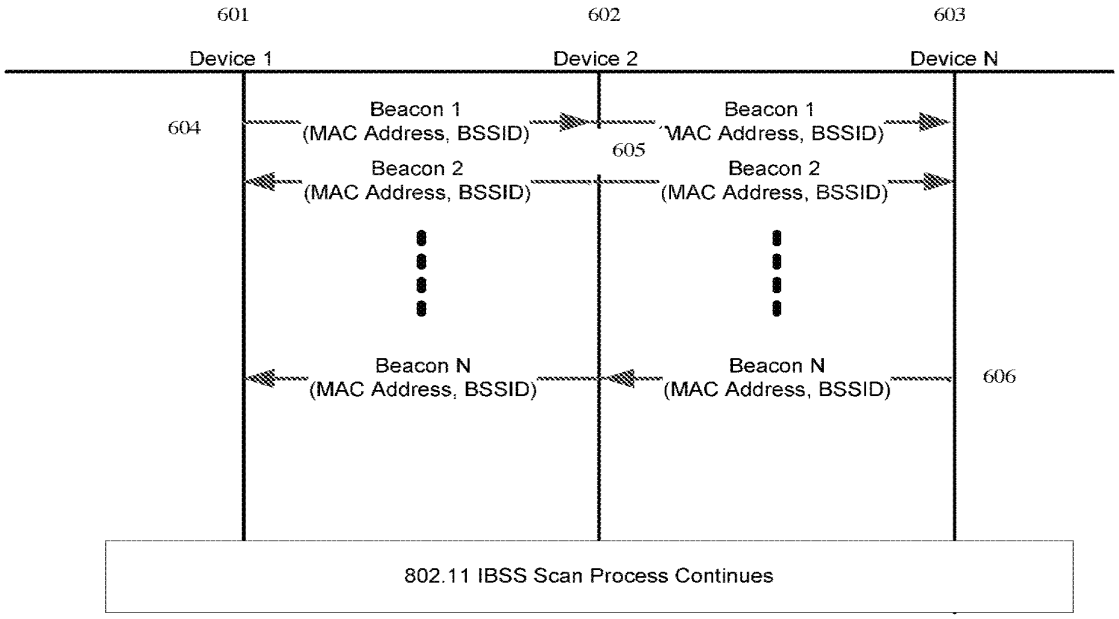


Figure 6 - 802.11 IBSS Beacon Process

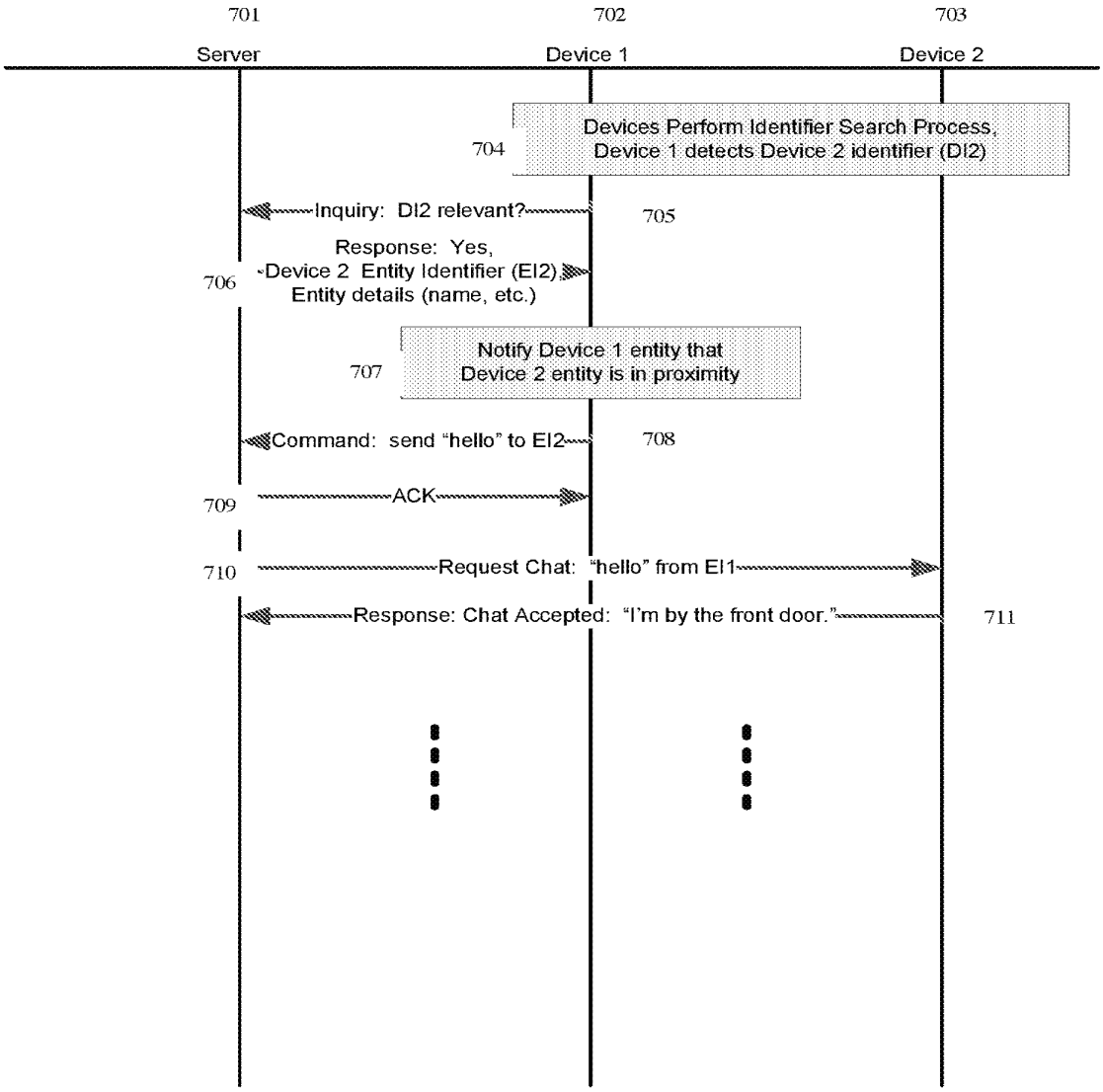


Figure 7 – Process of Detection and entering a Chat Session

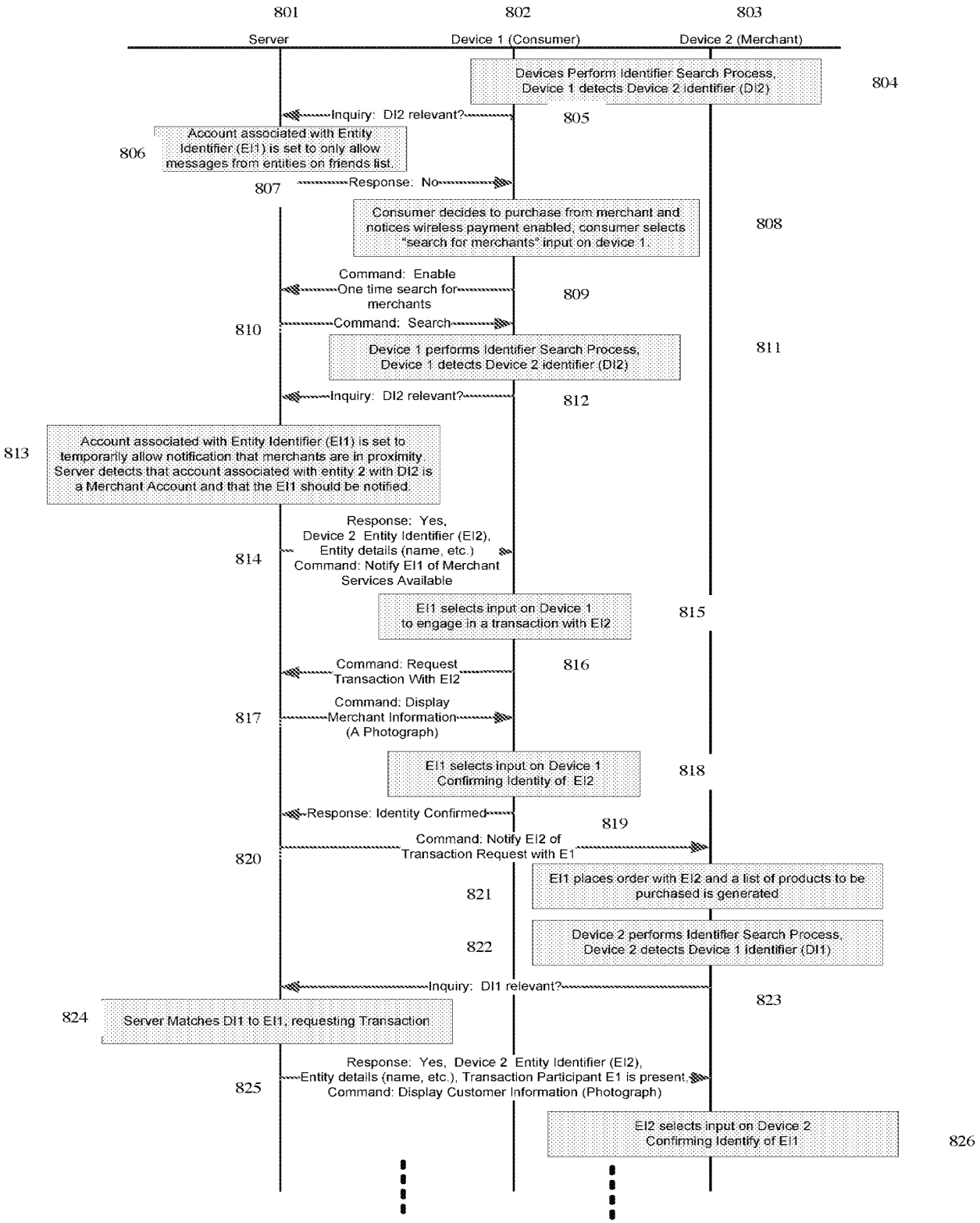
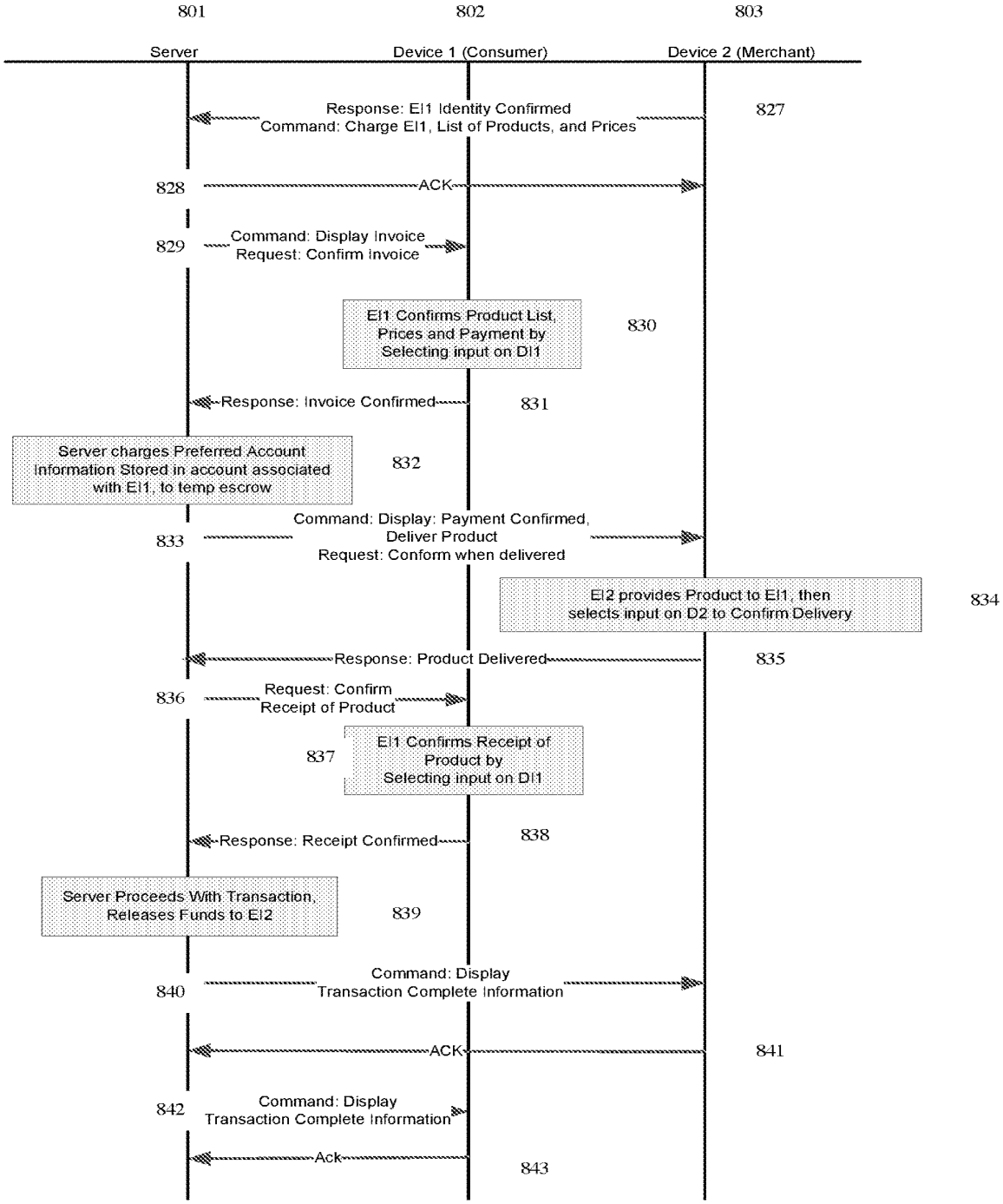


Figure 8A – E Commerce Process

Figure 8B – E Commerce Process Continued



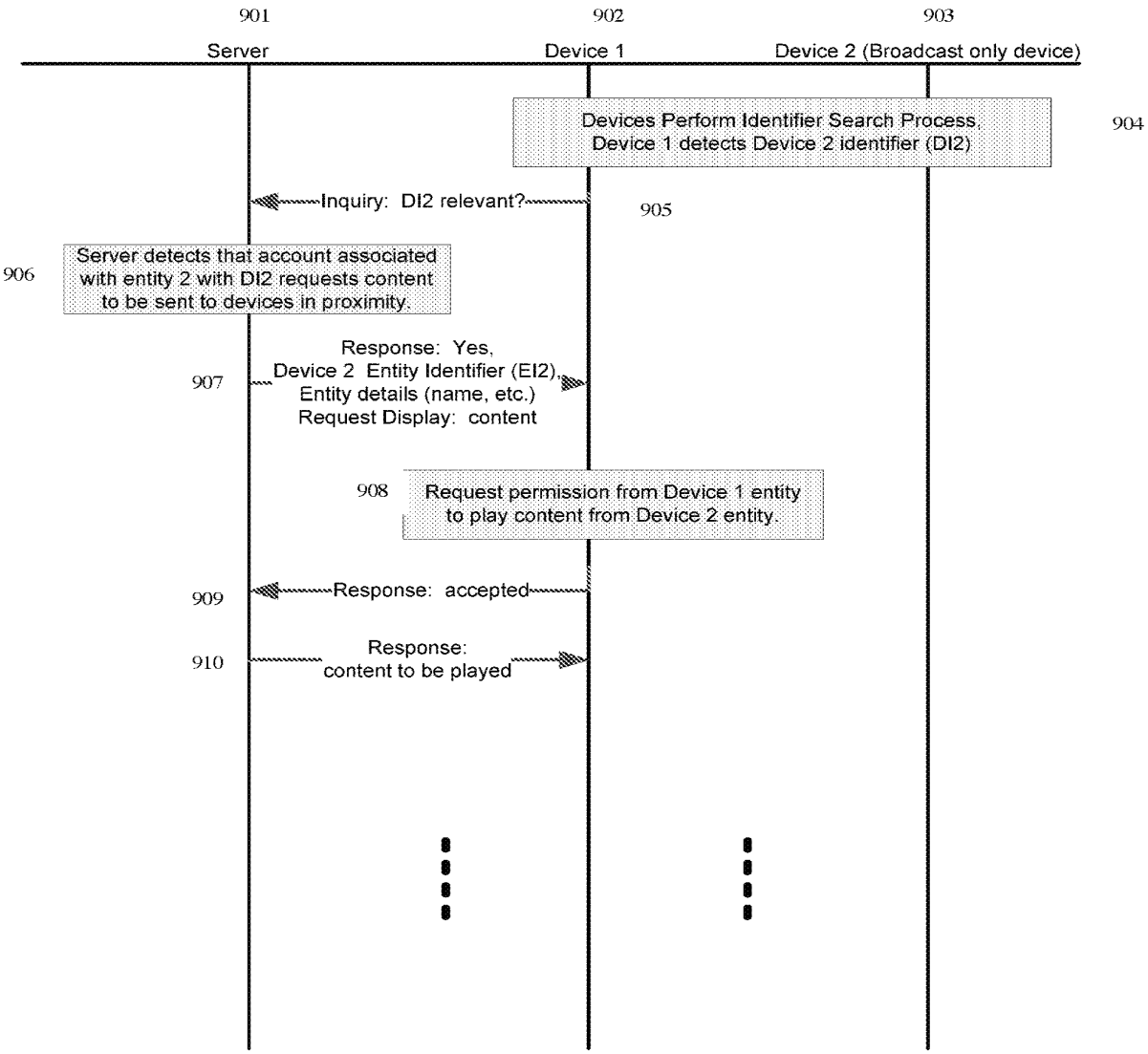


Figure 9 Broadcast and mobile device interaction

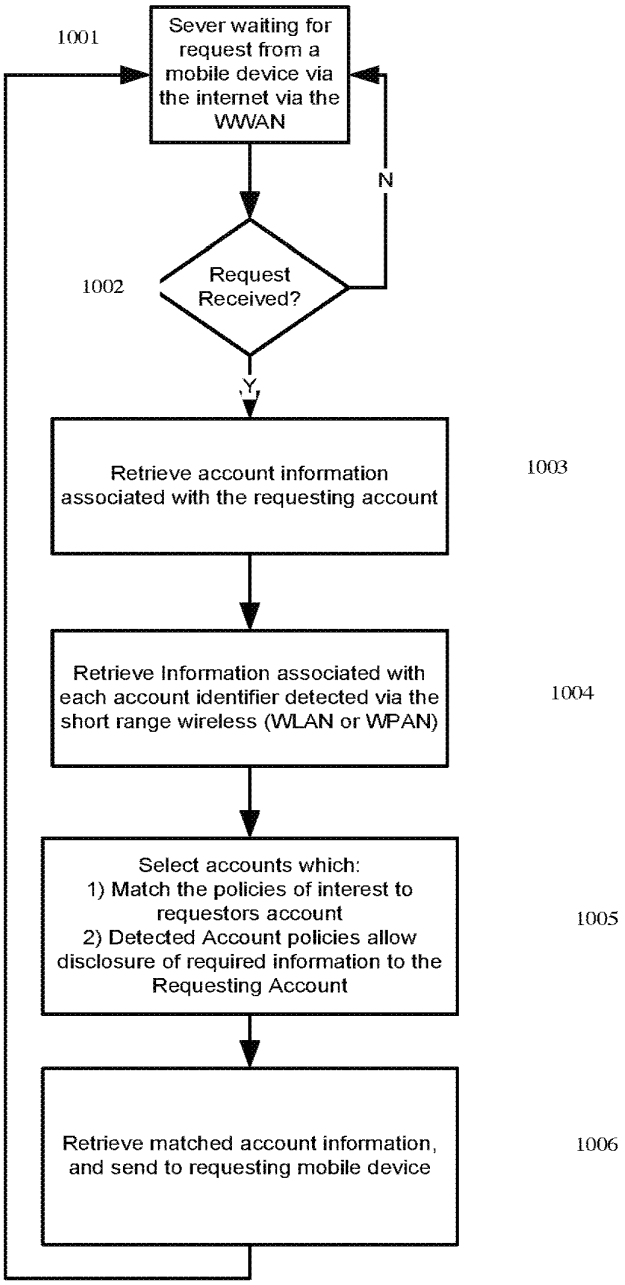


Figure 10 – Server Processing Example for Detected Device

Figure 11 – Example Individual Account Record associated with an Entity Stored in the Server

Record Index	Field	Field Information Group Disclosure Policy Assignments List
1	Account Number	[All, Explicit Approval, NONE, 1..N]
2	Identifier	
3	Identifier Type [Fixed MAC Address, Dynamic MAC Address, BSSID, Device Name]	
4	Number of Fields	
5	Field List	
6	Account User Name	NONE
7	Account Password	NONE
8	Entity Name	
9	Entity Address	
10	Entity Type [Individual, Merchant, Broadcast Entity]	
11	Billing Information	
12	Device Type	
13	Device IP Address	
14	Device SMS Phone Number	
15	Device Capabilities	
16	Entity AutoPlay Script 1	
17	Entity AutoPlay Script 2	
18	Detected AutoPlay Script 1	
19	Detected AutoPlay Script 2	
20	Entity Instant Message Address List	
21	Information Group Disclosure Policy 1 (IGDP#) [Characteristic 1 (C1), C2,.. CN, Friend List 1 (FL1), FL2, .. FLN, etc]	
22	Information Group Disclosure Policy 2	
23	Information Group Disclosure Policy 3	
24	Information Group Disclosure Policy 4	
25	Additional Personal Information Field 1 (APIF#) [Content Type/Content] (Picture, mp3, xml/AJAX, Text, Contact List, URL (MySpace, Facebook, Loopt), Login Credentials (MySpace, Facebook, Loopt, Itunes, etc.), Payment Information (Credit Card Information, PayPal Information, etc.), IM Credentials List (Username/Password))	
26	Additional Personal Information Field 2	
27	Additional Personal Information Field 3	
...		

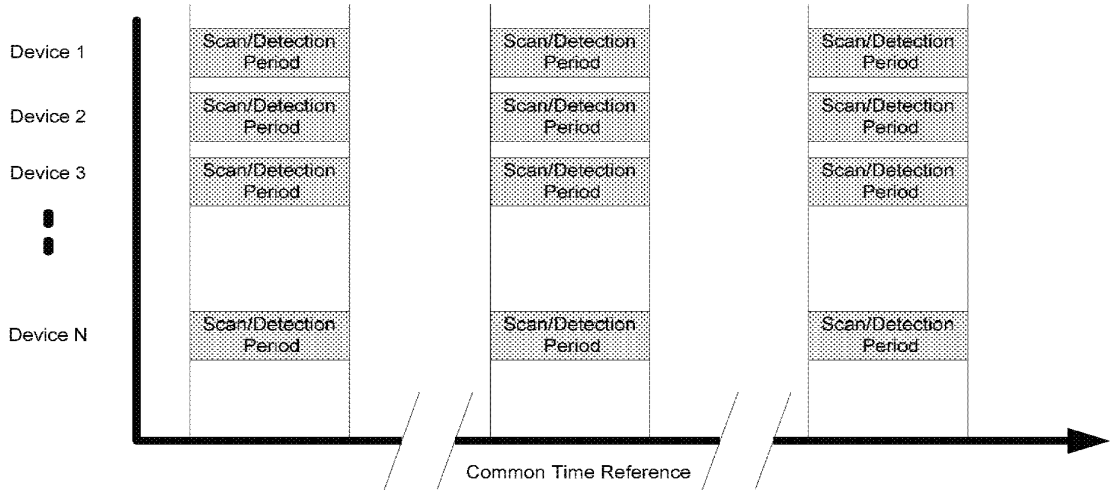


Figure 12 Use of common time reference for intermittent detection intervals

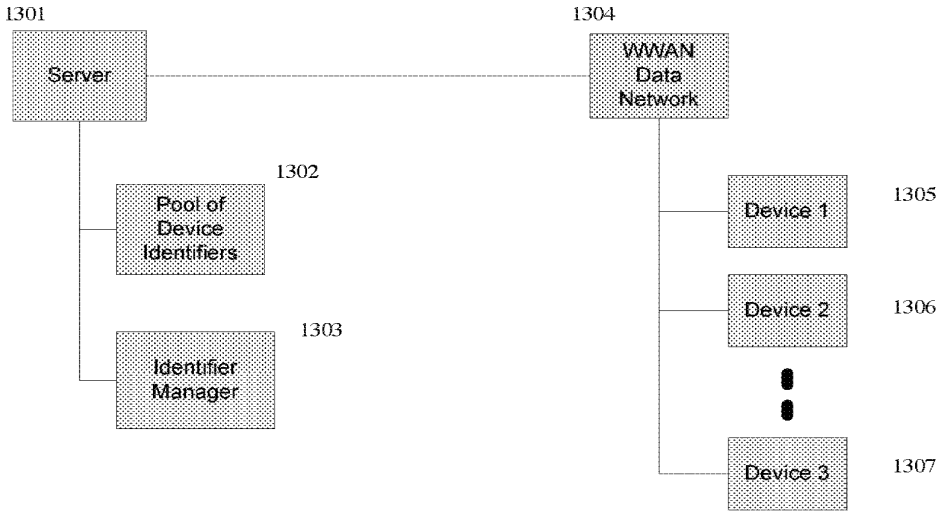


Figure 13 - Management of Device Identifiers by Identifier Manager in the Server

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Proxicom Wireless, LLC

Application No./Patent No.: Not Yet Assigned Filed/Issue Date: Herewith

Titled: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Proxicom Wireless, LLC, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 033637, Frame 0378, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

   1. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

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This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**.

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STATEMENT UNDER 37 CFR 3.73(c)

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5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

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6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/David J Thibodeau Jr Reg No 31671/	2016-09-21
Signature	Date
David J. Thibodeau, Jr.	Attorney of Record, Reg No 31671
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒ Practitioners associated with Customer Number: 24267

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☑ The address associated with Customer Number: 24267

OR

☐

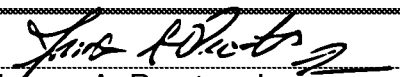
Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address: Proxicom Wireless, LLC
258 Seaview Street
Melbourne Beach, FL 32951

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	5-31-2013
Name	James A. Proctor, Jr.	Telephone	321-252-8411
Title	Managing Director, Proxicom Wireless, LLC		

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The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	26988896
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	24267
Filer:	David J. Thibodeau/stephany deblois
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	21-SEP-2016
Filing Date:	
Time Stamp:	12:11:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	2A43156.PDF	118495 1e0cb5521a65b513ba66fb9f02723425f4abd0ef	no	3

Warnings:

Information:					
2	Power of Attorney	2A43187.PDF	234587 e9af1650ae068460095db564e05ec056fd470469	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	353082		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SCORE Placeholder Sheet for IFW Content

Application Number: 15271410 Document Date: 09/21/2016

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions below.

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- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (http://Score.uspto.gov/ScoreAccessWeb/).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: September 30, 2013

Electronic Acknowledgement Receipt

EFS ID:	26988746
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James A. Proctor, Jr.
Customer Number:	24267
Filer:	David J. Thibodeau/stephany deblois
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	21-SEP-2016
Filing Date:	
Time Stamp:	12:03:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$3200
RAM confirmation Number	092116INTEFSW00009449031237
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	2A43299.PDF	33802 276c5ef15dec6c784e7e51fb1ce77d45ac11d69b	no	1
Warnings:					
Information:					
2	TrackOne Request	2A43197.PDF	114292 928e769114ffb45f6a309d8073ad00d455245cc3	no	2
Warnings:					
Information:					
3	Application Data Sheet	2A43163.PDF	1561795 01709b004b4e14793af99504961ba7d506d08228	no	7
Warnings:					
Information:					
4		2A43297.PDF	196389 20b21ebb8c16a387324e5bdc10cd24896b1fbbac	yes	47

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	39
Claims	40	46
Abstract	47	47

Warnings:					
Information:					
5	Drawings-only black and white line drawings	2A43150.PDF	342980 09c9b88017935340c624887d59331e0541ab1d54	no	14

Warnings:					
Information:					
6	Transmittal Letter	2A43295.PDF	18215 cc57515531a0702a42bb196aebee52eca97e6a9f	no	2
Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Form (SB08)	2A43301.PDF	118251 01ce60026274631942bca6c3ecf762905da2e6fe	no	9
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
8	Fee Worksheet (SB06)	fee-info.pdf	41960 ec2c879a9cf40752e397d2988414908cbad2d04a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2427684		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet	1	of	9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM/DD/YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	6,487,601		11/26/2002	Hubacher et al.	
	2	6,629,149		9/30/2003	Fraser et al.	
	3	6,675,153		1/6/2004	Cook et al.	
	4	6,700,535		3/2/2004	Gilkes et al.	
	5	6,929,149		8/6/2005	Selfridge et al.	
	6	6,978,165		12/20/2005	Martinez et al.	
	7	7,177,594		2/13/2007	Burr	
	8	7,185,204		2/27/2007	Narayanaswami et al.	
	9	7,207,480		4/24/2007	Geddes	
	10	7,213,742		5/8/2007	Birch et al.	
	11	7,213,743		5/8/2007	Carlson et al.	
	12	7,233,960		6/19/2007	Boris et al.	
	13	7,254,406		8/7/2007	Beros et al.	
	14	7,280,847		10/9/2007	Goldthwaite et al.	
	15	7,289,810		10/30/2007	Jagadeesan et al.	
	16	7,305,245		12/4/2007	Alizadeh-Shabdiz et al.	
	17	7,315,944		1/1/2008	Dutta et al.	
	18	7,330,112		2/12/2008	Emigh et al.	
	19	7,349,871		3/25/2008	Labrou et al.	
	20	7,359,674		4/15/2008	Markki et al.	
	21	7,363,494		4/22/2008	Brainard et al.	
	22	7,379,920		5/27/2008	Leung et al.	
	23	7,403,762		7/22/2008	Morgan et al.	
	24	7,414,988		8/19/2008	Jones et al.	
	25	7,433,649		10/7/2008	Toulis et al.	
	26	7,433,694		10/7/2008	Morgan et al.	
	27	7,434,723		10/14/2008	White et al.	

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	2	of	9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	28	7,471,954		12/30/2008	Brach et al.	
	29	7,502,933		3/10/2009	Jakobsson et al.	
	30	7,522,058		4/21/2009	Light et al.	
	31	7,546,141		6/9/2009	Leon et al.	
	32	7,580,699		8/25/2009	Shaw et al.	
	33	7,620,026		11/17/2009	Anschutz et al.	
	34	7,711,620		5/4/2010	Abifaker	
	35	7,714,712		5/11/2010	Emigh et al.	
	36	7,716,484		5/11/2010	Kaliski, Jr.	
	37	7,876,701		1/25/2011	Li et al.	
	38	7,936,736		5/3/2011	Proctor, Jr. et al.	
	39	7,991,664		8/2/2011	Stone	
	40	8,024,272		9/20/2011	Doran et al.	
	41	2001/0036200		11/01/2001	Nelson et al.	
	42	2002/0073027		06/13/2002	Hui et al.	
	43	2002/0128932		09/12/2002	Yung et al.	
	44	2002/0188565		12/12/2002	Nakamura et al.	
	45	2003/0045272		03/06/2003	Burr, Jeremy	
	46	2003/0074259		04/17/2003	Slyman et al.	
	47	2003/0195808		10/16/2003	Brown et al.	
	48	2004/0030601		02/12/2004	Pond et al.	
	49	2004/0167837		08/26/2004	Reel et al.	
	50	2004/0186768		09/23/2004	Wakim et al.	
	51	2004/0190468		09/30/2004	Saijonmaa, Jaakko	
	52	2004/0203895		10/14/2004	Balasuriya, Senaka	
	53	2004/0245332		12/09/2004	Silverbrook et al.	
	54	2004/0264466		12/30/2004	Huang, Leping	

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet	3	of	9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	55	2005/0165667		7/28/2005	Cox, George Chester	
	56	2005/0174975		8/11/2005	Mgrdechian et al.	
	57	2005/0188062		8/25/2005	Li et al.	
	58	2006/0069922		3/30/2006	Jelinek et al.	
	59	2006/0079284		4/13/2006	Lu et al.	
	60	2006/0085419		4/20/2006	Rosen, James S	
	61	2007/0060130		3/15/2007	Gogic et al.	
	62	2007/0078851		4/5/2007	Grell et al.	
	63	2007/0096909		5/3/2007	Lally, Matthew	
	64	2007/0106612		5/10/2007	O'Brien et al.	
	65	2007/0121534		5/31/2007	James et al.	
	66	2007/0178886		8/2/2007	Wang et al.	
	67	2007/0187491		8/16/2007	Godwin et al.	
	68	2007/0242765		10/18/2007	Parizhisky et al.	
	69	2007/0255653		11/1/2007	Tumminaro et al.	
	70	2007/0280269		12/6/2007	Rosenberg, Louis B.	
	71	2008/0010190		1/10/2008	Rackley, III et al.	
	72	2008/0037487		2/14/2008	Li et al.	
	73	2008/0051059		2/28/2008	Fisher, Michelle	
	74	2008/0097851		4/24/2008	Bemmel et al.	
	75	2008/0097879		4/24/2008	Sadowski et al.	
	76	2008/0109741		5/8/2008	Messing et al.	
	77	2008/0114647		5/15/2008	Singer et al.	
	78	2008/0114699		5/15/2008	Yuan et al.	
	79	2008/0133403		6/5/2008	Hamzeh, Mehrak	
	80	2008/0167961		7/10/2008	Wentker et al.	
	81	2008/0181154		7/31/2008	Sherman, Itay	

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet	4	of	9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
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	82	2008/0182591		7/31/2008	Krikorian, Raffi	
	83	2008/0182592		7/31/2008	Cha et al.	
	84	2008/0189394		8/7/2008	Ross et al.	
	85	2008/0214166		9/4/2008	Ramer et al.	
	86	2008/0222711		9/11/2008	Michaelis, Oliver	
	87	2008/0261564		10/23/2008	Logan, James D.	
	88	2008/0262928		10/23/2008	MICHAELIS, Oliver	
	89	2008/0288408		11/20/2008	Jacobsen, Jeffrey J.	
	90	2008/0306825		12/11/2008	Schick et al.	
	91	2008/0313079		12/18/2008	VAN BOSCH et al.	
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	93	2009/0016248		1/15/2009	Li et al.	
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	95	2009/0016255		1/15/2009	Park, Vincent D.	
	96	2009/0016315		1/15/2009	Laroia et al.	
	97	2009/0016353		1/15/2009	Li et al.	
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	99	2009/0019168		1/15/2009	Wu et al.	
	100	2009/0022096		1/22/2009	Walley et al.	
	101	2009/0037286		2/5/2009	Foster, Brian Edward	
	102	2009/0061901		3/5/2009	Arrasvuori et al.	
	103	2009/0063624		3/5/2009	Nordstrom et al.	
	104	2009/0170559		7/2/2009	Phillips, Simon	
	105	2009/0177530		7/9/2009	KING et al.	
	106	2009/0197681		8/6/2009	Krishnamoorthy et al.	
	107	2009/0270120		10/29/2009	Park, Vincent	
	108	2009/0271211		10/29/2009	Hammad, Ayman	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet	5	of	9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	109	2009/0281904		11/12/2009	PHARRIS, DENNIS J.	
	110	2009/0282130		11/12/2009	ANTONIOU et al.	
	111	2009/0285119		11/19/2009	Horn et al.	
	112	2009/0287827		11/19/2009	Horn et al .	
	113	2009/0303250		12/10/2009	Phillips, Simon	
	114	2009/0303926		12/10/2009	Den Hartog et al.	
	115	2009/0307132		12/10/2009	Phillips, Simon	
	116	2009/0307133		12/10/2009	Holloway	
	117	2009/0310517		12/17/2009	Narayanan et al.	
	118	2009/0313105		12/17/2009	Magnusson, Stefan	
	119	2009/0323647		12/31/2009	Park et al.	
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	121	2009/0325601		12/31/2009	Park et al.	
	122	2010/0030651		2/4/2010	Matotek et al.	
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	126	2010/0096450		4/22/2010	Silverbrook et al.	
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	130	2011/0119733		5/19/2011	Proctor, JR. et al.	
	131	2012/0066043		3/15/2012	Carmichael et al.	
	132	2012/0066199		3/15/2012	Ramer et al.	
	133	2006/0047835		03-2006	Greaux, Jeffrey Eric	
	134	7,213,742		05-2007	Birch et al.	
	135	2009/0307133		12-2009	Holloway et al.	

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 6 of 9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

Examiner Initials'	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	136	7,711,100		05-04-2010	Dennis	
	137	8,275,359		09-25-2012	Drennan	
	138	7,376,433		05-20-2008	Hose	
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FOREIGN PATENT DOCUMENTS

Examiner Initials'	Cite No.[1]	Foreign Patent Document Country Code[3]–Number[4]–Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	1	SG 134837	10/29/2007	SKYHOOK WIRELESS, INC.		
	2	SE 0702686-7	12/4/2007	Accumulate AB		
	3	WO 2007/081356	7/19/2007	SKYHOOK WIRELESS, INC.		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	**Not Yet Assigned**
				Filing Date	**September 22, 2015**
				First Named Inventor	**James A. Proctor, Jr.**
(use as many sheets as necessary)				Group Art Unit	**Not Yet Assigned**
				Examiner Name	**Not Yet Assigned**
Sheet	7	of	9	Attorney Docket Number	**111054–0001U4C6**

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	1	Heeger, David, "Signal Detection Theory Handout," University of Stanford, 1998, www.psych.stanford.edu/~lera/psych115s/notes/signal/, 7 pages.	
	2	Wauters, R., "TC50: Gift Card Auction Site Rackup Aims To Shake Up Market" [online], September 14, 2009. Retrieved from the Internet URL: http://techcrunch.com/2009/09/14/tc50-gift-card-auction-site-rackup-aims-to-shake-up-market/, one page.	
	3	Rusli, E., "Gift card marketplace Cardpool Introduces Instand Redemption, Attracts Super Angels" [online], September 7, 2010. Retrieved from the Internet URL: http://techcrunch.com/2010/09/07/gift-card-marketplace-cardpool-plasticjungle/, one page.	
	4	Office Action, U.S. Application No. 12/364,823, mail date December 28, 2010.	
	5	Office Action, U.S. Application No. 12/364,828, mail date September 15, 2010.	
	6	Notice of Allowance, U.S. Application No. 12/364,828, mail date July 1, 2010.	
	7	Office Action, U.S. Application No. 12/364,938, mail date September 14, 2010.	
	8	Office Action, U.S. Application No. 12/364,938, mail date July 21, 2011.	
	9	Office Action, U.S. Application No. 12/364,819, mail date November 15, 2010.	
	10	Final Office Action, U.S. Application No. 12/364,819, mail date June 28, 2011.	
	11	U.S. Provisional Application No. 60/758,010 filed on January 11, 2006 by Rajiv Laroia for Methods and apparatus for facilitating identification, synchronization or acquisition using beacon signals, 30 pages.	
	12	U.S. Provisional Application No. 60/758,011 filed on January 11, 2006 by Rajiv Laroia for Methods and apparatus for using beacon signals for identification, synchronization or acquisition in an ad hoc wireless network, 26 pages.	
	13	U.S. Provisional Application No. 60/758,012 filed on January 11, 2006 by Rajiv Laroia for Methods and apparatus for using beacon signals in a cognitive radio network, 24 pages.	
	14	U.S. Provisional Application No. 60/845,051 filed on September 15, 2006 by Junyi Li for Beacons in a mixed wireless communication system, 30 pages.	
	15	U.S. Provisional Application No. 60/845,052 filed on September 15, 2006 by Aleksandar Jovicic for Beacons in a mixed wireless communication system, 29 pages.	

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	8	of	9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Group Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	16	U.S. Provisional Application No. 60/863,304 filed on October 27, 2006 by Rajiv Laroia for POWER ALLOCATION SCHEME, 15 pages.	
	17	Ortiz-Yepes, "Enhancing Authentication in eBanking with NFC enabled mobile phones;" Masters Thesis, Department of Mathematics and Computer Science, Eihdhoven University of Technology; August 11, 2008.	
	18	Office Action, U.S. Application No. 12/364,819, mail date April 16, 2012.	
	19	Office Action, U.S. Application No. 13/212,766, mail date April 26, 2012.	
	20	Office Action, U.S. Application No. 13/213,028, mail date May 5, 2012.	
	21	http://www.smartcardalliance.org/resources/lib/Proximity_Mobile_Payments_200709.pdf; "Smart Card Alliance" 39 pages, September 2007, retrieved from Internet March 21, 2012.	
	22	http://www.ietf.org/rfc/rfc4793.txt; "The EAP Protected One-Time Password Protocol (EAP-POTP); 77 pages, February 2007; retrieved from Internet March 21, 2012.	
	23	Office Action, U.S. Application No. 12/364,819, mail date August 26, 2010.	
	24	Office Action, U.S. Application No. 12/364,823, mail date June 16, 2010.	
	25	Office Action, U.S. Application No. 12/364,828, mail date May 14, 2010.	
	26	Office Action, U.S. Application No. 12/364,938, mail date May 13, 2010.	
	27	Office Action, U.S. Application 13/015,306 mail date June 17, 2011.	
	28	Office Action, U.S. Application 13/015,306 mail date July 17, 2012.	
	29	Notice of Allowance, U.S. Application 13/015,306 mail date November 8, 2012.	
	30	Office Action, U.S. Application 13/015,306 mail date January 9, 2012.	
	31	Notice of Allowance, U.S. Application 13/212,723 mail date January 16, 2013.	

Examiner Signature		Date Considered	

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Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Group Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

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	32	S. S. (Peter) Wang et al., E-911 LOCATION STANDARDS AND LOCATION COMMERCIAL SERVICES, Nokia Research Center (2000) 5 pages.	
	33	Jonathan P. Munson & Vineet K. Gupta, Location-Based Notification as a General-Purpose Service, Proceedings of the 2nd International Workshop on Mobile Commerce (2002) 5 pages.	
	34	File History of U.S. Provisional Patent Application No. 60/814,254, filed on June 16, 2006, 44 pages.	

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Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James A. Proctor, Jr.
Filer:	David J. Thibodeau/stephany deblois
Attorney Docket Number:	111054-0001U4C7

Filed as Small Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	70	70
UTILITY SEARCH FEE	2111	1	300	300
UTILITY EXAMINATION FEE	2311	1	360	360
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2000	2000
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	2202	10	40	400
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70

Petition:	
Patent-Appeals-and-Interference:	
Post-Allowance-and-Post-Issuance:	
Extension-of-Time:	
Miscellaneous:	
Total in USD ($)	**3200**

Equivalent to PTO/AIA/15 (07-12)
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U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	**111054-0001U4C7**
First Inventor	**James A. Proctor, Jr.**
Title	**EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED**
Express Mail Label No.	**N/A EFS-Web Filing**

APPLICATION ELEMENTS

SEE MPEP chapter 600 concerning utility patent application contents.

1. ☐ Fee Transmittal Form (e.g., PTO/SB/17)
   (Submit an original and a duplicate for fee processing)
2. ☒ Applicant claims small entity status.
   See 37 CFR 1.27.
3. ☒ Specification *Total Pages:[47]*
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP § 608.01(a))
4. ☒ Drawing(s) (*35 U.S.C. 113*) *Total Sheets: [14]*
5. Inventor's Oath or Declaration *Total Sheets:[ ]*
   a. . ☐ Newly executed (original or copy)
   b. . ☐ Copy from a prior application (37 CFR 1.63 (d))
6. ☒ Application Data Sheet. *See Note below
   See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (*Appendix*)
8. Nucleotide and/or Amino Acid Sequence Submission
   (if applicable, items a.-c. are required)
   a. ☐ Computer Readable Form (CRF)
   b. ☐ Specification Sequence Listing on:
      i. . ☐ CD-ROM or CD-R (2 copies); or
      ii. . ☐ paper
   c. ☐ Statements verifying identity of above copies

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P.O. Box 1450
Alexandria VA 22313-1450

ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers
   (cover sheet & documents(s))
   Name of Assignee: _____
10. ☒ 37 CFR 3.73(c) Statement ☒ Power of Attorney
    (*when there is an assignee*)
11. ☐ English Translation Document
    (*if applicable*)
12. ☒ Information Disclosure Statement
    (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
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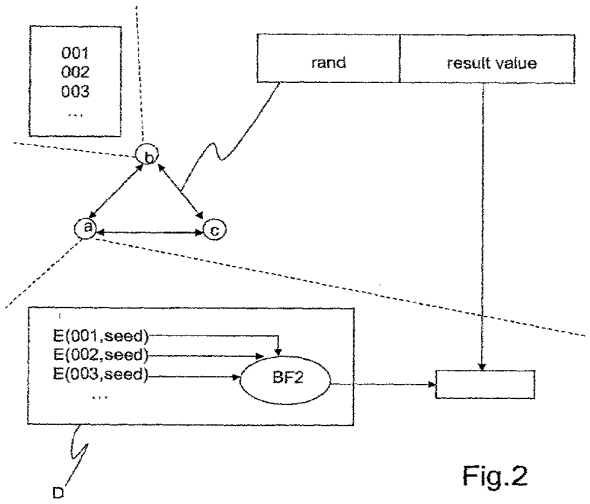


Fig.2

(57) **Abstract:** Various embodiments of the invention provide a contributory value (rand) (alternatively the contributory value is referred to as a random field or a rand), according to which a seed can be commonly created so that the seed is configured to be similar for all apparatuses. In the apparatus discovery phase this reduces the need for making several calculations to define whether an apparatus is known or not. A bloom filter can embody as an example of a data structure filter. If the values, e.g. the fields, are put together with a filter, it can be estimated by certain probability whether there are any known apparatuses or not. This estimation can be performed even by a single calculation or processing step. In various embodiments it should be noted that apparatuses may alternatively be referred to as devices as well.

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Privacy Seed with Data Structure Filter

TECHNICAL FIELD OF THE INVENTION

The invention concerns an apparatus configured to test whether another apparatus is a member of a known set. Furthermore the invention concerns an apparatus configured to generate a seed for the testing. Furthermore the invention concerns a wireless ad hoc network system comprising the apparatus. Even furthermore the invention concerns the use of the apparatuses or the system. Yet furthermore the invention concerns a computer program configured to operate the method.

BACKGROUND ART

Wireless communications has spread out widely. Wireless communication can be of ad hoc type, wherein the configuration and characteristics of the network may change dynamically due to uncoordinated behaviour of at least mobile apparatuses of the network. The communication distances may also vary being of a relatively short distance to even longer distance communications. Typically each apparatus comprises an address, typically used not only for addressing but also as an identity. The latter use makes it possible to gather and possibly mis-use the location information of the device (holder).

For groups of wireless apparatuses such as mobile personal area network (PAN) devices, address tracking and as a consequence involuntary positioning of the device holder is thus a possible nuisance, in some scenarios an outright threat. In view of the above, wireless ad hoc radio technologies have been subjected to various efforts to eliminate the mobile tracking threat. As an example Wibree radio that will be merged with the Bluetooth™ SIG for advancing Bluetooth™ wireless technology with ultra low power characteristics has introduced private addressing feature, where devices can have parallel identities that are not trackable to the unique addresses of the devices by an external source having no association with said devices. However a simple algorithmic construct falls short in known solutions where either multiple parallel identities need to be mapped to a single address. Also the construct fails in known solutions where there are numerous devices, needed to be found, (like members of a football club) rather than a limited set of devices that a user carries on his own person. This is mainly because the address resolving algorithm must be done for each target and address pair separately.

Thus the problem of known solutions relates to private address aspect that is introduced in short range ad hoc network such as Bluetooth ULP or a Wibree technology (www.wibree.com). In the private address concept, some messages such as advertisement message, including the private address that is derived from the actual unique address of the device, comprises a random field alternatively referred to as a challenge field, and a response fields. A device receiving the message can check with a keyed one-way function whether the device is a known device or not by calculating the result using the challenge. If it matches with the received result, the device can be identified. The problem with this kind of solution is that if there are lots of known devices, the device has to make the same calculation for each of the known devices to see whether the advertising device is a known device or not.

Further, in communication among groups, revocation and group management in general is a difficult problem to solve with simple mechanisms. An improved identity mechanism may enable more dynamism e.g. for pair wise identity contexts, bypassing the group management issues altogether.

SUMMARY

It is therefore the object of the invention to provide a lightweight mapping for encrypted private addresses of apparatuses within a network.

In accordance with an aspect of the invention there is provided an apparatus, comprising:

a communication module configured to communicate in a wireless ad hoc network, and

a data structure filter configured to test whether another apparatus is a member of a known set of apparatuses of said wireless ad hoc network based on at least one message received via said communication module.

In accordance with another aspect of the invention there is provided an apparatus, comprising:

a generator arranged to generate at least one contributory value corresponding to the apparatus,

a communication module configured to communicate in a wireless ad hoc network including other apparatuses, wherein the communication module is configured to

send and receive contributory values of one or more apparatuses within the wireless ad hoc network, and further configured to send the at least one contributory value corresponding to the apparatus, and

a data structure filter arranged to generate a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

In accordance with yet another aspect of the invention there is provided a system, comprising:

a first apparatus, comprising:

a communication module configured to communicate in a wireless ad hoc network, and

a first data structure filter configured to test whether a second apparatus is a member of a known set of apparatuses of said wireless ad hoc network based on at least one message received via said communication module,

the second apparatus, comprising:

a generator arranged to generate at least one contributory value corresponding to the second apparatus,

a communication module configured to communicate in the wireless ad hoc network including one or more apparatuses, wherein the communication module is configured to send and receive contributory values of the one or more apparatuses within the wireless ad hoc network, and further configured to send the at least one contributory value corresponding to the apparatus, and

a second data structure filter arranged to generate a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

In accordance with yet another aspect of the invention there is provided a method, comprising:

communicating by a communication module of a wireless ad hoc network,

receiving at least one message, and on a basis of the received message

testing, by a data structure filter, whether another apparatus is a member of a known set of apparatuses of said wireless ad hoc network.

In accordance with yet another aspect of the invention there is provided a computer program comprising computer code arranged to

communicating by a communication module of a wireless ad hoc network,

receiving at least one message, and on a basis of the received message

testing, by a data structure filter, whether another apparatus is a member of a known set of apparatuses of said wireless ad hoc network.

In accordance with yet another aspect of the invention there is provided A method comprising:

generating, by a generator, at least one contributory value corresponding to the apparatus,

communicating, by a communication module, in a wireless ad hoc network including other apparatuses,

sending and receiving, by the communication module, contributory values of one or more apparatuses within the wireless ad hoc network,

sending, by the communication module, the at least one contributory value corresponding to the apparatus, and

generating, by a data structure filter, a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

In accordance with yet another aspect of the invention there is provided a computer program comprising computer code arranged to

generating, by a generator, at least one contributory value corresponding to the apparatus,

communicating, by a communication module, in a wireless ad hoc network including other apparatuses,

sending and receiving, by the communication module, contributory values of one or more apparatuses within the wireless ad hoc network,

sending, by the communication module, the at least one contributory value corresponding to the apparatus, and

generating, by a data structure filter, a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

Various embodiments of the invention provide an efficient way to construct a contributory value to be used as an input for seed generation for the privacy mechanism of the network. Furthermore the discovery of the apparatuses within the network can be performed efficiently by the filter on a basis of the value. Various embodiments provide advantages, for example so that the filter is lightweight, further the closure result can be achieved relatively fast. Furthermore the filter saves significantly power at the discovery phase of the apparatus because the needed processing is significantly reduced. Thus the apparatus discovery can be significantly improved. The private address can be encrypted; however they can be efficiently discovered. Yet furthermore various embodiments can interact / co-exist with the earlier network systems.

BRIEF DESRIPTION OF THE DRAWINGS

Various embodiments of the invention will now be described, by way of examples only, with reference to the accompanying drawings, in which:

Figure 1 depicts an embodiment the invention relating to the generation for the seed,

Figure 2 depicts an embodiment of the invention relating to the discovery of the apparatuses,

Figure 3 depicts apparatuses each having a communication module of a wireless ad hoc network in accordance with various embodiments of the invention,

Figure 4 depicts an example of synchronizing the data structure filter according to an embodiment of the invention,

Figure 5 depicts a further example of adding supplementary value to increase diffusion of data structure filter in the group in accordance with a further embodiment of the invention,

Figure 6 depicts another further example of adding a least common denominator to further increase diffusion of data structure filter within the group in accordance with a further embodiment of the invention,

Figure 7 shows an example of simulation results about the creation of the common contributory value for the data structure filter,

Figure 8 shows an example of apparatus volatility within the network, and

Figure 9 depicts an example of the apparatus that can be used in various embodiments of the invention.

DESCRIPTION OF FURTHER EMBODIMENTS

Figure 1 depicts an embodiment the invention relating to the generation for the seed. In various further embodiments, apparatuses (e.g. a-c) are generating contributory values (rand). A generator (G) containing data structure filter (BF1 for example) receives the contributory value. The data structure filter outputs a seed, which is alternatively referred to as a beacon.

Figure 2 depicts an embodiment of the invention relating to the discovery of the apparatuses. Apparatuses (e.g. a-c) are communicating with each other by sending message containing at least the contributory value (rand) and possibly the result value. Each apparatus contains a list of known apparatuses (001,002,003,...). During device discovery operation, an apparatus (a,b,c) contains a discoverer module (D) that includes a data structure filter (for example BF2, the second filter). The filter receives as an input at least the common seed and identify value of one or more other devices. The filter, in response to the inputs, processes the inputs and outputs a result value, thereby a check for the correspondence between result values can be made so that the correspondence between the known set of apparatuses is performed.

Various embodiments of the invention provide a contributory value (rand) (alternatively the contributory value is referred to as 'random field' or 'rand'), according to which a seed can be commonly created so that the seed is configured to be similar for all apparatuses. In the device discovery phase this

reduces the need for making several calculations to define whether an apparatus in the network is known to the local device or not. A Bloom filter can serve as an example of a data structure filter. If the values, e.g. the fields, are put together with a filter, it can be estimated by a certain probability whether there are any known apparatuses or not in the environment. This estimation can be performed even by a single calculation or processing step. In various embodiments it should be noted that apparatuses may alternatively be referred to as devices as well.

In various embodiments of the invention, a plurality of apparatuses, or all apparatuses of a wireless ad hoc network, take part of the creation of the seed by contributory values so that the seed can be considered as a fresh value (i.e. the seed is dynamic that hinders potential eavesdroppers and other outside sources to track the apparatuses of the network). The creation of common seed by the contributory values can be reasonably fast. Accordingly, a relatively straightforward applicability of the value for discovering whether a certain apparatus is part of the known set of the apparatus can be performed, even by a single calculation step/process.

In various embodiments of the invention, the message to be communicated between the apparatuses comprises at least a contributory value, alternatively referred to as a rand, and possibly a result value as well. The result value can be used along with the seed for testing for the correspondence with the known set of apparatuses. It should be noted that the system comprises two different filters. The first one is used in the creation of the common seed, wherein the filter inputs the contributory values and outputs the seed. The second (alternatively referred to as a local) filter is used in the discovery so that the second filter inputs the common seed and result value and output the correspondence between the known set of apparatuses.

Referring to Figure 3, there is depicted apparatuses (a,b,c,d,e) each having a communication module (CM) of a wireless ad hoc network (N) in accordance with various embodiments of the invention. The network in the example of figure 3 comprises five apparatuses (a,b,c,d,e). It should be noted that the invention is by no means limited into these examples but the number of apparatuses may vary greatly. Each apparatus (a,b,c,d,e) comprises various operational modules, including a contributory value (rand) and a data structure filter (BF). Furthermore each apparatus (a,b,c,d,e) comprises a seed value generator (G), discoverer (D) arranged to search for peer apparatuses that are known in a set of known apparatuses of the wireless ad hoc network (N), a replay-protector (R-P), a replay-

discoverer (R-D), and a combiner (C) arranged to combine several identities into one address. The operation and functions of the operational modules that may comprise software and/or hardware are described in more detail in the various embodiments. In a further embodiment the network (N) can be a Wibree network, in another further embodiment the network (N) may be a Bluetooth™ network etc.

Data structure filters

Various embodiments of the invention embody Bloom filters. A Bloom filter, conceived by Burton H. Bloom in 1970, is an example of a space-efficient data structure filter (BF) that is used to test whether an element is a member of a set. The data structure filter can be a probabilistic data structure filter in a further embodiment. False positives are possible, but typically false negatives are not. Elements can be added to the set, but typically not removed (though this can be addressed with a counting filter). The more elements that are added to the set, the larger the probability of false positives. There are alternatives to the Bloom filter such as the one based on space efficient variants of cuckoo hashing.

As said various embodiments of the invention uses the data structure filters (BF) as accumulators for a variety of different purposes:

1. The data structure filters (BF) are used for seed, e.g. the logical beacon, generation (G) – the agreement of one (or a few) shared, contributory seed values (rand) among the apparatuses advertising their presence in local communication.

2. The data structure filters (BF) are used for optimizing the search (D) for peers that are known to the discoverer. This optimization is made possible based on the seed feature.

3. The data structure filters (BF) are used for replay-protection (R-P). The contributory algorithm may be attacked by an active adversary, and each apparatus (a...e) will see to it that a single private address is not re-used many times (this would allow apparatus tracking).

4. The data structure filters (BF) are used by initiating devices for replay-discovery (R-D). Adversaries may replay old addresses to trick incoming connections to be established, thereby possibly exposing the identity of the connecting apparatus.

5. The data structure filters (BF) can also potentially be used for combining several identities into one advertised address. This might be reasonable if a single

apparatus needs to advertise a large number of identities - so large that simply interleaving advertisements for unique identities becomes infeasible.

Wherever the input parameters (rand) to the filters (BF) are random data (or pseudo-random data like the image of an encryption function) the identity function can serve as the hash function for the filters. Typically, however not as a limiting option, for private addresses almost all input data is pseudo-random by nature.

Logical Beacon – the seed

The seed can be alternatively referred to as a logical beacon or the beacon. The reason for defining a beacon algorithm is to construct a common seed for private address generation. The common beacon in turn makes it possible to devise efficient algorithms for resolving identity presence. The property of a beacon in various further embodiments is that its value distribution should be close to a nonce (a non-repeating value) and that, either the origin of the beacon can be trusted, or that the non-repeating property can be asserted by all participants. The second requirement is in a distributed environment easiest achieved by making the beacon contributory in a way where all participants can assert their own (pseudo-random) contribution (rand) to the beacon.

As the reason for the beacon is to provide efficiency for resolving private addresses, it is not absolutely necessary that the beacon is unique. Savings are achieved with any system where the number of seeds for the random addresses can be narrowed down from the case where every apparatus has its own random address. Accordingly it is appropriate that a given environment has 2-3 seeds "active" at any given time.

The actual seed value, i.e. the logical beacon value, can be the value of any one-directional function with all input contributions considered. In a further embodiment of the invention a possible structure for seed construction is to calculate a CBC-MAC (Cipher Block Chaining - Message Authentication Code) over a symmetric cipher like AES (Advanced Encryption System), where the input is ordered according to byte values. The following formulae can keep and maintain the seed within certain bytes (for example 128 bits)

$$seed = E(M_x \oplus E(M_{x-1} \oplus E(...)))$$

Referring to an embodiment of Figure 4, every apparatus (a,b,c,d) is arranged to collect all input ($rand_{a,b,c,d}$) from all apparatuses (a,b,c,d). Furthermore all

apparatuses (a,b,c,d) are arranged to apply to the seed construction function, the data structure filter ($BF_{a,b,c,d}$) on the distributed values. As every apparatus' contribution ($rand_{a,b,c,d}$) is broadcast, one can, to a fair degree of accuracy, confirm that every apparatus sees the same input values by having every entity append to its random contribution a Bloom filter collecting all the inputs that the device has seen in the ether. Therefore any participant (a,b,c,d) can validate that its own contribution is present in the seed of any other apparatus - some advertisement messages may not reach all participants immediately, but even for those participants with a less-than complete picture of the environment any other participant with more information can calculate the seed used by the former participant.

The drawbacks of the embodiment of Figure 4 include problems caused by incomplete network topology (in a case not all advertisements reach all participants) and a high seed fluctuation probability at times where apparatuses enter or leave the network.

Referring now to Figure 5, the problems related to network topology and incomplete message diffusion can be remedied, for example by including supplemental information ($rand_{x,w,u,s..}rand_{y,v,r,t}$) in every broadcast - the contributions of other apparatuses (e.g. b,c,d). Thus even if a given apparatus (such as a) cannot hear some of the nodes, their contributions, i.e. the contributory values, will be forwarded by neighbours (b,c,d) that do hear the contribution. To add as supplemental information ($rand_{x,w,u,s..}rand_{y,v,r,t}$) all contributions that an apparatus knows about quickly become a significant transmission overhead, and force the advertisements to have dynamic length. Instead a fixed number of input value can be selected at random / in order. But even better, as everybody knows their own and their neighbours" Bloom filters (BF) indicating seed input but also knowledge of the values (rand), the operation

$$BF_a \oplus_{x\in(a,b,c,d)} \left(BF_a \oplus BF_x | \neg BF_x\right)$$

will in each apparatus (a,b,c,d) give a bit-vector, from which seed values present in this apparatus but missing in some apparatuses can be determined. Adding (at lest one or even a number of) these values as supplementary parameters ($rand_{x,w,u,s..}rand_{y,v,r,t}$) will speed up the diffusion of input values (rand). Thereby the process of creating the common operating filter can be speed-up.

In a further embodiment in order to make data aging relatively easy to implement, the supplemental input data broadcast by an apparatus will only be such data, which the apparatus has received first hand. Thus, when an apparatus leaves the neighbourhood, its contribution will also disappear shortly afterwards.

Referring to further embodiment of Figure 6, the question of seed fluctuation can be addressed by including only stable values as input parameters. Stable values would be such "inputs" that have diffused into the network, and on the other hand, apparatuses that leave should impact the whole network more or less simultaneously. Some examples for the system to stabilize for devices:

1. In a further embodiment of the invention, there is being calculated the seed based on an intersection ($BF_{\$}$) such as the least common denominator ($BF_{\$}$) between its own Bloom filter ($BF_{a,b,c,\text{ or }d}$) and the Bloom filters ($BF_{a,b,c,\text{and }d}$) seen during a small fresh time interval, and also advertise this filter for possible initiating apparatuses to use.

2. In a further embodiment of the invention, there isn't being contributed to beacon generation anymore if more than a limit of n apparatuses already are contributing to the beacon, and the resulting value is acceptable to the apparatus (it has not been used before).

With respect to the limit n in the context of seed generation, the seed will have entropy corresponding to the one-directional function deployed for its generation. It is advantageous to try to maximize the entropy of the seed, since it minimizes the probability for accidental replay. Thus, if e.g. every apparatus contributes 24 bits of input material, 6 apparatuses would already exceed entropy of 128 bits for the resulting value if the hash function produces 16 bytes of output. Thus, 6 could be a suitable value for n if combined with the AES-CBC construct above.

Referring back to the embodiment of Figure 6, the least common denominator can be represented as the difference to the broadcast, Bloom filter ($BF_{\$}$) indicating input value knowledge. In this manner this information should be sparsely populated with l-bits and thus efficiently compressable. If the Hamming distance between the two values is high, it is anyway an indication of the fact that the apparatus in question has not yet collected the information needed for the beacon, and the value can be left out altogether. Compressing Bloom filters can e.g. be done by encoding a maximum of 4 1-bits by the position indices of the respective bits, achieving a fixed 1-4/32 = 87% compression.

In various further embodiments, the aging of data in the network system is based on time. When apparatuses do not broadcast any more, the input data, which these apparatuses represent, will age in each apparatus with a predetermined speed. As the information is released from memories of the individual apparatuses there will be an intermediary period during which the beacon transforms into another value.

In the minimal case where an apparatus is broadcasting alone, it may indicate in its supplemental data ($rand_{x,w,u,s..}rand_{y,v,r,t}$) additional random values to artificially enlarge the entropy of the resulting seed. The same approach can be made for two or even three apparatuses, but apparatuses should soon stop this activity as the network grows, since these "imaginary peers" will not traverse the limits of the fully connected network.

Measures

In various further embodiments of the invention, a single advertisement with beacon generation, for example as described above comprises

1. A 3-byte random input

2. A 9-byte supplementary random field

3. A 32-byte Bloom filter

4. A 4-byte compressed representation of another Bloom filter

5. A checksum for identity validation (3 bytes in Wibree)

Mapped to the Wibree specification, the random contribution and the result value (alternatively referred to as the checksum) can constitute the address. However the remaining 45 bytes may sometimes be too high for inclusion in a single advertisement package - not only in terms of energy consumption but also since the payload size is limited to 32 bytes. Accordingly in yet another further embodiment, wherein there is not added any significant complexity, there is being defined the Bloom filters to be 128-bits in size. The Bloom filter hashing function cannot any more be the identity function, but an extension for the mapping of a byte for example using

$$H(a)=\begin{cases} a_{1...7} if a_0 = 0 \\ \neg a_{1...7} if a_0 = 1 \end{cases}$$

brings the Bloom filter size down to 16 bytes at the cost of requiring double the amount lookups when figuring out which addresses are part of a filter. With this extension, the payload size is decreased to 29 bytes which is within the acceptable limits of e.g. Wibree broadcasts. If the rule for typically including only 6 participants in the beacon, the false positive rate of the beacon filter remains acceptable, as the false positive rate is defined by

$$p = \left(1 - \left(1 - \frac{1}{m}\right)^{kn}\right)^{k}$$

where m is the 128 bits, k the number of hash functions (e.g. 3) and n the number of entries (e.g. 6), results in a false positive rate for the filter to be 2.2% compared with 0.3% for a 256-bit filter with the same parameters. Since the false positive rate is high, it must be circumvented in the beacon case. This can be achieved by constructing the local Bloom filter (BFI) in a way where the local contribution is added last. If the adding of the local contribution does not add a new 'l'-bit to the filter, the local contribution is changed. If all participants follow this precautionary algorithm, the false positives are soon eliminated.

Simulation results of further embodiments

Next there is being demonstrated some simulations with parameters that may be deployable e.g. with the Wibree radio technology. The random inputs are 24 bits each, and up to 3 supplementary random parameters are sent to improve diffusion. In the example every apparatus broadcasts in every timeslot, and a broadcast is received in a given device with 20 otherwise indicated. The bloom filters are 256 bits in width, and the hash function is trivially mapping each input byte to the Bloom filter.

Figure 7 shows the effect of lessening the probability of a broadcast being received according to at least one embodiment of the invention. A set of 70 apparatuses agreeing on a beacon is chosen to highlight the effect. The example graphs arc form four specific runs of the protocol, but the variation between runs is small. There can be seen that if a broadcast is received in an apparatus with 20% probability, the whole ad hoc network will close in on a common beacon in less than 10 time units. The algorithm works reasonably well with a 10% receiving rate, but around a broadcast throughput of 5% the network still has two clusters (seeds) after 40 time units, and the variation in the clustering rate is already evident from the graph.

The effects of apparatus volatility are relatively small for the network system as shown in an example of Figure 8. A network initially has 6 apparatuses. The network gets new incoming apparatuses from time to time, and some apparatuses will leave. The two graphs in the example show the total number of apparatuses in the network, as well as the number of clusters. The test run was made with the 20% broadcast receiving rate. From the test results, one can see that the seed value quickly stabilizes after a new entry or an exit.

Replay protection

Further embodiment of the invention employs replay protection (R-P). A local replay protection prevents producing addresses for the same beacon value twice. Anyway since the seed value may be, for example 128-bits the probability of an accidental re-occurrence is small. If a re-occurrence is found, the apparatus (a,b,c,d) may always contribute the beacon to move to another value. The concept of a contributory beacon ($BF_{\$}$) integrates well with the fact that also the replay protection Bloom filter will be triggered by false positives - now it does not really matter whether the "positive" is rightful or false, the consequence can in both cases be that the apparatus participates in the beacon generation and therefore re-adjusts it as long as a positive is not found.

The size of the replay protection (R-P) Bloom filter (BF) can be designed based on apparatus capabilities. If only limited memory is available, a rotation system of for example, 3-10 256- bit filters can be deployed (filled to "the limit" in rotating order). Around 50 seed values (increasing the false positive rate to around 2% for 50 values) can be stored per filter. The replay protection needs to be considered only when the apparatus is advertising.

An improvement to this concept is to store encountered positives in one (or several) separate longer-lived filter to identify "capture and replay" - attacks.

A memory efficient solution is for a device to always contribute to beacon construction. In that case no replay protection is needed.

Discovery

The value of the system is evident from the discovery phase. A network environment where the advertising apparatuses have agreed on a single beacon and thus the seed for the privacy system. The method trivially extends to the case where a few beacons are present too.

For each peer apparatus (a,b,c,d) for which the identity parameters are known, and to which one wants to make a connection, the result value (alternatively referred to as address checksum) is calculated based on the seed. The result values are added to a local Bloom filter ($BF_{a,b,c,d}$). Now, for each radio advertisement (i.e. the message), there is being checked for a match in the Bloom filter ($BF_{a,b,c,d}$). If a match is found the apparatus (e.g. a) knows that with a high probability one of the advertising apparatuses (e.g. b,c,d) is one of the apparatuses known. At this stage the apparatus (a) can resolve which of the identities matches the identity in advertisement, and initiate the connection.

The process of (re)generating the Bloom filter (BF) should be done every time the seed value changes, or if there are several seed values - for each value visible. This cryptographic operation is significantly smaller than to match every known identity to every seen address, which implies invocating the cryptographic algorithm at every intermediate step - the latter being the case in the current Wibree privacy system. Various embodiments of the invention are especially advantageous in high-density networks with low volatility (among the beacon participants) – resolving the privacy reduces to a simple match - equivalent to resolving public addresses without any privacy system at all.

Figure 9 depicts an example of the apparatus (any one of a,b,c,d,e etc.) that can be used in various embodiments of the invention. Apparatus has the communication module (CM) of a wireless ad hoc network (N). The apparatus (a) comprises the seed value and a data structure filter (BF). Furthermore the apparatus (a) comprises the seed value generator (G), discoverer (D) arranged to search for peers that are known in the set, a replay-protector (R-P), a replay-discoverer (R-D), and a combiner (C) arranged to combine several identities into one address. The operation and functions of the blocks are described in more detail with respect to the Figures. Thus the apparatus comprises blocks and functions arranged to carry out the operations described in these figures. For example the apparatus may contain software, middleware and/or hardware arranged to carry out the operations described in the Figures.

In various embodiments of the invention the computer program can be a computer program product. The product is an example of a tangible object. For example, it can be a medium such as a disc, a hard disk, an optical medium, CD-ROM, floppy disk, or the like storage etc. In another example the product may in a form of a signal such as an electromagnetic signal. The signal can be transmitted within the network for example. The product comprises computer program code or code

means arranged to perform the operations of various embodiments of the invention.

Ramifications and Scope

Although the description above contains many specifics, these are merely provided to illustrate the invention and should not be construed as limitations of the invention's scope. It should be also noted that the many specifics can be combined in various ways in a single or multiple embodiments. Thus it will be apparent to those skilled in the art that various modifications and variations can be made in the apparatuses and processes of the present invention without departing from the spirit or scope of the invention.

Claims

1. An apparatus, comprising:

a communication module configured to communicate in a wireless ad hoc network, and

a data structure filter configured to test whether another apparatus is a member of a known set of apparatuses of said wireless ad hoc network based on at least one message received via said communication module.

2. An apparatus according to claim 1, wherein the at least one message comprises at least a contributory value arranged to be used as an input for seed generation.

3. An apparatus according to claim 2, wherein a result value is arranged to be obtained on a basis of the generated seed, and wherein the filter is arranged to receive the result value and output whether the another apparatus is the member of the known set of apparatuses.

4. An apparatus according to any of the preceding claims, further comprising a memory configured to store identity values of the known set of apparatuses of said wireless ad hoc network.

5. An apparatus according to any of the preceding claims, wherein the data structure filter is further configured to check whether the obtained result value correlates with any identity values stored on the memory.

6. An apparatus according to any of the preceding claims, wherein the apparatus is further arranged to establish a connection to said another apparatus if an identity value corresponding to said another apparatus correlates with the obtained result value corresponding to said another apparatus.

7. An apparatus according to any of the preceding claims, wherein the filter is arranged to be regenerated every time a seed, according to which the filter is arranged to be created, changes.

8. An apparatus according to any of the preceding claims, wherein the result value comprises an encryption of the seed and the identity value.

9. An apparatus, comprising:

a generator arranged to generate at least one contributory value corresponding to the apparatus,

a communication module configured to communicate in a wireless ad hoc network including other apparatuses, wherein the communication module is configured to send and receive contributory values of one or more apparatuses within the wireless ad hoc network, and further configured to send the at least one contributory value corresponding to the apparatus, and

a data structure filter arranged to generate a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

10. An apparatus according to claim 9, wherein the apparatus is arranged to validate its contribution present in the seed.

11. An apparatus according to claim 9, wherein the filter is further configured according to supplementary information in messages between the apparatuses.

12. An apparatus according to claim 11, wherein the supplementary information comprises contributory values of the one or more apparatuses.

13. An apparatus according to claim 12, wherein the supplementary information comprises aggregates of all contributory values known to the apparatus.

14. An apparatus according to claim 13, wherein the apparatus is arranged to send within the supplementary information, on a basis of an aggregate of one or more apparatuses, contributory values missing from the one or more apparatuses.

15. An apparatus according to claim 11, wherein the supplementary information further comprises parameters corresponding to the data structure filter.

16. An apparatus according to claim 9, wherein the data structure filter is further configured to determine an intersection between the contributory value of the apparatus and the contributory values of the one or more apparatuses.

17. An apparatus according to any of the preceding claims, wherein the data structure filter comprises a probabilistic data structure filter.

18. An apparatus according to any of the preceding claims, wherein said probabilistic data structure filter comprises a Bloom filter.

19. An apparatus according to any of the preceding claims, wherein said filter comprises a one-way algorithm.

20. An apparatus according to any of the preceding claims, wherein an identity of the apparatus of the ad hoc wireless network can be detected on a basis of the seed and the filter.

21. An apparatus according to any of the preceding claims, wherein the ad hoc wireless network comprises a Wibree network or a Bluetooth network.

22. A system, comprising:

a first apparatus, comprising:

a communication module configured to communicate in a wireless ad hoc network, and

a first data structure filter configured to test whether a second apparatus is a member of a known set of apparatuses of said wireless ad hoc network based on at least one message received via said communication module,

the second apparatus, comprising:

a generator arranged to generate at least one contributory value corresponding to the second apparatus,

a communication module configured to communicate in the wireless ad hoc network including one or more apparatuses, wherein the communication module is configured to send and receive contributory values of the one or more apparatuses within the wireless ad hoc network, and further configured to send the at least one contributory value corresponding to the apparatus, and

a second data structure filter arranged to generate a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

23. A method, comprising:

communicating by a communication module of a wireless ad hoc network,

receiving at least one message, and on a basis of the received message

testing, by a data structure filter, whether another apparatus is a member of a known set of apparatuses of said wireless ad hoc network.

24. A computer program comprising computer code arranged to

communicating by a communication module of a wireless ad hoc network,

receiving at least one message, and on a basis of the received message

testing, by a data structure filter, whether another apparatus is a member of a known set of apparatuses of said wireless ad hoc network.

25. A method comprising:

generating, by a generator, at least one contributory value corresponding to the apparatus,

communicating, by a communication module, in a wireless ad hoc network including other apparatuses,

sending and receiving, by the communication module, contributory values of one or more apparatuses within the wireless ad hoc network,

sending, by the communication module, the at least one contributory value corresponding to the apparatus, and

generating, by a data structure filter, a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

26. A computer program comprising computer code arranged to

generating, by a generator, at least one contributory value corresponding to the apparatus,

communicating, by a communication module, in a wireless ad hoc network including other apparatuses,

sending and receiving, by the communication module, contributory values of one or more apparatuses within the wireless ad hoc network,

sending, by the communication module, the at least one contributory value corresponding to the apparatus, and

generating, by a data structure filter, a seed on a basis of the at least one contributory value corresponding to the apparatus and the contributory values of the one or more apparatuses.

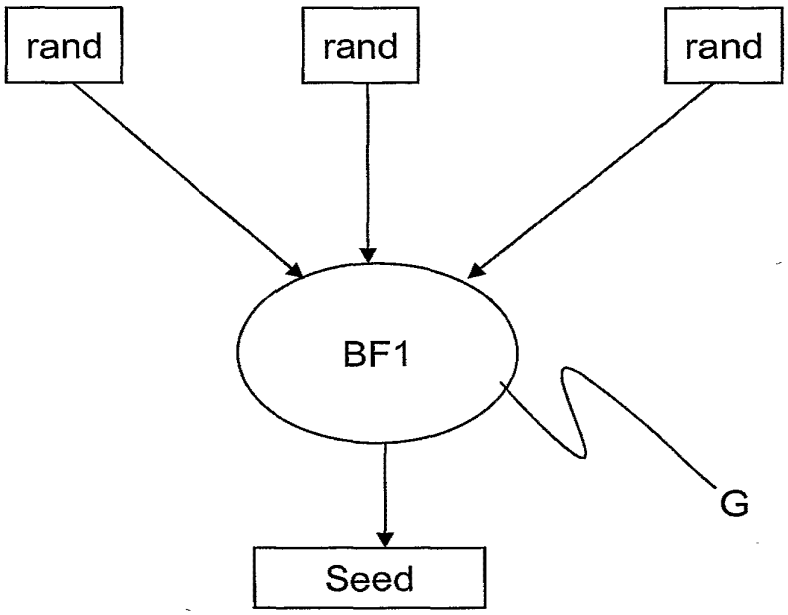


Fig.1

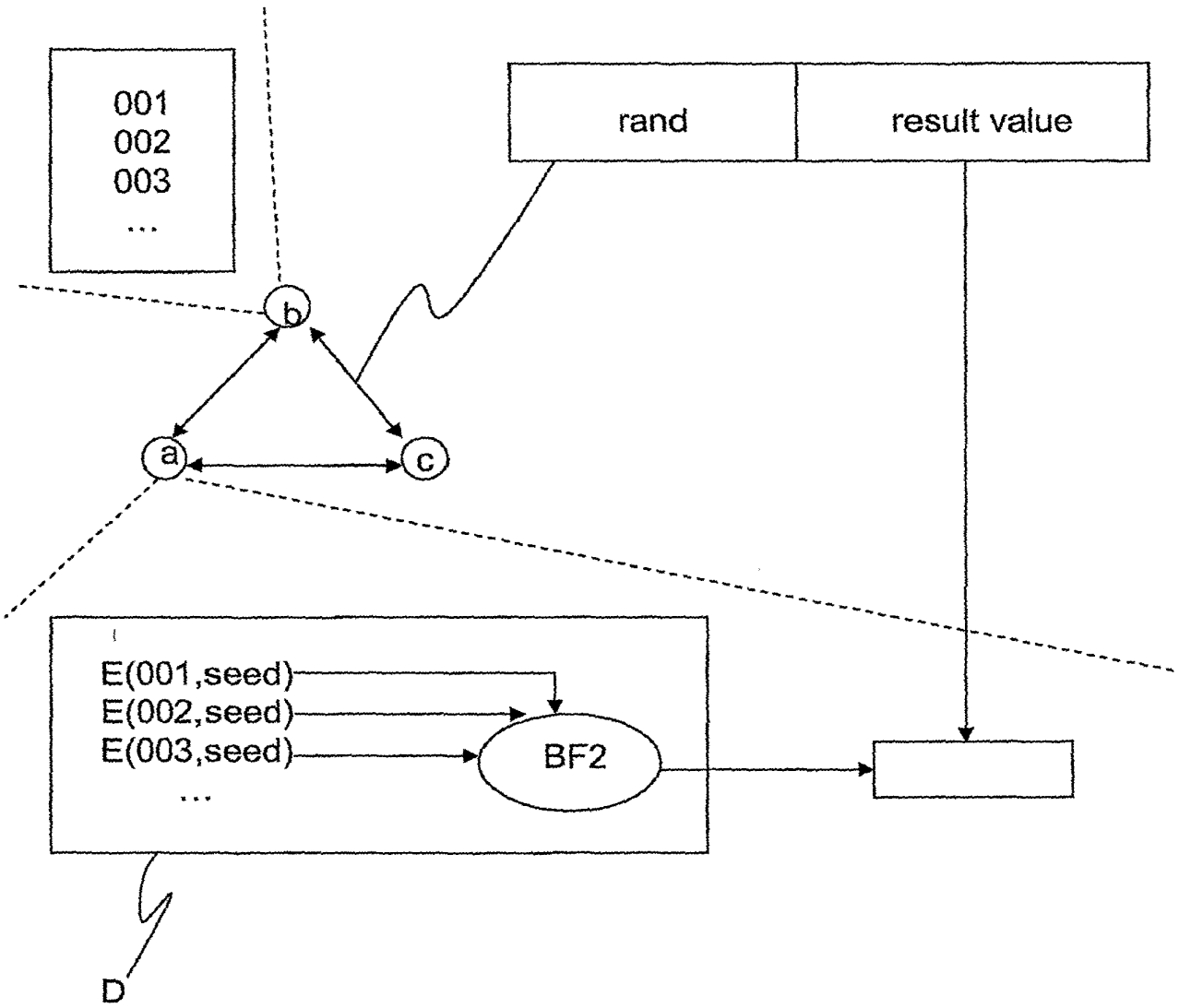

001
002
003
...
rand
result value
b
a
c
E(001,seed)
E(002,seed)
E(003,seed)
...
BF2
D

Fig.2

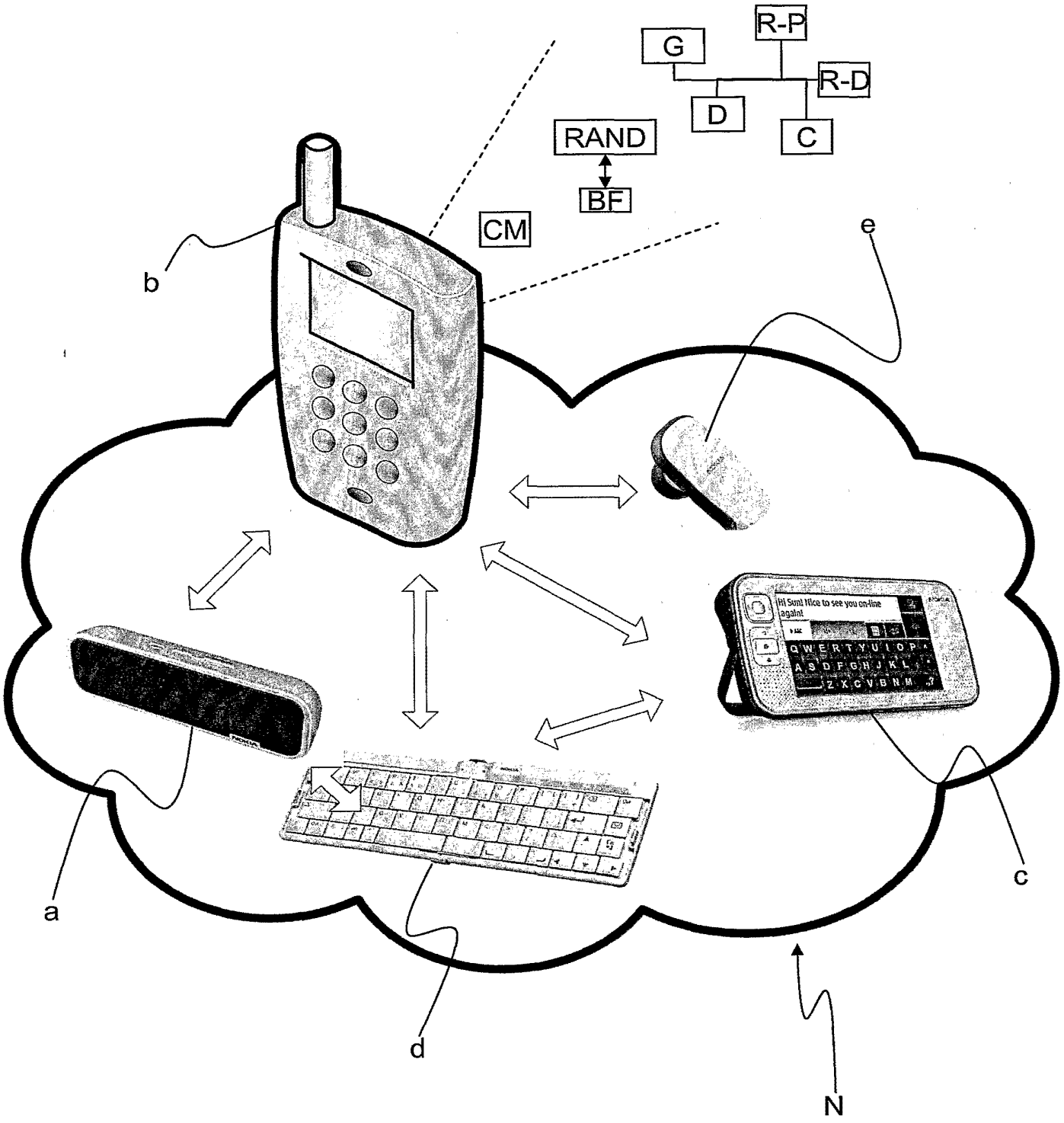


Fig.3

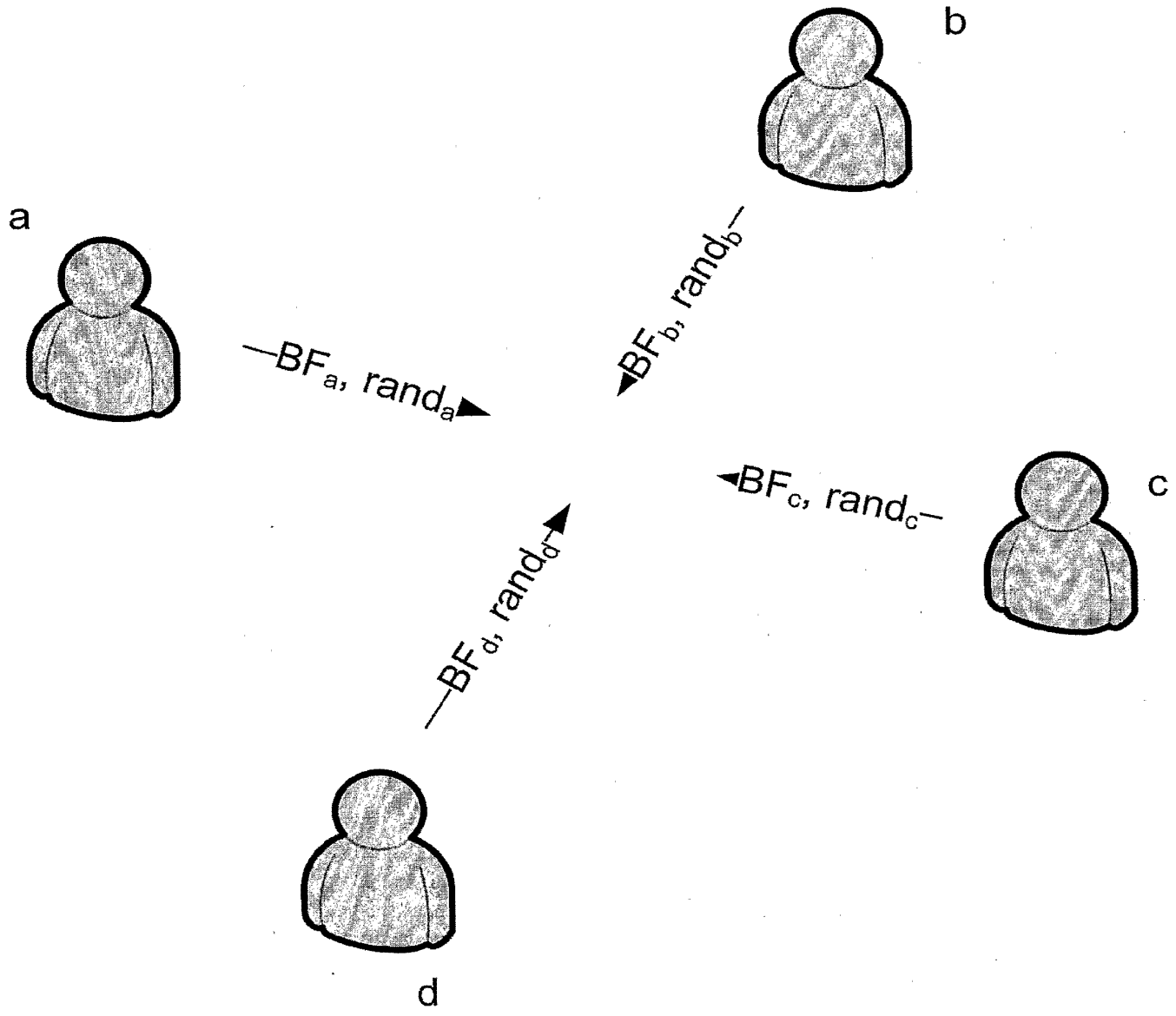


Fig.4

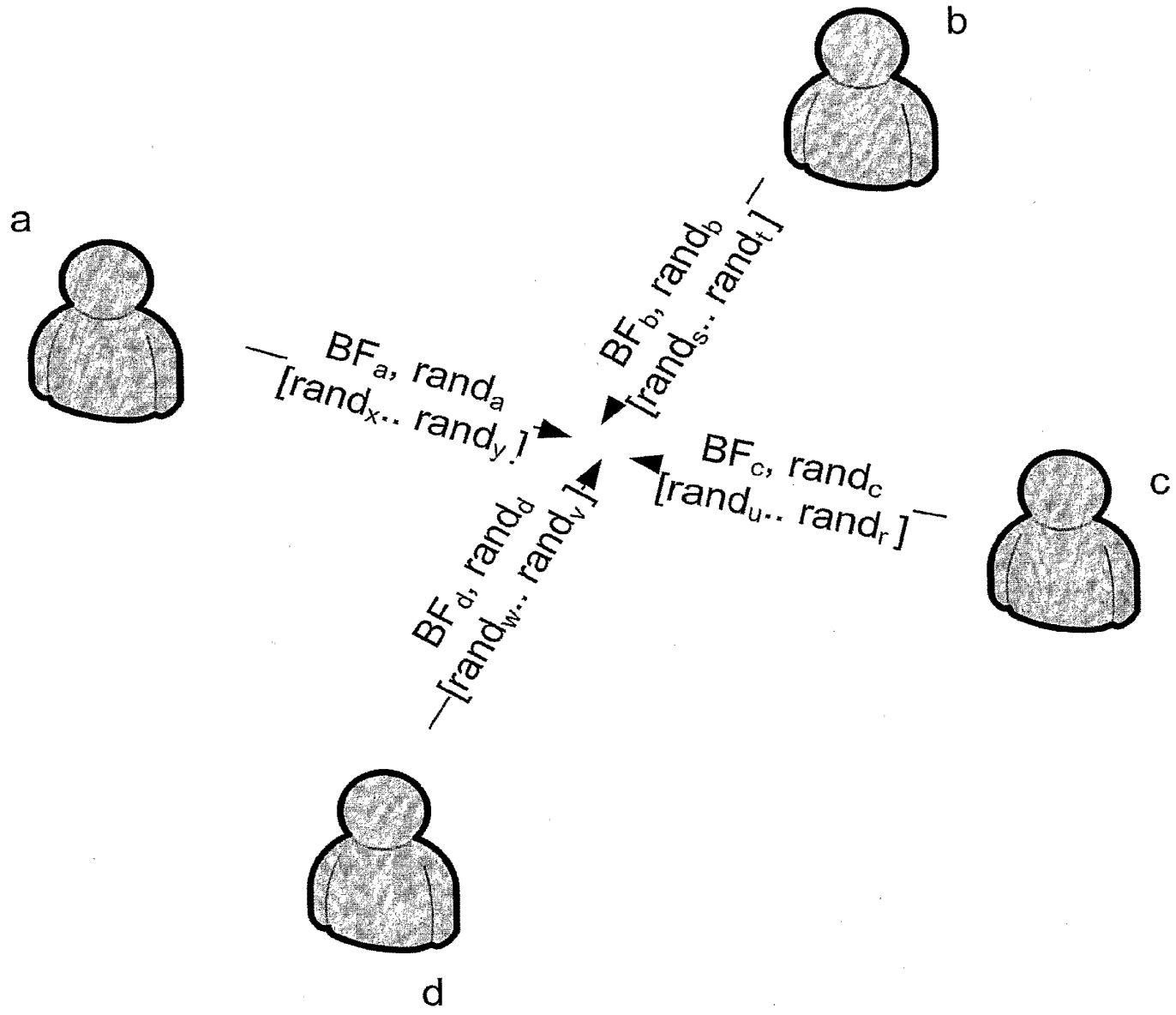

a
b
c
d
BF$_a$, rand$_a$
[rand$_x$.. rand$_y$]
BF$_b$, rand$_b$
[rand$_s$.. rand$_t$]
BF$_c$, rand$_c$
[rand$_u$.. rand$_r$]
BF$_d$, rand$_d$
[rand$_w$.. rand$_v$]

Fig.5

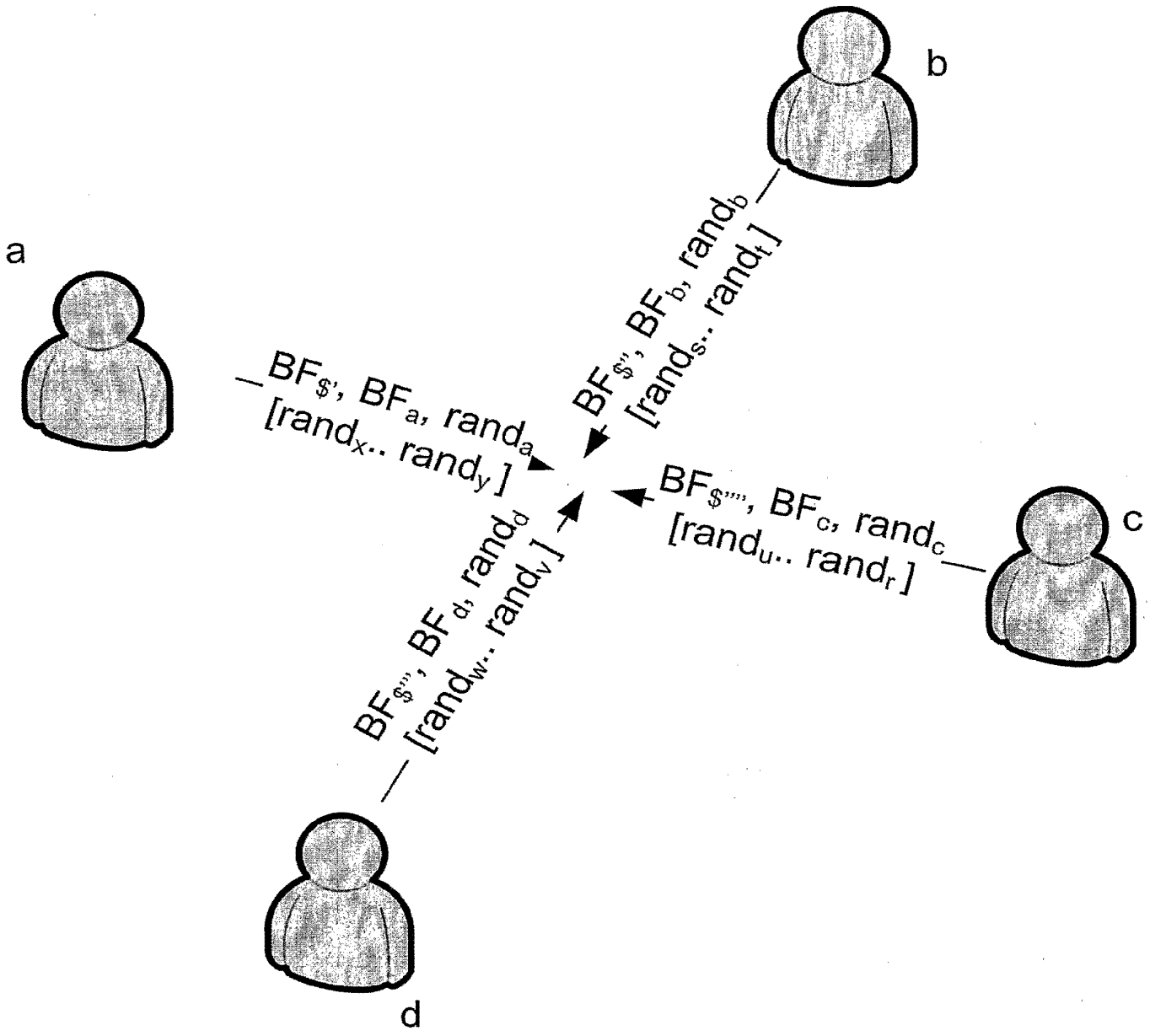

a
b
c
d
BF$', BF_a, rand_a
[rand_x.. rand_y]
BF$'', BF_b, rand_b
[rand_s.. rand_t]
BF$''', BF_d, rand_d
[rand_w.. rand_v]
BF$'''', BF_c, rand_c
[rand_u.. rand_r]

Fig.6

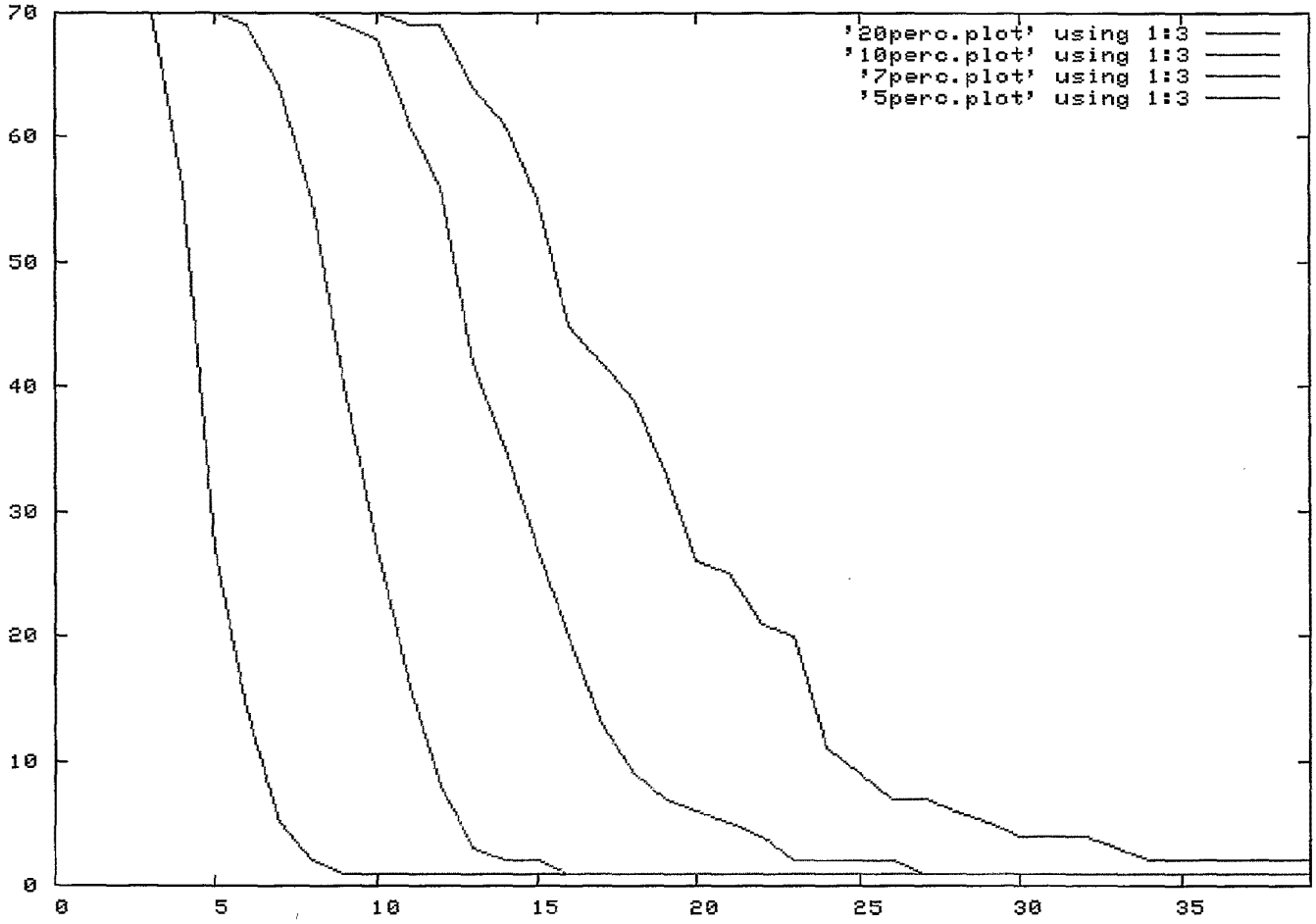

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'10perc.plot' using 1:3
'7perc.plot' using 1:3
'5perc.plot' using 1:3
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40
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20
10
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10
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25
30
35

Fig.7

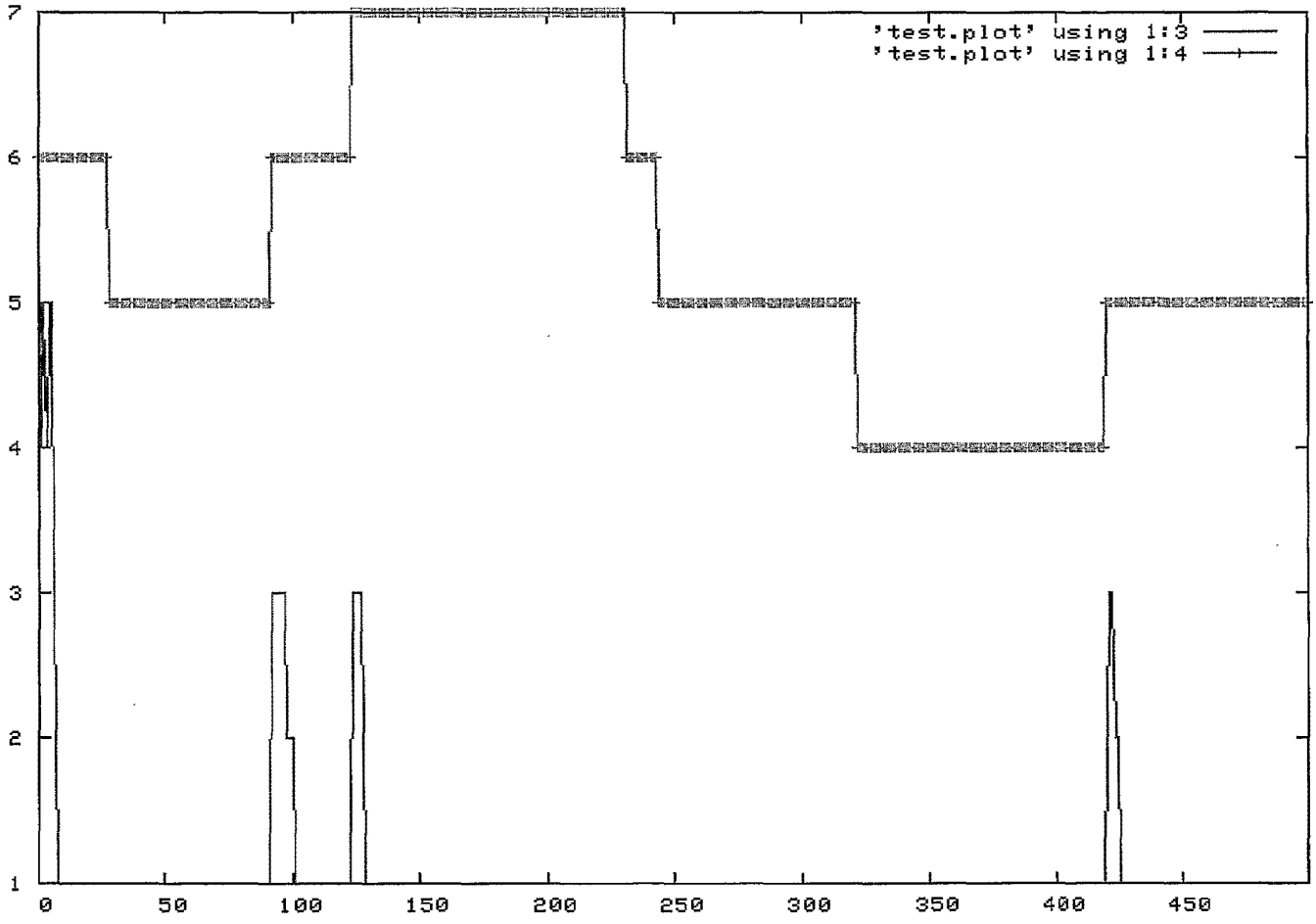

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'test.plot' using 1:4
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5
4
3
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1
0
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100
150
200
250
300
350
400
450

Fig.8

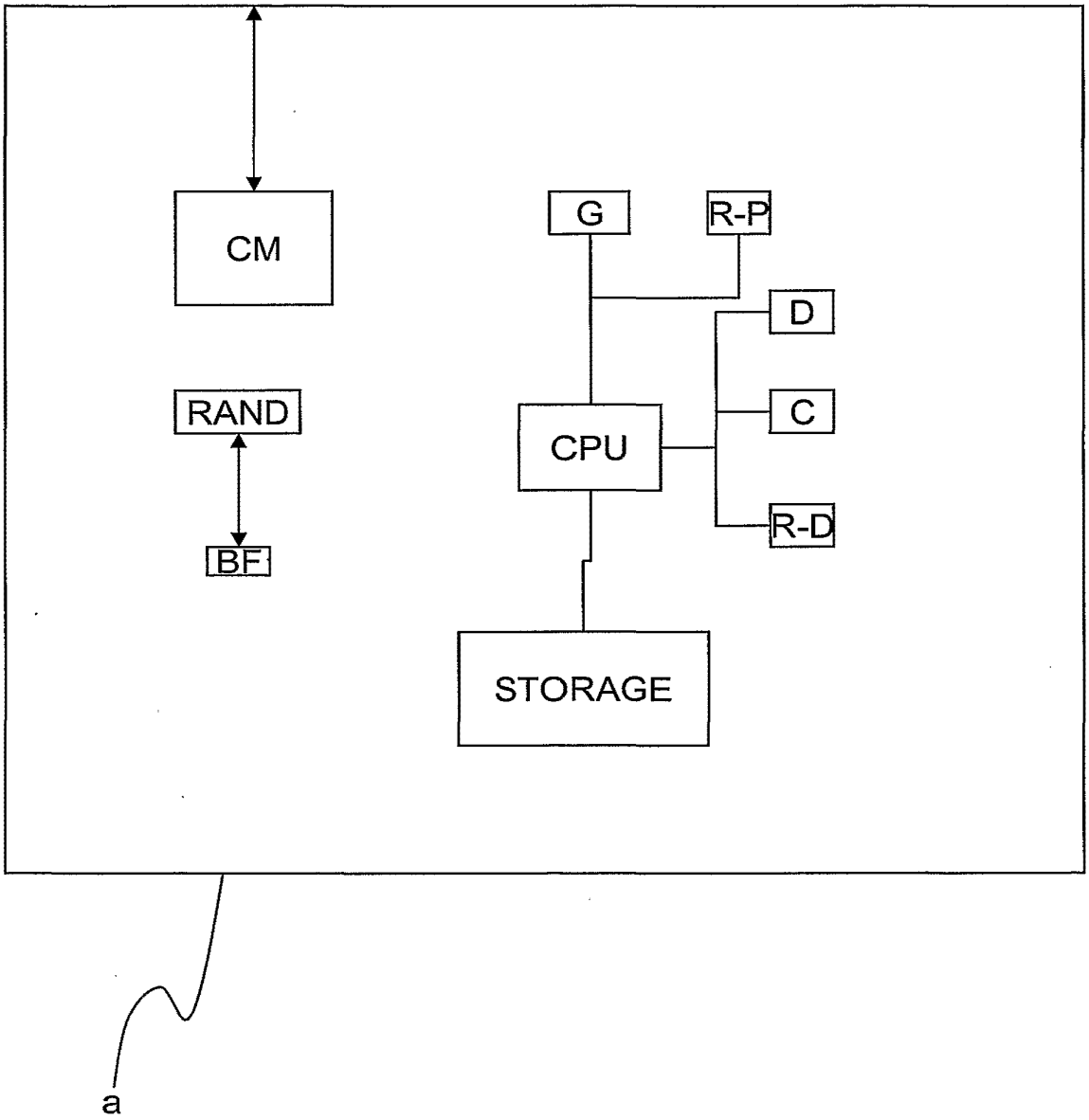


Fig.9

INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

IPC8: H04L

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

FI, SE, NO, DK

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

EPO-Internal, WPI, XPESP, XPIEE, XPI3E, INSPEC, IEEE Explore

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0177554 A1 (YANG FAN et al.) 02 August 2007 (02.08.2007), Figures 2, 3, and 7, [0017], [0019], [0023], [0024], [0027]-[0029], [0030], [0034]-[0039]	1-26
X	REN, K., et al. 'Multi-user Broadcast Authentication in Wireless Sensor Networks'. Proceedings of the 4th Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks, pp. 223-232, June 2007, Section III, page 227 column 1 line 1 - page 228 column 1 line 6	1, 4-6, 17-19, 21, 23, 24
X	MACCARI, L., et al. 'Mesh network firewalling with Bloom Filters'. Proceedings of the IEEE International Conference on Communications, pp. 1546-1551, June 2007 [retrieved on 2008-06-12]. Retrieved from Internet: <URL: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4288930>, Figure 4, Sections III and IV	1, 4-6, 17-19, 21, 23, 24

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2007/000246

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ZHANG, L., et al. 'Integrated location management and location-aided routing system for mobile ad hoc networks'. Journal of parallel and distributed computing, vol. 66, no. 3, p. 367-378, March 2006, Abstract, figures 1-3, sections 1, 3.1, 3.2, 3.3, and 3.4	1, 4-6, 17-19, 21, 23, 24
X	PAPAPETROU, E., et al. 'Speeding-up Cache Lookups in Wireless Ad-Hoc Routing using Bloom Filters'. IEEE 16th International Symposium on Personal, Indoor and Mobile Radio Communications, vol.3, pp.1419-1423, September 2005, Abstract, section I A.	1, 4-6, 17-19, 21, 23, 24
A	EKBERG, J.-E. 'Implementing Wibree Address Privacy'. First International Workshop on Security for Spontaneous Interaction (IWSSI 2007), September 2007 [retrieved on 2008-06-12]. Retrieved from Internet: <URL: http://www.comp.lancs.ac.uk/iwssi2007/papers/iwssi2007-07.pdf>, Sections 6 and 7	1-26
A	WO 2006/119281 A2 (PACKETHOP INC et al.) 09 November 2006 (09.11.2006), Whole document	1-26

Petitioner Samsung Ex-1004, 0128

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/FI2007/000246

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
US 2007/0177554 A1	02/08/2007	None	
WO 2006/119281 A2	09/11/2006	US 2007189249 A1	16/08/2007

Form PCT/ISA/210 (patent family annex) (April 2007)

INTERNATIONAL SEARCH REPORT

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PCT/FI2007/000246

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(74) Agent: **FRANK, Elliot L.**; c/o Morgan & Finnegan, LLP, Three World Financial Center, New York, NY 10281-2101 (US).

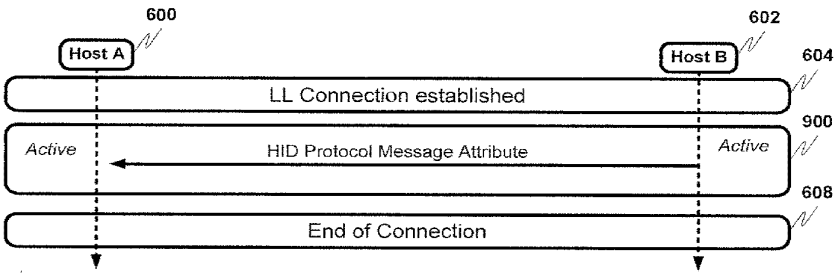
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(54) **Title:** HID ADAPTATION TO ATTRIBUTE PROTOCOL

FIG. 9



(57) **Abstract:** A system for conveying one or more message packets utilizing a wireless communication medium. The wireless communication medium may be utilized to convey message packets between a human interface device (HID) and a host device based on a HID profile. Fragmentation may be done at the HID profile level, and the resulting message packets may be conveyed without the requirement of first establishing lower level messaging channels in a PAL or L2CAP layer by utilizing an attribute protocol that is enabled to convey packet type.

WO 2009/063272 A1

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HID ADAPTATION TO ATTRIBUTE PROTOCOL

BACKGROUND OF INVENTION

1. Field of Invention:

[0001] The present invention relates to a system for expediting communication in a wireless communication protocol, and more specifically, to increasing the transmission efficiency of human interface device (HID) profile communication by removing the need to establish lower level messaging channels before sending message packets.

2. Background:

[0002] This section is intended to provide a background or context to the invention that is recited in the claims. The description herein may include concepts that could be pursued, but are not necessarily ones that have been previously conceived or pursued. Therefore, unless otherwise indicated herein, what is described in this section is not prior art to the description and claims in this application and is not admitted to be prior art by inclusion in this section.

[0003] More and more, the ability to communicate wirelessly is emerging as a popular feature to include in many devices where wireless communication was previously not contemplated. This popularity may, at least in part, be fueled by rapid technological development in the area of multifunction wireless communication devices (WCD). Consumers may now replace common standalone productivity devices like computers, laptops, facsimile machines, personal digital assistants, etc. with a single device capable of performing all of these functions. Devices including one or more of these exemplary abilities have been embraced by professionals who often find that work can be completed during times that were previously wasted (commutes to and from work, home, etc.)

[0004] However, while a WCD may be empowered with many beneficial features, the small size and power constraints of these devices may also create a hindrance for the user. For example, the operator interfaces installed in these devices are often small, and not conducive to high throughput. As a result, users must rely on peripheral input devices such as keyboards, mice, headsets, etc. in order to perform their work. Further, the small size and power limitations of many devices today also limits the number of physical ports

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to which wired devices may be connected. Therefore, a WCD must not only be able to support wireless communications with a peripheral device, it must also be able to support connections with multiple peripheral devices being operated concurrently.

[0005] As more and more common devices now include electronic control, there may also be a benefit realized by coupling these devices to a WCD, or possibly another "intelligent" mechanism. In an exemplary scenario, it may be desirable to wirelessly link two or more low power devices in a beneficial relationship, such as linking a wristwatch including health-monitoring intelligence to various wireless sensors placed on a user's body. Simpler communication protocols with reduced power requirements are now being developed so that even devices that have not historically been "computerized" may now provide wireless information to, and in some cases receive wireless information from, a another device. These devices must often run on battery power, and as a result, must rely on simple, power efficient communications in order to be functional.

[0006] Most of the existing wireless communication protocols are either too simple or too complex to make these newly computerized applications workable. For example, radio frequency (RF) communication is efficient and may be powered by a scanning device, however, currently available RF transponder chips are space-limited and usually only provide information. On the other hand, IEEE 802.11x WLAN or "WiFi" is a commonly available and widely accepted wireless solution, but the power requirements for WLAN may not make it efficient enough for small device installations. Bluetooth™ is another short-range wireless protocol that is often used for linking peripheral devices to a WCD. The Bluetooth™ standard was originally designed to replace wires with a wireless medium for simple peripheral input devices. While, Bluetooth™ has now evolved much further than linking headsets and mice, it still may not be the best solution for extremely resource constrained wireless devices, as will be explored further below.

[0007] At least one problem inherent in the Bluetooth™ wireless protocol with respect to wirelessly-coupled peripheral devices is the required initial channel setup and repeated wireless channel establishment steps that must be completed before messages may be conveyed between a peripheral device and the host (e.g., device to which a user interface device may be coupled). For example, messaging for devices classified as user interface peripheral devices may be controlled by a human interface device (HID) profile in Bluetooth™. The formalities that must be followed in order to convey these messages

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includes multiple steps to establish identified channels for sending messages of certain types, such as control messages and interrupt messages, and the repeated connection of these channels. The steps necessary to establish and utilize these channels may be acceptable for more substantial wireless devices, but may place an extreme burden on simpler devices where processing capability and stored energy may be extremely limited resources.

SUMMARY OF INVENTION

[0008] The present invention includes at least a method, computer program, module, device and system for conveying wireless messages. In at least one embodiment of the present invention, a wireless communication medium may be utilized to convey message packets between a human interface device (HID) and a host device without the requirement of first establishing and connecting lower level messaging channels.

[0009] In at least one embodiment of the present invention, a HID profile in a wireless communication medium protocol stack may create one or more message packets. These message packets may, for example, be created in response to activity that occurs in a peripheral human interface device or in a host device. The message packets created by the HID profile may include at least an HID header and a data payload. The message packets may further be one of two types, either control or interrupt message packets. Control message packets may be utilized for bi-directional data requests transmitted between the devices, while interrupt message packets usually contain data that was not requested and that is usually the result of activities or evcnts in one of the devices.

[0010] The Bluetooth™ HID profile currently specifies that HID message packets be sent using a connection protocol that establishes at least two L2CAP wireless channels for control and interrupt messages, respectively. With respect to at least the Wibree™ wireless protocol, the protocol adaptation layer (PAL) defines three transport types for conveying message packets including an attribute protocol. In at least one embodiment of the present invention, the attribute protocol may be utilized to send HID message packets without having to first establish PAL messaging channels. Utilizing attribute packets, a universally unique identifier (UUID) or an attribute handle may identify the type of one or more HID message packets that have been embedded within attribute message packets.

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[0011] Further, various embodiments of the present invention may use different transmission strategies for conveying HID message packets. For example, HID message packets may be conveyed using a continuous link layer connection, which may be more appropriate for frequent device communication. For more spontaneous communication, a discontinuous link layer connection, or even a broadcast strategy, may be employed to transmit data while conserving energy in a device. In the scenario where broadcasts are utilized, a repeat pattern may be employed to ensure that message packets are received.

DESCRIPTION OF DRAWINGS

[0012] The present invention will be further understood from the following detailed description of various exemplary embodiments, taken in conjunction with appended drawings, in which:

[0013] FIG. 1A discloses a modular description of an exemplary wireless communication device usable with at least one embodiment of the present invention.

[0014] FIG. 1B discloses an exemplary structural description of the wireless communication device previously described with respect to FIG. 1A.

[0015] FIG. 2 discloses exemplary Bluetooth™ and Wibree™ protocol stacks usable in accordance with at least one embodiment of the present invention.

[0016] FIG. 3A discloses an example of multiple wireless peripheral devices attempting to communicate concurrently with a dual-mode radio modem in accordance with at least one embodiment of the present invention.

[0017] FIG. 3B discloses further detail pertaining to the example of FIG. 3A regarding operational enhancements for managing the operation of a dual-mode modem in accordance with at least one embodiment of the present invention.

[0018] FIG. 4 discloses a more detailed example of a Wibree™ protocol stack in accordance with at least one embodiment of the present invention.

[0019] FIG. 5A discloses an exemplary HID header and a table of HID packet type codes in accordance with at least one embodiment of the present invention.

[0020] FIG. 5B discloses an example of communication packet growth as a part of routing in a typical communication protocol.

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[0021] FIG. 5C discloses an example of HID communication packet growth as a part of routing in a typical communication protocol when packet fragmentation is performed at the HID protocol level.

[0022] FIG. 6 discloses an example of the steps required to send HID message packets utilizing a connection oriented protocol.

[0023] FIG. 7 discloses examples of HID packets formulated as attribute protocol message packets in accordance with at least one embodiment of the present invention.

[0024] FIG. 8 discloses exemplary communication strategies for attribute protocol message packets in accordance with at least one embodiment of the present invention.

[0025] FIG. 9 discloses an example of the steps required to send HID message packets utilizing an attribute protocol in accordance with at least one embodiment of the present invention.

[0026] FIG. 10 discloses a flowchart of an exemplary process for formulating an HID message packet utilizing an attribute protocol in accordance with at least one embodiment of the present invention.

DESCRIPTION OF PREFERRED EMBODIMENT

[0027] While the invention has been described in terms of a number of exemplary embodiments, various changes can be made therein without departing from the spirit and scope of the invention, as described in the appended claims.

I. Wireless communication device

[0028] As previously described, the present invention may be implemented using a variety of wireless communication equipment. Therefore, it is important to understand the communication tools available to a user before exploring the various embodiments of the present invention. For example, in the case of a cellular handset or other handheld wireless devices, the integrated data handling capabilities of the device play an important role in facilitating transactions between the transmitting and receiving devices.

[0029] FIG. 1A discloses an exemplary modular layout for a device usable with the present invention. WCD 100 is broken down into modules representing the functional

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aspects of the device. These functions may be performed by the various combinations of software and/or hardware components discussed below.

[0030] Control module 110 may regulate the overall operation of the device. Inputs may be received from various other modules included within WCD 100. For example, interference sensing module 120 may utilize various techniques known in the art to sense sources of environmental interference within the effective transmission range of the wireless communication device. Control module 110 interprets these data inputs, and in response, may issue control commands to the other modules in WCD 100.

[0031] Communications module 130 may incorporate all of the communication aspects of WCD 100. As shown in FIG. 1A, communications module 130 may include, for example, long-range communications module 132, short-range communications module 134 and machine-readable data module 136 (e.g., for NFC). Communications module 130 utilizes at least these sub-modules to receive a multitude of different types of communication from both local and long distance sources, and to transmit data to recipient devices within the transmission range of WCD 100. Communications module 130 may be triggered by control module 110, or by control resources local to the module responding to sensed messages, environmental influences and/or other devices in proximity to WCD 100.

[0032] User interface module 140 may include visual, audible and tactile elements that allow a user to receive data from, and enter data into, the device. The data entered by a user may be interpreted by control module 110 to affect the behavior of WCD 100. User-inputted data may also be transmitted by communications module 130 to other devices within transmission range. Other devices in transmission range may further send information to WCD 100 via communications module 130, and control module 110 may cause this information to be transferred to user interface module 140 to display for a user.

[0033] Applications module 180 may incorporate all other hardware and/or software applications on WCD 100. These applications may include sensors, interfaces, utilities, interpreters, data applications productivity and/or entertainment applications, etc. These applications may be invoked by control module 210 to read information provided by various modules, and may in turn supply data to requesting modules in WCD 100.

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[0034] FIG. 1B discloses an exemplary structural layout of WCD 100, in accordance with at least one embodiment of the present invention, that may be used to implement the functionality of the modular system previously described with respect to FIG. 1A. Processor 150 may control the overall device operation of WCD 100. As shown in FIG. 1B, processor 150 may be coupled to at least communications sections 154, 158 and 166. Processor 150 may be implemented with one or more microprocessors that are each capable of executing software instructions stored in memory 152.

[0035] Memory 152 may include random access memory (RAM), read only memory (ROM), and/or flash memory, and stores information in the form of data and software components (also referred to herein as modules). The data stored by memory 152 may be associated with various software components or applications. In addition, this data may be associated with databases, such as a bookmark database, a productivity software database including business databases for scheduling, email, contacts, etc.

[0036] The software components stored by memory 152 include instructions that can be executed by processor 150. Various types of software components may be stored in memory 152. For instance, memory 152 may store software components that control the operation of communication sections 154, 158 and 166. Memory 152 may also store software components including a firewall, a service guide manager, a bookmark database, user interface manager, and any communication utilities modules or applications required to support WCD 100.

[0037] Long-range communications 154 may perform functions related to the exchange of information over large geographic areas (such as cellular networks) via an antenna. These communication methods may include technologies from the previously described 1G to 3G. In addition to basic voice communication (e.g., via GSM), long-range communications 154 may operate to establish data communication sessions, such as General Packet Radio Service (GPRS) sessions and/or Universal Mobile Telecommunications System (UMTS) sessions. Also, long-range communications 154 may operate to transmit and receive messages, such as short messaging service (SMS) messages and/or multimedia messaging service (MMS) messages.

[0038] As a subset of long-range communications 154, or alternatively operating as an independent module separately connected to processor 150, transmission receiver 156 allows WCD 100 to receive transmission messages via mediums such as Digital

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Video Broadcast for Handheld Devices (DVB-H). These transmissions may be encoded so that only certain designated receiving devices may access the transmission content, and may contain text, audio or video information. In at least one example, WCD 100 may receive these transmissions and use information contained within the transmission signal to determine if the device is permitted to view the received content.

[0039] Short-range communications 158 is responsible for functions involving the exchange of information across short-range wireless networks. As described above and depicted in FIG. 1B, examples of such short-range communications 158 are not limited to Bluetooth™, Wibree™, WLAN, UWB and Wireless USB connections. Accordingly, short-range communications 158 performs functions related to the establishment of short-range connections, as well as processing related to the transmission and reception of information via such connections.

[0040] Short-range input device 166, also depicted in FIG. 1B, may provide functionality related to the short-range scanning of machine-readable data (e.g., NFC). For example, processor 150 may control short-range input device 166 to generate RF signals for activating an RFID transponder, and may in turn control the reception of signals from an RFID transponder. Other short-range scanning methods for reading machine-readable data that may be supported by short-range input device 166 are not limited to IR communication, linear and 2-D (e.g., QR) bar code readers (including processes related to interpreting UPC labels), and optical character recognition devices for reading magnetic, UV, conductive or other types of coded data that may be provided in a tag using suitable ink. In order for short-range input device 166 to scan the aforementioned types of machine-readable data, the input device may include optical detectors, magnetic detectors, CCDs or other sensors known in the art for interpreting machine-readable information.

[0041] As further shown in FIG. 1B, user interface 160 may also be coupled to processor 150. User interface 160 may facilitate the exchange of information with a user. FIG. 1B shows that user interface 160 includes a user input 162 and a user output 164. User input 162 may include one or more components that allow a user to input information. Examples of such components include keypads, touch screens, and microphones. User output 164 allows a user to receive information from the device. Thus, user output portion 164 may include various components, such as a display, light

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emitting diodes (LED), tactile emitters and one or more audio speakers. Exemplary displays include liquid crystal displays (LCDs), and other video displays.

[0042] WCD 100 may also include one or more transponders 168. This is essentially a passive device that may be programmed by processor 150 with information to be delivered in response to a scan from an outside source. For example, an RFID reader mounted in an entryway may continuously emit radio frequency waves. When a person with a device containing transponder 168 walks through the door, the transponder is energized and may respond with information identifying the device, the person, etc. In addition, a reader may be mounted (e.g., as discussed above with regard to examples of short-range input device 166) in WCD 100 so that it can read information from other transponders in the vicinity.

[0043] Hardware corresponding to communications sections 154, 156, 158 and 166 provide for the transmission and reception of signals. Accordingly, these portions may include components (e.g., electronics) that perform functions, such as modulation, demodulation, amplification, and filtering. These portions may be locally controlled, or controlled by processor 150 in accordance with software communication components stored in memory 152.

[0044] The elements shown in FIG. 1B may be constituted and coupled according to various techniques in order to produce the functionality described in FIG. 1A. One such technique involves coupling separate hardware components corresponding to processor 150, communications sections 154, 156 and 158, memory 152, short-range input device 166, user interface 160, transponder 168, etc. through one or more bus interfaces (which may be wired or wireless bus interfaces). Alternatively, any and/or all of the individual components may be replaced by an integrated circuit in the form of a programmable logic device, gate array, ASIC, multi-chip module, etc. programmed to replicate the functions of the stand-alone devices. Each of these components may also be coupled to a power source, such as a removable and/or rechargeable battery (not shown).

[0045] User interface 160 may interact with a communication utilities software component, also contained in memory 152, which may provide for the establishment of service sessions using long-range communications 154 and/or short-range communications 158. The communication utilities component may include various routines that allow the reception of services from remote devices according to mediums

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such as the Wireless Application Medium (WAP), Hypertext Markup Language (HTML) variants like Compact HTML (CHTML), etc.

II. Wireless communication mediums

[0046] The present invention may be implemented with, but is not limited to, short-range wireless communication mediums. Bluetooth™ is an example of a short-range wireless technology quickly gaining acceptance in thc marketplace. A Bluetooth™ enabled WCD may transmit and receives data, for example, at a rate of 720 Kbps within a range of 10 meters, and may transmit up to 100 meters with additional power boosting. Current systems may run at a nominal rate of 1 Mbps. A user does not actively instigate a Bluetooth™ network. Instead, a plurality of devices within operating range of each other will automatically form a network group called a "piconet". Any device may promote itself to the master of the piconet, allowing it to control data exchanges with up to seven "active" slaves and 255 "parked" slaves. Active slaves exchange data based on the clock timing of the master. Parked slaves monitor a beacon signal in order to stay synchronized with the master, and wait for an activc slot to become available. These devices continually switch between various active communication and power saving modes in order to transmit data to other piconet members. In addition to Bluetooth™ other popular short-range wireless networks include WLAN (of which "Wi-Fi" local access points communicating in accordance with the IEEE 802.11 standard, is an example), WUSB, UWB, ZigBee (802.15.4, 802.15.4a), Wibree™ and UHF RFID. All of these mediums have fcatures and advantages that make them appropriate for various applications.

[0047] Wibree™ is an open standard industry initiative that has been adopted by the Bluetooth™ special intcrest group (SIG) as an ultra low power (ULP) extension of Bluetooth™ that may enable local connectivity in small devices with technology that increases the growth potential in these market segments. Wibree™ technology may complement close range communication with Bluetooth™-likc performance in the 0-10 m range with a data rate of 1 Mbps. Wibree™ is optimized for applications requiring extremely low power consumption, small size and low cost. Wibree™ may be implemented either as stand-alone chip or as Bluetooth™-Wibree™ dual-mode chip. More information can be found on the Wibree™ website: www.wibree.com.

[0048] Now referring to FIG. 2, an exemplary Bluetooth™ protocol stack and an exemplary Wibree™ protocol stack are disclosed. Bluetooth™ stack 200 includes

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elements that may convey information from a system level to a physical layer where it may be transmitted wireless to another device. At the top level, BT Profiles 202 include at least a description of a known peripheral device which may be connected wirelessly to WCD 100 (e.g., in a HID profile), or an application that may utilize Bluetooth™ in order to engage in wireless communication with a peripheral device. The use of the phrase "peripheral devices" is not intended to limit the present invention, and is used only to represent any device external to WCD 100 also capable of wirelessly communicating with WCD 100. Bluetooth™ profiles of other devices may be established through a pairing procedure wherein identification and connection information for a peripheral device may be received by WCD 100 through a polling process and then saved in order to expedite the connection to the device at a later time. After the application and/or target peripheral device (or devices) is established, any information to be sent must be prepared for transmission. L2CAP level 204 includes at least a logical link controller and adaptation protocol. This protocol supports higher level protocol multiplexing packet segmentation and reassembly, and the conveying of quality of service information. The information prepared by L2CAP level 204 may then be passed to an application-optional host controller interface (HCI) 206. This layer may provide a command interface to the lower link manager protocol (LMP) layers, link manager (LM) 208 and link controller (LC) 210. LM 208 may establish the link setup, authentication, link configuration and other protocols related to establishing a wireless link between two or more devices. Further, LC 210 may manage active links between two or more devices by handling low-level baseband protocols. Wireless communication may then be established and conducted using the hardware (modem, antenna, etc.) making up physical layer (PHY) 212. Of course, the above identified layers of Bluetooth™ stack 200 may also be utilized in an order reversed from that disclosed above in order to receive a wireless transmission into WCD 100 from a peripheral device.

[0049] The layers in the standalone Wibree™ stack 220 are similar to the elements previously described. However, due to the relative simplicity of Wibree™ when compared to Bluetooth™, there are actually less layers utilized to achieve wireless communication. W Profiles 222, similar to the profiles used in Bluetooth™, are used to specify applications that may use Wibree™ for communication and peripheral devices with which a Wibree™ modem may wirelessly communicate (e.g., in a HID profile). The

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profile adoption layer (PAL) 224 may be used to prepare the information for transmission via wireless communication. Host interface (e.g., HIF and also sometimes referred to as host control interface, HCI, as in Bluetooth™) 226 may provide an interface between the upper layers communicating with applications and schedulers in WCD 100, and the lower layers of the Wibree™ stack 220 which establish and maintain the links to peripheral devices. Lower layers of the Wibree™ stack 220 may further include at least link layer (LL) 228. LL 228 may both establish and maintain wireless communications with other wireless enabled devices through the use of Physical Layer (PHY) 230. Wibree™ LL 228, however, differs significantly from LM 208 and LC 210 in Bluetooth™.

III. Dual-mode modem

[0050] FIG. 3A includes an alternative exemplary implementation of at least one embodiment of the present invention. Again, in this example the three human interface devices (302, 304 and 306) are attempting concurrent communication with WCD 100 through dual-mode radio modem 300. Radio modem 300 may include local control resources for managing both "radios" (e.g., Bluetooth™ and Wibree™ software based radio control stacks) attempting to use the physical layer (PHY) resources of dual-mode radio modem 300. In this example, dual-mode radio modem 300 includes at least two radio stacks or radio protocols (labeled "Bluetooth" and "Wibree") that may share the PHY layer resources (e.g., hardware resources, antenna, etc.) of dual-mode radio modem 300. The local control resources may include an admission controller ("Adm Ctrl") and a dual-mode controller ("DuMo Manager"). These local control resources may be embodied as a software program and/or in a hardware form (e.g., logic device, gate array, MCM, ASIC, etc.) in a dual-mode radio modem interface, and the radio modem interface may be coupled to, or alternatively, embedded in dual-mode radio modem 300. The interaction of these control resources with the radio protocols utilizing dual-mode radio modem 300 is explained in reference to FIG. 3B.

[0051] With respect to FIG. 3B, an exemplary combination of the two separate radio protocol stacks (previously discussed with respect to FIG. 2) into a single combined entity controlled locally by at least an admission control 304 and a DuMo manager 316 is now disclosed. The two previously described standalone stacks are shown to establish the individual elements that may be incorporated into an integrated dual-mode entity 312. For a more specific discussion of the functioning of admission control 314 and a DuMo

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manager 316 in terms of managing the operations of dual-mode modem 300, please refer to Application No. 11/538,310, filed October 3, 2006, which is hereby incorporated by reference. Briefly, admission control 314 may act as a gateway for the dual-mode radio modem 300 by filtering out both Bluetooth™ and Wibree™ requests from the operating system of WCD 100 that may result in conflicts. Scheduling information may also be provided by Multiradio controller (MRC) 170, wherein certain periods of operation are allocated to dual-mode radio modem 300 in view of the other active radio modems operating in WCD 100. This scheduling information may be passed down to both the HCI + Extension level of the combined protocol stacks and also to DuMo manager 1228 for further processing. However, if scheduling information from MRC 600 is critical (delay-sensitive), it may be sent through MCS 700 via a direct connection to DuMo Manager 1228. The information received by DuMo manager may 316 then be used to create an interleaved schedule for dual-mode radio modem 300 allowing both the Bluetooth™ and Wibree™ protocols to operate concurrently.

IV. Protocol stacks and packet routing

[0052] FIG. 4 includes a more detailed description of the upper layers of the Wibree™ communication protocol. The Wibree™ system includes two parts: the Wibree™ Radio 408 and the Wibree™ Host 402. Connection between radio 408 and host 402 goes through the HIF (also known as HCI). Further, PAL 224 includes at least General Access Profile (GAP) 406.

[0053] Application layer 400 may include various software applications that may be executed on computing devices. For example, an application may be a communication utility or productivity program running on WCD 100. An application may use W Profiles 222 in Wibree™ (e.g. Profile 1, Profile 2, HID profile, etc.) in order to formulate message packets for conveyance utilizing Wibree™ protocol stack 220. This wireless transaction may be supervised by Host Manager 404. The information may then be prepared by PAL 224 and GAP 406 for routing to Wibree™ radio 408, wherein LL 228 may both establish new wireless connections and manage existing connections with peripheral devices through the various resources (modem, antenna, etc.) that make up PHY layer 230.

V. Problems with packet routing in existing devices

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[0054] Fig. 5A discloses an example of a HID message packet header 500 in accordance with at least one embodiment of the present invention. The HID header 500 may be one byte, including 8 bits that may specify two message packet characteristics. Bits 4-7 may express a HID packet type, and bits 0-3 may express any necessary parameters required by the particular header type. The various packet types that may be indicated in HID header 500 are shown further in table 502. The disclosed packet types may indicate, for example, whether the packet is a handshake, report, protocol or data packet. Further, the DataC type may be utilized to indicate that a message packet has been broken down into to smaller message packets due to the original packet being too large, and that the following packet is the continuation of the data in the DataC packet. The DataC functionality allows fragmentation of packets to occur at the HID profile level instead of delegating fragmentation to PAL 224 or below, reducing the reliance of the on lower level message packet handling and fragmentation when wirelessly conveying data.

[0055] Fig. 5B discloses a routing example for HID packets being created in a wireless communication protocol stack in accordance with methods currently known in the art. The wireless communication protocol in this example is Bluetooth™. A basic information frame packet (B-frame packet) is disclosed in layer 510. The packet in layer 510 may include at least a header portion and a payload portion. The header includes routing destination information for the packet, and the payload includes information such as general data, commands with corresponding parameters, etc. The header information in this example is a basic L2CAP header 512 including at least a length and a channel ID. The header for exemplary packet 510 further includes HID header 514. Information included in the header may then be used in routing the packet to the next layer.

[0056] The process of header creation repeats in the next protocol layer 516 , and the new header information may be inserted in front of the packet (as received) before being forwarded to the next layer. Packets may become so large that, in the case of some networks, the packet will exceed the maximum allowed length and will have to be split (e.g., fragmented). An example of packet fragmentation is shown in FIG. 5B wherein the packet from layer 510 is separated in layer 516 into packets 518 and 520. These two packets may then be forwarded to PHY layer 522 where additional header information may be added to each packet to form packets 524 and 526. These packets may then be transmitted via wireless communication and subsequently reassembled by a receiving

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device. In a receiving device the process shown may work in reverse, wherein each level from PHY to L2CAP (in the case of Bluetooth™) may remove the packet information added by the corresponding layer until the original packet manifests at the top level.

[0057] Another example of packet fragmentation is disclosed in FIG. 5C. In this example, HID data 550 may be created at the HID application level. The creation of this information may be triggered, for example, in response to an HID event in an HID device. In some instances, HID data 550 may yield a message packet that must first be segmented before being passed down through the protocol stack. For example, the size of a message packet created from HID data 550 may exceed a maximum transfer unit (MTU) size setting defined for the L2CAP layer. More specifically, the MTU setting may specify a maximum message packet size permitted for transmission by the L2CAP layer. The HID protocol includes, among other things, the ability to fragment message packets, and as a result, exemplary HID packets 552 and 554 may be created from original HID data 550.

[0058] Similar to the previous example, message packets 552 and 554 may then be passed to the L2CAP layer to form message packets 556 and 558. Since fragmentation has already occurred at the HID profile level, no further fragmentation is necessary in the L2CAP layer. The L2CAP may then pass message packets 556 and 558 to the link level layer where additional header information may be added to yield message packets 560 and 562. Finally, link level layer message packets 560 and 562 may be passed to PHY layer, where additional routing information may be added to the header to form message packets 564 and 566. The message packets may then be sent via wireless communication.

[0059] In many wireless systems this packet size enlargement may not be a problem. Systems with more processing resources and unlimited power may be designed to handle higher packet traffic with larger packets. However, moving large packets may present a problem in restricted resource systems. Each transferred byte takes additional power, so systems that run under tight power constraints, for example battery-powered systems in small electronic devices, may experience operational difficulties due to the energy wasted in moving large packets. Further, buffer size limitations in some devices, for example simple wireless devices, may be limited in the lower protocol stack layers. As a result, there may not be adequate space to reassemble packets if the overall packet size has grown so substantially that a single message packet becomes highly fragmented.

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[0060] Bluetooth™ currently specifies that HID message packets be sent utilizing a connection oriented protocol in L2CAP 204. A connection oriented protocol requires that messaging channels first be established before message packets may be sent. FIG. 6 discloses and example of the steps involved in this communication. Host A 600 and Host B 602 may first establish a link layer connection as shown at 604. After this initial low level connection, the connection channel must first be opened before message packets may be sent. At 606, a PAL_Channel_Connect_Request may be issued from Host A 600. This initial message may convey the channel ID information for the control and interrupt channels to Host B 602. After this message is received, Host B 602 may save the channel ID information and may respond with a PAL_Channel_Connect_Response message.

[0061] Once channels are established, message packets transmitted on a channel may be identified by the channel ID. More specifically, the transmitting device sets the channel ID of the receiving device to the HID packet it is transmitting. This way, the receiving device may not only distinguish between HID control and interrupt messages, but may also distinguish HID message packets from packets created by another profile. After the HID protocol messages are sent as shown at 606 in FIG. 6, the channels that were opened between Host A 600 and Host B 602 must be closed. However, in some cases this termination may be problematic. For example, a Bluetooth™ mouse may not immediately terminate connection because there may be continuous data exchange (e.g., as the mouse is moved) requiring a continuous LL and L2CAP (e.g., or PAL) channel connections. For devices that transmit data very infrequently, such as a remote control, there is no benefit in maintaining these continuous connections. More importantly, these continuous connections may negatively impact resource-constrained devices since each time a device sends messages it must first create a LL connection, L2CAP channels, send the data, close the L2CAP connection and then the LL connection. This is shown where PAL_Channel_Disconnect_Request is followed by PAL_Channel_Disconnect_Response. The link level connection may then terminate communication between the devices at 608.

[0062] While the aforementioned HID message packet conveyance process may be acceptable for WCD 100, it may be overly burdensome for less sophisticated devices. For example, the necessity to establish one or more wireless channels for particular types of messaging, and then the requirement to connect and disconnect these channels before sending message packets would require both processing and power resources. In many

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simple devices both these resources are constrained, and therefore, the aforementioned PID message process, as set forth under Bluetooth™, is not optimized for these devices. Further, communication delays may become detrimental in the operation of devices that do not communicate on a regular or periodic basis, like a remote control. The duration of time needed for devices to establish lower level links and messaging channels every time a message is sent, and then subsequently closing these connections, may be prohibitive to spontaneous communication scenarios where immediate response is desired or required.

VI. Sending HID message packets utilizing attribute protocol

[0063] The present invention, in at least one embodiment, reduces the number of steps involved in conveying HID message packets, and as a result, may be more suitable for devices that, for example, are simple and/or resource-constrained, as well as devices that may require fast response to sporadic messaging. While Wibree™ will be described for the sake of explanation, the present invention is not limited to using in this wireless communication medium, and may also utilize Bluetooth™ or any other similar protocol.

[0064] Various embodiments of the present invention propose a fundamental change from the strategy utilized in the Bluetooth™ HID profile when implementing an HID profile in Wibree™. As previously described, the Bluetooth™ HID profile utilizes messaging controlled in L2CAP layer 204 that first requires the establishment of control and interrupt channels before conveying HID message packets. However, Wibree™ includes an attribute protocol that doesn't require the initial establishment of channels in PAL 224 before conveying a message. Therefore, using the attribute protocol may reduce overall communication burden, making it more appropriate for resource limited devices.

[0065] FIG. 7 discloses a variety of exemplary HID message packet structures in accordance with at least one embodiment of the present invention. A generic attribute packet created, for example by Wibree™ PAL 224, is shown at 700-704. Data payload 704 may be 28 bytes in length. The header portion of the exemplary attribute packet may include an attribute handle or a universally unique identifier (UUID) 702 that may be two bytes in length, as well as an operational code, or opcode 700, that is one byte in length. Opcode 700 relates to commands that may be interpreted by a receiving device. More specifically, opcode 700 may specify operations to be performed, the specification and format of which may be defined within the instruction set architecture (ISA) of the

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receiving device. WCD 100 may utilize this information to process message packets without having to first establish messaging channels for different HID message types.

[0066] An exemplary embodiment of the present invention utilizing attribute handles is shown in FIG. 7 at 710-716. A packet utilizing attribute handle-value indication may include a data payload 716 of 27 bytes, a HID header 714 of one byte, an attribute handle 712 of two bytes and a one byte opcode 710. Attribute Handle 712 may utilize reserved values for control and interrupt message packets that may be exchanged and stored when two devices first encounter each other. After this initial exchange, HID message packets may be sent without having to first establish a control and interrupt channel. Instead, a receiving device may identify the type of HID message packet from the previously stored attribute handle 712 and then process the packet accordingly.

[0067] Alternatively, another configuration of HID packet usable with the exemplary proposed Wibree™ HID architecture is shown in FIG. 7 at 720-726. UUID 722 may replace attribute handle 712 in the attribute packet header. Otherwise, data payload 726, HID header 724 and opcode 720 may be similar to the examples disclosed above. In this approach, only a UUID 722 of the pipe (e.g., control or interrupt) is required. UUID 722 may include a universally defined reserved value (e.g., 0x0011 or 0x0013) each specifying a control and an interrupt message types. Devices using this exemplary packet configuration do not need to define attribute handles 712 for UUID 722, exchange attribute handles 712 with each other, or store attribute handles 712 of encountered devices. As a result, using UUID 722 directly may be especially beneficial for HID devices and/or hosts that may be connected to multiple HID devices, because the universal definition of UUID 722 removes the requirement of storing multiple attribute handles 712 specific to each encountered HID device. Further, as described with respect to the attribute handle packet configuration, no preconfigured PAL-level messaging channels are required since the packet type is determinable from UUID 722 alone.

VII. Communication strategy

[0068] The attribute handle and UUID packet configurations of FIG. 7 may result in more compact and efficient communication between devices. This, in turn, may allow for alternative device communication strategies customizable to different scenarios. FIG. 8 discloses three exemplary communication strategies in accordance with at least one embodiment of the present invention. The first strategy utilizes a continuous link layer

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connection between devices. For example, a peripheral device may be wirelessly coupled to WCD 100 utilizing Wibree™. In this scenario, Master/HID host 800 may transmit packets at regular intervals. Slave/HID slave 802, aware this regular interval, may respond accordingly to each interval, or may skip some connection events if connection parameters enable a sleep mode. This strategy may be suitable where quick message response is required or devices are communicating constantly, and therefore, maintaining a continuous connection will help to maintain optimized communication performance.

[0069] The second example is a discontinuous link layer connection only when needed. HID host (initiator and master) 810 may request a connection by scanning for advertising information from HID device (advertiser and slave) 812. When the HID device has information to transmit, the HID may began to send advertising data which may be scanned by HID host 810. A connection may then be established by the initiator 810 in order to convey message packets between the devices. This type of link may be more appropriate for devices that communicate regularly, but not frequently enough to warrant the power expended in maintaining a continuous connection between the devices.

[0070] A third communication strategy may be most suitable for devices that communicate infrequently and/or spontaneously. For example, a remote control utilizing Wibree™ may fall within this category. HID host (scanner) 820 may scan at regular intervals for signals from HID device (advertiser) 822. HID device (advertiser) 822 may then transmit a broadcast signal whenever message packets are pending for transmission (e.g., in response to an action or event in HID device 822). One possible drawback to this strategy is that there is no acknowledgement that the broadcast has been received by HID host (scanner) 820. In at least one embodiment of the present invention, HID device 822 may repeat the broadcast message packets in a predetermined pattern in order to help ensure that the message packets being broadcast will be received by host (scanner) 822.

[0071] Now referring to FIG. 9, an exemplary activity flow for HID messages sent utilizing an attribute protocol in Wibree™ is disclosed in accordance with at least one embodiment of the present invention. As described with respect to FIG. 6, Host A 600 and Host B 602 may be coupled wirelessly via link level connection 604. However, in this example no channels are needed since an attribute protocol is being employed to communicate HID message packets instead of the previously described L2CAP controlled messaging as dictated by the Bluetooth™ HID profile. As disclosed at 900, only an HID

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protocol message attribute is transmitted before the connection is terminated at 608. As a result, the communication of HID message packets may require fewer steps, conserving processing and energy resources, which may be beneficial in resource limited devices. A reduction in steps needed to send messages may also yield faster message processing, and therefore, faster response in a receiving device that increases overall system performance.

[0072] An exemplary flowchart in accordance with at least one embodiment of the present invention is disclosed in FIG. 10. Initially, a link level connection may be established in step 1000 via a wireless communication medium (e.g., Wibree™). The process may then wait in step 1002 to until an HID event is detected. An HID event may include, for example, a user interaction with a human interface device (e.g., typing on a keyboard, moving a mouse, activating a headset, etc.) It is important to note that while a connection is shown as being established before an HID event in the present example, it is also possible for the HID event to occur before the link, which may in turn trigger the establishment of a wireless connection in order to send HID message packets. At least one scenario wherein the HID event may occur first is an instance where the HID device is acting in a remote control mode. Irregular use may be more suitable for a broadcast-type connection such as discussed in FIG. 8, part C. When communication is sporadic, device resources may be conserved by only maintaining a wireless link when necessary.

[0073] Regardless of the step in the process during which a wireless connection may be established, an HID message packet may be formulated in response to the detected event as disclosed in step 1004. More specifically, the type and content of packet (e.g., control or interface) may be determined by the nature of the event. A determination may then be made in step 1006 as to whether packet fragmentation is required in view of the HID packet size, the limitations of the wireless communication medium being used, etc. If fragmentation is required, then in step 1008 fragmentation may occur at the HID profile level. Adjusting packet size at this high level allows the present invention, in accordance with at least one embodiment, to avoid reliance on the L2CAP 204 or PAL 224 protocol levels for packet resizing. Regardless of whether packet fragmentation is required, the exemplary process may then proceed to step 1010, wherein the one or more HID message packets may be prepared for transmission using an attribute protocol by attaching header data usable for identification and routing purposes.

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[0074] In step 1010 a determination may be made as to whether the one or more message packets are associated with HID control messages or interrupt messages. If the one or more message packets are part of an HID interrupt message, then in step 1012 a UUID 722 or attribute handle 712 may be added to the one or more message packets identifying them as interrupt packets. Alternatively, if the one or more message packets are part of a HID control message, then in step 1014 a UUID 722 or attribute handle 712 header may be added to the one or more message packets identifying them as part of control message. In either case, steps 1012 or 1014 may proceed to step 1016 so that an opcode (e.g., 710) may be added to each header of the one or more message packets.

[0075] If the one or more message packets are being sent as part of a broadcast message (e.g., no acknowledgement will be received), then it may be appropriate to execute a repeat pattern in order to increase the likelihood that the one or more message packets will be received. A determination as to the message strategy to be employed may be made in step 1018. If the message is not a broadcast message (e.g., the one or more message packets are being conveyed utilizing a continuous link layer or discontinuous link layer connection), the process may send the message (including the transmission of the one or more message packets and the receipt of corresponding acknowledgements from the receiving device) in step 1020 and then resume again at step 1000 awaiting the detection of new HID events requiring the generation of HID message packets. However, if in step 1018 the one or more message packets are determined to be part of a broadcast message, then in step 1022 the one or more message packets may be sent in accordance with a predetermined repeat pattern, after which the process may return to step 1000 to await the detection of new HID events requiring the generation of HID message packets.

[0076] Accordingly, it will be apparent to persons skilled in the relevant art that various changes in forma and detail can be made therein without departing from the spirit and scope of the invention. The breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

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WHAT IS CLAIMED:

1. A method, comprising:

establishing a link level connection over a wireless communication medium;

detecting an event requiring human interface device (HID) profile based communication;

determining a type for one or more HID message packets based on the event;

creating the one or more message packets at the HID profile level of a protocol stack for the wireless communication medium, each of the one or more message packets comprising a HID header field and a data payload field;

adding an attribute header corresponding to the determined type to each of the one or more message packets; and

sending the one or more message packets via the wireless communication medium.

2. The method of claim 1, wherein creating the one or more message packets includes a determination as to whether the one or more message packet requires fragmentation.

3. The method of claim 1, wherein determining a type includes determining whether the one or more message packets are control message packets or interrupt message packets.

4. The method of claim 1, wherein the attribute header includes at least opcode information.

5. The method of claim 4, wherein the attribute header further includes either attribute handle information or universally unique identifier (UUID) information.

6. The method of claim 5, wherein adding an attribute header comprises including the opcode information and either the attribute handle information or the UUID

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information in each attribute header, the attribute handle information and the UUID information identifying each message packet as a control message packet or an interrupt message packet.

7. The method of claim 1, wherein sending the one or more message packets does not require any pre-established profile adaptation layer (PAL) communication channels.

8. The method of claim 1, wherein sending the one or more message packets further comprises receiving an acknowledgement for the one or more message packets.

9. The method of claim 1, wherein sending the one or more packets further comprises broadcasting the one or more packets without receiving acknowledgement.

10. The method of claim 9, wherein broadcasting the one or more message packets includes repeating the one or more message packets in a predetermined pattern.

11. A computer program product comprising a computer usable medium having computer readable program code embodied in said medium, comprising:

a computer-readable program code configured to establish a link level connection over a wireless communication medium;

a computer-readable program code configured to detect an event requiring human interface device (HID) profile based communication;

a computer-readable program code configured to determine a type for one or more HID message packets based on the event;

a computer-readable program code configured to create the one or more message packets at the HID profile level of a protocol stack for the wireless communication medium, each of the one or more message packets comprising a HID header field and a data payload field;

a computer-readable program code configured to add an attribute header corresponding to the determined type to each of the one or more message packets; and

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a computer-readable program code configured to send the one or more message packets via the wireless communication medium.

12. The computer program product of claim 11, wherein creating the one or more message packets includes a determination as to whether the one or more message packet requires fragmentation.

13. The computer program product of claim 11, wherein determining a type includes determining whether the one or more message packets are control message packets or interrupt message packets.

14. The computer program product of claim 11, wherein the attribute header includes at least opcode information.

15. The computer program product of claim 14, wherein the attribute header further includes either attribute handle information or universally unique identifier (UUID) information.

16. The computer program product of claim 15, wherein adding an attribute header comprises including the opcode information and either the attribute handle information or the UUID information in each attribute header, the attribute handle information and the UUID information identifying each message packet as a control message packet or an interrupt message packet.

17. The computer program product of claim 11, wherein sending the one or more message packets does not require any pre-established profile adaptation layer (PAL) communication channels.

18. The computer program product of claim 11, wherein sending the one or more message packets further comprises receiving an acknowledgement for the one or more message packets.

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19. The computer program product of claim 11, wherein sending the one or more packets further comprises broadcasting the one or more packets without receiving acknowledgement.

20. The computer program product of claim 19, wherein broadcasting the one or more message packets includes repeating the one or more message packets in a predetermined pattern.

21. A module, comprising:

at least one communication component coupled to an antenna array, and

at least one processing component coupled to the communication component, the at least one processing component being configured to:

establish a link level connection over a wireless communication medium;

detect an event requiring human interface device (HID) profile based communication;

determine a type for one or more HID message packets based on the event;

create the one or more message packets at the HID profile level of a protocol stack for the wireless communication medium, each of the one or more message packets comprising a HID header field and a data payload field;

add an attribute header corresponding to the determined type to each of the one or more message packets; and

send the one or more message packet via the wireless communication medium.

22. A device, comprising:

at least one communication module; and

at least one processor coupled to the communication module, the at least one processor being configured to:

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establish a link level connection over a wireless communication medium;

detect an event requiring human interface device (HID) profile based communication;

determine a type for one or more HID message packets based on the event;

create the one or more message packets at the HID profile level of a protocol stack for the wireless communication medium, each of the one or more message packets comprising a HID header field and a data payload field;

add an attribute header corresponding to the determined type to each of the one or more message packets; and

send the one or more message packet via the wireless communication medium.

23. The device of claim 22, wherein determining a type includes determining whether the one or more message packets are control message packets or interrupt message packets.

24. A device, comprising:

means for establishing a link level connection over a wireless communication medium;

means for detecting an event requiring human interface device (HID) profile based communication;

means for determining a type for one or more HID message packets based on the event;

means for creating the one or more message packets at the HID profile level of a protocol stack for the wireless communication medium, each of the one or more message packets comprising a HID header field and a data payload field;

means for adding an attribute header corresponding to the determined type to each of the one or more message packets; and

means for sending the one or more message packets via the wireless communication medium.

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25. The device of claim 24, wherein determining a type includes determining whether the one or more message packets are control message packets or interrupt message packets.

26. A system comprising:

at least one host device; and

at least one human interface device (HID);

the at least one HID device establishing a link level connection with the at least one host device over a wireless communication medium;

the at least one HID device detecting an event requiring human interface device (HID) profile based communication;

the at least one HID device determining a type for one or more HID message packets based on the event;

the at least one HID device creating the one or more message packets at the HID profile level of a protocol stack for the wireless communication medium, each of the one or more message packets comprising a HID header field and a data payload field;

the at least one HID device adding an attribute header corresponding to the determined type to each of the one or more message packets; and

the at least one HID device sending the one or more message packets to the at least one host device via the wireless communication medium.

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FIG. 1A

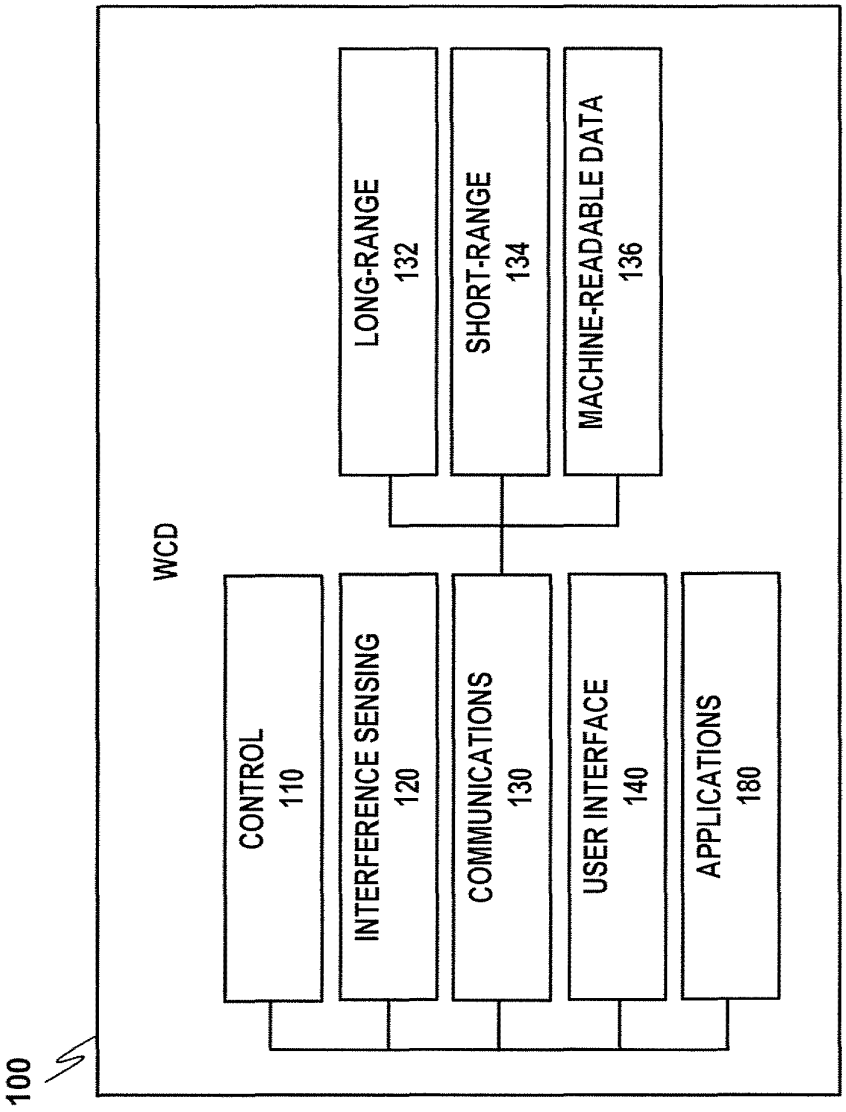

100
WCD
CONTROL
110
INTERFERENCE SENSING
120
COMMUNICATIONS
130
USER INTERFACE
140
APPLICATIONS
180
LONG-RANGE
132
SHORT-RANGE
134
MACHINE-READABLE DATA
136

FIG. 1B

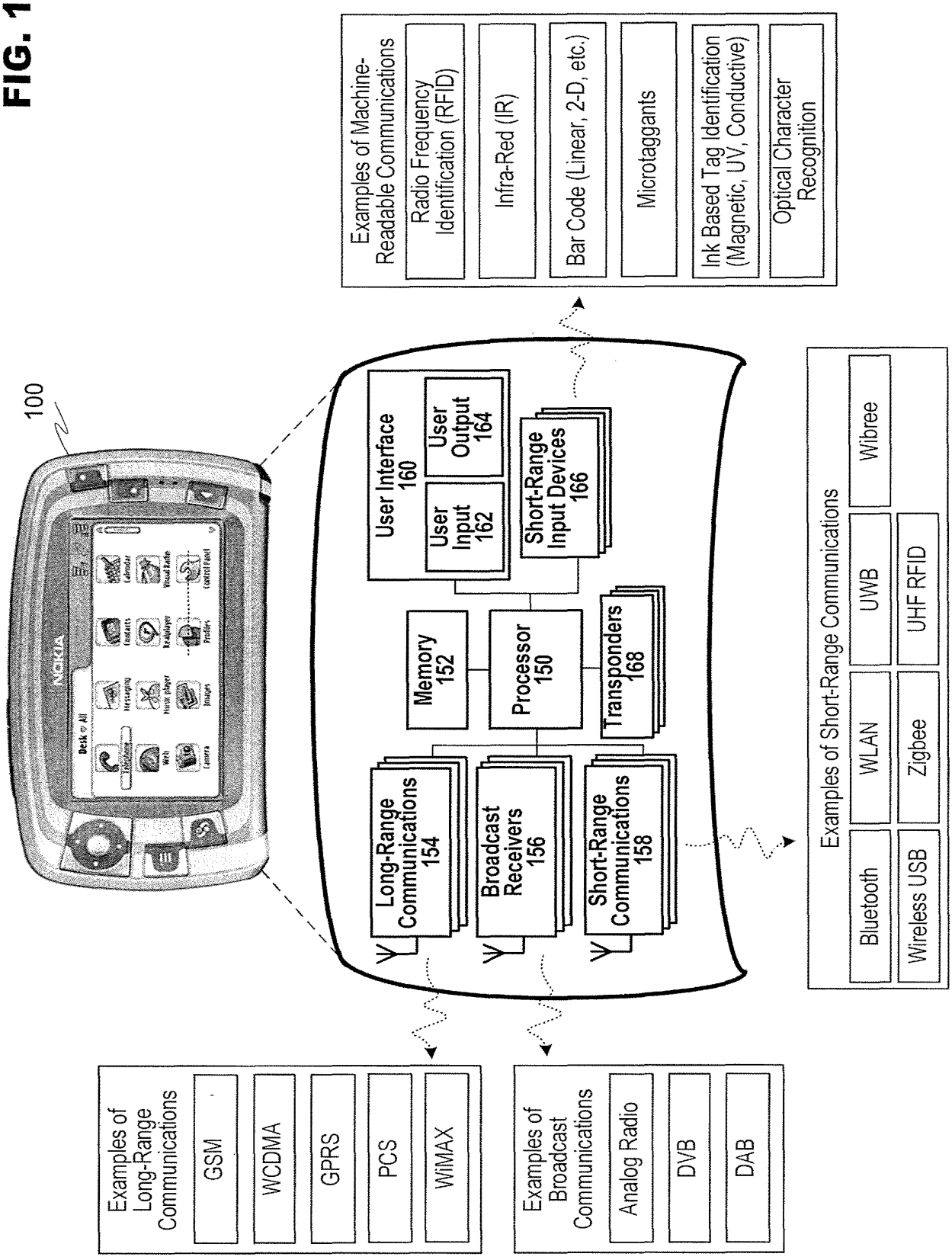
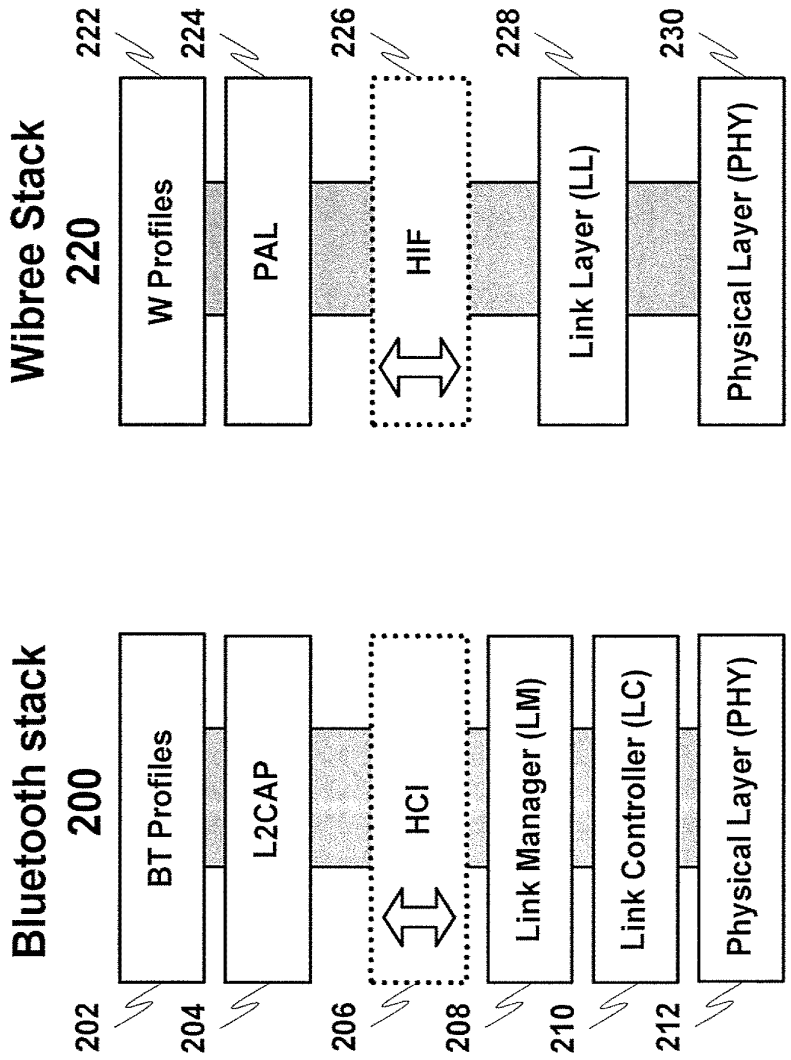

100
Examples of Machine-Readable Communications
Radio Frequency Identification (RFID)
Infra-Red (IR)
Bar Code (Linear, 2-D, etc.)
Microtaggants
Ink Based Tag Identification (Magnetic, UV, Conductive)
Optical Character Recognition
User Interface 160
User Input 162
User Output 164
Short-Range Input Devices 166
Memory 152
Processor 150
Transponders 168
Long-Range Communications 154
Broadcast Receivers 156
Short-Range Communications 158
Examples of Short-Range Communications
Bluetooth
WLAN
UWB
Wibree
Wireless USB
Zigbee
UHF RFID
Examples of Long-Range Communications
GSM
WCDMA
GPRS
PCS
WiMAX
Examples of Broadcast Communications
Analog Radio
DVB
DAB

FIG. 2


Wibree Stack
220
W Profiles
PAL
HIF
Link Layer (LL)
Physical Layer (PHY)
222
224
226
228
230
Bluetooth stack
200
BT Profiles
L2CAP
HCI
Link Manager (LM)
Link Controller (LC)
Physical Layer (PHY)
202
204
206
208
210
212

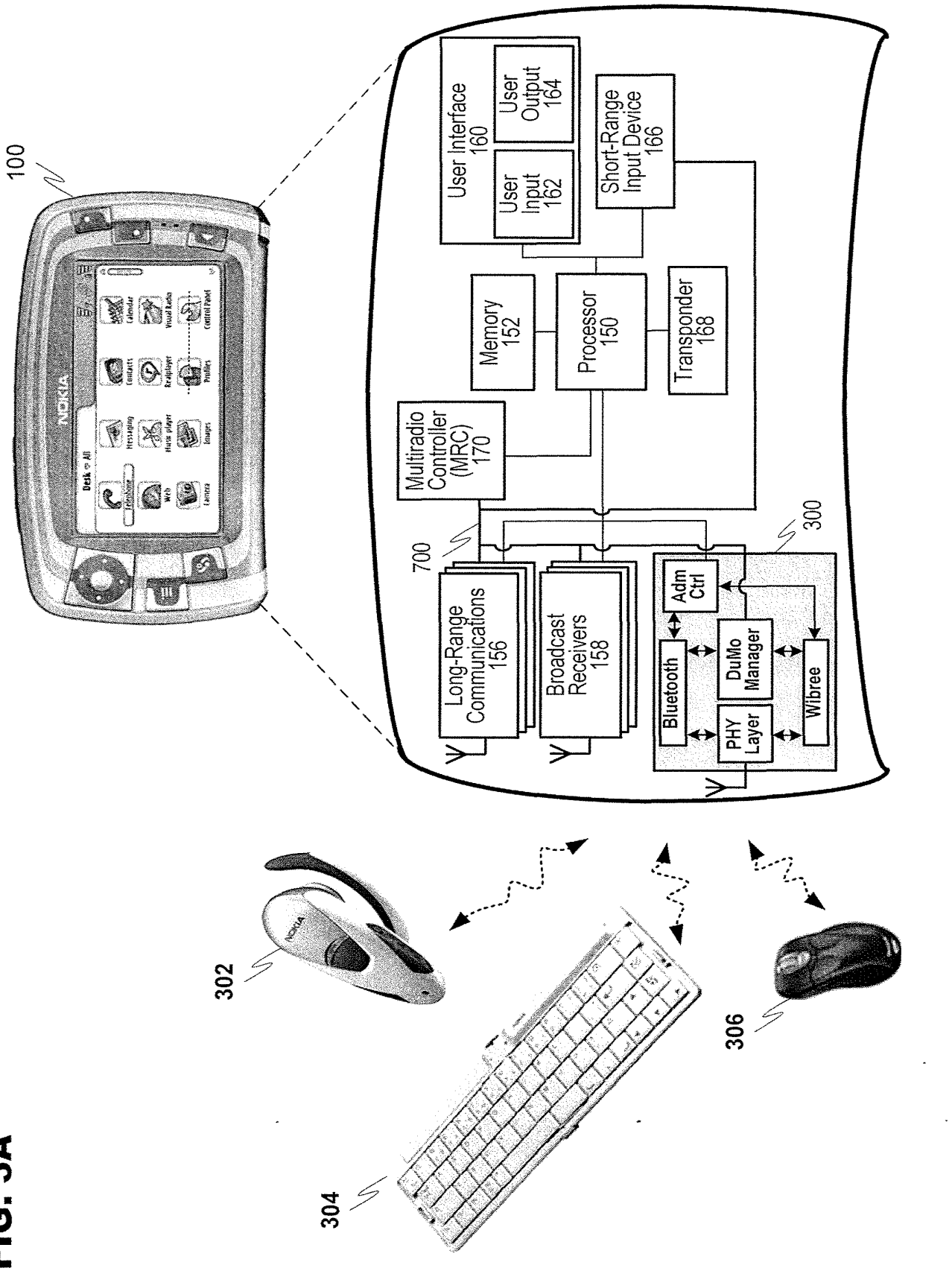

100
User Interface 160
User Input 162
User Output 164
Short-Range Input Device 166
Memory 152
Processor 150
Transponder 168
Multiradio Controller (MRC) 170
700
300
Long-Range Communications 156
Broadcast Receivers 158
Adm Ctrl
Bluetooth
DuMo Manager
PHY Layer
Wibree
302
304
306

FIG. 3A

FIG. 3B

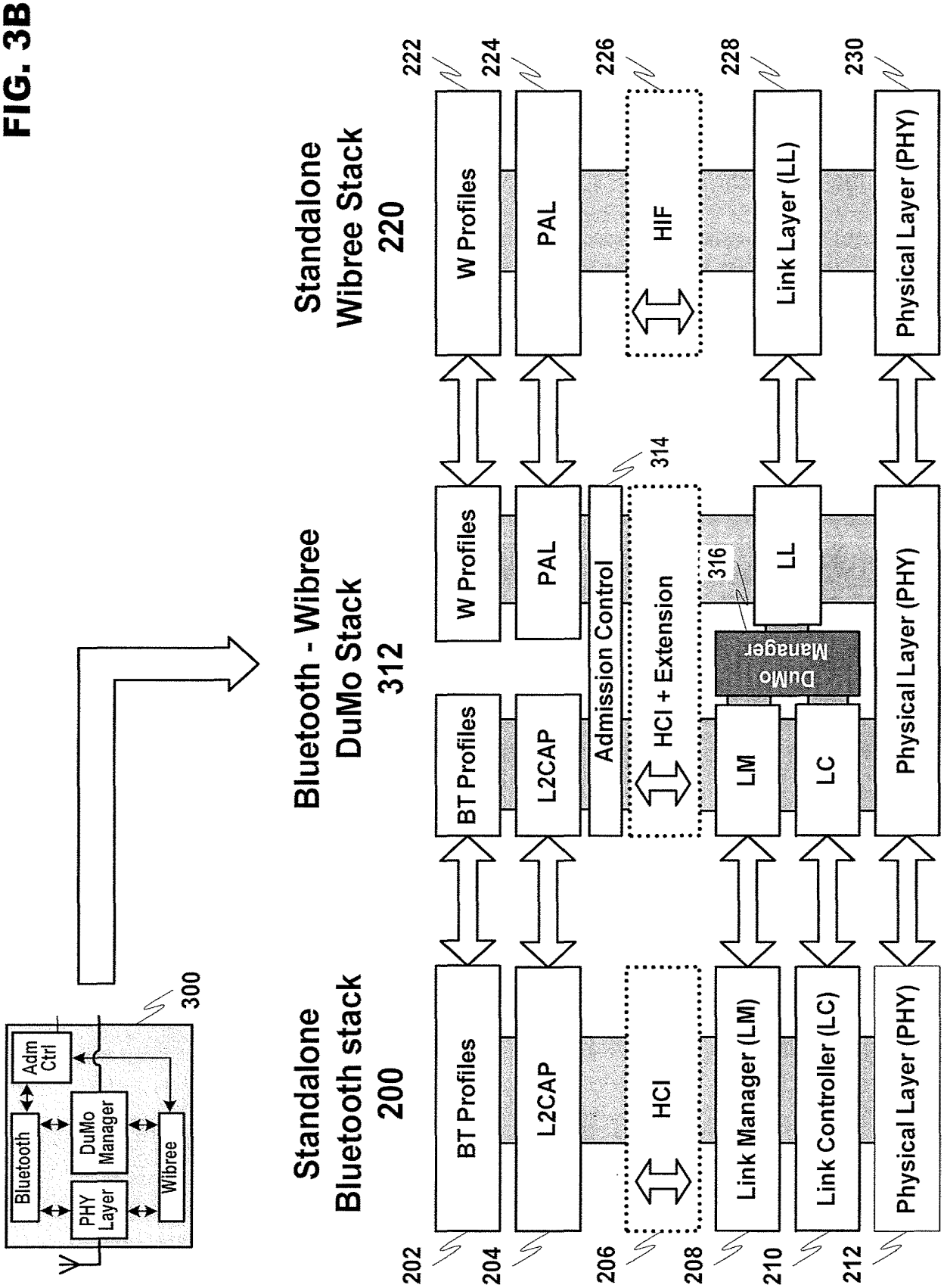

300
Adm Ctrl
Bluetooth
DuMo Manager
PHY Layer
Wibree
Standalone Bluetooth stack 200
Bluetooth - Wibree DuMo Stack 312
Standalone Wibree Stack 220
BT Profiles
L2CAP
HCI
Link Manager (LM)
Link Controller (LC)
Physical Layer (PHY)
Admission Control
HCI + Extension
314
316
DuMo Manager
LM
LC
LL
W Profiles
PAL
HIF
Link Layer (LL)
Physical Layer (PHY)
202
204
206
208
210
212
222
224
226
228
230

FIG. 4

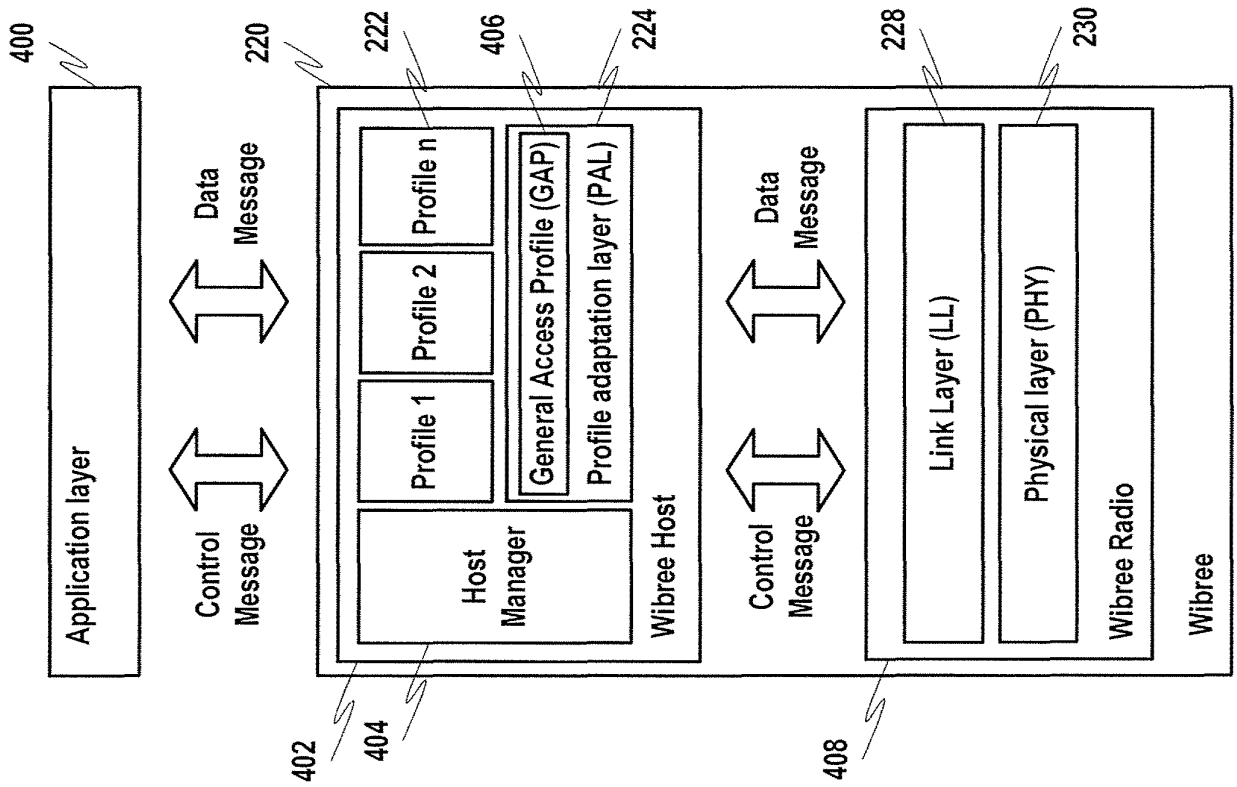
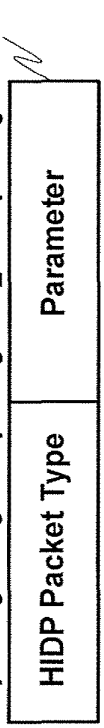

400
Application layer
Data Message
Control Message
220
222
406
224
228
230
Profile n
Profile 2
Profile 1
General Access Profile (GAP)
Profile adaptation layer (PAL)
Host Manager
Wibree Host
Data Message
Control Message
Link Layer (LL)
Physical layer (PHY)
Wibree Radio
Wibree
402
404
408

FIG. 5A



502

Hex	Packet Type	Sent By	Payload Length (Bytes)
0	HANDSHAKE	Device	1
1	HID_CONTROL	Device and Host	1
2-3	Reserved	N/A	
4	GET_REPORT	Host	1 to 4
5	SET_REPORT	Host	1 + Report data payload
6	GET_PROTOCOL	Host	1
7	SET_PROTOCOL	Host	1
8	Reserved	N/A	
9	Reserved	N/A	
A	DATA	Device and Host	1 + Report data payload
B	DATAC	Device and Host	1 + Continuation of report data payload
C-F	Reserved	N/A	

FIG. 5B

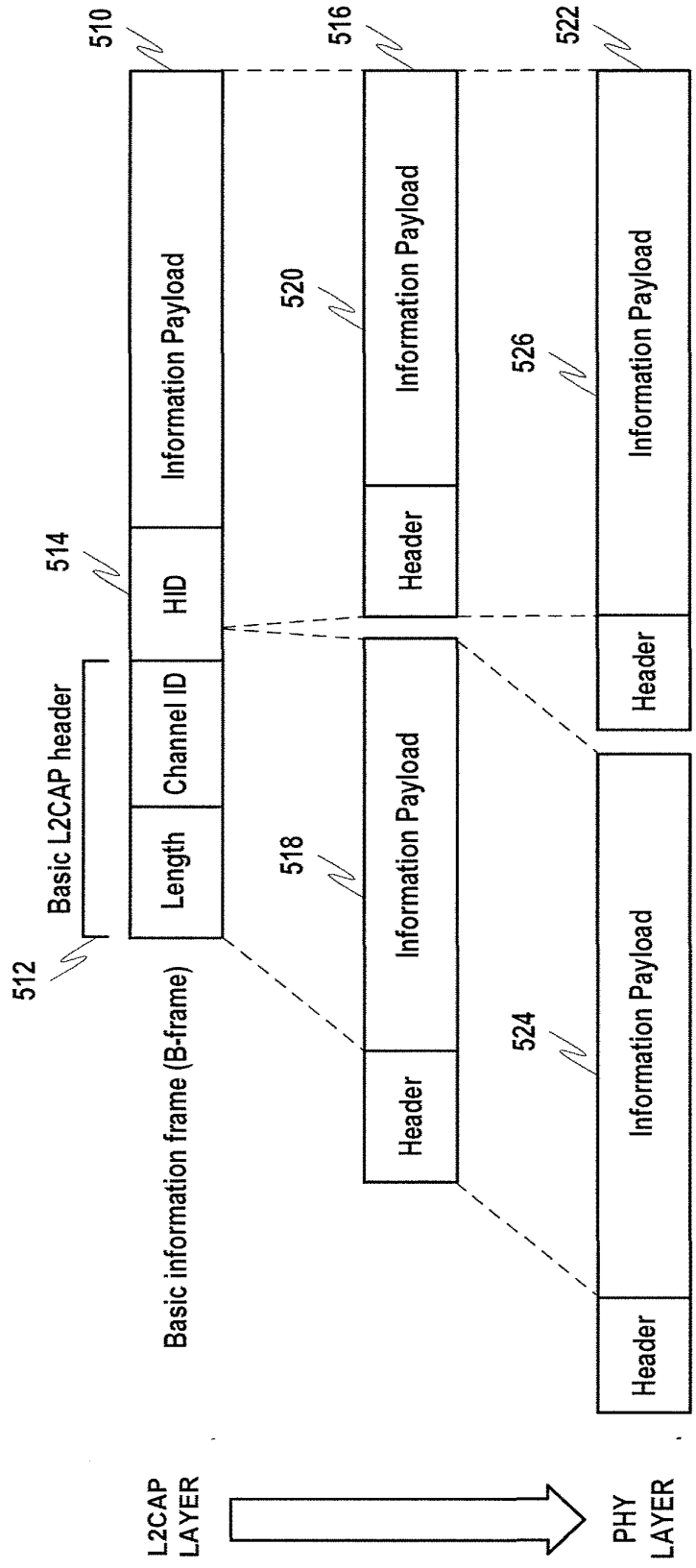

510
516
522
514
520
526
Information Payload
Information Payload
Information Payload
HID
Header
Header
Basic L2CAP header
Channel ID
Length
518
524
512
Information Payload
Information Payload
Header
Header
Basic information frame (B-frame)
L2CAP LAYER
PHY LAYER

FIG. 5C

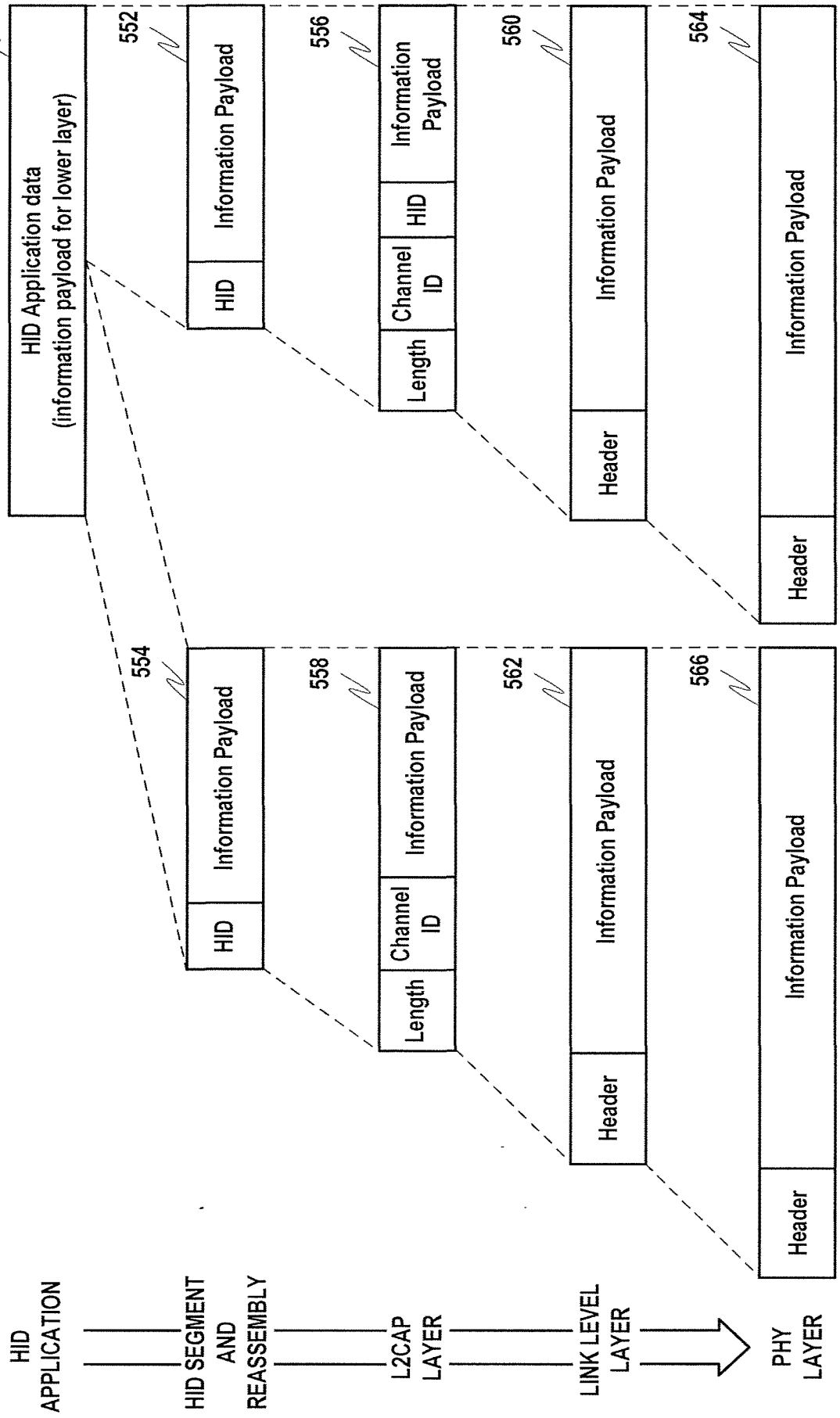

550
HID Application data
(information payload for lower layer)
552
HID
Information Payload
554
HID
Information Payload
556
Length
Channel ID
HID
Information Payload
558
Length
Channel ID
Information Payload
560
Header
Information Payload
562
Header
Information Payload
564
Header
Information Payload
566
Header
Information Payload
HID APPLICATION
HID SEGMENT AND REASSEMBLY
L2CAP LAYER
LINK LEVEL LAYER
PHY LAYER

FIG. 6

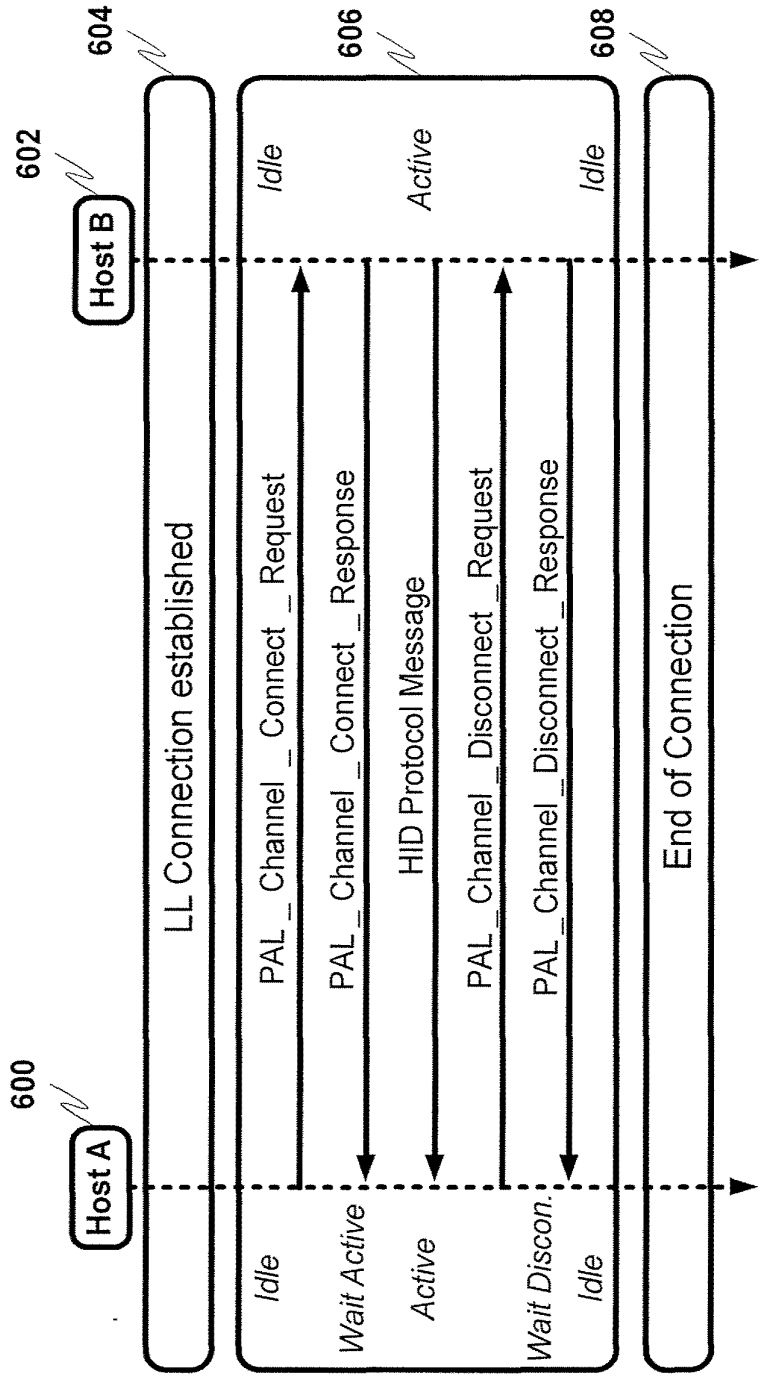

600
602
604
606
608
Host A
Host B
LL Connection established
Idle
Wait Active
Active
Wait Discon.
Idle
PAL_Channel_Connect_Request
PAL_Channel_Connect_Response
HID Protocol Message
PAL_Channel_Disconnect_Request
PAL_Channel_Disconnect_Response
Idle
Active
Idle
End of Connection

FIG. 7

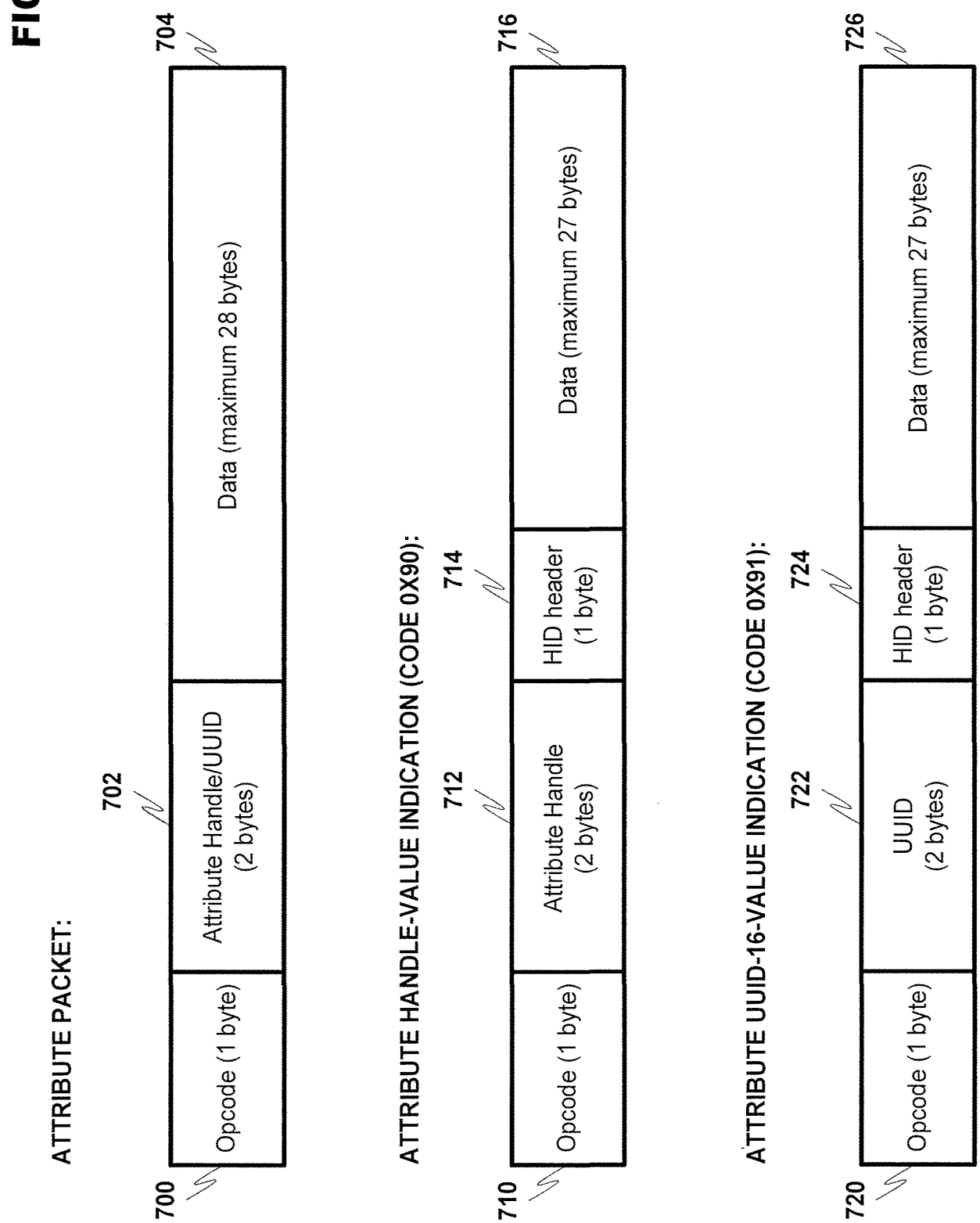
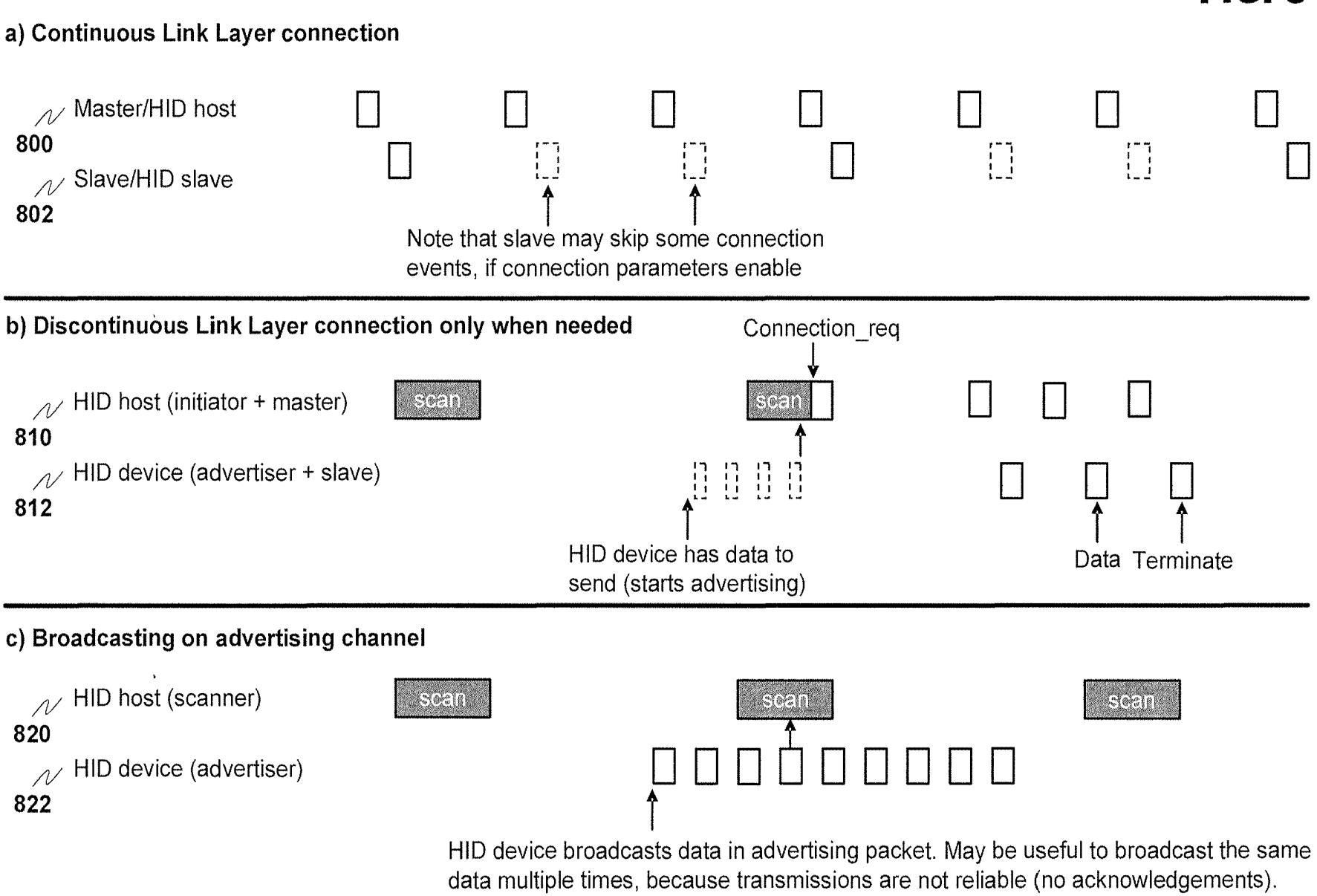

ATTRIBUTE PACKET:
700
Opcode (1 byte)
702
Attribute Handle/UUID (2 bytes)
704
Data (maximum 28 bytes)
ATTRIBUTE HANDLE-VALUE INDICATION (CODE 0X90):
710
Opcode (1 byte)
712
Attribute Handle (2 bytes)
714
HID header (1 byte)
716
Data (maximum 27 bytes)
ATTRIBUTE UUID-16-VALUE INDICATION (CODE 0X91):
720
Opcode (1 byte)
722
UUID (2 bytes)
724
HID header (1 byte)
726
Data (maximum 27 bytes)

FIG. 8



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FIG. 9

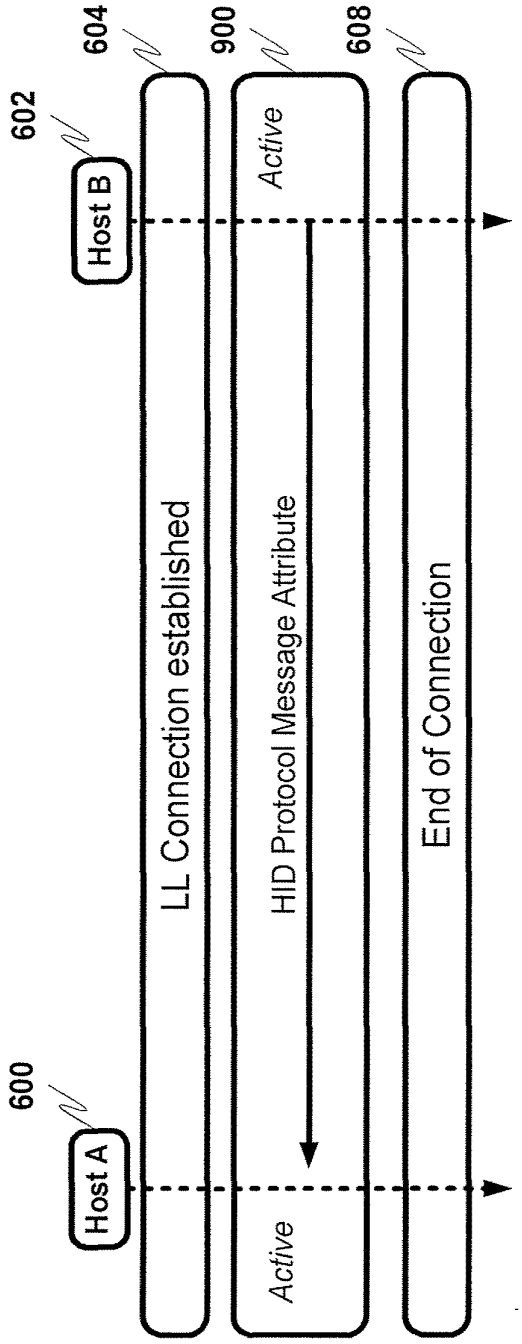
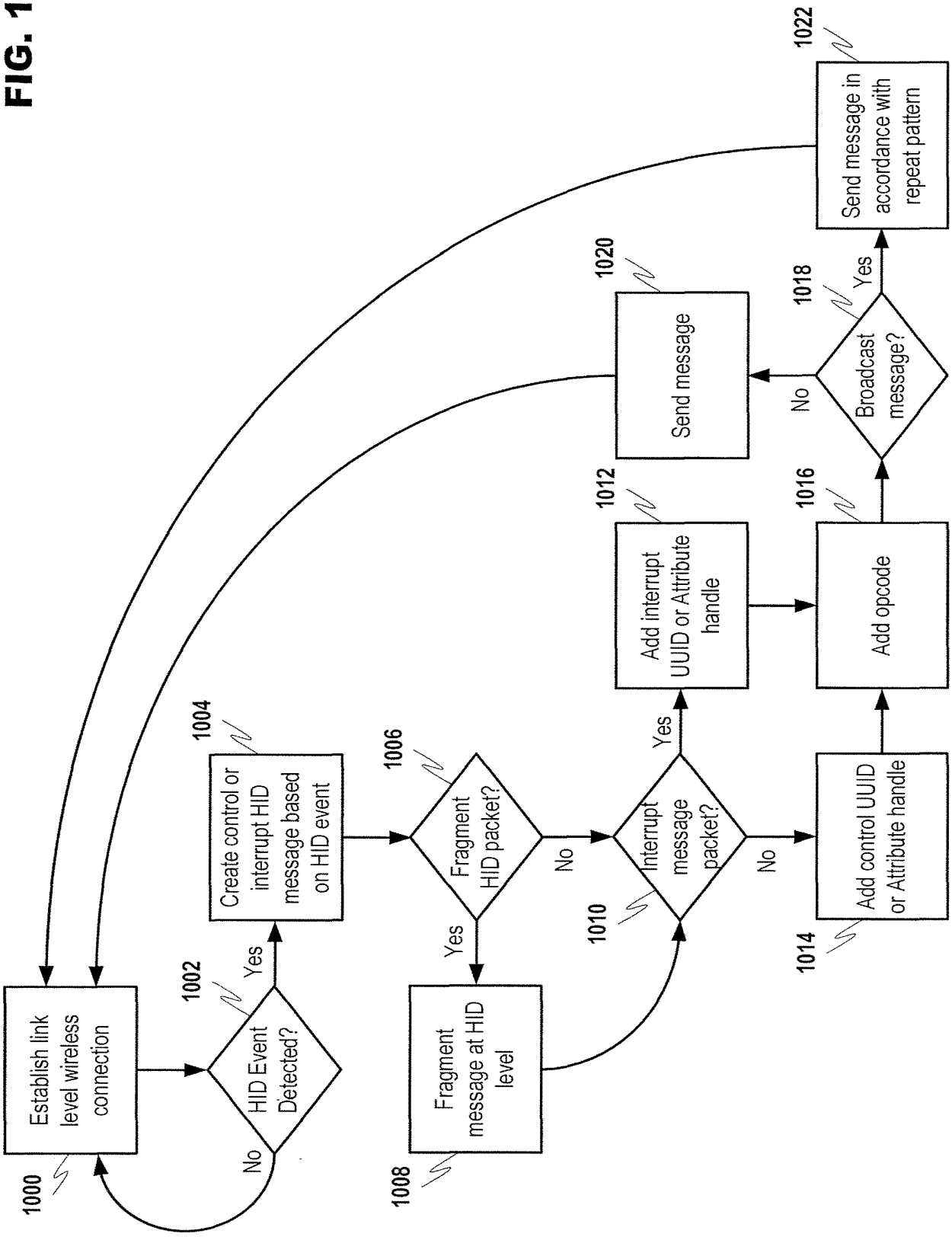

600
602
604
900
608
Host A
Host B
LL Connection established
HID Protocol Message Attribute
End of Connection
Active
Active

FIG. 10


1000
Establish link level wireless connection
1002
HID Event Detected?
Yes
No
1004
Create control or interrupt HID message based on HID event
1006
Fragment HID packet?
Yes
No
1008
Fragment message at HID level
1010
Interrupt message packet?
Yes
No
1012
Add interrupt UUID or Attribute handle
1014
Add control UUID or Attribute handle
1016
Add opcode
1018
Broadcast message?
Yes
No
1020
Send message
1022
Send message in accordance with repeat pattern

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/054621

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L12/28 H04L12/56

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)
H04L

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CRAIG RANTA ET AL: "Human Interface Device (HID) Profile 1.0" INTERNET CITATION, 22 May 2003 (2003-05-22), pages 1-123, XP002486381 [retrieved on 2003-05-22] paragraph [05.4] paragraph [07.1] paragraph [07.3] paragraph [7.5.1] paragraph [07.6] ----- -/--	1-26

[X] Further documents are listed in the continuation of Box C. [ ] 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 document 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
10 July 2008	24/07/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Rothlübbers, C

Form PCT/ISA/210 (second sheet) (April 2005)

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/054621

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"Ultra Low Power (ULP) Bluetooth Technology"[Online] 9 August 2007 (2007-08-09), pages 1-29, XP002487550 Retrieved from the Internet: URL:http://www.ndc.fi/images/pdf%20tiedostot/Bluetooth%20Ultra%20Low%20Power%20(ULP).pdf> [retrieved on 2008-07-09] the whole document	1-26

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

Petitioner Samsung Ex-1004, 0174

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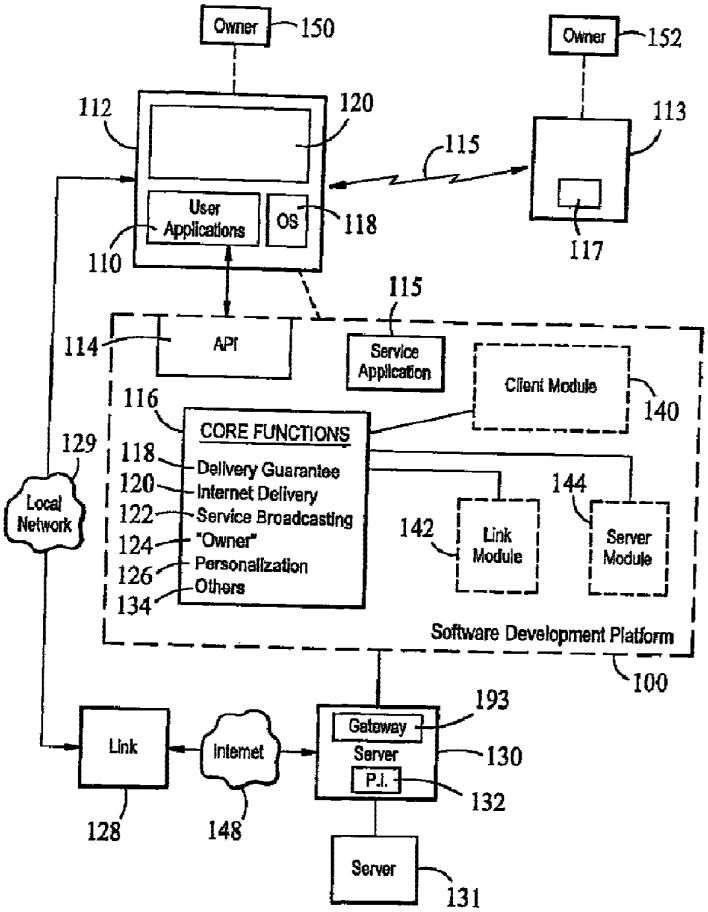
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(57) Abrégé/Abstract:
An application development platform enables applications to be created easily for, e.g., mobile devices that have short-range wireless communication capability. The development platform exposes a carefully chosen core set of services through an API.

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(57) **Abrégé(suite)/Abstract(continued)**:
Each of the applications can broadcast its services to local and remote devices. Message delivery between devices is guaranteed even for messages than cannot be delivered directly by local short-range wireless transmission. Message delivery through other channels, including the Internet, can occur transparently to the user. Each device can be associated with an "owner", which can be a person or an entity. Services can be customized to the owner based on stored information that maps owners to devices. Information associated with each of the owners of devices can be stored centrally and used in connection with providing the services at each of the mobile devices. Virtual GPS capabilities can be provided for mobile devices that do not have GPS chips.

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70850-146E

ABSTRACT

An application development platform enables applications to be created easily for, e.g., mobile devices that have short-range wireless communication capability. The development platform exposes a carefully chosen core set of services through an API. Each of the applications can broadcast its services to local and remote devices. Message delivery between devices is guaranteed even for messages than cannot be delivered directly by local short-range wireless transmission. Message delivery through other channels, including the Internet, can occur transparently to the user. Each device can be associated with an "owner", which can be a person or an entity. Services can be customized to the owner based on stored information that maps owners to devices. Information associated with each of the owners of devices can be stored centrally and used in connection with providing the services at each of the mobile devices. Virtual GPS capabilities can be provided for mobile devices that do not have GPS chips.

70850-146E

MOBILE COMPUTING AND COMMUNICATION

BACKGROUND

This application is a divisional of Canadian Patent Application Serial No. 2,437,706, filed on February 1, 2002.

This invention relates to mobile computing and communication.

Personal digital assistants, mobile telephones, and other mobile devices offer a wide range of computing and communication capabilities. To provide these capabilities, mobile devices have hardware complements that may include microprocessors, memories, displays that are in some cases touch sensitive, microphones, speakers, keys, and other user input and output mechanisms.

A variety of specific functions are often provided on mobile devices, including data entry, handwriting recognition, speech recognition, voice and data communication, memo writing, calendars, word processors, spreadsheets, to-do lists, and address books. These functions are implemented in software or firmware applications that are stored on the devices and use the features of an operating system such as Microsoft Windows CE or Palm OS that runs on and controls the hardware components of the mobile devices.

Mobile devices that are capable of wireless communication typically comply with one or more of the standard wireless communications protocols such as Bluetooth and the Wireless Application Protocol (WAP).

Bluetooth, for example, uses radio frequency transmission for relatively short-range communication. Bluetooth capabilities may be implemented in a small microchip that is incorporated into the mobile or other device.

To create an application for Bluetooth-capable devices, a developer typically writes custom software that implements the particular features of the application. A piece of custom software must be written for each of the devices that

are involved in performing functions of the application on either end of each Bluetooth communication link. Each piece of custom software is written to conform to the peculiar hardware and operating system characteristics of the device on which it will run.

SUMMARY

Some embodiments of the invention enable a fundamental shift in the way developers can enable users of mobile devices to interact with users of other mobile devices and users of stationary devices that have wireless capability.

In general, in one aspect, the invention features a method that includes running client modules on mobile devices, running a server module on a server that is accessible through a communication network, and running link modules on link devices that have communication channels to the mobile devices and are capable of accessing the server through the communication network. The client, server, and link modules provide core services through application programming interfaces to applications running on the mobile devices, the server, and the link devices.

Implementations of the invention may include one or more of the following features.

Service applications also run on the client modules to enable users of the mobile devices to manage the core services. The core services include interaction with short-range wireless transceivers in the mobile devices. A mobile device operating system is also running on the mobile devices and the client modules use services of the operating system. The mobile devices include personal digital assistants or mobile phones. The core services include at least one of the following: broadcast of information about real-world services; interaction with a wireless transceiver in the mobile device; guaranteed message delivery; and encryption.

In general, in another aspect, the invention features a method that includes running client modules on wireless devices, the client modules providing core services through application programming interfaces to applications running on the devices, at least some of

the applications being associated with real-world services that are provided by individuals or enterprises,

Implementations of the invention may include one or more of the following features. Information is maintained identifying relationships between each of the real- world services and at least one of the devices through which the service is provided, the core services providing a sharing among the devices of the information identifying the relationships between the real-world services and the devices. Information about the services available through each of the devices is broadcast by the core services to the other devices. The real-world services associated with the devices are registered by the core services. The real-world services include at least one of communication services, computational services, commercial services, or governmental services.

In general, in another aspect, the invention features maintaining in a wireless device a list of real- world services that are available from a user of the device through an application running on the device; and through a wireless communication channel, broadcasting information from the device indicative of the available real- world services.

Implementations of the invention may include one or more of the following features. The information is broadcast periodically. Another wireless device that receives the broadcast information accesses one of the available real-world services.

In general, in another aspect, the invention features a method that includes running client modules on mobile devices that are associated with identified users, running a server module on a server that is accessible on a communication network, and running link modules on link devices that have communication links to the mobile devices and are capable of accessing the server through the communication network,

Implementations of the invention may include one or more of the following features. A message is received from a user of one of the mobile devices through one of the applications running on the device, the message being directed to another user of an application running on another one of the mobile devices, and the message is delivered to the other user through the Internet. The message is sent through the links and the server. The client module running on the device from which the message is sent determines whether the target mobile device is within short-range wireless distance, and, if not, the client module forwards the message to one of the link modules. The link module forwards the message to the server through the Internet. The server module determines the location of the target mobile device and identifies a communication channel through which to forward the message to the other user.

In general, in another aspect, the invention features a method that includes maintaining a list of short-range wireless devices within range of a first short-range wireless device; and transmitting a message from an identified user of the first device to a second identified user of a second wireless device over a communication medium, the communication medium being selected based at least in part on whether the second device is included on the list, the selection being transparent to the user of the first device.

Implementations of the invention may include one or more of the following features. If the second device is included on the list, the message is transmitted to the second device over a short-range radio link, and if the second device is not included on the list, the message is transmitted to the second device using another communication medium. If the second device is not included on the list, the message is transmitted to the second device over either the Internet or by mobile telephony.

In general, in another aspect, the invention features a method that includes transmitting a

message from an identified user of a short-range wireless device to an identified user of another device; and automatically confirming to the identified user of the first device whether the transmitted message was received by the identified user of the other device.

Implementations of the invention may include one or more of the following features. Information is stored about the transmitted message in the first device after transmission; and a match is made between received confirmations and the transmitted message stored in the device. The transmitted message is resent if a confirmation for the transmitted message is not received within a specified period. A communications manager is notified in the first device if the transmitted message is undeliverable. The notifying includes providing an explanation of why the transmitted message was undeliverable. The transmitted message is removed from the device after it is confirmed that the transmitted message was received by the identified user of the other device. The device from which the message is transmitted is responsible for guaranteeing the delivery.

In general, in another aspect, the invention features a method that includes running applications on devices that are associated with respective owning entities, sending a message from an initiating owning entity to a target owning entity using one of the applications running on one of the devices associated with the initiating owning entity, identifying one of the devices as being associated with the target owning entity and as being accessible by a communication link, and forwarding the message to the device that is associated with the target owning entity through the communication link.

Implementations of the invention may include one or more of the following features. Each of the devices runs a client module that encrypts and decrypts the message using a public key associated with the owning entity of the device. The public key is stored in the device and in a server through which the message passes. The device comprises a mobile device. The owning entity

comprises a person. The owning entity comprises an enterprise and the device comprises a stationary device.

In general, in another aspect, the invention features a method that includes (a) storing information that identifies real- world entities and defines modes of interaction by the real-world entities through distributed devices, each of the real-world entities providing services to other real-world entities and using services of other real- world entities, (b) enabling any of the real- world entities using any arbitrary one or more of the distributed devices to log into the server, (c) loading portions of the stored information from the server to the device being used, and (d) regulating the interaction of the real- world entity using the device with other real-world entities based on the stored information, the interaction including the use of the services of the other real- world entities.

Implementations of the invention may include one or more of the following features. Client modules are run on the device, a server module is run on a server that is accessible on a communication network, the client and server modules provide core services through application programming interfaces to applications running on the devices, and the core services include access to the information that is stored on the server and relates to real-world entities. The stored information includes at least one of identification information, demographic information, and preference information.

In general, in another aspect, the invention features a method that includes associating with each one of a number of different mobile devices that have a short-range wireless communication capability, a person who is a user of the device; storing information about the association of devices and users and information about each of the users at a publicly accessible server; and providing services at each of the mobile devices that depend on the information about the user of the device that is stored at the server.

Implementations of the invention may include one or more of the following features. The information about the users is communicated to the devices from the server for use in providing the functions. The information about the users includes at least one of: demographic information, identification information, preference information, or location information. At least some of the information about the users is stored on the mobile devices associated with the users.

In general, in another aspect, the invention features a method that includes recognizing automatically that an entity in possession of a short-range wireless device is within a particular geographic area; obtaining data about the entity from a commonly accessible database; and sending information to the short-range wireless device, the information sent to the device depending on the data obtained from the database.

Implementations of the invention may include one or more of the following features. Access to the data about the entity in the commonly accessible database is contingent on permission of the entity. The entity can access and modify its data in the commonly accessible database using the wireless device. A second short-range wireless device recognizes that the entity is within the particular geographic area, obtains the data, and sends the information. The information sent to the first device includes promotional material for facilitating a transaction with an entity associated with the second device. The entity obtains information about an entity associated with the second device from the commonly accessible database using the first device. Recognition that the entity is within a particular geographic area is based on receipt of a message from the first device, the message including an identification code mapped to the entity.

In general, in another aspect, the invention features a method that includes (a) electronically storing, in a publicly accessible location, information about real-world entities that are users of devices that have short-range wireless

communication capability, (b) providing client modules on the devices and a server module at the publicly accessible location, the client modules and the server module cooperating to provide guaranteed messaging between users of any of the devices and to enable commercial transactions between users of the devices based on the electronically stored information.

Implementations of the invention may include one or more of the following features. One of the two wireless devices is fixed and one of the two wireless devices is mobile. The user of one of the devices comprises a commercial entity. The user of one of the devices comprises a consumer. The transaction comprises delivery of marketing information from one of the two devices to the other. The transaction comprises the use by one of the two devices of a service provided by means of the other of the two devices. The transaction comprises electronic messaging. The transaction occurs when the two devices are out of range of each other. Access to the stored information is under the control of the user to which it pertains. The stored information comprises the location of the user. The stored information comprises consumption preferences of a consumer. Each of the users is associated with more than one of the devices. The transaction is effected between the two users through the server that is located out of range of the two devices. The two devices are in range of each other and the transaction is effected between two users carrying the two devices. The transaction comprises sending an electronic business card from one of the devices to another one of the devices and displaying the card on the other one of the devices. The transaction comprises an electronic message communicated from one of the users to the other through at least one of the two devices and by a route that includes a mode of communication that is selected from among the Internet, mobile telephony, and short-range wireless communication, the selection being made without the user's awareness.

In general, in another aspect, the invention features a method that includes, at a first device, receiving information from a second device through a short-

range wireless communication channel, the information identifying an actual geographic location of the second device based on signals received from GPS sources, and updating a derived geographic location stored at the first device based on the information received from second device.

Implementations of the invention may include one or more of the following features. The derived geographic location is updated to be the same as the actual geographic location of the second device. The first device receives information over time from multiple other devices, the information representing the actual GPS geographic locations of the other devices, and the derived geographic location is updated from time to time based on the information received over time from the other devices. The first device is mobile and the second device is stationary.

Other features and advantages will become apparent from the following description and the claims.

DESCRIPTION

Figure 1 shows a communication system.

Figure 2 shows a wireless mobile device.

Figures 3A, 3B, and 3C show data structures.

Figures. 4A through 41 show functions that can be used by a wireless device.

Figure 5 shows communication paths.

Figure 6 shows a server.

Figure 7 shows a client.

Figures 8A and 8B show a method for wireless communication.

Figure 9 through 14 show uses of the system.

OVERVIEW

One general aspect of the invention is an application development platform that includes client, link, and server modules that expose core services through an application programming interface (API). Applications can be easily built on the API. The core services are selected to enable unique and widely useful applications to be created.

Each of the applications can make services available to local and remote devices on which the client modules run. The availability of services is broadcast and known to the mobile devices, links, and services so that devices throughout the system can take advantage of them.

One core service is message delivery. The client, link, and server modules coordinate their activities to guarantee at a high level the delivery of messages initiated by applications running on the mobile devices. Messages may be sent directly by a short-range wireless channel from a mobile device to another mobile device that is in the vicinity. If the target device is not in the vicinity, the message may be sent through other channels, including the Internet, to the target device. The communication channel can be chosen transparently to the user of the originating device.

Each device in the system can be associated with an "owner", which can be a person or an entity, such as a retail establishment. Information can be stored that links devices to owners so that messages, for example, can be directed to an owner. The system will determine the identity and location of a device associated

with the owner. The message will then be sent to the identified device wherever it is located using whatever communication channel is appropriate.

Information associated with each of the owners of devices can be stored centrally and used in providing the services at each of the mobile devices. For example, information about the owner's preferences or characteristics can be used to govern the manner in which services are provided, information is made available and communications are effected.

The system can be used to provide virtual GPS capabilities for mobile devices that do not include GPS chips. Such a mobile device can obtain actual GPS information from other devices in the vicinity using short-range wireless communication. The mobile device can maintain a virtual GPS location that is nearly as accurate as if it had the GPS chip on-bard.

As shown in figure 1, the invention provides a common software development platform 100 that enables developers to easily, quickly, and effectively build a wide range of user applications 110 for devices 112, including mobile devices, that have short-range wireless communication capabilities, such as those provided by the Bluetooth standard. The common software development platform provides core functions and features 116 that can be invoked by the user applications through an API 114.

This architecture enables the developer to provide functions and features that are especially suited to mobile devices and short-range wireless communication and that have extremely broad appeal to users of the mobile devices. The developer need not re-invent, for each type of device and each communication protocol, the manner in which the applications interact with the operating system 118 running on the device, the device hardware 120, and the communications protocols.

The core functions include

providing a high-level guarantee of message delivery from one device to another 119

a delivery service that transparently arranges for the delivery of messages from one user to another through, e.g., the Internet 148, if the two devices are not within short-range wireless communication distance of each other 120

broadcasting of available services by a device and use of information that is broadcast from other devices 122

associating an "owner" with each device 124, and

integration with information associated with the owner 126.

The applications may enable both person-to-person interaction and person-to-location interaction, which involves a person interacting with an institution or real- world location or enterprise such as a store or airport.

The devices need not be mobile, but may include stationary devices that are to be part of the communication, including personal computers, cash registers, servers, and parking meters, to name a few. The platform extends to the hardware and software that provides a link 128 between the mobile devices and other devices, including a central servers 130, that are not within direct reach of the short-range wireless communication capabilities of the mobile device.

Based on the common development platform and the API that it presents to developers, any developer can easily create applications that change the way individuals interact with one another and with their environments.

The platform enables a developer to easily create applications that do virtually any job that requires local communication between devices (including mobile devices) 112, 113, or longer-distance communication between local devices and central servers. Because the platform encompasses servers, it also enables a developer to use personalization information 132 that is stored on a server to personalize the operation of applications that are running on local devices.

The core functions exposed by the API include functions that are expected to be used by a large proportion of applications that are built on Bluetooth. The application developer can build other features and functions 134 into his application and can supplement and expand the core functions.

In addition to the initial ease of creating the applications, the use of a common development platform leads to applications that are inter-compatible, more uniform, and more standardized.

The common development platform includes a client module 140, a server module 144, and a link module 142. The client module runs on a client device 112, such as a mobile device or a stationary local device owned by a merchant or a consumer. The server module runs on a server 130 that is typically not within short-range communication distance of the client devices, and the link module runs on a device 128 that provides a link between one or more client devices and the servers.

"Owner" of a device

Conceptually, each client device has an "owner" 150, 152. In a simple example, the owner is a person who owns and uses the device, say the owner of a Palm Pilot with Bluetooth capability. Another example of an owner would be a restaurant operator

with respect to a Bluetooth-capable client cash register at a restaurant. The owner of a device is known to the client, server, and link modules. An owner may change, for example, when a person lends his mobile telephone to another person.

The system stores information about the owners of the devices in a centralized database 132 to which one or more servers 130, 131 have access. The information could include names, addresses, and billing information, and other information such as the current location of the person and his current telephone number. The information could also include demographic information and user-entered preferences about products, services, and user interfaces.

One benefit of having the information accessible to the servers and clients is that it becomes possible for one party at one location to communicate with an owner located anywhere in the world even if, on one occasion, the communication is by Bluetooth, on another occasion by mobile telephony, and on another occasion through the Internet 148. The initiating party need not know where the owner is located or how to reach him; the server is aware of that information and can forward the message through the link to a server and from the server through an appropriate medium to the owner.

By combining the features of centrally stored information with easy-to-develop applications for mobile devices, it is possible to create a broad range of portable, standardized applications that make fundamental changes in the way people interact with the world around them.

Broadcast of services

The development platform 100 includes a function that enables an application 110 running on a mobile device to broadcast information about services that it provides to other devices running applications. Conversely, an application is able to identify and learn about services that are made available by applications

running on other devices, for example, devices that are within short-range wireless communication and devices that are accessible through the link module. The service-broadcasting capability enables the creation of a fabric of millions of devices (mobile devices, central servers, links, and others) that provide and use services, where a person's mobile device can be kept aware of available services as it moves through a world populated by the other devices.

Personalization

Because the client, link, and server provide the basic core capability of finding, storing, and editing personalization information in a central database 132, the applications built on the modules can provide functions that are dependent on the personalization information for the "owner" of the device.

Guaranteed delivery

Another of the key core functions provided by the application development platform is so-called high-level guaranteed delivery of messages. When an application running on a device such as a mobile PDA initiates a message to another device anywhere in the world, the modules guarantee delivery of the message even if the other device is not within short-range communication and even if the other device is not in use at the moment. To do this, the modules determine the location of the target device, determine an appropriate mode of communication (e.g., a Bluetooth communication to a local device followed by a link to the Internet and then a telephony link to the target device) and track the message until delivery has occurred.

The Internet can be used as a transparent alternative to Bluetooth for message delivery. When a user of an application on a device takes a step that requires a message to be sent to another device, the message can be sent through the Internet at the election of the modules, without the user being aware that Bluetooth is not being used.

THE WIRELESS DEVICE

As shown in figure 2, the client device 112 can be a wireless device that has a Bluetooth chip 11 enabling it to communicate over short-range radio links (such as link 115, figure 1) with another chip 117 (figure 1) in another device in accordance with the Bluetooth protocol. The device 112 could be, for example, a mobile telephone, personal data assistant (PDAs), handheld computer or organizer, personal computer, cash register, parking meter, or other device. The device can include a touch-sensitive display 123 to allow the user to view information and interact with the device, a keypad 170, a keyboard 172, a mouse 174, or other means for allowing the user to interact with the device.

The chip 11 has a unique identification code 180 that is mapped in the personalization database 132 to the user or owner of the device. The user of the device may be an individual, vehicle, or other mobile entity, or may be an entity whose location is fixed such as a store or restaurant.

Generally, the device 112 also has a memory or memories 190 that store an operating system 118, applications 110, and the client module 140, a processor or processors 192, and one or more internal system communication buses 194 interconnecting these hardware components (the hardware components are together identified by the numeral 120 on figure 1).

Interaction between the Bluetooth chip, on one hand, and the operating system, the client module, and the applications, on the other hand conforms to a Bluetooth API that is exposed by the chip to the devices that interact with it. By making calls to the chip 11 through the client module, application programs 16 created by a variety of parties and running on the device 112 can achieve a broad range of functions. By interacting with the operating system 118 of the device 112, the client module 140 can take advantage of the communication, processing, display and user interaction features provided by the operating system.

TRACKING AVAILABLE SERVICES

The client module 140 keeps a registry 141 of services that are available from the applications running on the local device 112 and services that are available from applications running on other devices, including devices that are within short-range wireless distance of the local device 112.

An entry in the registry related to a service may have the format shown in figure 3 A for a locally available service and the format shown in figure 3B for a service available on another device. Other formats could be used.

Exemplary services that could be made available by applications running on devices include a WML server or an instant messaging client.

The platform exposes "AddService" and "RemoveService" functions (see figures 4E and 4F) that can be used by applications to add (register) or remove (unregister) services from the list in the registry 141.

The client module makes information about the user (owner) of a device and the services available from that device by a periodic broadcast ping to all devices within range of a local device. The broadcast function allows numerous devices constantly to be aware of a range of services offered by other devices. Each device can take advantage of and use a wide range of services for the user's benefit. The client module uses the information stored in the registry 141 by the applications to provide other devices with descriptions of services and instructions on how to access them.

The applications running on the device can include core service applications that enable user interaction with and control of functions provided by the client module.

One service application, for example, may enable a user of the device to modify the contents of the registry and to specify preferences with respect to the services available on the device. For example, the user may choose whether or not to be notified when a message is received for a particular service.

MESSAGE PASSING THROUGH THE LINK

In addition to communicating with nearby wireless devices, the client module can access the Internet or other public network through a link 128 (figure 1) that is running a link module 142. Any device having local network capabilities 129 and an Internet 148 connection can serve as the link. The link could be a mobile device or a stationary device.

As shown in figure 5, in some implementations, the link 128 includes a device with a Bluetooth chip 11 that provides local network capabilities (as defined in the Bluetooth standard), a copy of the link module 142, and an Internet connection through an Internet interface 15, such as a dialup or dedicated connection to the Internet 148.

Some communications can be sent over the Internet as a transparent alternative to sending the messages using Bluetooth technology. The link 128 allows users within short-range wireless distance to send and receive data through the Internet to and from, for example, server 130 running a copy of the server module 144. Other technologies such as infrared could also provide the local network capabilities for the link 129.

The client module tracks whether there are any links 128 in range of the device based on information stored in the service registry 18, because the links broadcast their available services in the manner described earlier. Messages destined for devices that are not within range are stored by the client module in a queue until the device is within range of a link 128

In one example, messages (called Kmessages) stored in the client's message queue have the format shown in figure 3C. Once the device is within range of a link 128, the messages are transmitted through the link to a server 130. The server 23 can then transmit the messages to another link 131 (figure 3) that is close to the target device 133. A registry in the target device stores messages waiting to be retrieved by specific services on the device.

The "getMessages" and "getMessage" functions (shown in figures 4B and 4C) are exposed by the client module and enable an application running on the client device to be used to retrieve messages sent from other devices. The stored messages are communicated from the client to an application using the Kmessage structure shown in figure 3C.

The core services of the modules support the Transport Control Protocol/Internet Protocol (TCP/IP) to allow for Internet connectivity through what amounts to an ad hoc network of the devices that are within the vicinity of the links. IP masquerading is used by the link module to assign an IP address to each device in range of the link, thereby enabling the devices to communicate using TCP/IP.

THE SERVER

The server module 144 running on the server 130 allows users of devices anywhere in the world to send messages to one another without knowing where the recipient is located or which device the recipient is using.

As shown in figure 6, the server system 130 serves as a global router 60 that exposes services to server applications to enable messages to be stored and passed, for example, between a device 12 on which a client module 14 resides and another device 54 on which another client module 56 resides.

In general, a given user may be an owner of multiple devices and may log on to some or all of them at one time. The server module includes a database 62 that tracks the devices associated with each user. The server module can support the HyperText Transfer Protocol (HTTP) and WAP, as well as other technologies, to send and receive messages.

In one implementation, the server module includes software written in the Java computer language that can run, for example, on a Windows, Solaris or Linux system. The server module also can store information about the services that are made available by each of the user's devices in a registry of services 66 so that other devices can locate and access the services. A "getSurrounding Services" function (shown in figure 4D) is exposed by the client module to applications running on a device to enable the devices to obtain from the server module an array of mappings of users of other devices and services available on their devices.

PERSONALIZATION

The server module also provides an interface service to the personalization system 132 and a gateway service 173 to other technologies such as the Internet 148. A web server 58 using, for example, a Generalized Markup

Language, allows messages to be served to any mobile device that has an Internet connection. In addition, any client device can access resources and information from the server through the Internet.

The user can log on to the server, for example, to access the personalization system 26 and to enter or edit personalized information.

On of the service applications 115 (figure 1) provided with the client module 14 allows the user to modify personal information and preferences stored by the personalization system. A "changepersonalizationdata" function (shown in figure 4G) can be used for that purpose. The user also can set indicators to permit or deny access by other users to various pieces of data stored in the personalization system and associated with that user.

For example, user information stored in the personalization system may be designated as shared or public using the "Changepersonalizationpermissions" function (shown in figure 41).

One of the service applications running on one user's device can access other users' profiles from the personalization system using a "Getpersonahzationdata" function (shown in figure 4H). Access is denied if a particular user does not have permission to access another user's profile. All relevant data from the personalization system is loaded dynamically through a link when the user logs on to the server. Thus, user information stored at the client device can be updated regularly to keep it synchronized with the data stored in the personalization system.

An administrative graphical user interface (GUI) is associated with the server to allow an administrator to change configurations for users manually. The administrative GUI also allows an administrator to analyze the load on resources

used by the server, test and debug the server, and access user information stored in the personalization system if the user permits such access.

GUARANTEED DELIVERY

In general, the client module exposes a service that is responsible for ensuring delivery of messages from one device to another. Upon receipt of a message from an application, the client module returns a confirmation including a unique identification number for each transmission of data. If the client module is not able to guarantee that a message was delivered, the text of the message is returned to the sender, with a message indicating that the text was undeliverable. If a message including data is received by a device that does not have the necessary application to operate on the data, then the message is returned to the sender. On the other hand, if the required application is listed in the registry of the recipient's device, but the recipient's device is not currently running the application, the client module stores the message and notifies the user that the message has been received.

When a message is sent to a particular user from the server through the links, the message is sent to all devices that the user "owns" and on which he is logged on. If the user is not logged on to any of his devices, the server module stores the message in a mailbox database 64. When the user subsequently logs on, he is notified of the message. Therefore, when a message is to be sent to a particular device, the sender of the message need not determine which device the recipient is closest to or on which device the recipient prefers to receive messages. The server transparently routes the message to the proper device. Because encryption technology is integrated with the client module, the user automatically digitally signs communications using a global key stored in the personalization system and in a personalization module 143 stored on the client device (see figure 2).

As shown in figure 7, the client module includes a transfer module 30

that provides an interface to communications media, including the Bluetooth chip 32, a wireless modem 34 that permits mobile telephone communications, an infrared port 36, or other communications channels 38.

The transfer module 30 references a socket or equivalent layer of each communications media available to the device and manages the communications media. The transfer module 30 passes received messages to a confirmation manager 40 and provides information to the communications manager about the available communications media. The transfer module 30 can be requested by the confirmation manager 40 to send messages over a particular communication medium.

The confirmation manager 40 is the portion of the client module that is responsible for guaranteeing delivery of messages. It maintains a queue of outgoing messages, as well as a queue of messages awaiting confirmation. The confirmation manager 40 tracks messages that have been sent and matches received confirmations with the original outgoing messages. If confirmation is not received within a specified period, the message is re-sent.

The confirmation manager 40 can be called upon by a communications manager 42 to send messages and notifies the communications manager if a message is undeliverable. A message explaining why a message is undeliverable can accompany the notification to the communications manager 42.

The communications manager 42 is responsible checks for other devices entering or leaving the range of the device and decides which communication medium to use when a service application 16 requests that a message be sent. Messages can be sent to a security module 46 for encryption and receipt of a digital signature.

The communications manager 42 is notified by the confirmation manager 40 of received messages and passes the received messages to the security module 46 for authentication of digital signatures. User name and security information is received from the personalization system through a personalization module 48. The communications manager 42 notifies the service applications 16, through an applications manager 44, of received messages based on settings in the local registry 18. The service applications 16 then can retrieve messages in a message queue through the applications manager 44.

The communications manager 42 also receives and acts upon registry request messages and broadcasts and retrieves local service application settings from the registry 18. Additionally, the communications manager updates the information about other devices in the registry 18 based on server messages and registry broadcasts.

The applications manager 44 provides an interface between the service applications 16 and the communications manager 42, the registry 18 and the personalization module 48 of the client. The applications manager 44 can retrieve or modify local service application settings stored in the registry 18. It also can access or modify the registry's list of other devices within range of the device 12, and information about services available on those users' devices. The applications manager 44 also can send and receive messages through the communications manager 42. Information stored in the personalization system 132 can be accessed or modified (assuming permission is granted) through the personalization module 48.

The personalization module 48 serves as an interface to the personalization system 132 and provides access to user information, user preferences, and user permissions stored in the personalization system. The personalization module 48 is capable of caching information and synchronizing information with the personalization system 132. It can access information stored in

the personalization system 132 in a manner that is transparent to the entity requesting the information. The personalization module 48 provides the user name for message headers and provides public or private encryption keys to the security module 46 through the communications manager 42.

The security module 46 is responsible for providing secure communications between the device 12 and other devices and executes a cryptographic algorithm. The security module 46 obtains security information from the communications manager 42. It encrypts and decrypts messages, digitally signs outgoing messages and verifies the digital signatures of incoming messages.

A "sendMessage" instruction (see figure 4A) in an application can call a client module routine that allows messages to be sent to other wireless devices through the facilities of the chip.

MESSAGE COMMUNICATION AND ENCRYPTION

Figures 8 A and 8B show how a message initiated by a service application 16 can be sent from the device 12. The particular service application 16 passes 1100 a message with an identification of the intended recipient to the applications manager 44. In this example, it is assumed that the application service requests that the transmission of the message be secure and guaranteed. The applications manager 44 passes 1102 the message and the recipient's identification to the communications manager 42 and requests that the message be transmitted in a secure and guaranteed manner. The communications manager 40 passes 1104 the message and security information to the security module 46. The security module 46 executes the cryptographic algorithm on the message and returns 1106 the encrypted message to the communications manager 42. The communications manager 42 then passes 1108 the encrypted message to the confirmation manager 40 and specifies the channel of communication.

The confirmation manager 40 generates 1110 a message identification number and attaches it to the message header. The confirmation manager 40 also adds 1112 the encrypted message to its queue of non-confirmed messages. The confirmation manager 40 passes 1114 the encrypted message and an identification of the specified channel to the transfer module 30. The transfer module 30 then sends 1116 the encrypted message over the specified communication channel. If the confirmation manager 40 does not receive a confirmation within a specified time frame, it re-sends the message.

The transfer module in the recipient device receives 1118 the encrypted message and passes it to the recipient device's confirmation manager. The confirmation manager in the receiving device passes 1120 the message to the communications manager. In addition, the confirmation manager in the recipient device adds the message identification number to its list of received messages and generates 1122 a confirmation message that is passed to the transfer module in the recipient device. The transfer module sends 1124 the confirmation message over the same communication channel over which the original message arrived. The transfer module 30 in the sending device 12 receives the confirmation message and passes 1126 it to the confirmation manager 40. The confirmation manager 40 then removes 1128 the original message from its queue of messages that are awaiting confirmation.

After receiving the encrypted message, the communications manager in the recipient device removes 1130 the header and passes 1132 the encrypted, digitally signed message to the security module. The security module responds 1134 to the communications manager with the sender's identity. The communications manager in the recipient device then adds 1136 the decrypted message to its

message queue and notifies 1138 the user and service application, according to the settings in the registry of the recipient device.

To receive the decrypted message, the service application requests 1140 the message from the communications manager through the applications manager in the recipient device. The communications manager passes 1142 the next message marked for the intended application from the message queue to the service application. The communications manager then deletes 1144 the message from its message queue.

In addition to sending and receiving messages, a service application 16 can retrieve or modify data and permissions stored in the personalization system 132 by calling functions of the personalization module's API through the applications manager 44. Additionally, a service application 16 can view information about users and devices within range of the device 12 by calling functions of the registry's API through the applications manager 44. Similarly, a service application 16 can retrieve or modify service application settings on the local device 12 by calling functions of the registry's API through the applications manager 44.

USES

As shown in figure 9, in one use of the system described above, a clothing store 70 at a fixed location provides electronic coupons to potential customers. A device 17 with a Bluetooth chip 15 is mounted in the store 70. If a user carrying a mobile device comes within range of the chip 15, the device 17 detects and stores that information in its client's service registry. The device 17 can obtain information 74 about the user from the personalization system 132. Such information 74 may include, for example, the clothing size and clothing purchase history of the user. Access to such information can be subject to the grant of permission by the user.

The device 17 can send one or more electronic coupons to the user's device 12 by incorporating the coupons into one or more messages sent directly through the Bluetooth link or indirectly through a local area network (LAN). The messages containing the coupons can inform the user of sales and items that may be of special interest to the user based on the information obtained from the personalization system. The electronic coupons can be turned in and used to purchase items from the store 70 by communicating directly with the device 17 over the LAN.

The user need not wait for coupons to be sent to his device 12. For example, once the user is within range of the store 70, the registry associated with the client module residing on the user's device 12 would store the identification code for the store 70. The user can use the device 12 to view the various coupons offered by the store 70.

Another application can provide a service that acts as a shopping assistant to match user preferences to available store inventory. In one scenario, the user may want information about a particular product from stores in a specified area such as a commercial street or shopping mall. Stores would update information stored in the personalization system about their product inventory. The user would use the device 12 to request information from the personalization system regarding the availability of various models, sizes, costs, of the particular product from stores in the specified area. A list of the available products and related information then would be provided to the user's device. An identification code can be associated with each store that can be used as discussed below.

After reviewing the information obtained from the personalization system, the user can get additional information from the personalization system, for example, about promotions or coupons that the listed stores may be offering. After selecting a particular store, the user enters the store identification code into the

device 12 to access a link to the selected store, for example, over the Internet 22. Once the user's device 12 is within range of the store's Bluetooth-enabled device, the two devices would recognize one another. Communications then would take place directly or over the local network. The user would be able to purchase items from the store using the device 12. Personnel at the store may gather the purchased items and send a message to the user when the items are ready to be picked up.

As shown in figure 10, another application allows the user to place an order, for example, at a restaurant 76 and pay for the order without having to wait in line. The user orders and pays while sitting at a table or walking in the vicinity of the restaurant. When the user arrives at the restaurant 76, the restaurant's Bluetooth-enabled device 17 recognizes the presence of the user's device and retrieves the user's personal information from the personalization system. The personal information may include the customer's food preferences or the usual order that the customer places at the restaurant 76. The restaurant's device 17 sends a message to the customer's device asking, for example, if the customer wishes to place his usual order. The customer can place an order and pay using the device. The customer also can access the personalization system to obtain information about the restaurant 76. The restaurant information 80 can include, for example, a menu, a list of specials, and available coupons. Such information can be obtained directly from the restaurant as well using the restaurant's local network.

The information regarding the user's preferences retrieved by the restaurant's device 17 from the personalization system may include information that can facilitate transactions between different commercial entities with respect to the identified customer. For example, when the user passes within the vicinity of the restaurant, the restaurant's Bluetooth-enabled device 17 recognizes the presence of the user's device and retrieves the user's personal information 78 from the personalization system. The personal information 78 may indicate that the user

enjoys movies. The restaurant's device would exchange information with a local theater 77 that also is in possession of a Bluetooth-enabled device 79, and the local theater 77 would post an electronic movie discount on the user's device.

Another application can facilitate travel. For example, assume the user is scheduled to depart on an airline flight. As shown in figure 11, upon arrival at the airport 82, a Bluetooth-enabled device 17 would detect the presence of the user's device. The airport's device 17 obtains the user's scheduled flight number and time of departure from the personalization system. The device 17 then sends flight, airport and ground transportation information tailored to the traveler's itinerary to the user's device. Similar applications can be used in connection with other means of travel such as trains or buses.

Other applications can be used in connection with parking meters to facilitate payment through use of a Bluetooth-enabled device. In one scenario, users would purchase pre-paid units of time. As shown in figure 12, when a user in possession of the device parks a car near a parking meter 86, a Bluetooth-enabled device 17 in the parking meter senses the presence of the user's device 12. The device 17 checks the user's account identification number 88 by accessing the personalization system 26 and sends a message to the user's device requesting an indication of how much time the user plans to park at the location. Once the user 10 responds, payment automatically can be deducted from the user's account. The application program can consistently show how much time is left on the meter 86, and can allow the user to add time to the meter from distant locations.

A wireless credit card application program can allow the user to make purchases with the device from a merchant 90. For example, as shown in figure 13, a merchant's Bluetooth-enabled device 17 would sense the presence of the user's device and, if permission is granted, would obtain the user's credit card information 92, including the user's name, account number and account expiration date, from the personalization system 26.

Furthermore, the application program can store a personal budget set by the user. If the user exceeds his personal budget, a message is sent to the device indicating that the personal budget has been exceeded.

A network of strategically placed Bluetooth-enabled devices in parking meters, city streets lamps, and other locations can provide a virtual global positioning system (GPS) that allows a user's device to know its precise location without requiring that the user's device carry a global positioning chip. As illustrated in figure 14, a number of Bluetooth-enabled devices 200 carry a Bluetooth chip 204 as well as a global positioning chip 206 that allows the device 200 to determine its GPS location by receiving global positioning information from a satellite 202. Each device 200 can periodically broadcast its global positioning location. Other Bluetooth-enabled devices that are within range of one of the devices 100 can receive the broadcast and thereby determine their own location. A variety of location-based applications 16, such as an electronic map identifying the user's location, can be implemented without requiring a costly GPS chip on the device 14.

Yet another application program that can run on the client 14 allows users to post information that can be retrieved and read by other parties. A virtual information board can be implemented by storing the information on a local device or on the server. For example, a restaurant can post its daily specials using such an application to help reduce the cost of menus.

A public information booth can have a Bluetooth-enabled device that provides information about museums, historical sites, statues and other sites of interest within a particular geographical location. An application can be run on the client residing on the user's device. The devices interact according to the Bluetooth protocol, and the device sends out a brief history or summary of the area to the user's

device. The application also allows a user to view a list and summary of the various sites in the area. Self-guided tours can be tailored so that the user only receives information about specific aspects of the area based on the user's interest.

Another application can serve as a wireless identity tool. This tool can facilitate the user's navigating through a hospital or other bureaucracy. For example, in a hospital, the user can sign in or pick up medical prescriptions without completing written forms. The application can provide the appropriate information.

Other application programs can provide communications with another device associated with an entity such as an individual who is free to roam from one location to another. Exemplary application programs include instant messaging, buddy lists, and personal contact cards.

Instant messaging, for example, allows messages to be passed between Bluetooth-enabled devices regardless of whether or not the devices are within local range of one another. The location of the parties may impact which means of communication is used to send a particular message. However, the sender of the message need not be concerned with the means of communication or device compatibility issues because the incoming message will be tailored to the recipient's device. If an instant message cannot reach its destination, for example, because the intended recipient has set his permissions so as not to allow instant messaging or because the recipient device does not have the proper software, the sender can be notified that the message cannot be delivered.

Other applications that can run on the device facilitate the use of buddy lists. Thus, a user of the device can be notified automatically when a buddy enters or leaves the local area network. The user can add or remove persons on the buddy list. For more privacy, the user can select an option in the application to prevent other persons on the buddy list from being informed of the user's entering or leaving

particular networks. A list can be stored in the personalization system to specify information and communication access permissions. The list can be used across multiple applications and can be updated dynamically through the personalization system. Different members of the buddy list can have different permissions.

Another application program allows the user to send a virtual business card from the device. In some situations, the electronic business card can include graphical images of an actual business card.

Other implementations are within the scope of the claims.

CLAIMS:

1. A method comprising

associating with each one of a number of different mobile devices that have a short-range wireless communication capability, a person who is a user of the device,

storing information about the association of devices and users and information about each of the users at a publicly accessible server, and

providing services at each of the mobile devices that depend on the information about the user of the device that is stored at the server.

2. The method of claim 1 in which the information about the users is communicated to the devices from the server for use in providing the functions.

3. The method of claim 1 in which the information about the users includes at least one of: demographic information, identification information, preference information, or location information.

4. The method of claim 1 in which at least some of the information about the users is stored on the mobile devices associated with the users.

5. A method comprising:

recognizing automatically that an entity in possession of a short-range wireless device is within a particular geographic area;

obtaining data about the entity from a commonly accessible database; and

sending information to the short-range wireless device, the information sent to the device depending on the data obtained from the database.

6. The method of claim 5 in which access to the data about the entity in the commonly accessible database is contingent on permission of the entity.

7. The method of claim 5 in which the entity can access and modify its data in the commonly accessible database using the wireless device.

8. The method of 5 in which a second short-range wireless device recognizes that the entity is within the particular geographic area, obtains the data, and sends the information.

9. The method of claim 7 in which the information sent to the first device includes promotional material for facilitating a transaction with an entity associated with the second device.

10. The method of claim 7 in which the entity obtains information about an entity associated with the second device from the commonly accessible database using the first device.

11. The method of claim 7 in which recognizing that the entity is within a particular geographic area is based on receipt of a message from the first device, the message including an identification code mapped to the entity.

12. A method comprising:

electronically storing, in a publicly accessible location, information about real-world entities that are users of devices that have short-range wireless communication capability,

providing client modules on the devices and a server module at the publicly accessible location, the client modules and the server module cooperating to provide guaranteed messaging between users of any of the devices and to enable commercial transactions between users of the devices based on the electronically stored information.

13. The method of claim 12 in which

one of the two wireless devices is fixed and one of the two wireless devices is mobile.

14. The method of claim 12 in which

the user of one of the devices comprises a commercial entity.

15. The method of claim 12 in which

the user of one of the devices comprises a consumer.

16. The method of claim 12 in which

the transaction comprises delivery of marketing information from one of the two devices to the other.

17. The method of claim 12 in which the transaction comprises the use by one of the two devices of a service provided by means of the other of the two devices.

18. The method of claim 12 in which

the transaction comprises electronic messaging.

19. The method of claim 12 in which

the transaction occurs when the two devices are out of range of each other.

20. The method of claim 12 in which access to the stored information is under the control of the user to which it pertains.

21. The method of claim 12 in which the stored information comprises the location of the user.

22. The method of claim 12 in which the stored information comprises consumption preferences of a consumer.

23. The method of claim 12 in which each of the users is associated with more than one of the devices.

24. The method of claim 12 in which the transaction is effected between the two users through the server that is located out of range of the two devices.

25. The method of claim 12 in which the two devices are in range of each other and the transaction is effected between two users carrying the two devices.

26. The method of claim 12 in which the transaction comprises sending an electronic business card from one of the devices to another one of the devices and displaying the card on the other one of the devices.

27. The method of claim 12 in which the transaction comprises an electronic message communicated from one of the users to the other through at least one of the two devices and by a route that includes a mode of communication that is selected from among the Internet, mobile telephony, and short-range wireless communication, the selection being made without the user's awareness.

28. Embodiments as described herein and/or shown in the drawings.

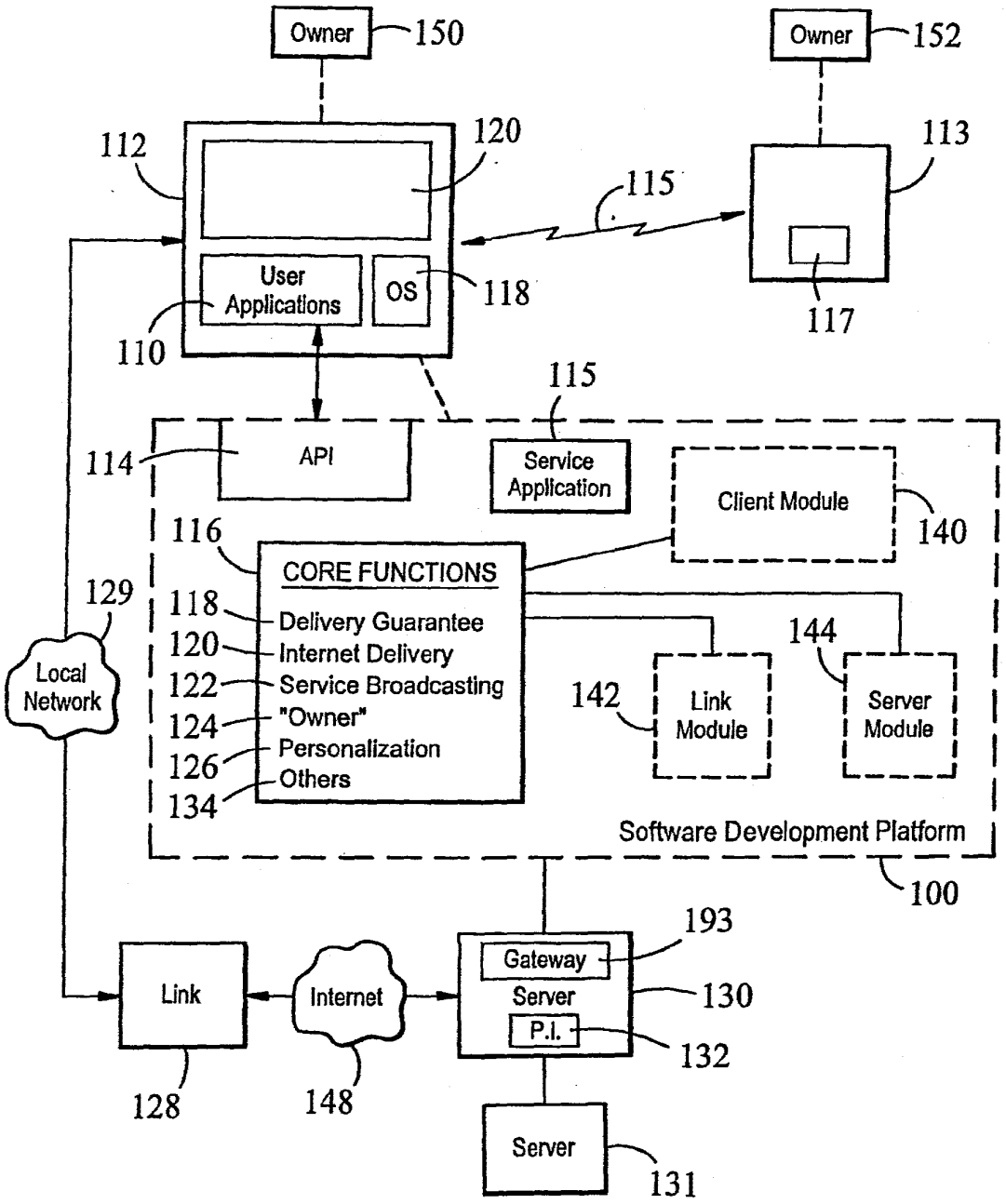

Owner
150
Owner
152
112
120
115
113
User Applications
OS
118
110
117
115
API
114
Service Application
Client Module
140
116
CORE FUNCTIONS
129
118 Delivery Guarantee
120 Internet Delivery
122 Service Broadcasting
124 "Owner"
126 Personalization
134 Others
144
142
Link Module
Server Module
Local Network
Software Development Platform
100
193
Gateway
Server
130
P.I.
132
Link
Internet
128
148
Server
131

FIG. 1

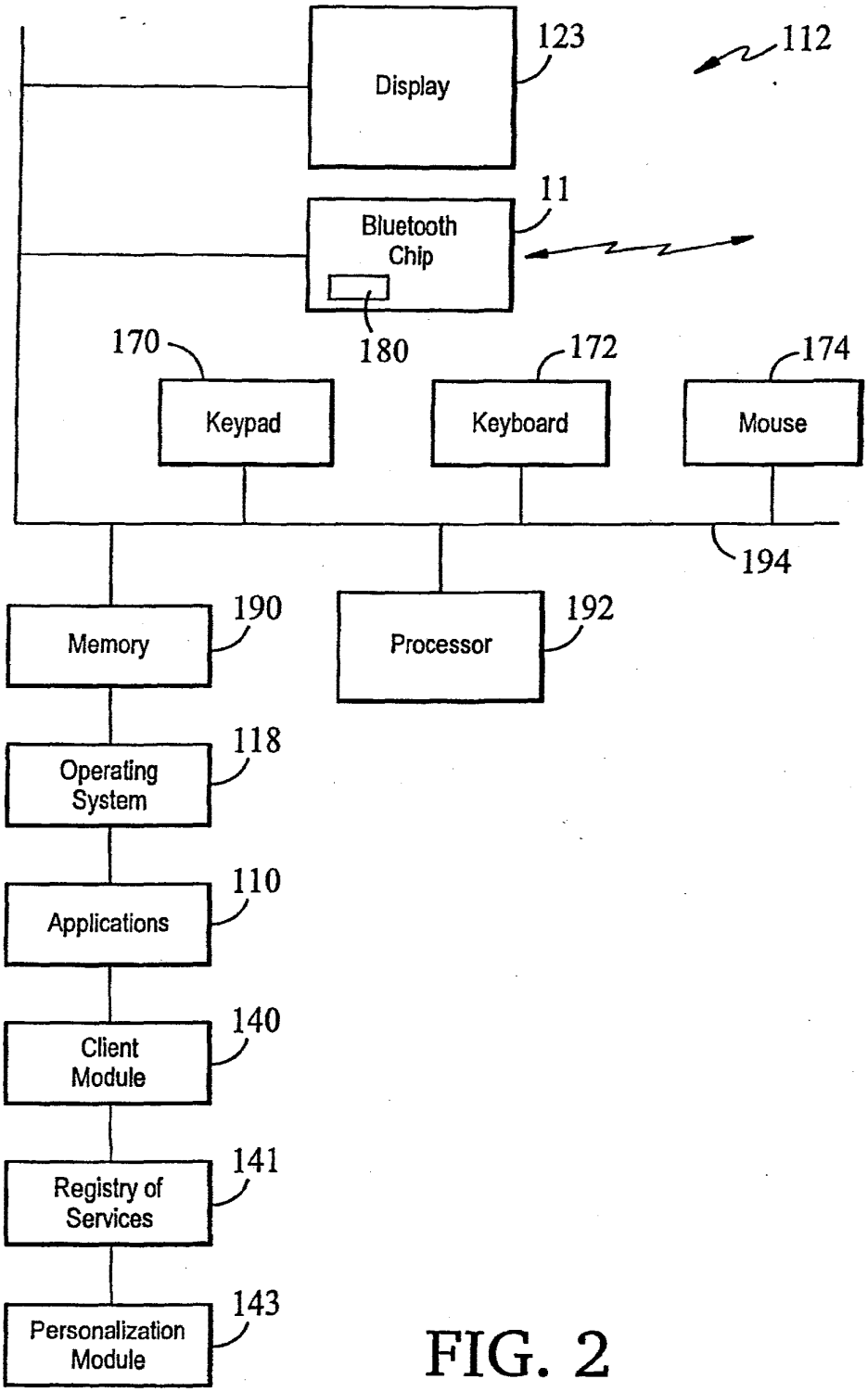

Display
123
112
Bluetooth Chip
11
180
170
Keypad
172
Keyboard
174
Mouse
194
Memory
190
Processor
192
Operating System
118
Applications
110
Client Module
140
Registry of Services
141
Personalization Module
143

FIG. 2

FIG. 3A

```
• LocalService {
    char * serviceName;
    int receive WhenRunning;
    int receive WhenNotRunning;
    int running;
    int maxNumOfMessagesToStore;
    char * exp_fld1;
    char * exp_fld2;
    char * exp_fld3;
    char * exp_fld4;
    char * exp_fld5;
  };
```

FIG. 3B

```
• RemoteService {
    char * serviceName;
    char * userName;
  };
```

FIG. 3C

```
• KMessage {
    char * serviceName;
    char * date;
    char * recipient;
    char * sender;
    char * messageBody;
  };
```

Name	sendMessage
Arguments	char * to, char * serviceName, char * data
Return Values	int err
Description	This function provides sending capabilities so that messages or any kind of unformatted text can be sent between Bluetooth devices. Reception of the text is guaranteed, because even when the devices are not within range, the text is stored and communicated via an Internet connection. If a user is logged in to more than one device simultaneously, the message/text will be sent to both devices at the same time.

FIG. 4A

Name	getMessages
Arguments	struct KMessage * message
Return Values	int err
Description	The getMessages function retrieves all messages or any other formatted text sent from another Bluetooth device. It returns the data in the KMessage data structure.If a user is logged in to more than one device simultaneously, the message/text will be received from both devices at the same time.

FIG. 4B

Name	getMessage
Arguments	struct KMessage * message
Return Values	int err
Description	The getMessage function retrieves just one message or any other unformatted text sent from another Bluetooth device. It returns the data in the KMessage data structure.If a user is logged in to more than one device simultaneously, the message/text will be received from both devices at the same time.

FIG. 4C

Name	getSurroundingServices
Arguments	struct RemoteService areaServices []
Return Values	int err
Description	This function returns an array of mappings of users and services available on that user's device. This information was previously stored in a database termed the registry, which is a list of devices within range of a Bluetooth device.

FIG. 4D

Name	AddService
Arguments	char * serviceName
Return Values	int err
Description	This function adds a service entry to the registry.

FIG. 4E

Name	RemoveService
Arguments	char * serviceName
Return Values	int err
Description	This function removes a service entry from the registry.

FIG. 4F

Name	changePMTdata
Arguments	<<waiting to hear about PMT API>>
Return Values	int err
Description	A function that allows users to update their personal PMT data and preferences using their particular devices. If the device is not within Bluetooth range of an Internet connection, it will restore these update preferences, and make changes within the permanent PMT upon coming into contact with an Internet connection.

FIG. 4G

Name	GetPMTdata
Arguments	char * user
Return Values	int err
Description	Allows a service to get the PMT data of a particular user from the PMT database. If the service cannot reach the PMT database, the information comes from the local storage on the device of the user. Only information that is designated as shared for public data will be retrieved.

FIG. 4H

Name	ChangePMTpermissions
Arguments	<<waiting to hear about PMT API>>
Return Values	int err
Description	This function allows a user to change his PMT permissions from his device.

FIG. 4I

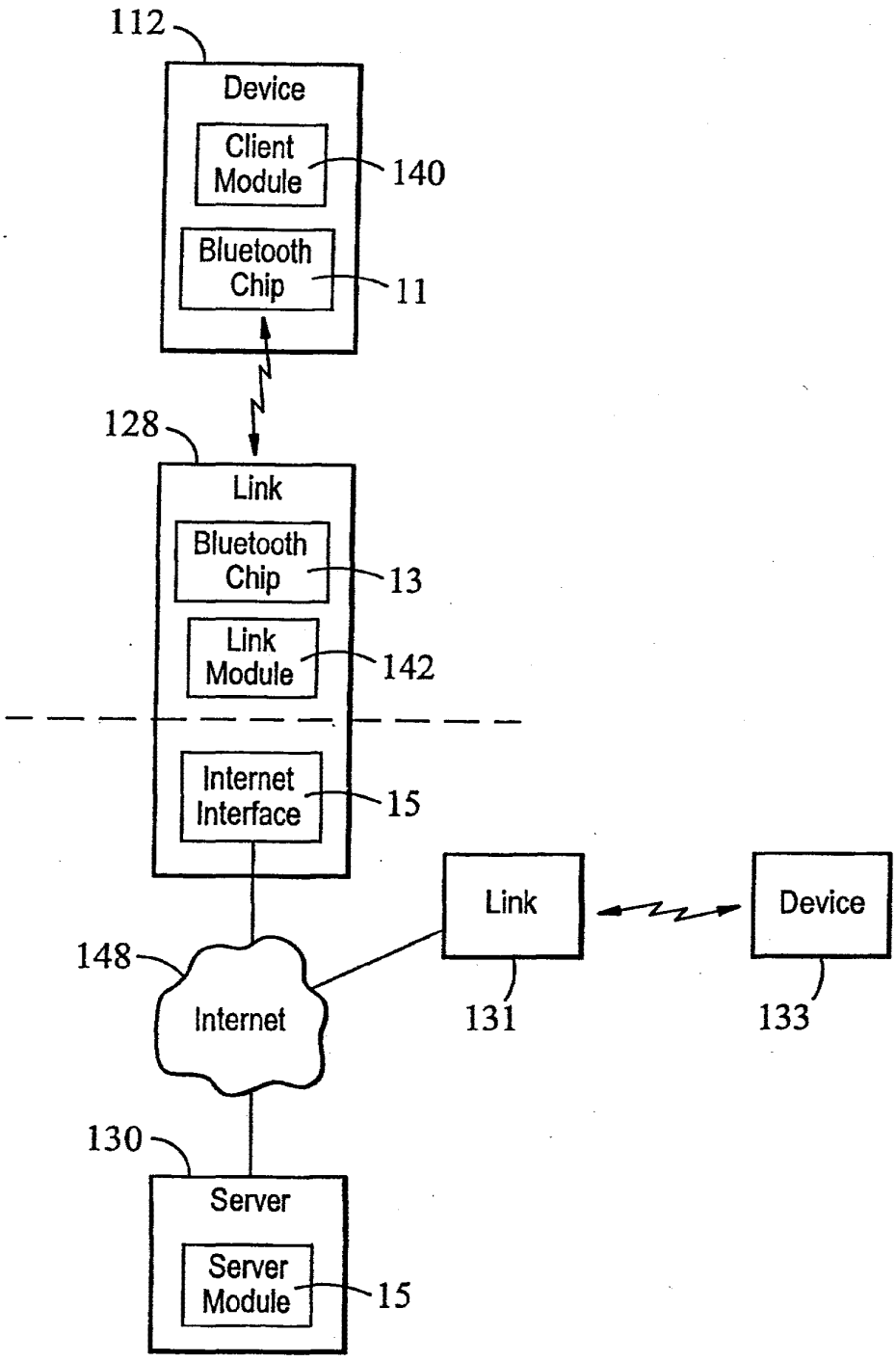

112
Device
Client Module
140
Bluetooth Chip
11
128
Link
Bluetooth Chip
13
Link Module
142
Internet Interface
15
Link
Device
148
Internet
131
133
130
Server
Server Module
15

FIG. 5

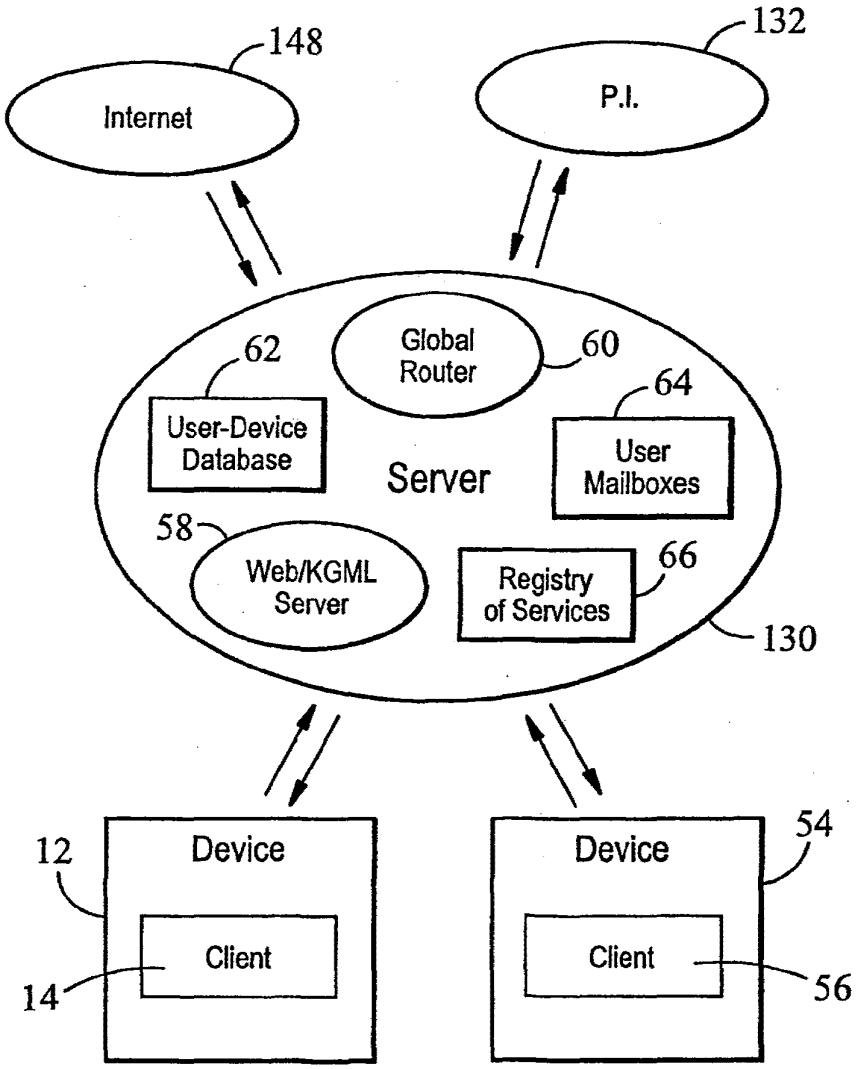
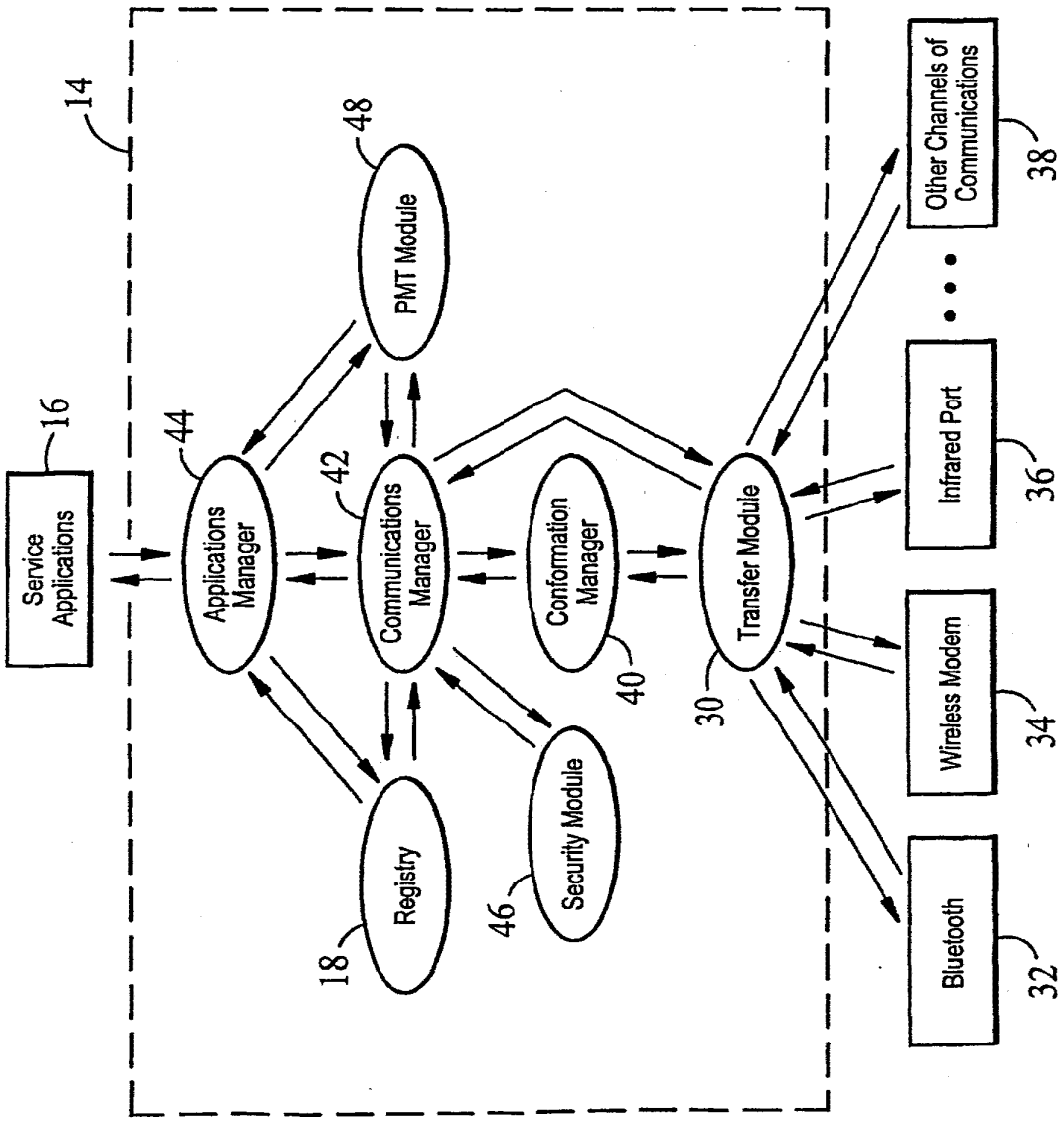

148
Internet
132
P.I.
62
User-Device Database
Global Router
60
64
User Mailboxes
Server
58
Web/KGML Server
66
Registry of Services
130
12
Device
Client
14
Device
54
Client
56

FIG. 6

FIG. 7


14
16
Service Applications
44
Applications Manager
42
Communications Manager
48
PMT Module
18
Registry
46
Security Module
40
Conformation Manager
30
Transfer Module
Other Channels of Communications
38
Infrared Port
36
Wireless Modem
34
Bluetooth
32

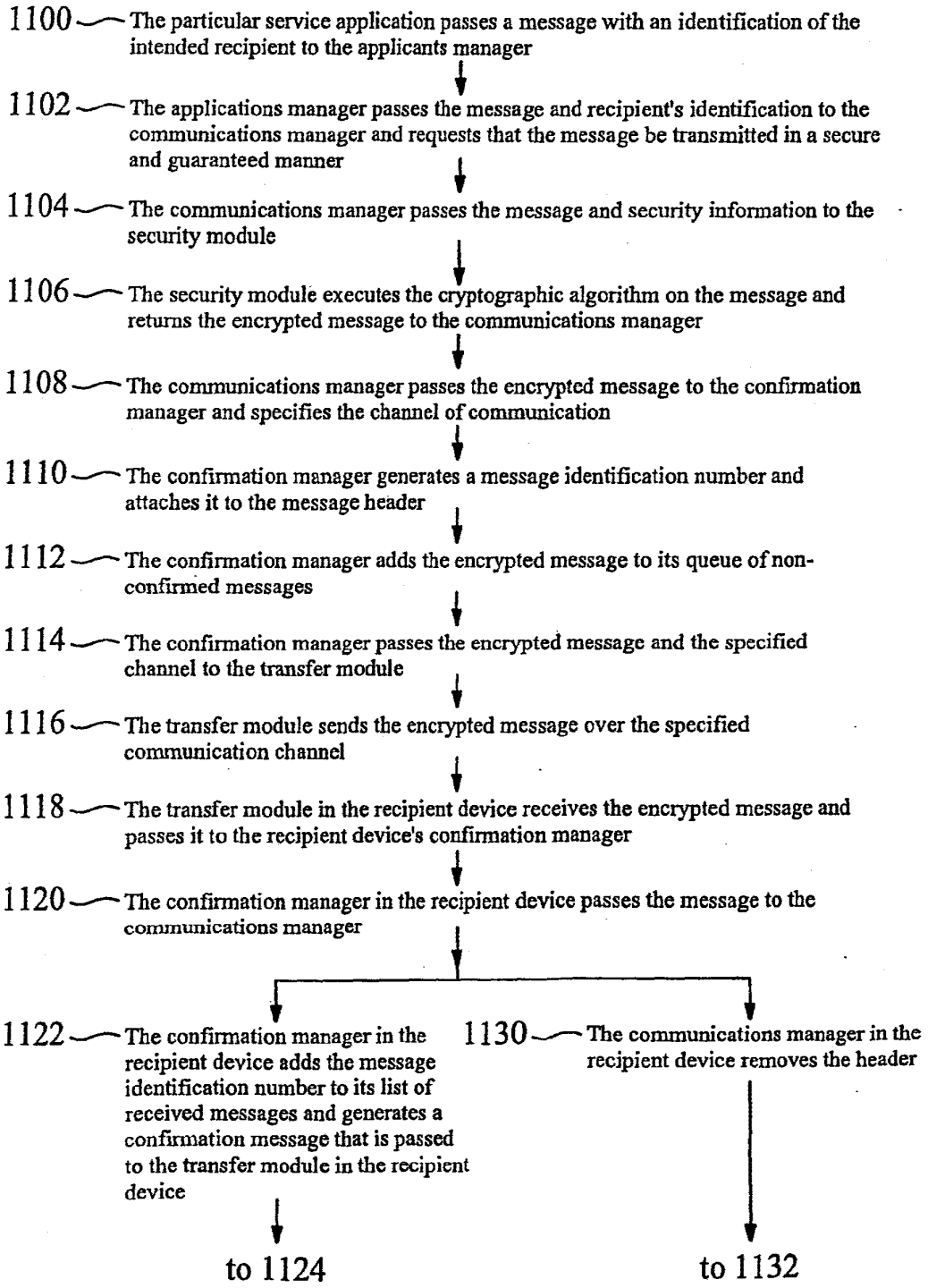

1100
The particular service application passes a message with an identification of the intended recipient to the applicants manager
1102
The applications manager passes the message and recipient's identification to the communications manager and requests that the message be transmitted in a secure and guaranteed manner
1104
The communications manager passes the message and security information to the security module
1106
The security module executes the cryptographic algorithm on the message and returns the encrypted message to the communications manager
1108
The communications manager passes the encrypted message to the confirmation manager and specifies the channel of communication
1110
The confirmation manager generates a message identification number and attaches it to the message header
1112
The confirmation manager adds the encrypted message to its queue of non-confirmed messages
1114
The confirmation manager passes the encrypted message and the specified channel to the transfer module
1116
The transfer module sends the encrypted message over the specified communication channel
1118
The transfer module in the recipient device receives the encrypted message and passes it to the recipient device's confirmation manager
1120
The confirmation manager in the recipient device passes the message to the communications manager
1122
The confirmation manager in the recipient device adds the message identification number to its list of received messages and generates a confirmation message that is passed to the transfer module in the recipient device
to 1124
1130
The communications manager in the recipient device removes the header
to 1132

FIG. 8A

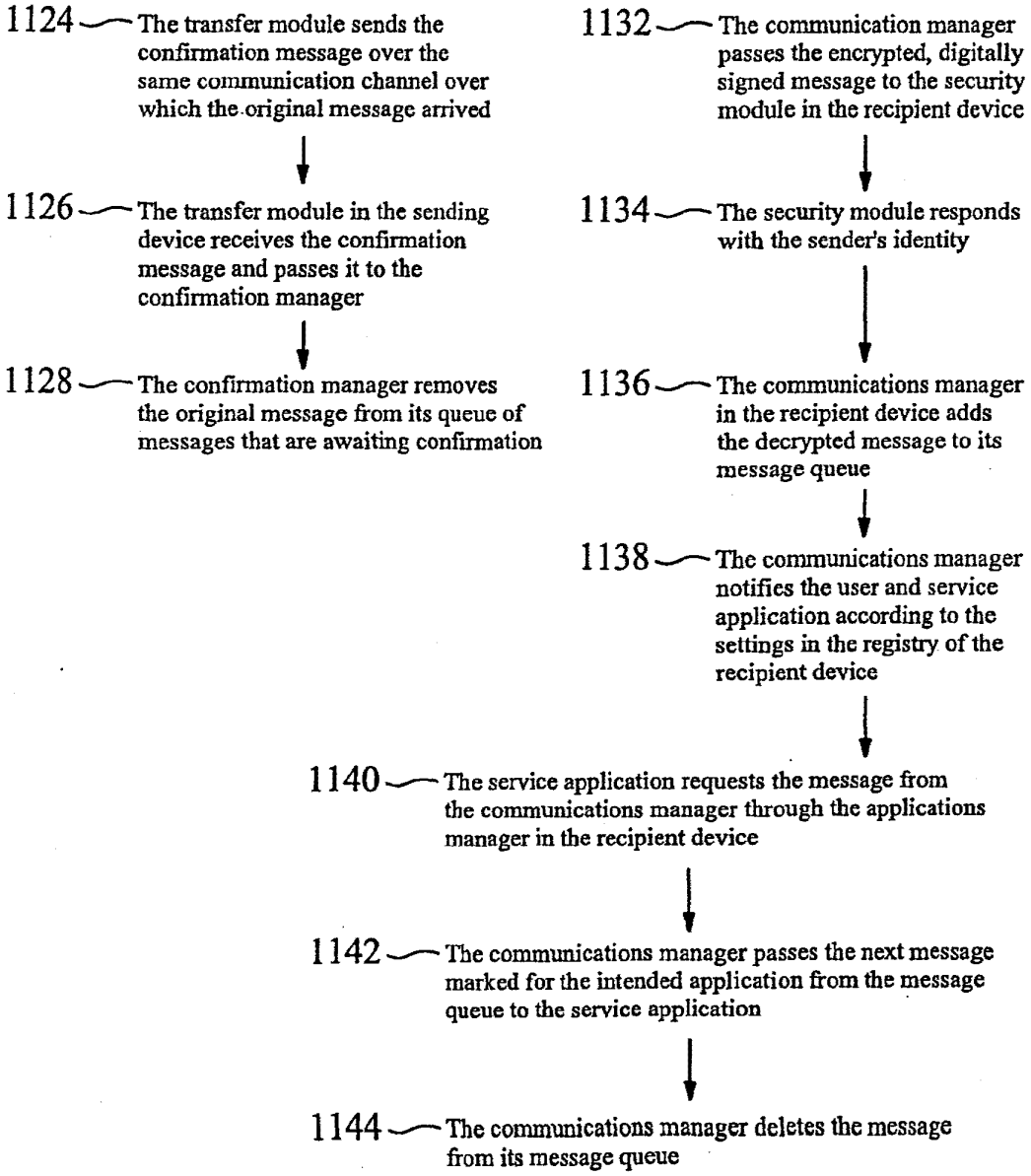

1124
The transfer module sends the confirmation message over the same communication channel over which the original message arrived
1126
The transfer module in the sending device receives the confirmation message and passes it to the confirmation manager
1128
The confirmation manager removes the original message from its queue of messages that are awaiting confirmation
1132
The communication manager passes the encrypted, digitally signed message to the security module in the recipient device
1134
The security module responds with the sender's identity
1136
The communications manager in the recipient device adds the decrypted message to its message queue
1138
The communications manager notifies the user and service application according to the settings in the registry of the recipient device
1140
The service application requests the message from the communications manager through the applications manager in the recipient device
1142
The communications manager passes the next message marked for the intended application from the message queue to the service application
1144
The communications manager deletes the message from its message queue

FIG. 8B

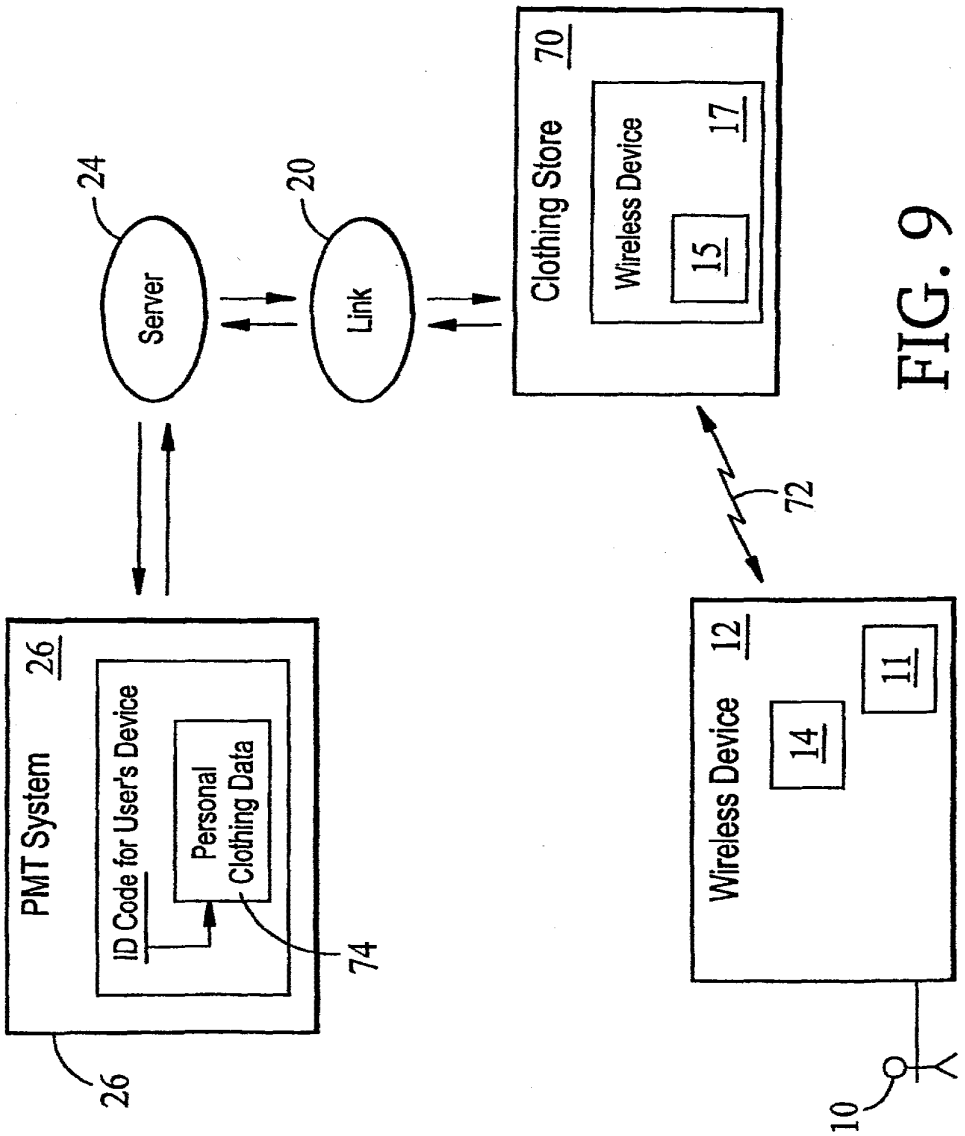

24
Server
20
Link
Clothing Store 70
Wireless Device 17
15
72
PMT System 26
ID Code for User's Device
Personal Clothing Data
74
26
Wireless Device 12
14
11
10

FIG. 9

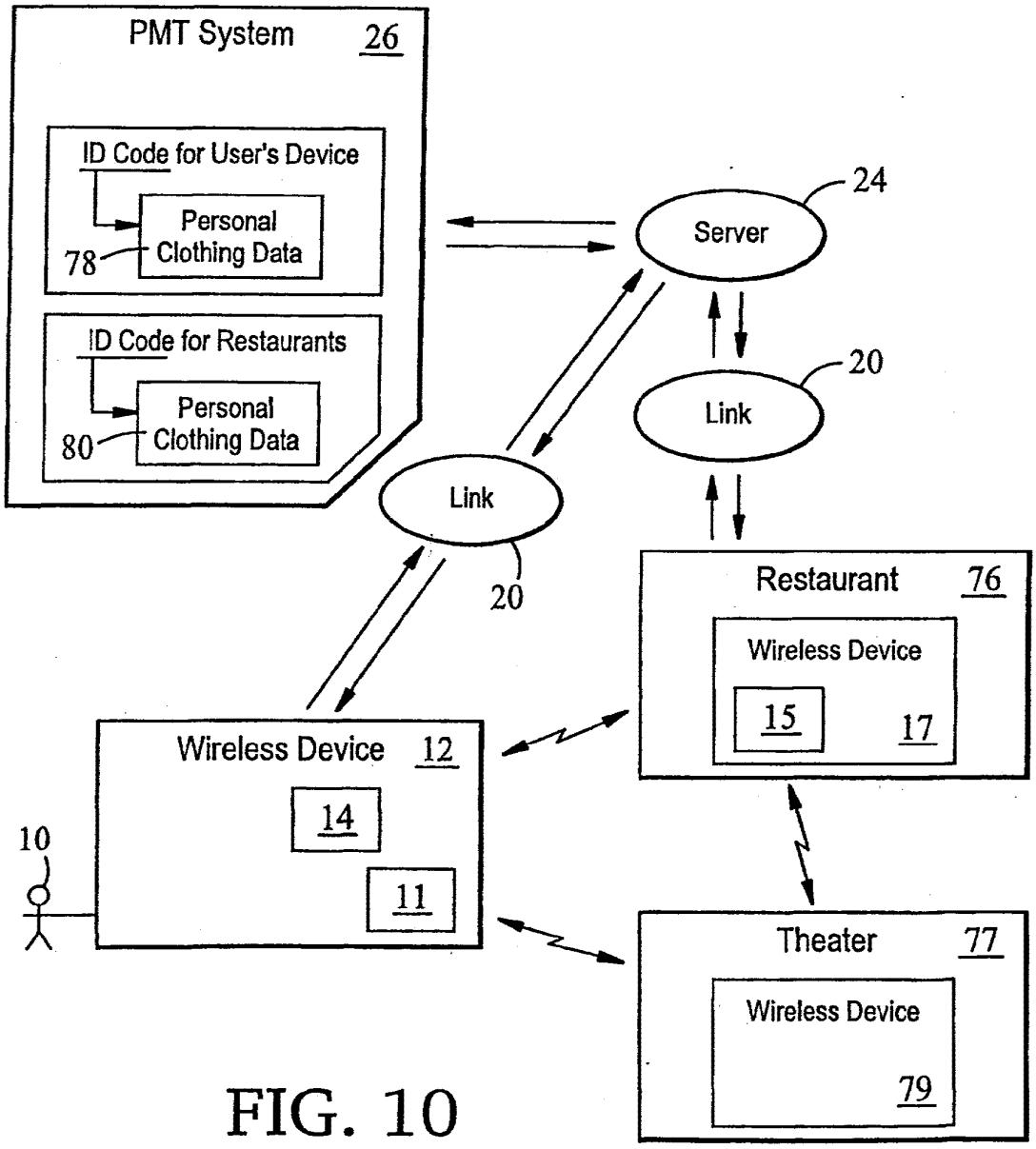

PMT System 26
ID Code for User's Device
Personal Clothing Data
78
ID Code for Restaurants
Personal Clothing Data
80
Server
24
Link
20
Link
20
Restaurant 76
Wireless Device
15
17
Wireless Device 12
14
11
10
Theater 77
Wireless Device
79

FIG. 10

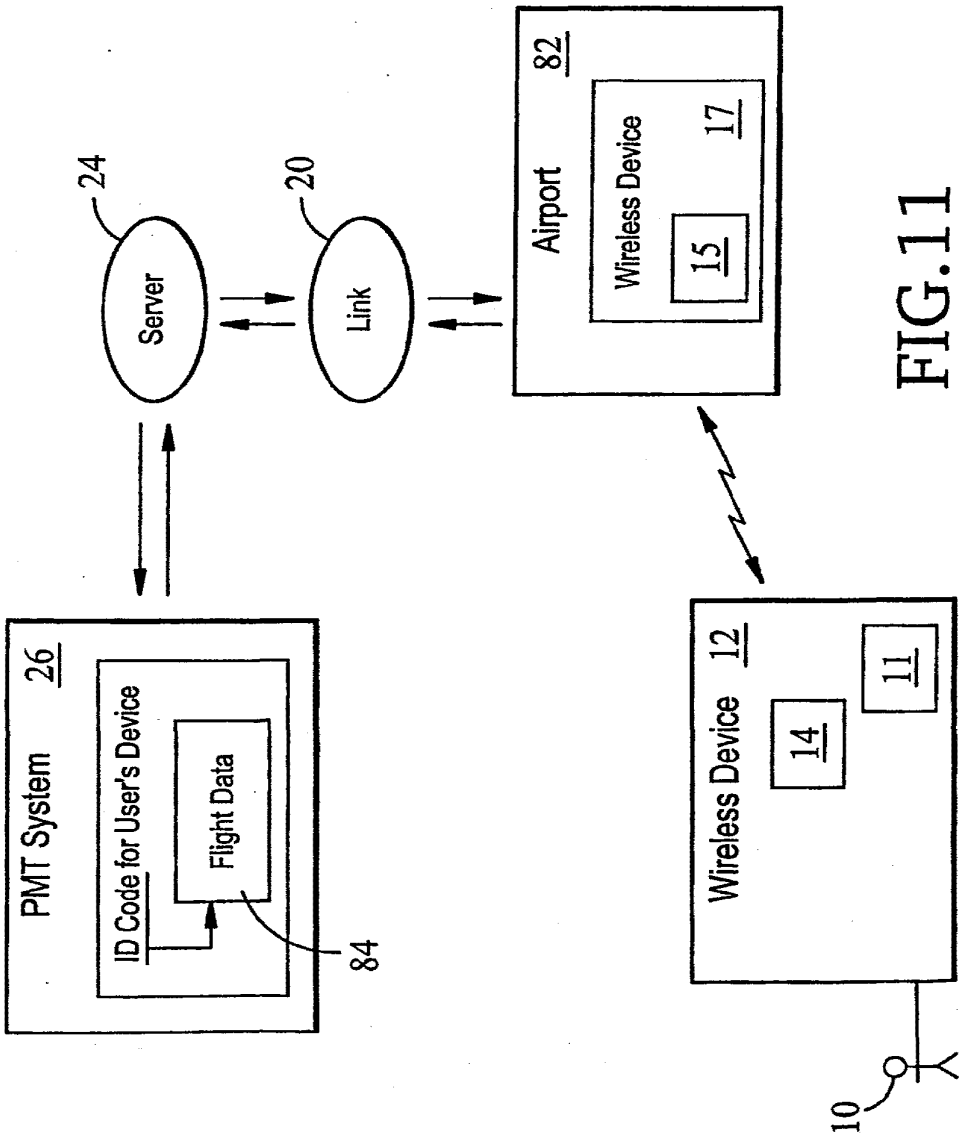

24
Server
20
Link
Airport
82
Wireless Device
17
15
PMT System
26
ID Code for User's Device
Flight Data
84
Wireless Device
12
14
11
10

FIG.11

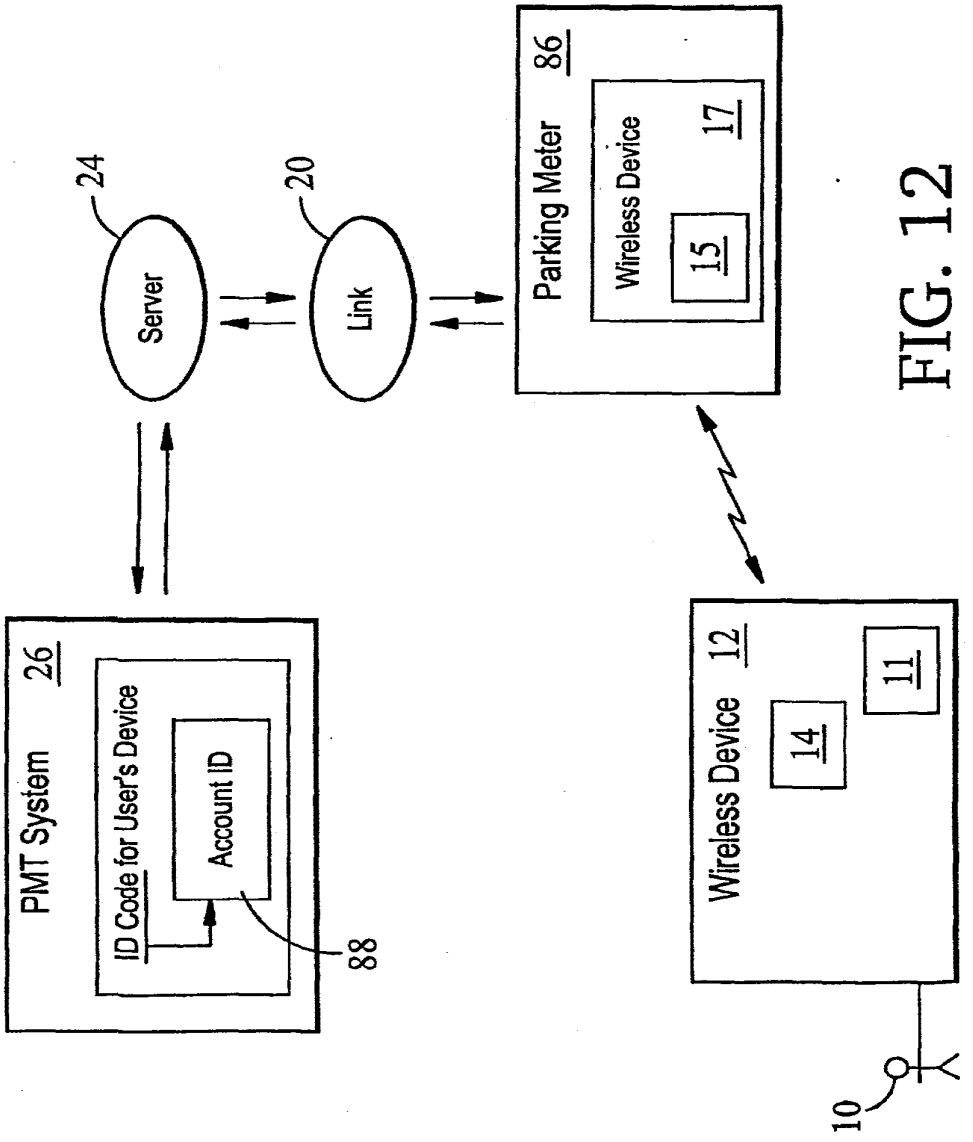

24
Server
20
Link
Parking Meter 86
Wireless Device 17
15
PMT System 26
ID Code for User's Device
Account ID
88
Wireless Device 12
14
11
10

FIG. 12

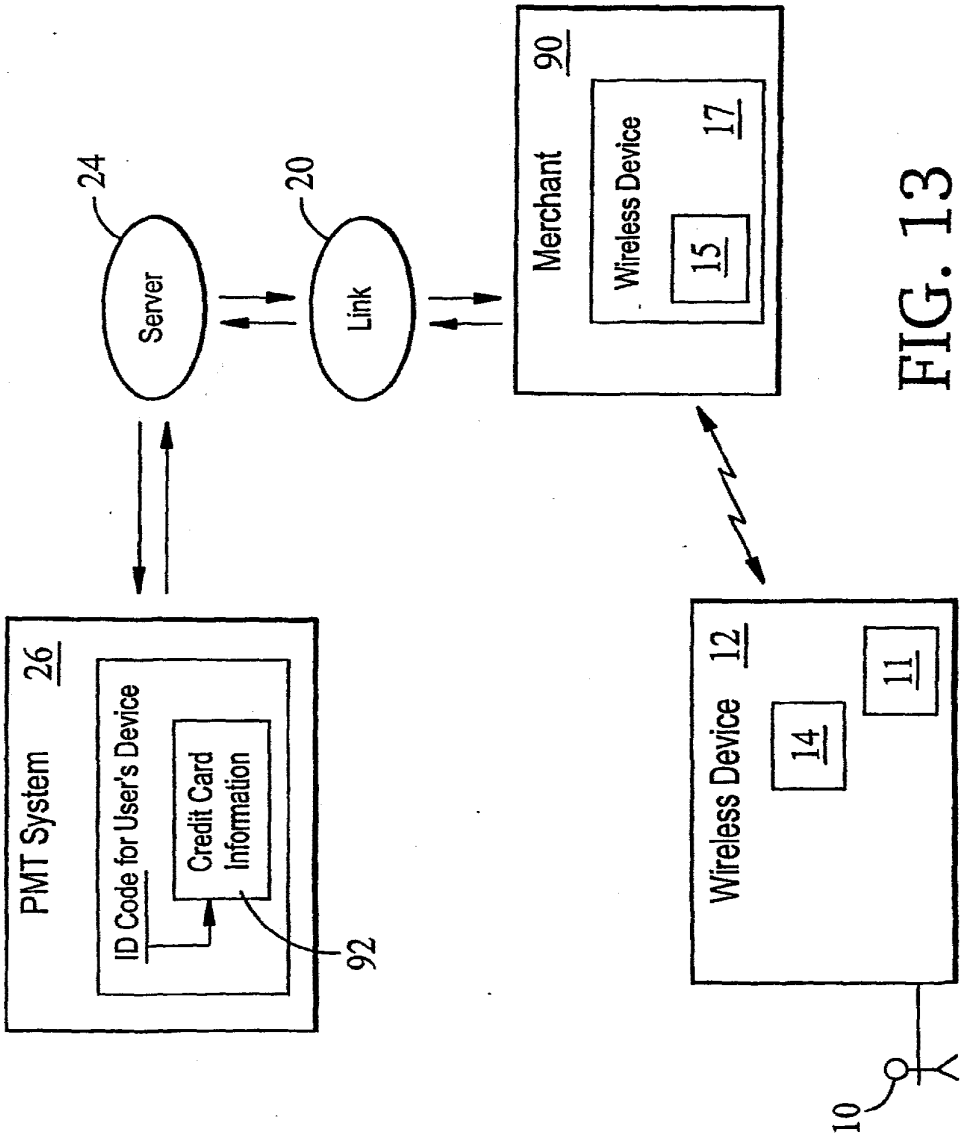

24
Server
20
Link
Merchant 90
Wireless Device 17
15
PMT System 26
ID Code for User's Device
Credit Card Information
92
Wireless Device 12
14
11
10

FIG. 13

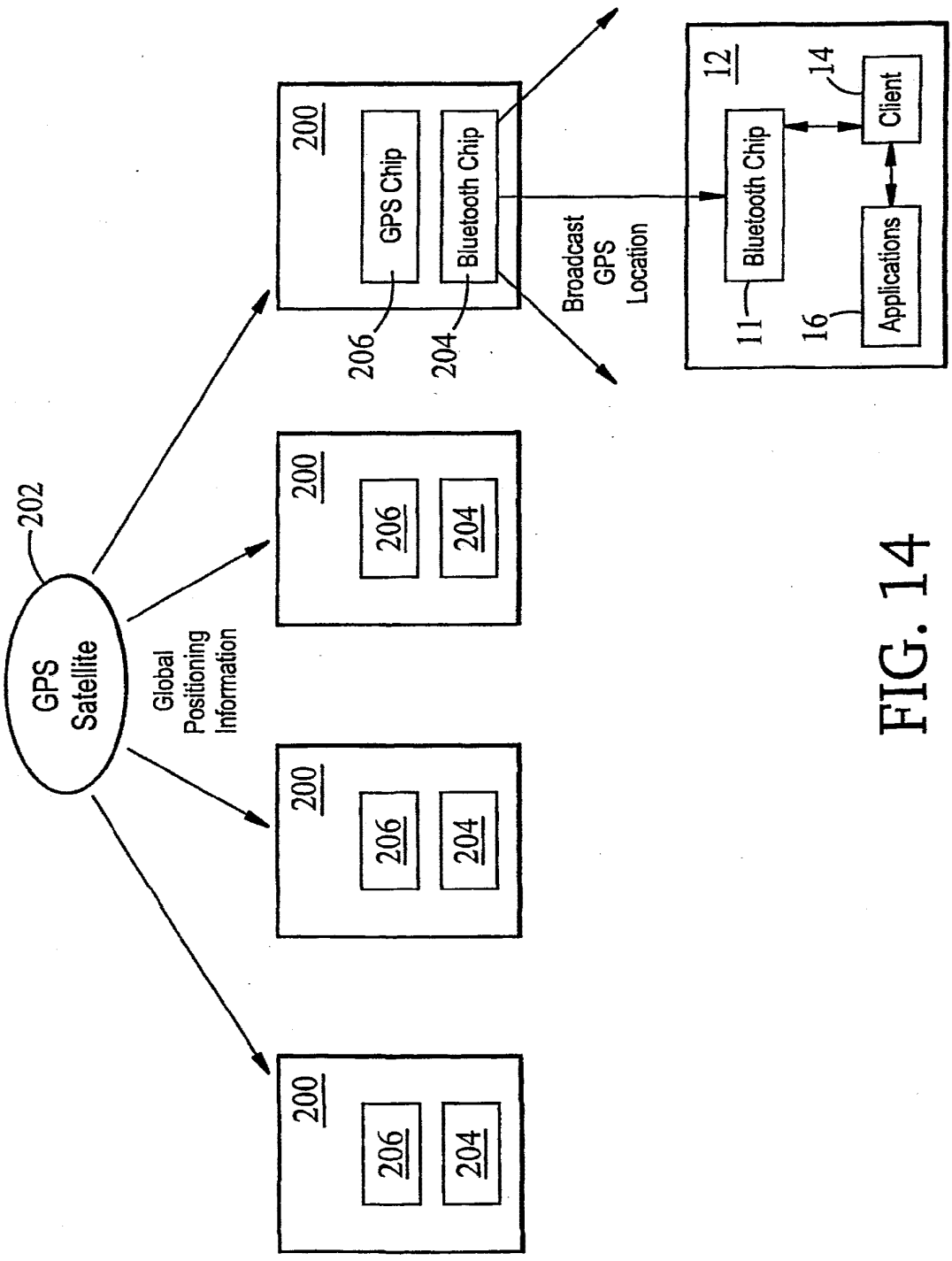
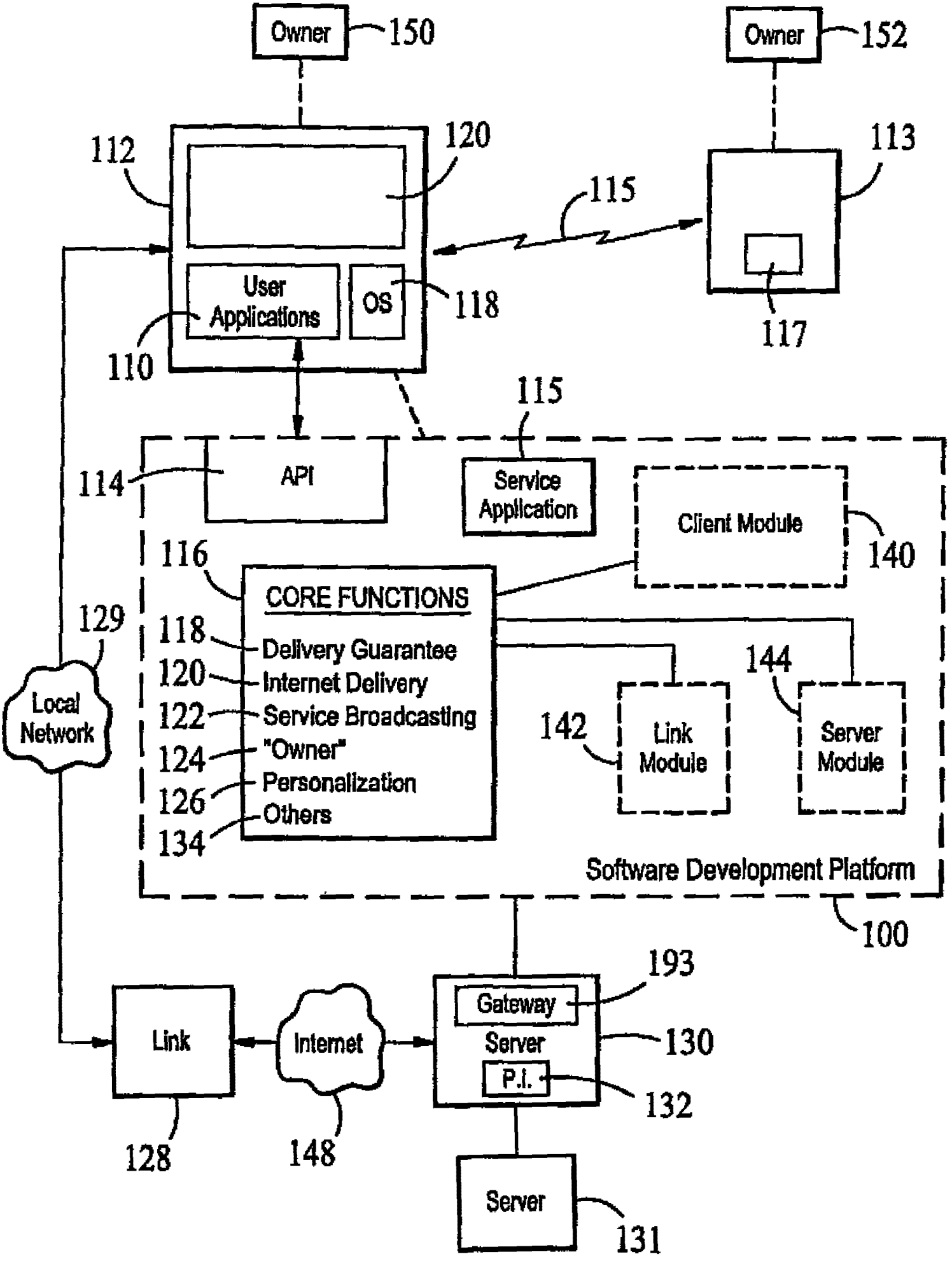

GPS Satellite
202
Global Positioning Information
200
206
204
GPS Chip
Bluetooth Chip
Broadcast GPS Location
12
14
Client
Bluetooth Chip
11
16
Applications

FIG. 14


Owner
150
Owner
152
112
120
113
115
User Applications
OS
118
110
117
115
API
114
Service Application
Client Module
140
116
CORE FUNCTIONS
129
118
Delivery Guarantee
120
Internet Delivery
122
Service Broadcasting
124
"Owner"
126
Personalization
134
Others
144
142
Link Module
Server Module
Local Network
Software Development Platform
100
193
Gateway
Server
130
P.I.
132
Link
Internet
128
148
Server
131

PATENTS
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1005-007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
James A. Proctor, Jr., et al.

Serial No.: 15/271,410

Examiner: Not yet assigned

Filed: September 21, 2016

Art Unit: Not yet assigned

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Confirmation No.: 7653

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
September 29, 2016

CERTIFICATE OF TRANSMISSION

I hereby certify that the following paper is being electronically transmitted to the Patent and Trademark Office by EFS-Web on September 29, 2016.

/Stephany DeBlois/
Stephany DeBlois

Commissioner for Patents
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Alexandria, VA 22313-1450

Sir/Madam:

INFORMATION DISCLOSURE STATEMENT

In keeping with the duty of candor and good faith owed to the Patent and Trademark Office, Applicant wishes to bring to the Examiner's attention the references

Petitioner Samsung Ex-1004, 0234

listed on the accompanying form PTO-1449. A copy of each listed foreign and non-patent literature reference is enclosed.

To the extent required by 37 C.F.R. §1.98(a)(3), Applicant has described what they consider to be the relevance, and/or provided an English translation, of any non-English-language documents, or portion thereof.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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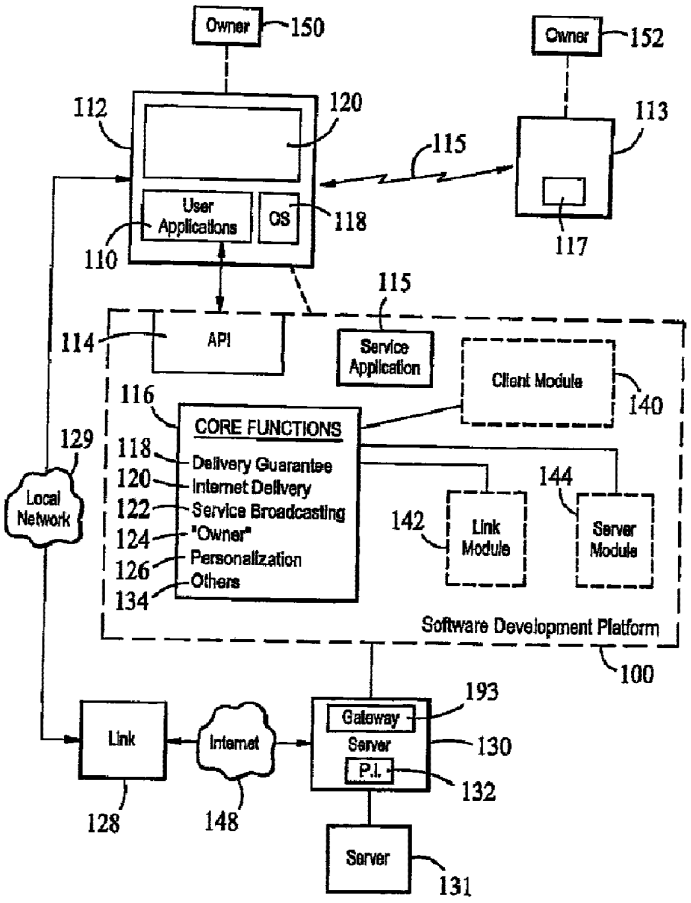
(51) Cl.Int./Int.Cl. *G06Q 30/06* (2012.01), *G06Q 20/40* (2012.01), *G07F 17/24* (2006.01), *H04W 4/00* (2009.01), *H04W 84/10* (2009.01), *H04W 88/06* (2009.01)

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(54) Titre : INFORMATIQUE ET COMMUNICATION MOBILES
(54) Title: MOBILE COMPUTING AND COMMUNICATION



(57) Abrégé/Abstract:
An application development platform enables applications to be created easily for, e.g., mobile devices that have short-range wireless communication capability. The development platform exposes a carefully chosen core set of services through an API.

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(21) 2 766 184

(13) A1

(57) **Abrégé(suite)/Abstract(continued)**:
Each of the applications can broadcast its services to local and remote devices. Message delivery between devices is guaranteed even for messages than cannot be delivered directly by local short-range wireless transmission. Message delivery through other channels, including the Internet, can occur transparently to the user. Each device can be associated with an "owner", which can be a person or an entity. Services can be customized to the owner based on stored information that maps owners to devices. Information associated with each of the owners of devices can be stored centrally and used in connection with providing the services at each of the mobile devices. Virtual GPS capabilities can be provided for mobile devices that do not have GPS chips.

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70850-146F

ABSTRACT

An application development platform enables applications to be created easily for, e.g., mobile devices that have short-range wireless communication capability. The development platform exposes a carefully chosen core set of services through an API. Each of the applications can broadcast its services to local and remote devices. Message delivery between devices is guaranteed even for messages than cannot be delivered directly by local short-range wireless transmission. Message delivery through other channels, including the Internet, can occur transparently to the user. Each device can be associated with an "owner", which can be a person or an entity. Services can be customized to the owner based on stored information that maps owners to devices. Information associated with each of the owners of devices can be stored centrally and used in connection with providing the services at each of the mobile devices. Virtual GPS capabilities can be provided for mobile devices that do not have GPS chips.

70850-146F

MOBILE COMPUTING AND COMMUNICATION

This application is a divisional of Canadian National Phase Patent Application Serial No. 2,437,706, filed on February 1, 2002.

BACKGROUND

This invention relates to mobile computing and communication.

Personal digital assistants, mobile telephones, and other mobile devices offer a wide range of computing and communication capabilities. To provide these capabilities, mobile devices have hardware complements that may include microprocessors, memories, displays that are in some cases touch sensitive, microphones, speakers, keys, and other user input and output mechanisms.

A variety of specific functions are often provided on mobile devices, including data entry, handwriting recognition, speech recognition, voice and data communication, memo writing, calendars, word processors, spreadsheets, to-do lists, and address books. These functions are implemented in software or firmware applications that are stored on the devices and use the features of an operating system such as Microsoft Windows CE or Palm OS that runs on and controls the hardware components of the mobile devices.

Mobile devices that are capable of wireless communication typically comply with one or more of the standard wireless communications protocols such as Bluetooth and the Wireless Application Protocol (WAP).

Bluetooth, for example, uses radio frequency transmission for relatively short-range communication. Bluetooth capabilities may be implemented in a small microchip that is incorporated into the mobile or other device.

To create an application for Bluetooth-capable devices, a developer typically writes custom software that implements the particular features of the application. A piece of custom software must be written for each of the devices that

are involved in performing functions of the application on either end of each Bluetooth communication link. Each piece of custom software is written to conform to the peculiar hardware and operating system characteristics of the device on which it will run.

SUMMARY

Some embodiments of the invention enable a fundamental shift in the way developers can enable users of mobile devices to interact with users of other mobile devices and users of stationary devices that have wireless capability.

According to an aspect of the invention, there is provided a method comprising: at a commonly accessible server: electronically storing information about a commercial transaction account of a user of a mobile device having short-range wireless communication capability, transmitting to a second device at a fixed location at least some of the information about the commercial transaction account of the user of the mobile device, and interacting with the mobile device and the second device, to enable a transaction between the user and a party associated with the second device based on the electronically stored information.

A further aspect of the invention provides an apparatus comprising: a mobile device having a short-range wireless communication capability and a first client module, the first client module being configured: to interact with a second client module on a second device at a fixed location and a commonly accessible database storing information about a commercial transaction account of a user of the mobile device, the second client module having received, from the commonly accessible database, at least some of the information about the commercial transaction account of the user of the mobile device, and to enable a transaction between the user and a party associated with the second client device based on the information.

There is also provided an apparatus comprising: an electronic device at a fixed location having a first client module, the first client module being configured: to interact with a second client module on a mobile device having a short-range wireless communication capability and a commonly accessible database including information about a commercial transaction account of a user of the mobile device, to receive, from the commonly accessible database, at least some of the information about the commercial transaction account of the user of the mobile device, and to enable a

transaction between the user and a party associated with the first client module based on the information.

In general, in one aspect, the invention features a method that includes running client modules on mobile devices, running a server module on a server that is accessible through a communication network, and running link modules on link devices that have communication channels to the mobile devices and are capable of accessing the server through the communication network. The client, server, and link modules provide core services through application programming interfaces to applications running on the mobile devices, the server, and the link devices.

Implementations of the invention may include one or more of the following features.

Service applications also run on the client modules to enable users of the mobile devices to manage the core services. The core services include interaction with short-range wireless transceivers in the mobile devices. A mobile device operating system is also running on the mobile devices and the client modules use services of the operating system. The mobile devices include personal digital assistants or mobile phones. The core services include at least one of the following: broadcast of information about real-world services; interaction with a wireless transceiver in the mobile device; guaranteed message delivery; and encryption.

In general, in another aspect, the invention features a method that includes running client modules on wireless devices, the client modules providing core services through application programming interfaces to applications running on the devices, at least some of

the applications being associated with real-world services that are provided by individuals or enterprises,

Implementations of the invention may include one or more of the following features. Information is maintained identifying relationships between each of the real- world services and at least one of the devices through which the service is provided, the core services providing a sharing among the devices of the information identifying the relationships between the real-world services and the devices. Information about the services available through each of the devices is broadcast by the core services to the other devices. The real-world services associated with the devices are registered by the core services. The real-world services include at least one of communication services, computational services, commercial services, or governmental services.

In general, in another aspect, the invention features maintaining in a wireless device a list of real- world services that are available from a user of the device through an application running on the device; and through a wireless communication channel, broadcasting information from the device indicative of the available real- world services.

Implementations of the invention may include one or more of the following features. The information is broadcast periodically. Another wireless device that receives the broadcast information accesses one of the available real-world services.

In general, in another aspect, the invention features a method that includes running client modules on mobile devices that are associated with identified users, running a server module on a server that is accessible on a communication network, and running link modules on link devices that have communication links to the mobile devices and are capable of accessing the server through the communication network,

Implementations of the invention may include one or more of the following features. A message is received from a user of one of the mobile devices through one of the applications running on the device, the message being directed to another user of an application running on another one of the mobile devices, and the message is delivered to the other user through the Internet. The message is sent through the links and the server. The client module running on the device from which the message is sent determines whether the target mobile device is within short-range wireless distance, and, if not, the client module forwards the message to one of the link modules. The link module forwards the message to the server through the Internet. The server module determines the location of the target mobile device and identifies a communication channel through which to forward the message to the other user.

In general, in another aspect, the invention features a method that includes maintaining a list of short-range wireless devices within range of a first short-range wireless device; and transmitting a message from an identified user of the first device to a second identified user of a second wireless device over a communication medium, the communication medium being selected based at least in part on whether the second device is included on the list, the selection being transparent to the user of the first device.

Implementations of the invention may include one or more of the following features. If the second device is included on the list, the message is transmitted to the second device over a short-range radio link, and if the second device is not included on the list, the message is transmitted to the second device using another communication medium. If the second device is not included on the list, the message is transmitted to the second device over either the Internet or by mobile telephony.

In general, in another aspect, the invention features a method that includes transmitting a message from an identified user of a short-range wireless

device to an identified user of another device; and automatically confirming to the identified user of the first device whether the transmitted message was received by the identified user of the other device.

Implementations of the invention may include one or more of the following features. Information is stored about the transmitted message in the first device after transmission; and a match is made between received confirmations and the transmitted message stored in the device. The transmitted message is resent if a confirmation for the transmitted message is not received within a specified period. A communications manager is notified in the first device if the transmitted message is undeliverable. The notifying includes providing an explanation of why the transmitted message was undeliverable. The transmitted message is removed from the device after it is confirmed that the transmitted message was received by the identified user of the other device. The device from which the message is transmitted is responsible for guaranteeing the delivery.

In general, in another aspect, the invention features a method that includes running applications on devices that are associated with respective owning entities, sending a message from an initiating owning entity to a target owning entity using one of the applications running on one of the devices associated with the initiating owning entity, identifying one of the devices as being associated with the target owning entity and as being accessible by a communication link, and forwarding the message to the device that is associated with the target owning entity through the communication link.

Implementations of the invention may include one or more of the following features. Each of the devices runs a client module that encrypts and decrypts the message using a public key associated with the owning entity of the device. The public key is stored in the device and in a server through which the message passes. The device comprises a mobile device. The owning entity comprises a person. The owning entity comprises an enterprise and the device comprises a stationary device.

In general, in another aspect, the invention features a method that includes (a) storing information that identifies real- world entities and defines modes of interaction by the real-world entities through distributed devices, each of the real-world entities providing services to other real-world entities and using services of other real- world entities, (b) enabling any of the real- world entities using any arbitrary one or more of the distributed devices to log into the server, (c) loading portions of the stored information from the server to the device being used, and (d) regulating the interaction of the real- world entity using the device with other real-world entities based on the stored information, the interaction including the use of the services of the other real- world entities.

Implementations of the invention may include one or more of the following features. Client modules are run on the device, a server module is run on a server that is accessible on a communication network, the client and server modules provide core services through application programming interfaces to applications running on the devices, and the core services include access to the information that is stored on the server and relates to real-world entities. The stored information includes at least one of identification information, demographic information, and preference information.

In general, in another aspect, the invention features a method that includes associating with each one of a number of different mobile devices that have a short-range wireless communication capability, a person who is a user of the device; storing information about the association of devices and users and information about each of the users at a publicly accessible server; and providing services at each of the mobile devices that depend on the information about the user of the device that is stored at the server.

Implementations of the invention may include one or more of the following features. The information about the users is communicated to the devices from the server for use in providing the functions. The information about the users includes at least one of: demographic information, identification information, preference information, or location information. At least some of the information about the users is stored on the mobile devices associated with the users.

In general, in another aspect, the invention features a method that includes recognizing automatically that an entity in possession of a short-range wireless device is within a particular geographic area; obtaining data about the entity from a commonly accessible database; and sending information to the short-range wireless device, the information sent to the device depending on the data obtained from the database.

Implementations of the invention may include one or more of the following features. Access to the data about the entity in the commonly accessible database is contingent on permission of the entity. The entity can access and modify its data in the commonly accessible database using the wireless device. A second short-range wireless device recognizes that the entity is within the particular geographic area, obtains the data, and sends the information. The information sent to the first device includes promotional material for facilitating a transaction with an entity associated with the second device. The entity obtains information about an entity associated with the second device from the commonly accessible database using the first device. Recognition that the entity is within a particular geographic area is based on receipt of a message from the first device, the message including an identification code mapped to the entity.

In general, in another aspect, the invention features a method that includes (a) electronically storing, in a publicly accessible location, information about real-world entities that are users of devices that have short-range wireless

communication capability, (b) providing client modules on the devices and a server module at the publicly accessible location, the client modules and the server module cooperating to provide guaranteed messaging between users of any of the devices and to enable commercial transactions between users of the devices based on the electronically stored information.

Implementations of the invention may include one or more of the following features. One of the two wireless devices is fixed and one of the two wireless devices is mobile. The user of one of the devices comprises a commercial entity. The user of one of the devices comprises a consumer. The transaction comprises delivery of marketing information from one of the two devices to the other. The transaction comprises the use by one of the two devices of a service provided by means of the other of the two devices. The transaction comprises electronic messaging. The transaction occurs when the two devices are out of range of each other. Access to the stored information is under the control of the user to which it pertains. The stored information comprises the location of the user. The stored information comprises consumption preferences of a consumer. Each of the users is associated with more than one of the devices. The transaction is effected between the two users through the server that is located out of range of the two devices. The two devices are in range of each other and the transaction is effected between two users carrying the two devices. The transaction comprises sending an electronic business card from one of the devices to another one of the devices and displaying the card on the other one of the devices. The transaction comprises an electronic message communicated from one of the users to the other through at least one of the two devices and by a route that includes a mode of communication that is selected from among the Internet, mobile telephony, and short-range wireless communication, the selection being made without the user's awareness.

In general, in another aspect, the invention features a method that includes, at a first device, receiving information from a second device through a short-

range wireless communication channel, the information identifying an actual geographic location of the second device based on signals received from GPS sources, and updating a derived geographic location stored at the first device based on the information received from second device.

Implementations of the invention may include one or more of the following features. The derived geographic location is updated to be the same as the actual geographic location of the second device. The first device receives information over time from multiple other devices, the information representing the actual GPS geographic locations of the other devices, and the derived geographic location is updated from time to time based on the information received over time from the other devices. The first device is mobile and the second device is stationary.

Other features and advantages will become apparent from the following description and the claims.

DESCRIPTION

Figure 1 shows a communication system.

Figure 2 shows a wireless mobile device.

Figures 3A, 3B, and 3C show data structures.

Figures. 4A through 41 show functions that can be used by a wireless device.

Figure 5 shows communication paths.

Figure 6 shows a server.

Figure 7 shows a client.

Figures 8A and 8B show a method for wireless communication.

Figure 9 through 14 show uses of the system.

OVERVIEW

One general aspect of the invention is an application development platform that includes client, link, and server modules that expose core services through an application programming interface (API). Applications can be easily built on the API. The core services are selected to enable unique and widely useful applications to be created.

Each of the applications can make services available to local and remote devices on which the client modules run. The availability of services is broadcast and known to the mobile devices, links, and services so that devices throughout the system can take advantage of them.

One core service is message delivery. The client, link, and server modules coordinate their activities to guarantee at a high level the delivery of messages initiated by applications running on the mobile devices. Messages may be sent directly by a short-range wireless channel from a mobile device to another mobile device that is in the vicinity. If the target device is not in the vicinity, the message may be sent through other channels, including the Internet, to the target device. The communication channel can be chosen transparently to the user of the originating device.

Each device in the system can be associated with an "owner", which can be a person or an entity, such as a retail establishment. Information can be stored that links devices to owners so that messages, for example, can be directed to an owner. The system will determine the identity and location of a device associated

with the owner. The message will then be sent to the identified device wherever it is located using whatever communication channel is appropriate.

Information associated with each of the owners of devices can be stored centrally and used in providing the services at each of the mobile devices. For example, information about the owner's preferences or characteristics can be used to govern the manner in which services are provided, information is made available and communications are effected.

The system can be used to provide virtual GPS capabilities for mobile devices that do not include GPS chips. Such a mobile device can obtain actual GPS information from other devices in the vicinity using short-range wireless communication. The mobile device can maintain a virtual GPS location that is nearly as accurate as if it had the GPS chip on-bard.

As shown in figure 1, the invention provides a common software development platform 100 that enables developers to easily, quickly, and effectively build a wide range of user applications 110 for devices 112, including mobile devices, that have short-range wireless communication capabilities, such as those provided by the Bluetooth standard. The common software development platform provides core functions and features 116 that can be invoked by the user applications through an API 114.

This architecture enables the developer to provide functions and features that are especially suited to mobile devices and short-range wireless communication and that have extremely broad appeal to users of the mobile devices. The developer need not re-invent, for each type of device and each communication protocol, the manner in which the applications interact with the operating system 118 running on the device, the device hardware 120, and the communications protocols.

The core functions include

providing a high-level guarantee of message delivery from one device to another 119

a delivery service that transparently arranges for the delivery of messages from one user to another through, e.g., the Internet 148, if the two devices are not within short-range wireless communication distance of each other 120

broadcasting of available services by a device and use of information that is broadcast from other devices 122

associating an "owner" with each device 124, and

integration with information associated with the owner 126.

The applications may enable both person-to-person interaction and person-to-location interaction, which involves a person interacting with an institution or real- world location or enterprise such as a store or airport.

The devices need not be mobile, but may include stationary devices that are to be part of the communication, including personal computers, cash registers, servers, and parking meters, to name a few. The platform extends to the hardware and software that provides a link 128 between the mobile devices and other devices, including a central servers 130, that are not within direct reach of the short-range wireless communication capabilities of the mobile device.

Based on the common development platform and the API that it presents to developers, any developer can easily create applications that change the way individuals interact with one another and with their environments.

The platform enables a developer to easily create applications that do virtually any job that requires local communication between devices (including mobile devices) 112, 113, or longer-distance communication between local devices and central servers. Because the platform encompasses servers, it also enables a developer to use personalization information 132 that is stored on a server to personalize the operation of applications that are running on local devices.

The core functions exposed by the API include functions that are expected to be used by a large proportion of applications that are built on Bluetooth. The application developer can build other features and functions 134 into his application and can supplement and expand the core functions.

In addition to the initial ease of creating the applications, the use of a common development platform leads to applications that are inter-compatible, more uniform, and more standardized.

The common development platform includes a client module 140, a server module 144, and a link module 142. The client module runs on a client device 112, such as a mobile device or a stationary local device owned by a merchant or a consumer. The server module runs on a server 130 that is typically not within short-range communication distance of the client devices, and the link module runs on a device 128 that provides a link between one or more client devices and the servers.

"Owner" of a device

Conceptually, each client device has an "owner" 150, 152. In a simple example, the owner is a person who owns and uses the device, say the owner of a Palm Pilot with Bluetooth capability. Another example of an owner would be a restaurant operator

with respect to a Bluetooth-capable client cash register at a restaurant. The owner of a device is known to the client, server, and link modules. An owner may change, for example, when a person lends his mobile telephone to another person.

The system stores information about the owners of the devices in a centralized database 132 to which one or more servers 130, 131 have access. The information could include names, addresses, and billing information, and other information such as the current location of the person and his current telephone number. The information could also include demographic information and user-entered preferences about products, services, and user interfaces.

One benefit of having the information accessible to the servers and clients is that it becomes possible for one party at one location to communicate with an owner located anywhere in the world even if, on one occasion, the communication is by Bluetooth, on another occasion by mobile telephony, and on another occasion through the Internet 148. The initiating party need not know where the owner is located or how to reach him; the server is aware of that information and can forward the message through the link to a server and from the server through an appropriate medium to the owner.

By combining the features of centrally stored information with easy-to-develop applications for mobile devices, it is possible to create a broad range of portable, standardized applications that make fundamental changes in the way people interact with the world around them.

Broadcast of services

The development platform 100 includes a function that enables an application 110 running on a mobile device to broadcast information about services that it provides to other devices running applications. Conversely, an application is able to identify and learn about services that are made available by applications

running on other devices, for example, devices that are within short-range wireless communication and devices that are accessible through the link module. The service-broadcasting capability enables the creation of a fabric of millions of devices (mobile devices, central servers, links, and others) that provide and use services, where a person's mobile device can be kept aware of available services as it moves through a world populated by the other devices.

Personalization

Because the client, link, and server provide the basic core capability of finding, storing, and editing personalization information in a central database 132, the applications built on the modules can provide functions that are dependent on the personalization information for the "owner" of the device.

Guaranteed delivery

Another of the key core functions provided by the application development platform is so-called high-level guaranteed delivery of messages. When an application running on a device such as a mobile PDA initiates a message to another device anywhere in the world, the modules guarantee delivery of the message even if the other device is not within short-range communication and even if the other device is not in use at the moment. To do this, the modules determine the location of the target device, determine an appropriate mode of communication (e.g., a Bluetooth communication to a local device followed by a link to the Internet and then a telephony link to the target device) and track the message until delivery has occurred.

The Internet can be used as a transparent alternative to Bluetooth for message delivery. When a user of an application on a device takes a step that requires a message to be sent to another device, the message can be sent through the Internet at the election of the modules, without the user being aware that Bluetooth is not being used.

THE WIRELESS DEVICE

As shown in figure 2, the client device 112 can be a wireless device that has a Bluetooth chip 11 enabling it to communicate over short-range radio links (such as link 115, figure 1) with another chip 117 (figure 1) in another device in accordance with the Bluetooth protocol. The device 112 could be, for example, a mobile telephone, personal data assistant (PDAs), handheld computer or organizer, personal computer, cash register, parking meter, or other device. The device can include a touch-sensitive display 123 to allow the user to view information and interact with the device, a keypad 170, a keyboard 172, a mouse 174, or other means for allowing the user to interact with the device.

The chip 11 has a unique identification code 180 that is mapped in the personalization database 132 to the user or owner of the device. The user of the device may be an individual, vehicle, or other mobile entity, or may be an entity whose location is fixed such as a store or restaurant.

Generally, the device 112 also has a memory or memories 190 that store an operating system 118, applications 110, and the client module 140, a processor or processors 192, and one or more internal system communication buses 194 interconnecting these hardware components (the hardware components are together identified by the numeral 120 on figure 1).

Interaction between the Bluetooth chip, on one hand, and the operating system, the client module, and the applications, on the other hand conforms to a Bluetooth API that is exposed by the chip to the devices that interact with it. By making calls to the chip 11 through the client module, application programs 16 created by a variety of parties and running on the device 112 can achieve a broad range of functions. By interacting with the operating system 118 of the device 112, the client module 140 can take advantage of the communication, processing, display and user interaction features provided by the operating system.

TRACKING AVAILABLE SERVICES

The client module 140 keeps a registry 141 of services that are available from the applications running on the local device 112 and services that are available from applications running on other devices, including devices that are within short-range wireless distance of the local device 112.

An entry in the registry related to a service may have the format shown in figure 3 A for a locally available service and the format shown in figure 3B for a service available on another device. Other formats could be used.

Exemplary services that could be made available by applications running on devices include a WML server or an instant messaging client.

The platform exposes "AddService" and "RemoveService" functions (see figures 4E and 4F) that can be used by applications to add (register) or remove (unregister) services from the list in the registry 141.

The client module makes information about the user (owner) of a device and the services available from that device by a periodic broadcast ping to all devices within range of a local device. The broadcast function allows numerous devices constantly to be aware of a range of services offered by other devices. Each device can take advantage of and use a wide range of services for the user's benefit. The client module uses the information stored in the registry 141 by the applications to provide other devices with descriptions of services and instructions on how to access them.

The applications running on the device can include core service applications that enable user interaction with and control of functions provided by the client module.

One service application, for example, may enable a user of the device to modify the contents of the registry and to specify preferences with respect to the services available on the device. For example, the user may choose whether or not to be notified when a message is received for a particular service.

MESSAGE PASSING THROUGH THE LINK

In addition to communicating with nearby wireless devices, the client module can access the Internet or other public network through a link 128 (figure 1) that is running a link module 142. Any device having local network capabilities 129 and an Internet 148 connection can serve as the link. The link could be a mobile device or a stationary device.

As shown in figure 5, in some implementations, the link 128 includes a device with a Bluetooth chip 11 that provides local network capabilities (as defined in the Bluetooth standard), a copy of the link module 142, and an Internet connection through an Internet interface 15, such as a dialup or dedicated connection to the Internet 148.

Some communications can be sent over the Internet as a transparent alternative to sending the messages using Bluetooth technology. The link 128 allows users within short-range wireless distance to send and receive data through the Internet to and from, for example, server 130 running a copy of the server module 144. Other technologies such as infrared could also provide the local network capabilities for the link 129.

The client module tracks whether there are any links 128 in range of the device based on information stored in the service registry 18, because the links broadcast their available services in the manner described earlier. Messages destined for devices that are not within range are stored by the client module in a queue until the device is within range of a link 128

In one example, messages (called Kmessages) stored in the client's message queue have the format shown in figure 3C. Once the device is within range of a link 128, the messages are transmitted through the link to a server 130. The server 23 can then transmit the messages to another link 131 (figure 3) that is close to the target device 133. A registry in the target device stores messages waiting to be retrieved by specific services on the device.

The "getMessages" and "getMessage" functions (shown in figures 4B and 4C) are exposed by the client module and enable an application running on the client device to be used to retrieve messages sent from other devices. The stored messages are communicated from the client to an application using the Kmessage structure shown in figure 3C.

The core services of the modules support the Transport Control Protocol/Internet Protocol (TCP/IP) to allow for Internet connectivity through what amounts to an ad hoc network of the devices that are within the vicinity of the links. IP masquerading is used by the link module to assign an IP address to each device in range of the link, thereby enabling the devices to communicate using TCP/IP.

THE SERVER

The server module 144 running on the server 130 allows users of devices anywhere in the world to send messages to one another without knowing where the recipient is located or which device the recipient is using.

As shown in figure 6, the server system 130 serves as a global router 60 that exposes services to server applications to enable messages to be stored and passed, for example, between a device 12 on which a client module 14 resides and another device 54 on which another client module 56 resides.

In general, a given user may be an owner of multiple devices and may log on to some or all of them at one time. The server module includes a database 62 that tracks the devices associated with each user. The server module can support the HyperText Transfer Protocol (HTTP) and WAP, as well as other technologies, to send and receive messages.

In one implementation, the server module includes software written in the Java computer language that can run, for example, on a Windows, Solaris or Linux system. The server module also can store information about the services that are made available by each of the user's devices in a registry of services 66 so that other devices can locate and access the services. A "getSurrounding Services" function (shown in figure 4D) is exposed by the client module to applications running on a device to enable the devices to obtain from the server module an array of mappings of users of other devices and services available on their devices.

PERSONALIZATION

The server module also provides an interface service to the personalization system 132 and a gateway service 173 to other technologies such as the Internet 148. A web server 58 using, for example, a Generalized Markup

Language, allows messages to be served to any mobile device that has an Internet connection. In addition, any client device can access resources and information from the server through the Internet.

The user can log on to the server, for example, to access the personalization system 26 and to enter or edit personalized information.

On of the service applications 115 (figure 1) provided with the client module 14 allows the user to modify personal information and preferences stored by the personalization system. A "changepersonalizationdata" function (shown in figure 4G) can be used for that purpose. The user also can set indicators to permit or deny access by other users to various pieces of data stored in the personalization system and associated with that user.

For example, user information stored in the personalization system may be designated as shared or public using the "Changepersonalizationpermissions" function (shown in figure 41).

One of the service applications running on one user's device can access other users' profiles from the personalization system using a "Getpersonahzationdata" function (shown in figure 4H). Access is denied if a particular user does not have permission to access another user's profile. All relevant data from the personalization system is loaded dynamically through a link when the user logs on to the server. Thus, user information stored at the client device can be updated regularly to keep it synchronized with the data stored in the personalization system.

An administrative graphical user interface (GUI) is associated with the server to allow an administrator to change configurations for users manually. The administrative GUI also allows an administrator to analyze the load on resources

used by the server, test and debug the server, and access user information stored in the personalization system if the user permits such access.

GUARANTEED DELIVERY

In general, the client module exposes a service that is responsible for ensuring delivery of messages from one device to another. Upon receipt of a message from an application, the client module returns a confirmation including a unique identification number for each transmission of data. If the client module is not able to guarantee that a message was delivered, the text of the message is returned to the sender, with a message indicating that the text was undeliverable. If a message including data is received by a device that does not have the necessary application to operate on the data, then the message is returned to the sender. On the other hand, if the required application is listed in the registry of the recipient's device, but the recipient's device is not currently running the application, the client module stores the message and notifies the user that the message has been received.

When a message is sent to a particular user from the server through the links, the message is sent to all devices that the user "owns" and on which he is logged on. If the user is not logged on to any of his devices, the server module stores the message in a mailbox database 64. When the user subsequently logs on, he is notified of the message. Therefore, when a message is to be sent to a particular device, the sender of the message need not determine which device the recipient is closest to or on which device the recipient prefers to receive messages. The server transparently routes the message to the proper device. Because encryption technology is integrated with the client module, the user automatically digitally signs communications using a global key stored in the personalization system and in a personalization module 143 stored on the client device (see figure 2).

As shown in figure 7, the client module includes a transfer module 30

that provides an interface to communications media, including the Bluetooth chip 32, a wireless modem 34 that permits mobile telephone communications, an infrared port 36, or other communications channels 38.

The transfer module 30 references a socket or equivalent layer of each communications media available to the device and manages the communications media. The transfer module 30 passes received messages to a confirmation manager 40 and provides information to the communications manager about the available communications media. The transfer module 30 can be requested by the confirmation manager 40 to send messages over a particular communication medium.

The confirmation manager 40 is the portion of the client module that is responsible for guaranteeing delivery of messages. It maintains a queue of outgoing messages, as well as a queue of messages awaiting confirmation. The confirmation manager 40 tracks messages that have been sent and matches received confirmations with the original outgoing messages. If confirmation is not received within a specified period, the message is re-sent.

The confirmation manager 40 can be called upon by a communications manager 42 to send messages and notifies the communications manager if a message is undeliverable. A message explaining why a message is undeliverable can accompany the notification to the communications manager 42.

The communications manager 42 is responsible checks for other devices entering or leaving the range of the device and decides which communication medium to use when a service application 16 requests that a message be sent. Messages can be sent to a security module 46 for encryption and receipt of a digital signature.

The communications manager 42 is notified by the confirmation manager 40 of received messages and passes the received messages to the security module 46 for authentication of digital signatures. User name and security information is received from the personalization system through a personalization module 48. The communications manager 42 notifies the service applications 16, through an applications manager 44, of received messages based on settings in the local registry 18. The service applications 16 then can retrieve messages in a message queue through the applications manager 44.

The communications manager 42 also receives and acts upon registry request messages and broadcasts and retrieves local service application settings from the registry 18. Additionally, the communications manager updates the information about other devices in the registry 18 based on server messages and registry broadcasts.

The applications manager 44 provides an interface between the service applications 16 and the communications manager 42, the registry 18 and the personalization module 48 of the client. The applications manager 44 can retrieve or modify local service application settings stored in the registry 18. It also can access or modify the registry's list of other devices within range of the device 12, and information about services available on those users' devices. The applications manager 44 also can send and receive messages through the communications manager 42. Information stored in the personalization system 132 can be accessed or modified (assuming permission is granted) through the personalization module 48.

The personalization module 48 serves as an interface to the personalization system 132 and provides access to user information, user preferences, and user permissions stored in the personalization system. The personalization module 48 is capable of caching information and synchronizing information with the personalization system 132. It can access information stored in

the personalization system 132 in a manner that is transparent to the entity requesting the information. The personalization module 48 provides the user name for message headers and provides public or private encryption keys to the security module 46 through the communications manager 42.

The security module 46 is responsible for providing secure communications between the device 12 and other devices and executes a cryptographic algorithm. The security module 46 obtains security information from the communications manager 42. It encrypts and decrypts messages, digitally signs outgoing messages and verifies the digital signatures of incoming messages.

A "sendMessage" instruction (see figure 4A) in an application can call a client module routine that allows messages to be sent to other wireless devices through the facilities of the chip.

MESSAGE COMMUNICATION AND ENCRYPTION

Figures 8 A and 8B show how a message initiated by a service application 16 can be sent from the device 12. The particular service application 16 passes 1100 a message with an identification of the intended recipient to the applications manager 44. In this example, it is assumed that the application service requests that the transmission of the message be secure and guaranteed. The applications manager 44 passes 1102 the message and the recipient's identification to the communications manager 42 and requests that the message be transmitted in a secure and guaranteed manner. The communications manager 40 passes 1104 the message and security information to the security module 46. The security module 46 executes the cryptographic algorithm on the message and returns 1106 the encrypted message to the communications manager 42. The communications manager 42 then passes 1108 the encrypted message to the confirmation manager 40 and specifies the channel of communication.

The confirmation manager 40 generates 1110 a message identification number and attaches it to the message header. The confirmation manager 40 also adds 1112 the encrypted message to its queue of non-confirmed messages. The confirmation manager 40 passes 1114 the encrypted message and an identification of the specified channel to the transfer module 30. The transfer module 30 then sends 1116 the encrypted message over the specified communication channel. If the confirmation manager 40 does not receive a confirmation within a specified time frame, it re-sends the message.

The transfer module in the recipient device receives 1118 the encrypted message and passes it to the recipient device's confirmation manager. The confirmation manager in the receiving device passes 1120 the message to the communications manager. In addition, the confirmation manager in the recipient device adds the message identification number to its list of received messages and generates 1122 a confirmation message that is passed to the transfer module in the recipient device. The transfer module sends 1124 the confirmation message over the same communication channel over which the original message arrived. The transfer module 30 in the sending device 12 receives the confirmation message and passes 1126 it to the confirmation manager 40. The confirmation manager 40 then removes 1128 the original message from its queue of messages that are awaiting confirmation.

After receiving the encrypted message, the communications manager in the recipient device removes 1130 the header and passes 1132 the encrypted, digitally signed message to the security module. The security module responds 1134 to the communications manager with the sender's identity. The communications manager in the recipient device then adds 1136 the decrypted message to its

message queue and notifies 1138 the user and service application, according to the settings in the registry of the recipient device.

To receive the decrypted message, the service application requests 1140 the message from the communications manager through the applications manager in the recipient device. The communications manager passes 1142 the next message marked for the intended application from the message queue to the service application. The communications manager then deletes 1144 the message from its message queue.

In addition to sending and receiving messages, a service application 16 can retrieve or modify data and permissions stored in the personalization system 132 by calling functions of the personalization module's API through the applications manager 44. Additionally, a service application 16 can view information about users and devices within range of the device 12 by calling functions of the registry's API through the applications manager 44. Similarly, a service application 16 can retrieve or modify service application settings on the local device 12 by calling functions of the registry's API through the applications manager 44.

USES

As shown in figure 9, in one use of the system described above, a clothing store 70 at a fixed location provides electronic coupons to potential customers. A device 17 with a Bluetooth chip 15 is mounted in the store 70. If a user carrying a mobile device comes within range of the chip 15, the device 17 detects and stores that information in its client's service registry. The device 17 can obtain information 74 about the user from the personalization system 132. Such information 74 may include, for example, the clothing size and clothing purchase history of the user. Access to such information can be subject to the grant of permission by the user.

The device 17 can send one or more electronic coupons to the user's device 12 by incorporating the coupons into one or more messages sent directly through the Bluetooth link or indirectly through a local area network (LAN). The messages containing the coupons can inform the user of sales and items that may be of special interest to the user based on the information obtained from the personalization system. The electronic coupons can be turned in and used to purchase items from the store 70 by communicating directly with the device 17 over the LAN.

The user need not wait for coupons to be sent to his device 12. For example, once the user is within range of the store 70, the registry associated with the client module residing on the user's device 12 would store the identification code for the store 70. The user can use the device 12 to view the various coupons offered by the store 70.

Another application can provide a service that acts as a shopping assistant to match user preferences to available store inventory. In one scenario, the user may want information about a particular product from stores in a specified area such as a commercial street or shopping mall. Stores would update information stored in the personalization system about their product inventory. The user would use the device 12 to request information from the personalization system regarding the availability of various models, sizes, costs, of the particular product from stores in the specified area. A list of the available products and related information then would be provided to the user's device. An identification code can be associated with each store that can be used as discussed below.

After reviewing the information obtained from the personalization system, the user can get additional information from the personalization system, for example, about promotions or coupons that the listed stores may be offering. After selecting a particular store, the user enters the store identification code into the

device 12 to access a link to the selected store, for example, over the Internet 22. Once the user's device 12 is within range of the store's Bluetooth-enabled device, the two devices would recognize one another. Communications then would take place directly or over the local network. The user would be able to purchase items from the store using the device 12. Personnel at the store may gather the purchased items and send a message to the user when the items are ready to be picked up.

As shown in figure 10, another application allows the user to place an order, for example, at a restaurant 76 and pay for the order without having to wait in line. The user orders and pays while sitting at a table or walking in the vicinity of the restaurant. When the user arrives at the restaurant 76, the restaurant's Bluetooth-enabled device 17 recognizes the presence of the user's device and retrieves the user's personal information from the personalization system. The personal information may include the customer's food preferences or the usual order that the customer places at the restaurant 76. The restaurant's device 17 sends a message to the customer's device asking, for example, if the customer wishes to place his usual order. The customer can place an order and pay using the device. The customer also can access the personalization system to obtain information about the restaurant 76. The restaurant information 80 can include, for example, a menu, a list of specials, and available coupons. Such information can be obtained directly from the restaurant as well using the restaurant's local network.

The information regarding the user's preferences retrieved by the restaurant's device 17 from the personalization system may include information that can facilitate transactions between different commercial entities with respect to the identified customer. For example, when the user passes within the vicinity of the restaurant, the restaurant's Bluetooth-enabled device 17 recognizes the presence of the user's device and retrieves the user's personal information 78 from the personalization system. The personal information 78 may indicate that the user

enjoys movies. The restaurant's device would exchange information with a local theater 77 that also is in possession of a Bluetooth-enabled device 79, and the local theater 77 would post an electronic movie discount on the user's device.

Another application can facilitate travel. For example, assume the user is scheduled to depart on an airline flight. As shown in figure 11, upon arrival at the airport 82, a Bluetooth-enabled device 17 would detect the presence of the user's device. The airport's device 17 obtains the user's scheduled flight number and time of departure from the personalization system. The device 17 then sends flight, airport and ground transportation information tailored to the traveler's itinerary to the user's device. Similar applications can be used in connection with other means of travel such as trains or buses.

Other applications can be used in connection with parking meters to facilitate payment through use of a Bluetooth-enabled device. In one scenario, users would purchase pre-paid units of time. As shown in figure 12, when a user in possession of the device parks a car near a parking meter 86, a Bluetooth-enabled device 17 in the parking meter senses the presence of the user's device 12. The device 17 checks the user's account identification number 88 by accessing the personalization system 26 and sends a message to the user's device requesting an indication of how much time the user plans to park at the location. Once the user 10 responds, payment automatically can be deducted from the user's account. The application program can consistently show how much time is left on the meter 86, and can allow the user to add time to the meter from distant locations.

A wireless credit card application program can allow the user to make purchases with the device from a merchant 90. For example, as shown in figure 13, a merchant's Bluetooth-enabled device 17 would sense the presence of the user's device and, if permission is granted, would obtain the user's credit card information 92, including the user's name, account number and account expiration date, from the personalization system 26.

Furthermore, the application program can store a personal budget set by the user. If the user exceeds his personal budget, a message is sent to the device indicating that the personal budget has been exceeded.

A network of strategically placed Bluetooth-enabled devices in parking meters, city streets lamps, and other locations can provide a virtual global positioning system (GPS) that allows a user's device to know its precise location without requiring that the user's device carry a global positioning chip. As illustrated in figure 14, a number of Bluetooth-enabled devices 200 carry a Bluetooth chip 204 as well as a global positioning chip 206 that allows the device 200 to determine its GPS location by receiving global positioning information from a satellite 202. Each device 200 can periodically broadcast its global positioning location. Other Bluetooth-enabled devices that are within range of one of the devices 100 can receive the broadcast and thereby determine their own location. A variety of location-based applications 16, such as an electronic map identifying the user's location, can be implemented without requiring a costly GPS chip on the device 14.

Yet another application program that can run on the client 14 allows users to post information that can be retrieved and read by other parties. A virtual information board can be implemented by storing the information on a local device or on the server. For example, a restaurant can post its daily specials using such an application to help reduce the cost of menus.

A public information booth can have a Bluetooth-enabled device that provides information about museums, historical sites, statues and other sites of interest within a particular geographical location. An application can be run on the client residing on the user's device. The devices interact according to the Bluetooth protocol, and the device sends out a brief history or summary of the area to the user's

device. The application also allows a user to view a list and summary of the various sites in the area. Self-guided tours can be tailored so that the user only receives information about specific aspects of the area based on the user's interest.

Another application can serve as a wireless identity tool. This tool can facilitate the user's navigating through a hospital or other bureaucracy. For example, in a hospital, the user can sign in or pick up medical prescriptions without completing written forms. The application can provide the appropriate information.

Other application programs can provide communications with another device associated with an entity such as an individual who is free to roam from one location to another. Exemplary application programs include instant messaging, buddy lists, and personal contact cards.

Instant messaging, for example, allows messages to be passed between Bluetooth-enabled devices regardless of whether or not the devices are within local range of one another. The location of the parties may impact which means of communication is used to send a particular message. However, the sender of the message need not be concerned with the means of communication or device compatibility issues because the incoming message will be tailored to the recipient's device. If an instant message cannot reach its destination, for example, because the intended recipient has set his permissions so as not to allow instant messaging or because the recipient device does not have the proper software, the sender can be notified that the message cannot be delivered.

Other applications that can run on the device facilitate the use of buddy lists. Thus, a user of the device can be notified automatically when a buddy enters or leaves the local area network. The user can add or remove persons on the buddy list. For more privacy, the user can select an option in the application to prevent other persons on the buddy list from being informed of the user's entering or leaving

particular networks. A list can be stored in the personalization system to specify information and communication access permissions. The list can be used across multiple applications and can be updated dynamically through the personalization system. Different members of the buddy list can have different permissions.

Another application program allows the user to send a virtual business card from the device. In some situations, the electronic business card can include graphical images of an actual business card.

Other implementations are within the scope of the claims.

CLAIMS:

1. A method comprising:

at a commonly accessible server:

electronically storing information about a commercial transaction account of a user of a mobile device having short-range wireless communication capability,

transmitting to a second device at a fixed location at least some of the information about the commercial transaction account of the user of the mobile device, and

interacting with the mobile device and the second device, to enable a transaction between the user and a party associated with the second device based on the electronically stored information.

2. The method of claim 1 further comprising:

at the second device,

detecting the mobile device,

receiving, from the mobile device, an identification of the user,

receiving, from the server, the information about the user, the information usable to pay for a service,

receiving authorization to pay for the service, and

transferring payment from the user to the party associated with the second device.

3. The method of claim 2 in which the authorization is received from a third device.

4. The method of claim 1 further comprising:

at the mobile device,

receiving, from the second device, a request for authorization to pay for a service,

prompting the user to indicate an amount of the service to pay for, and

transmitting the amount of the service to pay for to the second device.

5. The method of claim 1 further comprising:

at a third device,

receiving a request for authorization to pay for a service,

prompting a user of the third device to indicate an amount of the service to pay for, and

transmitting the indicated amount of the service to pay for to the second device.

6. The method of claim 1 further comprising:

at a third device,

transmitting an identification of the mobile device and an amount of a service to pay for to the second device; and

at the second device,

crediting the amount of service to the user of the mobile device.

7. The method of claim 1 in which the second device is a parking meter, and the electronically stored information comprises information usable to pay for parking.

8. The method of claim 7 further comprising:

at the mobile device,

informing the user about an amount of time remaining on the parking meter,

receiving, from the user, an instruction to pay for additional time, and

transmitting, to the parking meter, the instruction to pay for additional time.

9. The method of claim 8 in which the transmitting comprises direct communication from the mobile device to the parking meter using the short-range communication capability.

10. The method of claim 8 in which the transmitting comprises indirect communication from the mobile device to the parking meter through a third party using a long-range communication capability.

11. The method of claim 1 in which the second device requests from the server the information about the user, the request based on sensing the presence of the mobile device.

12. An apparatus comprising:

a mobile device having a short-range wireless communication capability and a first client module,

the first client module being configured:

to interact with a second client module on a second device at a fixed location and a commonly accessible database storing information about a commercial transaction account of a user of the mobile device, the second client module having received, from the commonly accessible database, at least some of the information about the commercial transaction account of the user of the mobile device, and

to enable a transaction between the user and a party associated with the second client device based on the information.

13. The apparatus of claim 12 in which the first client module is configured to transmit to the second client module by direct communication from the mobile device to the second device using the short-range communication capability.

14. The apparatus of claim 12 in which the second client module also requests information about the user from the commonly accessible database, the request based on sensing the presence of the mobile device.

15. An apparatus comprising:

an electronic device at a fixed location having a first client module,

the first client module being configured:

to interact with a second client module on a mobile device having a short-range wireless communication capability and a commonly accessible database including information about a commercial transaction account of a user of the mobile device,

to receive, from the commonly accessible database, at least some of the information about the commercial transaction account of the user of the mobile device, and

to enable a transaction between the user and a party associated with the first client module based on the information.

16. The apparatus of claim 15 in which the electronic device comprises a parking meter, and the information comprises information usable to pay for parking.

17. The apparatus of claim 15 in which the first client module is also configured to:

receive, from a third device, an identification of the mobile device and an amount of a service to pay for; and

credit the amount of service to the user of the mobile device.

18. The apparatus of claim 15 in which the first client module is also configured to request from the commonly accessible database the information about the user, the request based on sensing the presence of the mobile device.

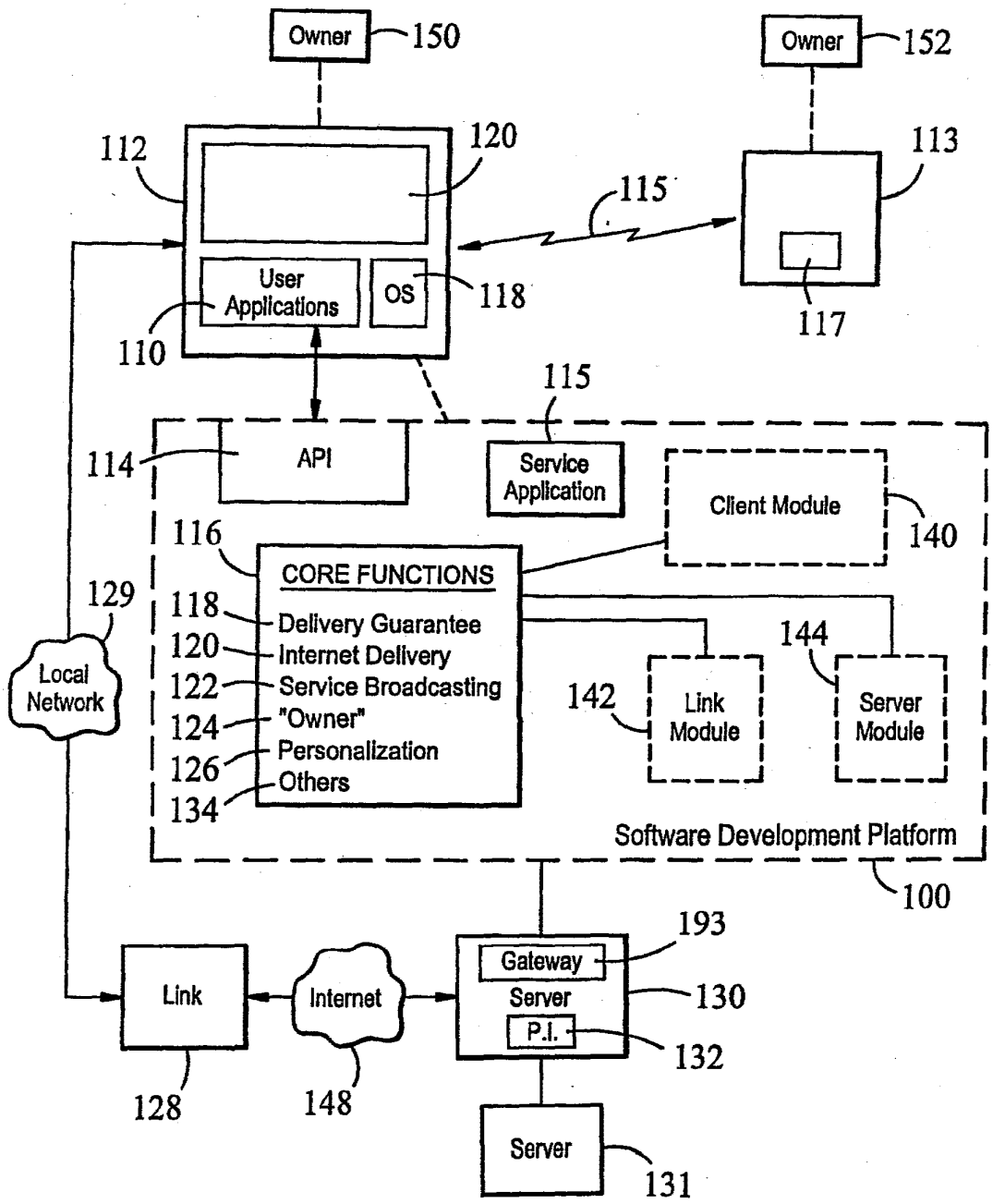

Owner
150
Owner
152
112
120
115
113
User Applications
OS
118
110
117
115
114
API
Service Application
Client Module
140
116
CORE FUNCTIONS
129
118
Delivery Guarantee
120
Internet Delivery
122
Service Broadcasting
124
"Owner"
126
Personalization
134
Others
144
142
Link Module
Server Module
Local Network
Software Development Platform
100
193
Gateway
Server
130
P.I.
132
Link
Internet
128
148
Server
131

FIG. 1

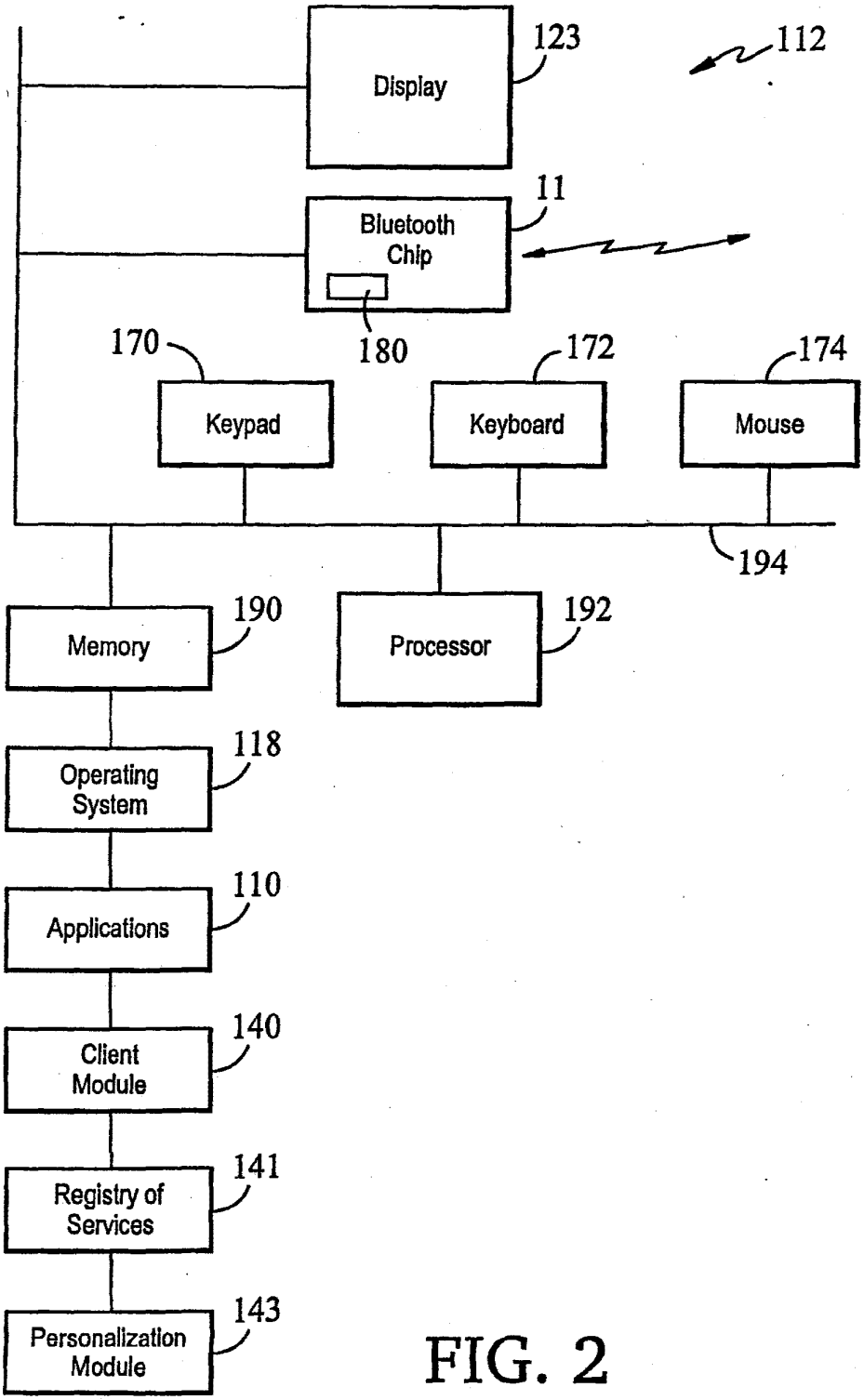

Display
123
112
Bluetooth Chip
11
180
170
Keypad
172
Keyboard
174
Mouse
194
Memory
190
Processor
192
Operating System
118
Applications
110
Client Module
140
Registry of Services
141
Personalization Module
143

FIG. 2

FIG. 3A

```
• LocalService {
    char * serviceName;
    int receive WhenRunning;
    int receive WhenNotRunning;
    int running;
    int maxNumOfMessagesToStore;
    char * exp_fld1;
    char * exp_fld2;
    char * exp_fld3;
    char * exp_fld4;
    char * exp_fld5;
  };
```

FIG. 3B

```
• RemoteService {
    char * serviceName;
    char * userName;
  };
```

FIG. 3C

```
• KMessage {
    char * serviceName;
    char * date;
    char * recipient;
    char * sender;
    char * messageBody;
  };
```

Name	sendMessage
Arguments	char * to, char * serviceName, char * data
Return Values	int err
Description	This function provides sending capabilities so that messages or any kind of unformatted text can be sent between Bluetooth devices. Reception of the text is guaranteed, because even when the devices are not within range, the text is stored and communicated via an Internet connection. If a user is logged in to more than one device simultaneously, the message/text will be sent to both devices at the same time.

FIG. 4A

Name	getMessages
Arguments	struct KMessage * message
Return Values	int err
Description	The getMessages function retrieves all messages or any other formatted text sent from another Bluetooth device. It returns the data in the KMessage data structure.If a user is logged in to more than one device simultaneously, the message/text will be received from both devices at the same time.

FIG. 4B

Name	getMessage
Arguments	struct KMessage * message
Return Values	int err
Description	The getMessage function retrieves just one message or any other unformatted text sent from another Bluetooth device. It returns the data in the KMessage data structure.If a user is logged in to more than one device simultaneously, the message/text will be received from both devices at the same time.

FIG. 4C

Name	getSurroundingServices
Arguments	struct RemoteService areaServices []
Return Values	int err
Description	This function returns an array of mappings of users and services available on that user's device. This information was previously stored in a database termed the registry, which is a list of devices within range of a Bluetooth device.

FIG. 4D

Name	AddService
Arguments	char * serviceName
Return Values	int err
Description	This function adds a service entry to the registry.

FIG. 4E

Name	RemoveService
Arguments	char * serviceName
Return Values	int err
Description	This function removes a service entry from the registry.

FIG. 4F

Name	changePMTdata
Arguments	<<waiting to hear about PMT API>>
Return Values	int err
Description	A function that allows users to update their personal PMT data and preferences using their particular devices. If the device is not within Bluetooth range of an Internet connection, it will restore these update preferences, and make changes within the permanent PMT upon coming into contact with an Internet connection.

FIG. 4G

Name	GetPMTdata
Arguments	char * user
Return Values	int err
Description	Allows a service to get the PMT data of a particular user from the PMT database. If the service cannot reach the PMT database, the information comes from the local storage on the device of the user. Only information that is designated as shared for public data will be retrieved.

FIG. 4H

Name	ChangePMTpermissions
Arguments	<<waiting to hear about PMT API>>
Return Values	int err
Description	This function allows a user to change his PMT permissions from his device.

FIG. 4I

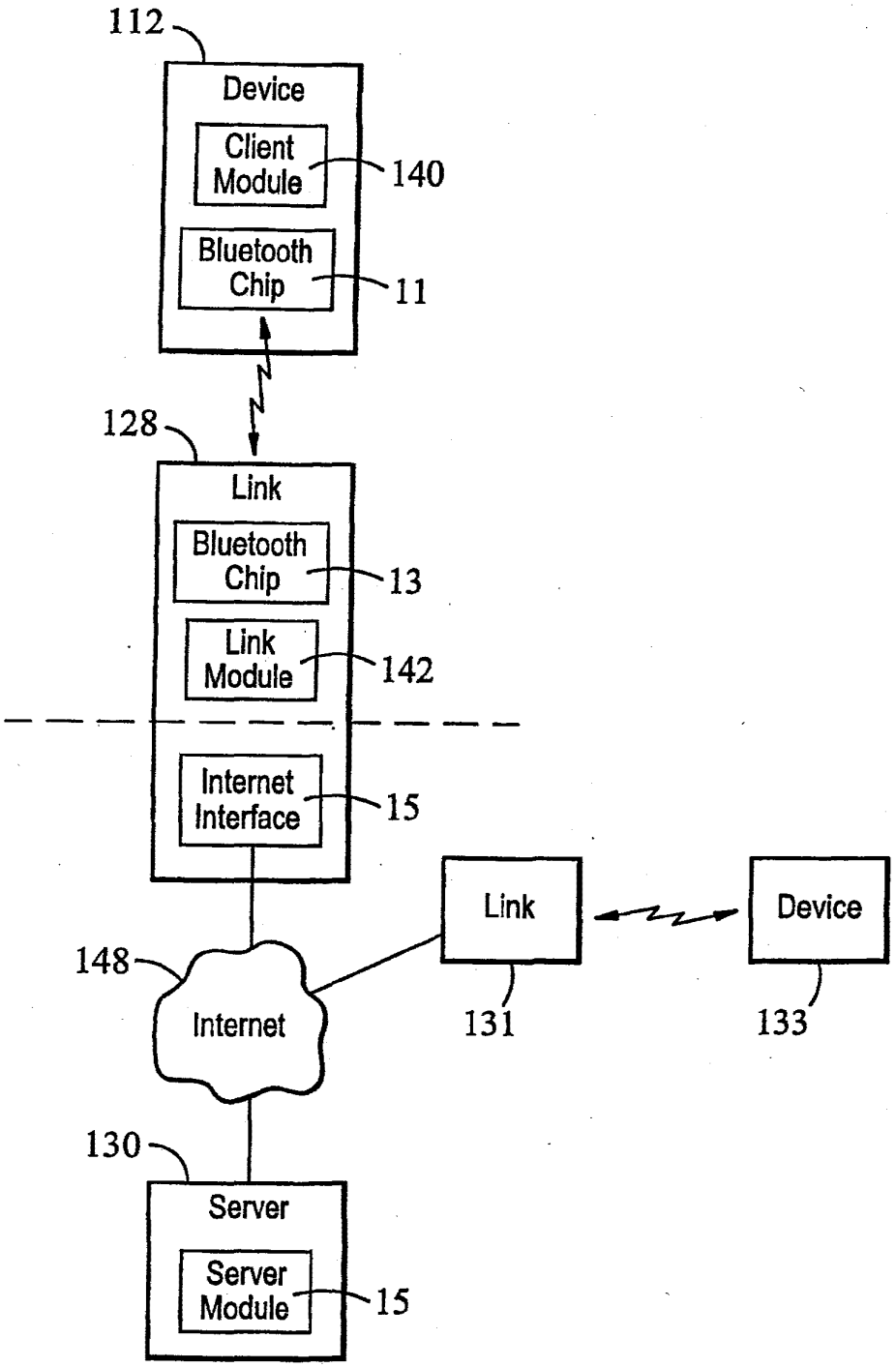

112
Device
Client Module
140
Bluetooth Chip
11
128
Link
Bluetooth Chip
13
Link Module
142
Internet Interface
15
Link
Device
148
Internet
131
133
130
Server
Server Module
15

FIG. 5

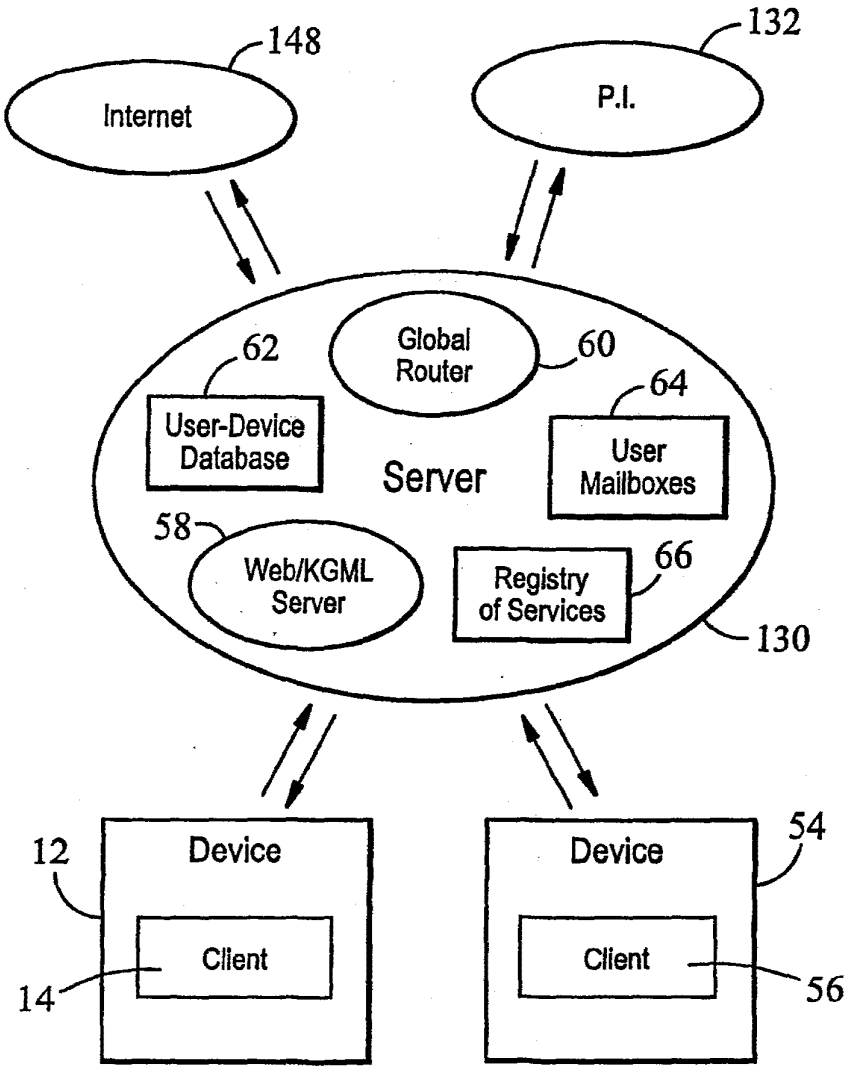
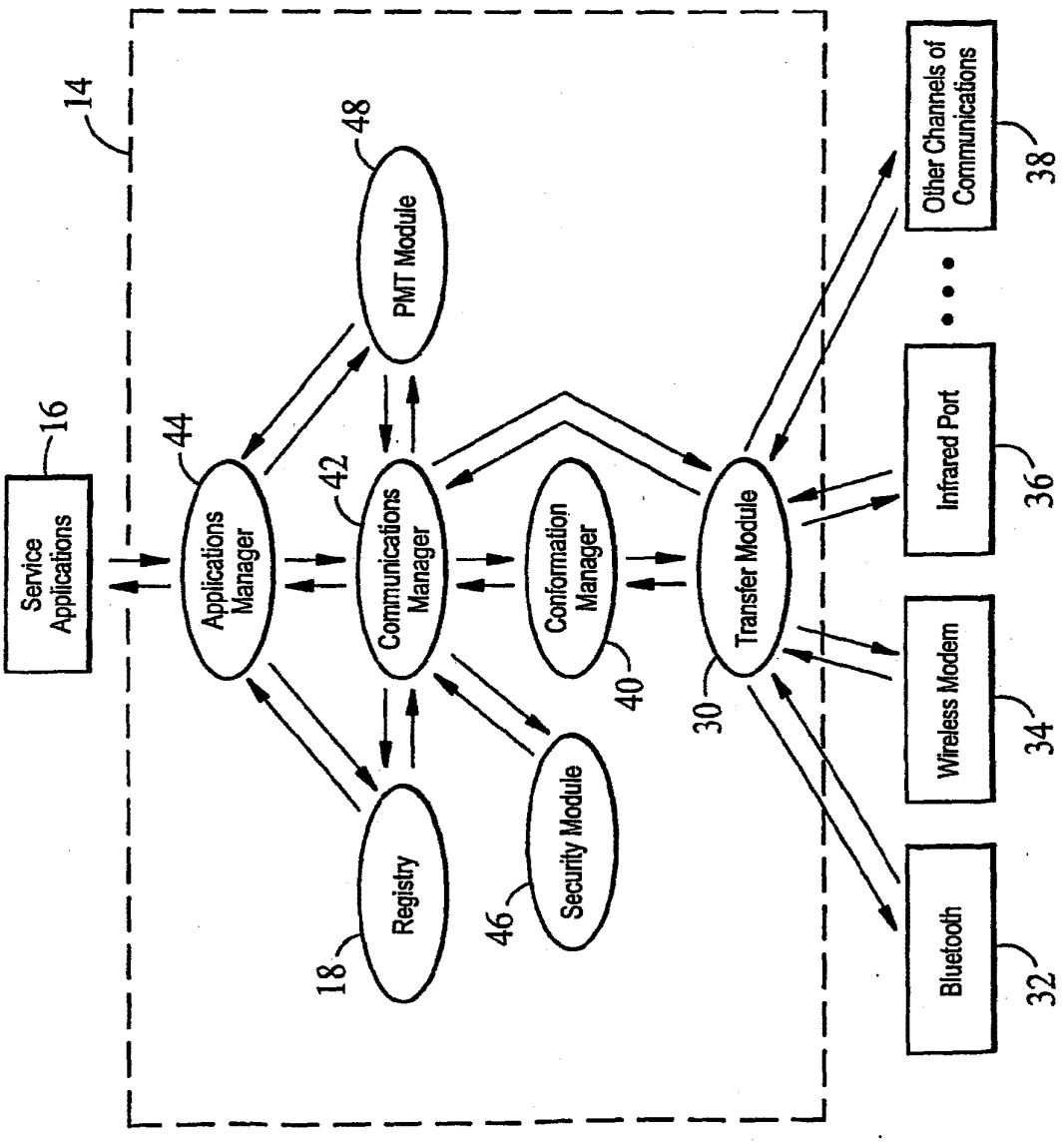

148
Internet
132
P.I.
62
User-Device Database
Global Router
60
64
User Mailboxes
Server
58
Web/KGML Server
Registry of Services
66
130
12
Device
Client
14
Device
54
Client
56

FIG. 6

FIG. 7


14
16
Service Applications
Applications Manager
44
PMT Module
48
Communications Manager
42
Conformation Manager
40
Transfer Module
30
Registry
18
Security Module
46
Other Channels of Communications
38
Infrared Port
36
Wireless Modem
34
Bluetooth
32

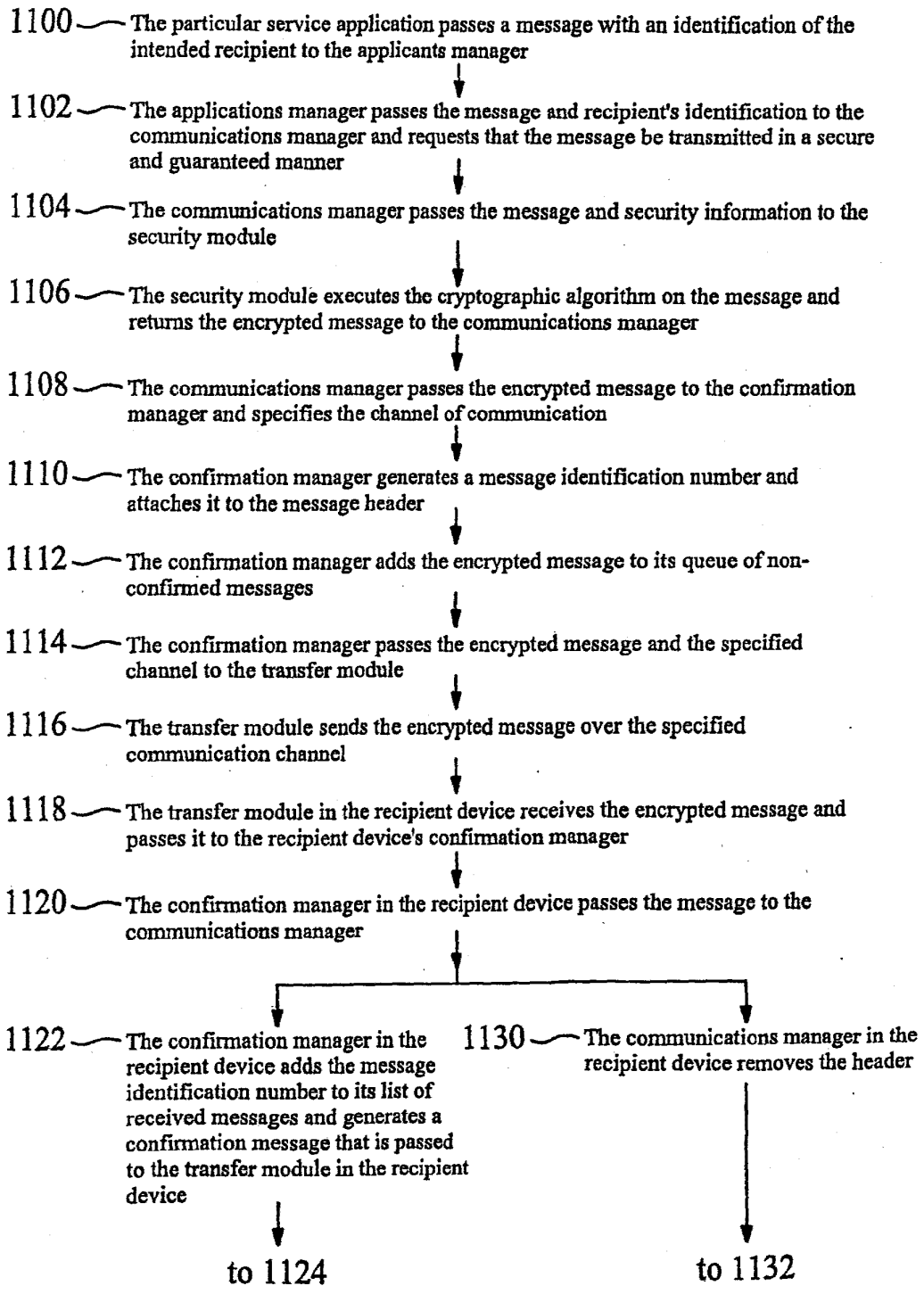

1100
The particular service application passes a message with an identification of the intended recipient to the applicants manager
1102
The applications manager passes the message and recipient's identification to the communications manager and requests that the message be transmitted in a secure and guaranteed manner
1104
The communications manager passes the message and security information to the security module
1106
The security module executes the cryptographic algorithm on the message and returns the encrypted message to the communications manager
1108
The communications manager passes the encrypted message to the confirmation manager and specifies the channel of communication
1110
The confirmation manager generates a message identification number and attaches it to the message header
1112
The confirmation manager adds the encrypted message to its queue of non-confirmed messages
1114
The confirmation manager passes the encrypted message and the specified channel to the transfer module
1116
The transfer module sends the encrypted message over the specified communication channel
1118
The transfer module in the recipient device receives the encrypted message and passes it to the recipient device's confirmation manager
1120
The confirmation manager in the recipient device passes the message to the communications manager
1122
The confirmation manager in the recipient device adds the message identification number to its list of received messages and generates a confirmation message that is passed to the transfer module in the recipient device
to 1124
1130
The communications manager in the recipient device removes the header
to 1132

FIG. 8A

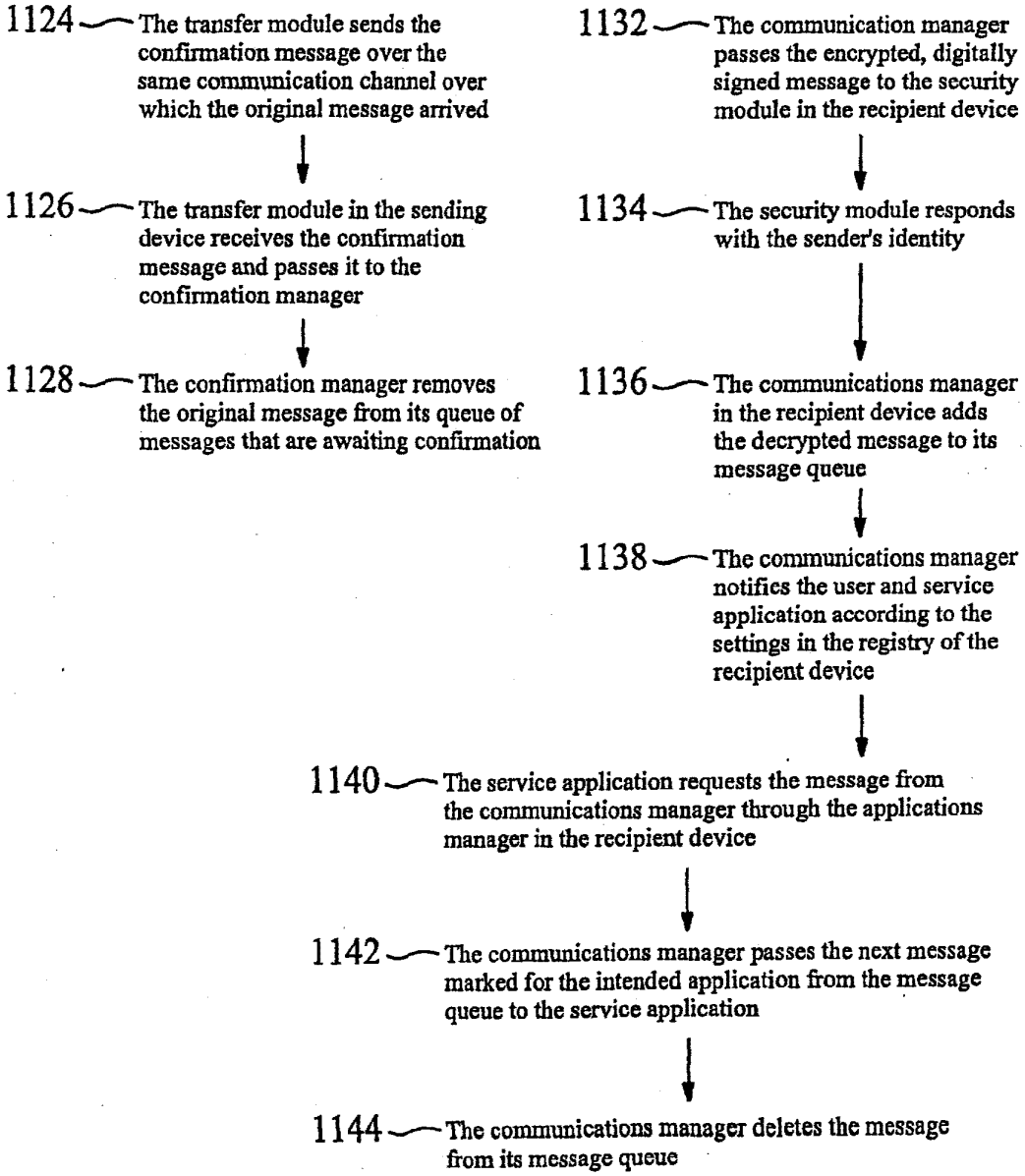

1124
The transfer module sends the confirmation message over the same communication channel over which the original message arrived
1126
The transfer module in the sending device receives the confirmation message and passes it to the confirmation manager
1128
The confirmation manager removes the original message from its queue of messages that are awaiting confirmation
1132
The communication manager passes the encrypted, digitally signed message to the security module in the recipient device
1134
The security module responds with the sender's identity
1136
The communications manager in the recipient device adds the decrypted message to its message queue
1138
The communications manager notifies the user and service application according to the settings in the registry of the recipient device
1140
The service application requests the message from the communications manager through the applications manager in the recipient device
1142
The communications manager passes the next message marked for the intended application from the message queue to the service application
1144
The communications manager deletes the message from its message queue

FIG. 8B

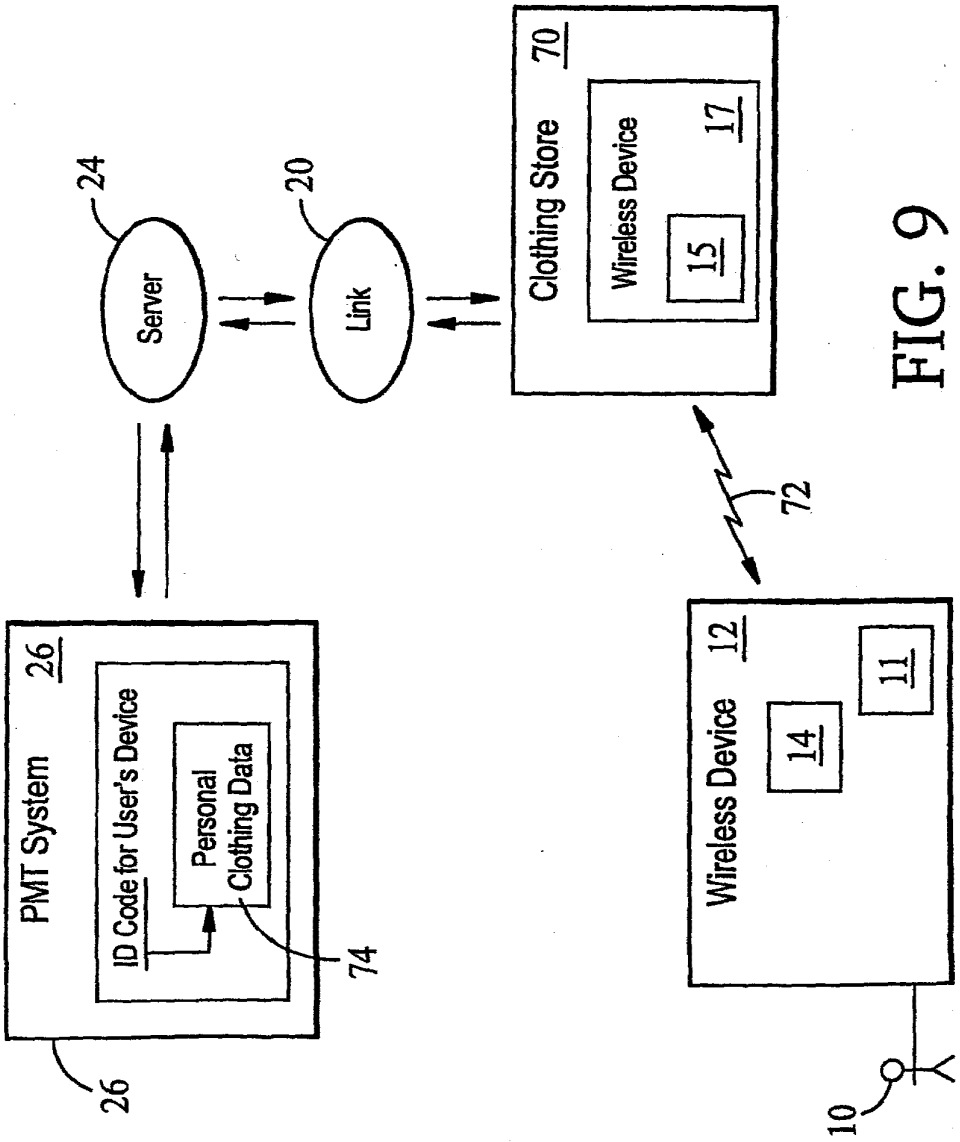

24
Server
20
Link
Clothing Store 70
Wireless Device 17
15
72
PMT System 26
ID Code for User's Device
Personal Clothing Data
74
26
Wireless Device 12
14
11
10

FIG. 9

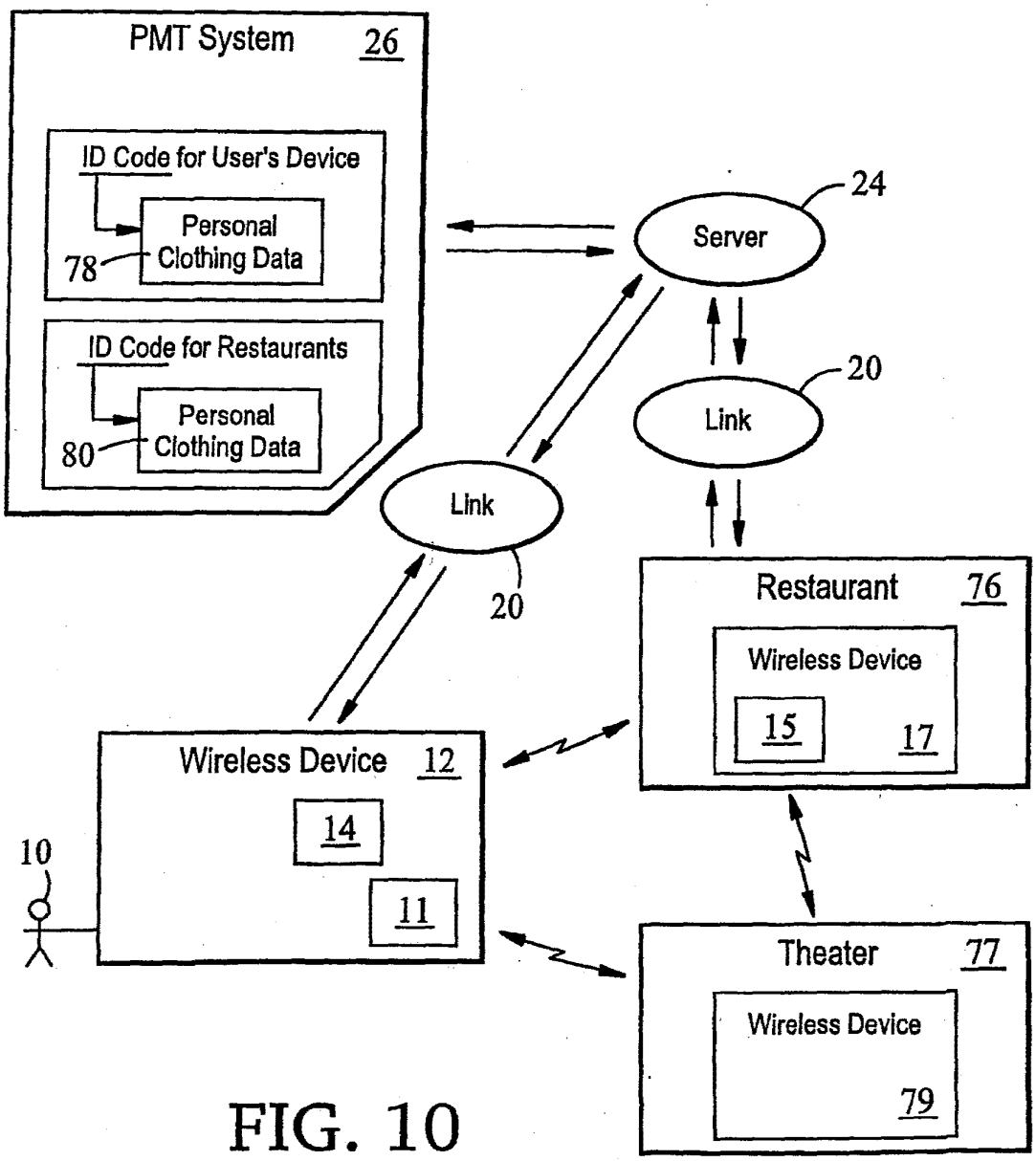

PMT System 26
ID Code for User's Device
Personal Clothing Data
78
ID Code for Restaurants
Personal Clothing Data
80
Server
24
Link
20
Link
20
Restaurant 76
Wireless Device
15
17
Wireless Device 12
14
11
10
Theater 77
Wireless Device
79

FIG. 10

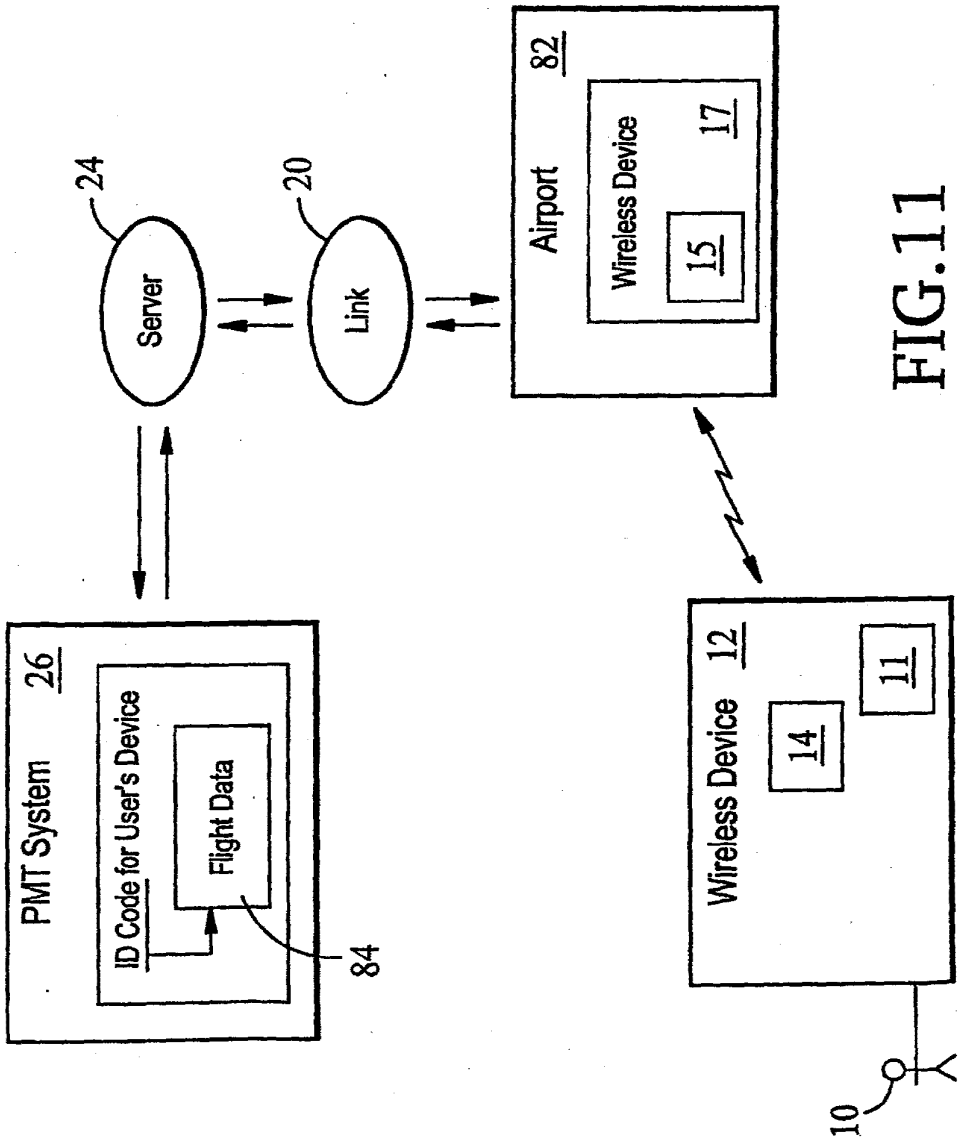

24
Server
20
Link
Airport 82
Wireless Device 17
15
PMT System 26
ID Code for User's Device
Flight Data
84
Wireless Device 12
14
11
10

FIG.11

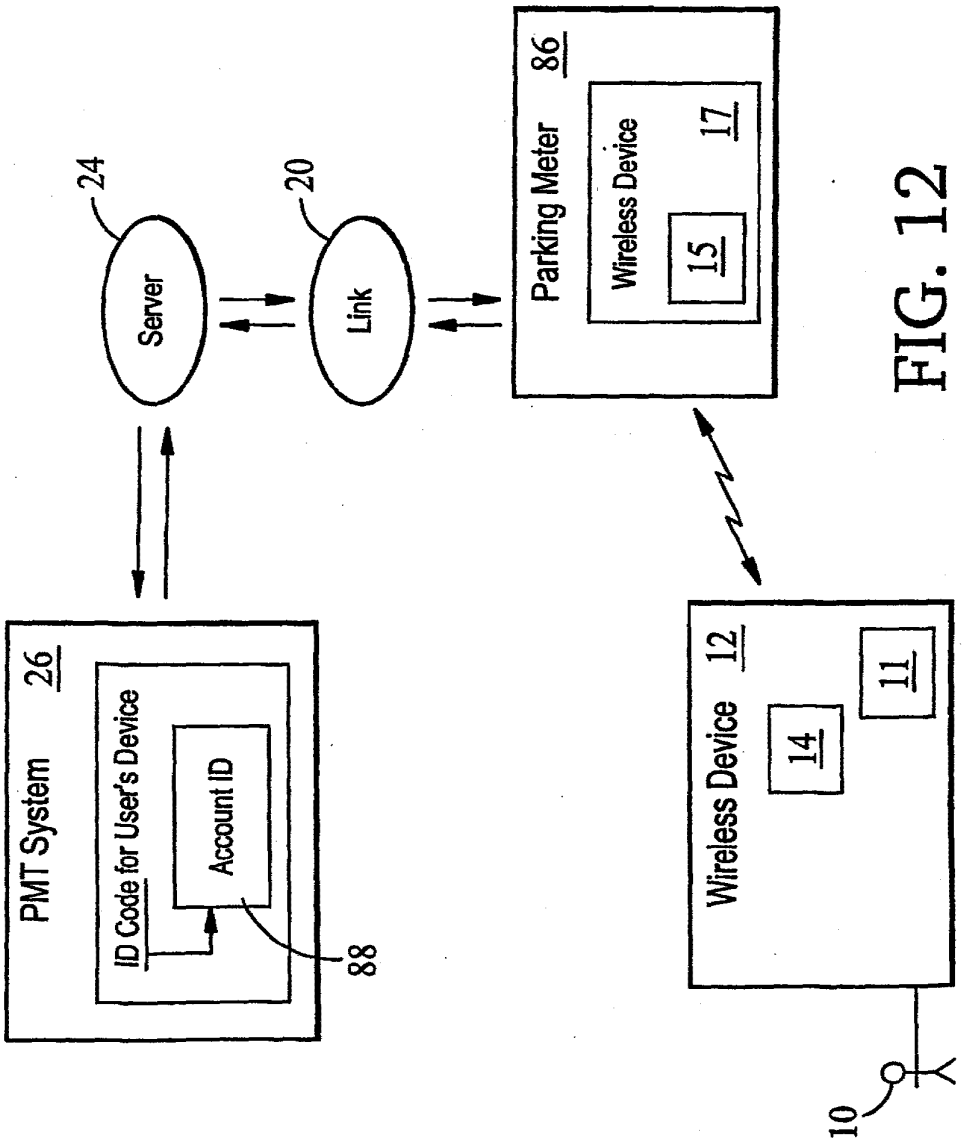

24
Server
20
Link
Parking Meter 86
Wireless Device 17
15
PMT System 26
ID Code for User's Device
Account ID
88
Wireless Device 12
14
11
10

FIG. 12

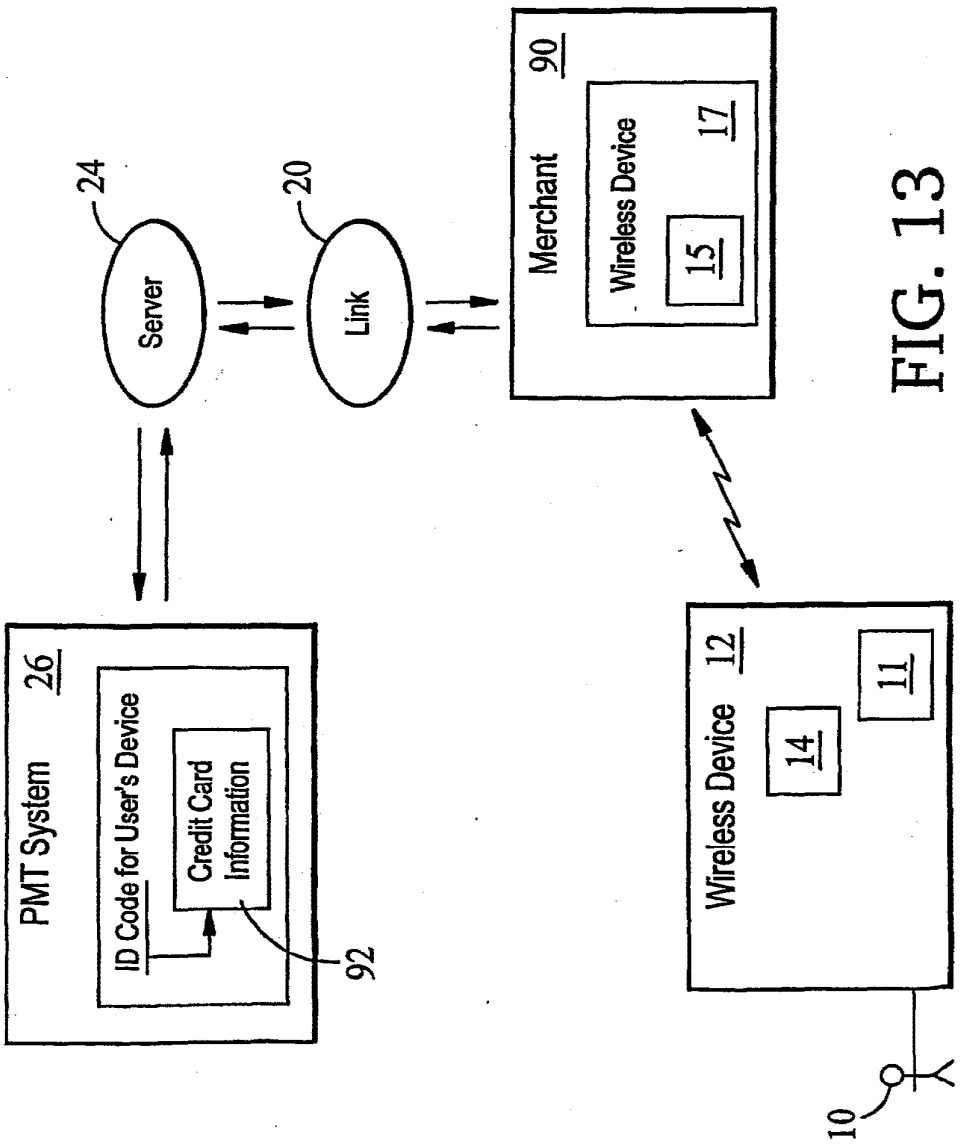

24
Server
20
Link
Merchant 90
Wireless Device 17
15
PMT System 26
ID Code for User's Device
Credit Card Information
92
Wireless Device 12
14
11
10

FIG. 13

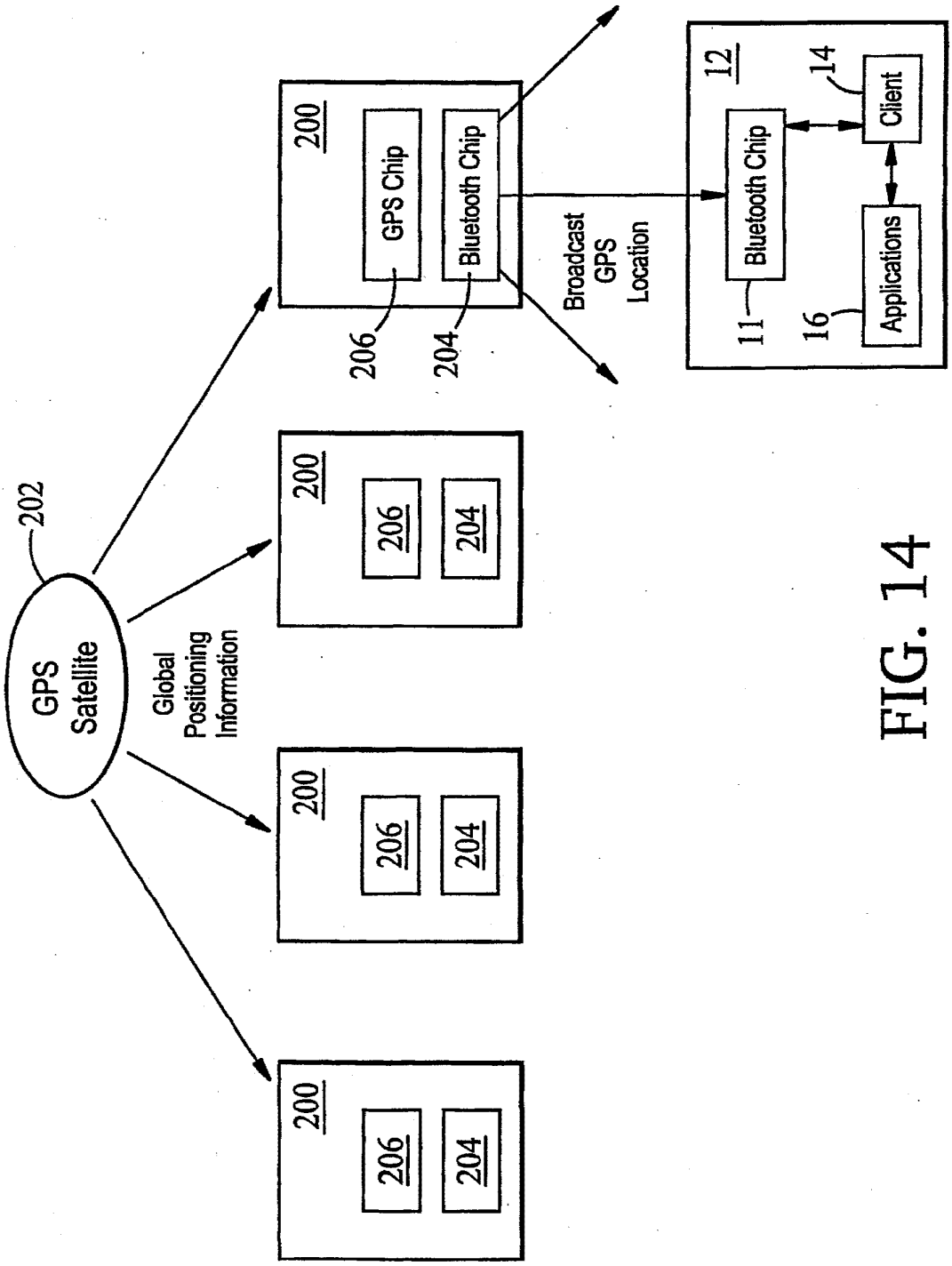
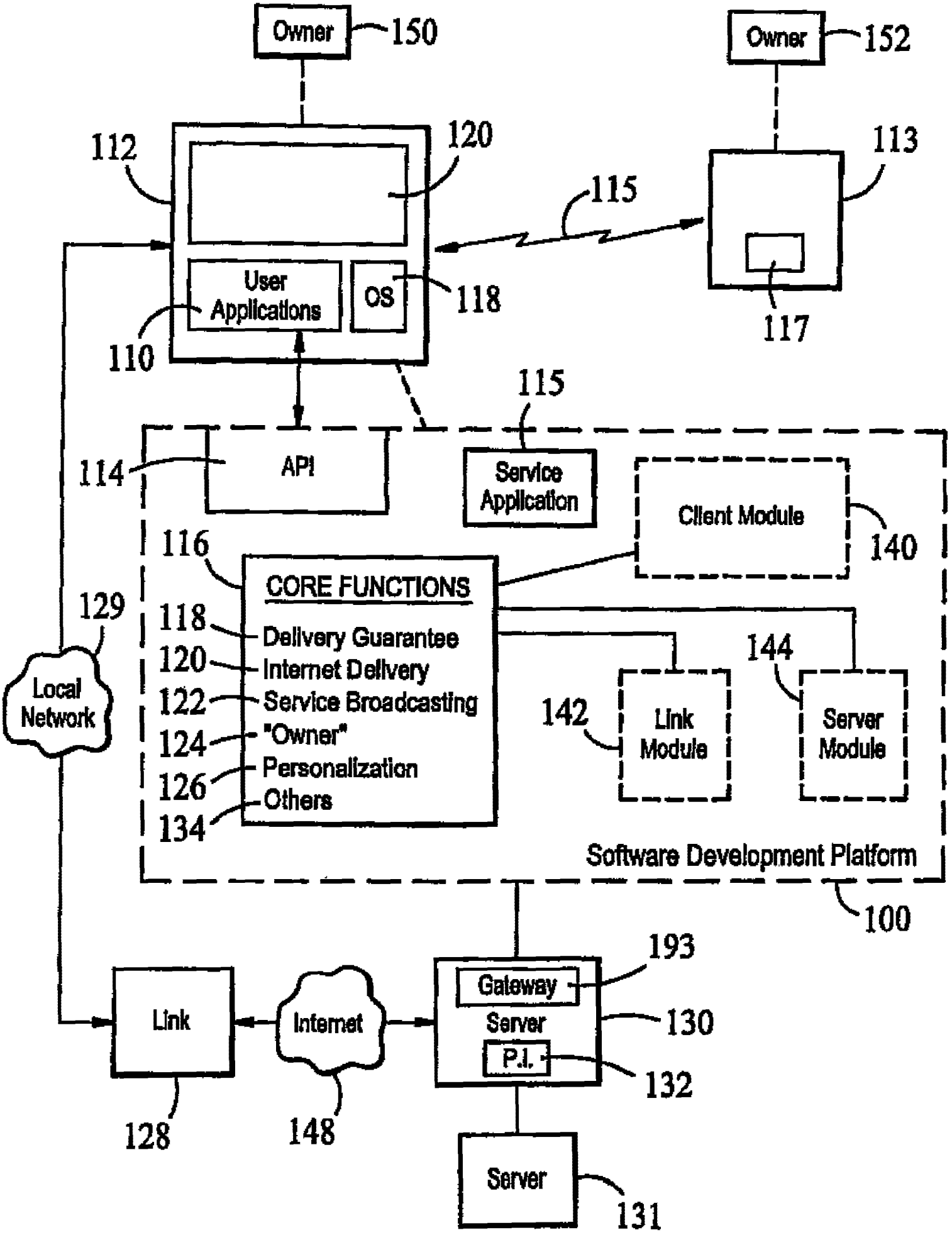

GPS Satellite
202
Global Positioning Information
200
206
204
GPS Chip
Bluetooth Chip
Broadcast GPS Location
12
Bluetooth Chip
Client
Applications
11
16
14

FIG. 14


Owner
150
Owner
152
112
120
113
115
User Applications
OS
118
110
117
115
114
API
Service Application
Client Module
140
116
CORE FUNCTIONS
129
118
Delivery Guarantee
120
Internet Delivery
122
Service Broadcasting
124
"Owner"
126
Personalization
134
Others
144
142
Link Module
Server Module
Local Network
Software Development Platform
100
193
Gateway
Server
130
P.I.
132
Link
Internet
128
148
Server
131

Electronic Acknowledgement Receipt

EFS ID:	27075078
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	24267
Filer:	David J. Thibodeau/stephany deblois
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	29-SEP-2016
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Application Type:	Utility under 35 USC 111(a)

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Warnings:

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2	Non Patent Literature	2A49237.PDF	384010 47617e828a01676e02b5983b1be786b254c90e76	no	10
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3	Non Patent Literature	2A49244.PDF	215622 7595108a5c6932a423c18953119053189 1fb55e7	no	29
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4	Non Patent Literature	2A49309.PDF	178295 defa90f4cc65e74981fbd8933a56ea95a152c54e	no	15
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5	Non Patent Literature	2A49321.PDF	192562 070209fefc3a4c0564aeebd13154ff77144db7bd	no	16
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8	Non Patent Literature	2A49326.pdf	2379219 b30c8f85b02400ce46f99fe96d7da5c934eb9299	no	15
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12	Non Patent Literature	2A49333.PDF	1045253 c24892ad486735bc6c1296010e5bd9e873e82d04	no	12
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13	Non Patent Literature	2A49336.PDF	1092253 2b6f6f3e5b781654c054933b95b8533c1b2df660	no	21
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Information:					
14	Non Patent Literature	2A49338.PDF	1109048 446bcdee4bcf4cbad6aeee4b404e5f78b6aa7677	no	50
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15	Non Patent Literature	2A49340.PDF	2993012 41f17313e4d8e7669eae7a7d0868b0ecd6e42354	no	59
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Information:					

16	Foreign Reference	2A49318.PDF	2021664 57a446d5651bfb5029acd7f9e246565060fbba82	no	59
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17	Foreign Reference	2A49319.PDF	2064207 76112a63b09122c7db26c7857fc12b8600d96a25	no	61
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Information:					
18	Foreign Reference	2A46688.PDF	536842 2af3141df862c30a6619d4a79d8c57f903ff50f2	no	35
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19	Foreign Reference	2A46690.PDF	781872 0b2e318ef68e76c7ed167135226ea085614c3307	no	44
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Information:					
20	Non Patent Literature	2A46694.pdf	217691 bbe6872d573bcbddb181f2a9d4d4dd43e858c842	no	5
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Information:					
21	Non Patent Literature	2A46692.pdf	140062 852e17964fdd6a7cc95006932158c063d84e6ab8	no	7
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Information:					
22	Non Patent Literature	2003.pdf	4861878 3d35aeb307d00670a8d91801635829bcf2f29e62	no	679
Warnings:					
Information:					

23	Transmittal Letter	2A49861.PDF	18055 7877cca60fe2ffa5fdef874caaaa982dd860c64c	no	2
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New International Application Filed with the USPTO as a Receiving Office
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Sheet 1 of 2

Complete if Known	
Application Number	**15/271,410**
Filing Date	**September 21, 2016**
First Named Inventor	**James A. Proctor, Jr., et al.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C7**

U.S. PATENT DOCUMENTS

Examiner Initials'	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2002/0101993		08-01-2002	Eskin	
		6,629,149		09-30-2003	Fraser et al.	
		6,934,535		08-23-2005	Phyalammi	
		2006/0003785		01-05-2006	Zatezalo	
		2006/0104243		05-18-2006	Park	
		7,151,764		12-19-2006	Heinonen et al.	
		2007/0060117		03-15-2007	Fishman et al.	
		2007/0118748		05-24-2007	Edney	
		7,249.182		07-24-2007	Heinonen et al.	
		2008/0089519		04-17-2008	Ekberg	
		2008/0132223		06-05-2008	Lin et al.	
		2008/0220746		09-11-2008	Ekberg	
		2008/0305738		12-11-2008	Khedouri et al	
		7,756,467		07-13-2010	Bent et al.	
		2010/0274859		10-28-2010	Bucuk	
		8,787,575		07-22-2014	Laaksonen et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials'	Cite No.[1]	Foreign Patent Document Country Code[3]–Number[4]–Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		CA 2 766 024	08-08-2002	ACK Ventures Holdings, LLC		
		CA 2 766 184	08-08-2002	ACK Ventures Holdings, LLC		
		WO 2009050322	04-23-2009	Nokia Corporation		
		WO 2009063272	05-22-2009	Nokia Corporation		

Examiner Signature		Date Considered	

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Complete if Known	
Application Number	**15/271,410**
Filing Date	**September 21, 2016**
First Named Inventor	**James A. Proctor, Jr., et al.**
Group Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C7**

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		Hunn, Nick, "EZURiO – An Introduction to Wibree" November 2006, 7 pages.	
		Shruthi et al., "Wibree Using Digital Radio Technology" International Journal of Advanced Trends in Computer Science and Engineering, Vol. 3 , No.1, Pages : 260 – 264 (2014), Special Issue of ICETETS 2014 - Held on 24-25 February, 2014 in Malla Reddy Institute of Engineering and Technology, Secunderabad– 14, AP, India	
		Ateniese et al., "Untraceable RFID Tags via Insubvertible Encryption", CCS'05, November 7–11, 2005, Alexandria, Virginia, USA. Copyright 2005 ACM 1-59593-226-7/05/0011, 10 pages.	
		Juels, Ari, "Minimalist Cryptography for Low-Cost RFID Tags" SCN'04 Proceedings of the 4th international conference on Security in Communication Networks, Springer-Verlag Berlin, Heidelberg ©2005, 29 Pages	
		Molnar, David, Andrea Soppera, and David Wagner. "A scalable, delegatable pseudonym protocol enabling ownership transfer of RFID tags." International Workshop on Selected Areas in Cryptography. Springer Berlin Heidelberg, 2005, 15 pages.	
		IEEE Standard for Information Technology Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (LR-WPANs), IEEE Std 802.15.4, 1 October 2003, 679 pages.	
		Honkanen et al., "Low End Extension for Bluetooth," Radio and Wireless Conference, 2004 IEEE, pages 199-202	
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		D. Ramireddy PowerPoint Presentation – WIBREE Technology, Mar 26, 2015, 21 pages.	
		Jukka Reunamäki PowerPoint Presentation - Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs), Submission Title: [Nokia PHY submission to Task Group 4], July 2001, 59 pages.	
		Huomo et al., PowerPoint Presentation - Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs), Submission Title: [Nokia MAC Proposal for IEEE802.15 TG4], July 2001, 50 pages.	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing the this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.*If you need assistance in completing the form, call 1-800-PTO-9199 and select option2***

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/271,410

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	30 minus 20 =	* 10	x 40 =	400	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1130		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/271,410	09/21/2016	2642	1130	111054-0001U4C7	30	3

CONFIRMATION NO. 7653

FILING RECEIPT

24267
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

OC000000088194444

Date Mailed: 10/04/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

James Arthur Proctor JR., Indialantic, FL;
James Arthur Proctor III, Indialantic, FL;

Applicant(s)

Proxicom Wireless, LLC, Indialantic, FL;

Power of Attorney: The patent practitioners associated with Customer Number 24267

Domestic Priority data as claimed by applicant

This application is a CON of 14/861,563 09/22/2015
which is a CON of 14/472,477 08/29/2014 PAT 9161164
which is a CON of 13/775,435 02/25/2013 PAT 8849698
which is a CON of 13/212,723 08/18/2011 PAT 8385896
which is a CON of 12/364,828 02/03/2009 PAT 8090359
which claims benefit of 61/095,001 09/08/2008
and claims benefit of 61/095,359 09/09/2008

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: No

Petitioner Samsung Ex-1004, 0305

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 09/30/2016
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/271,410**
Projected Publication Date: 01/12/2017
Non-Publication Request: No
Early Publication Request: No
**** SMALL ENTITY ****
Title

EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Preliminary Class

455

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

Petitioner Samsung Ex-1004, 0306

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

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Petitioner Samsung Ex-1004, 0308

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/271,410	09/21/2016	James Arthur Proctor JR.	111054-0001U4C7

CONFIRMATION NO. 7653

24267
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

FORMALITIES LETTER

OC000000086194445

Date Mailed: 10/04/2016

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing.

Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **70** surcharge.
- $(**0**) previous unapplied payment amount.
- $ **70** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):

James Arthur Proctor JR.
James Arthur Proctor III

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tlulu/

Petitioner Samsung Ex-1004, 0310

STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR § 1.27(a))-SMALL BUSINESS CONCERN

DOCKET NUMBER: 111054-0001U4C7

Applicant or Patentee: Proxicom Wireless, LLC
Application or Patent No.: 15/271,410
Filed or Issued: September 21, 2016
Title: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

I hereby state that I am

☐ the owner of the small business concern identified below:

☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN Proxicom Wireless, LLC
ADDRESS OF SMALL BUSINESS CONCERN 1680 N. Riverside Dr., Indialantic, FL 32903

I hereby state that the above identified small business concern qualifies as a small business concern as defined in 13 CFR Part 121 for purposes of paying reduced fees to the United States Patent and Trademark Office. Questions related to size standards for a small business concern may be directed to: Small Business Administration, Size Standards Staff, 409 Third Street, SW, Washington, DC 20416 or you may call 202-205-6618.

I hereby state that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

☐ the specification filed herewith with title as listed above.

☒ the application identified above.

☐ the patent identified above.

If the rights held by the above identified small business concern are not exclusive, each person, concern or organization having rights in the invention must file separate statements as to their status as small entities. No rights to the invention are held by any person who would not qualify as a person under 37 CFR 1.27(a)(1), or by any concern which would not qualify as a small business concern under 37 CFR 1.27(a)(2), or a nonprofit organization under 37 CFR 1.27(a)(3).

Each additional person, concern or organization having any rights in the invention is listed below:

☒ no such person, concern, or organization exists.

☐ each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities.

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.27(g)(2))

NAME OF PERSON SIGNING James A. Proctor, Jr.

TITLE OF PERSON IF OTHER THAN OWNER Managing Director, Proxicom Wireless, LLC

ADDRESS OF PERSON SIGNING Proxicom Wireless, LLC, 1680 N. Riverside Dr., Indialantic, FL 32903

SIGNATURE  DATE 11/9/2016

1185250.1

Petitioner Samsung Ex-1004, 0311

Electronic Patent Application Fee Transmittal

Application Number:	15271410
Filing Date:	21-Sep-2016
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Filer:	David J. Thibodeau/stephany deblois
Attorney Docket Number:	111054-0001U4C7

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**70**

Electronic Acknowledgement Receipt

EFS ID:	27470154
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	24267
Filer:	David J. Thibodeau/stephany deblois
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	10-NOV-2016
Filing Date:	21-SEP-2016
Time Stamp:	11:15:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$70
RAM confirmation Number	111016INTEFSW00010657031237
Deposit Account	031237
Authorized User	Stephany DeBlois

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	2A88785.PDF	17781 aaa74e1af8b3ae15a1ee7b48cfed7ee2f4a8dadc	no	2
Warnings:					
Information:					
2	Oath or Declaration filed	2A88773.PDF	230929 ca9f8a7d484a7e9f3118c55a815f3996109dcd4a	no	2
Warnings:					
Information:					
3	Assertion of entitlement to small entity status	2A88733.PDF	40851 7ffb8aca99919f3afa91b145c11e8ffa5b93a0d5	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30523 bec4e58bd69436da39f82092b11da03357fb4136	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	320084		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENTS
111054–0001U4C7
1005-007

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)	
TITLE OF INVENTION	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

As the below-named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/271,410 filed on September 21, 2016.

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application entitled EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED, the specification of which was filed on September 21, 2016, as United States Application Number 15/271,410.

I hereby state that I have reviewed and understand the contents of the above-identified application specification, including the claims, as amended by any amendment specifically referred to herein.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in §1.56.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

LEGAL NAME OF INVENTOR

Inventor: James Arthur Proctor Jr. Date (Optional):

Signature: James A Proctor Jr

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional form for each additional inventor.

PATENTS
111054-0001U4C7
1005-007

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)	
TITLE OF INVENTION	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

As the below-named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/271,410 filed on September 21, 2016.

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application entitled EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED, the specification of which was filed on September 21, 2016, as United States Application Number 15/271,410.

I hereby state that I have reviewed and understand the contents of the above-identified application specification, including the claims, as amended by any amendment specifically referred to herein.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in §1.56.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

LEGAL NAME OF INVENTOR

Inventor: James Arthur Proctor III Date (Optional): 11/9/2016

Signature: James A Proctor III

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional form for each additional inventor.

PATENTS
111054–0001U4C7
1005-007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
James A. Proctor, Jr., et al.

Serial No.: 15/271,410

Examiner: Not yet assigned

Filed: September 21, 2016

Art Unit: 2642

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Confirmation No.: 7653

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
November 10, 2016

CERTIFICATE OF TRANSMISSION

I hereby certify that the following paper is being electronically transmitted to the Patent and Trademark Office by EFS-Web on November 10, 2016.

/Stephany DeBlois/
Stephany DeBlois

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION

Enclosed in response to the Notice to File Missing Parts of Application-Filing Date Granted mailed October 4, 2016, are executed Declarations and a Statement

Petitioner Samsung Ex-1004, 0319

Claiming Small Entity Status; along with Authorization to charge our Deposit Account No. 03-1237 $70 to cover the filing fee and surcharge for this Response.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/David J Thibodeau Jr Reg No 31671/

David J. Thibodeau, Jr.
Reg. No. 31,671
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210
Telephone: (617) 951-2500
Facsimile: (617) 951-3927

Petitioner Samsung Ex-1004, 0320

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/271,410

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	30 minus 20 =	* 10	x 40 =	400	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1130		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/271,410	09/21/2016	3622	1200	111054-0001U4C7	30	3

CONFIRMATION NO. 7653

UPDATED FILING RECEIPT

24267
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

OC000000087246174

Date Mailed: 11/17/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

James Arthur Proctor JR., Indialantic, FL;
James Arthur Proctor III, Indialantic, FL;

Applicant(s)

Proxicom Wireless, LLC, Indialantic, FL;

Power of Attorney: The patent practitioners associated with Customer Number 24267

Domestic Priority data as claimed by applicant

This application is a CON of 14/861,563 09/22/2015 ABN
which is a CON of 14/472,477 08/29/2014 PAT 9161164
which is a CON of 13/775,435 02/25/2013 PAT 8849698
which is a CON of 13/212,723 08/18/2011 PAT 8385896
which is a CON of 12/364,828 02/03/2009 PAT 8090359
which claims benefit of 61/095,001 09/08/2008
and claims benefit of 61/095,359 09/09/2008

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: No

Petitioner Samsung Ex-1004, 0322

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 09/30/2016
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/271,410**
Projected Publication Date: 01/12/2017
Non-Publication Request: No
Early Publication Request: No
**** SMALL ENTITY ****
Title

EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Preliminary Class

705

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

Petitioner Samsung Ex-1004, 0323

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Petitioner Samsung Ex-1004, 0325

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CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON MA 02210

MAILED
NOV 18 2016
OFFICE OF PETITIONS

Doc Code: TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 15/271,410

1. THE REQUEST FILED September 21, 2016 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination

A. ☒ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;
B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
C. filing a **request for continued examination**;
D. filing a notice of appeal;
E. filing a request for suspension of action;
F. mailing of a notice of allowance;
G. mailing of a final Office action;
H. completion of examination as defined in 37 CFR 41.102; or
I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to Brian W. Brown at 571-272-5338.

/Brian W. Brown/
[*Signature*]

Petitions Examiner, Office of Petitions
(Title)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/271,410	09/21/2016	James Arthur Proctor JR.	111054-0001U4C7	7653

24267 7590 12/14/2016

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

EXAMINER
SHERR, MARIA CRISTI OWEN

ART UNIT	PAPER NUMBER
3685	

NOTIFICATION DATE	DELIVERY MODE
12/14/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@c-m.com
USPTOMail@c-m.com

Office Action Summary	Application No. 15/271,410	Applicant(s) PROCTOR ET AL.	
	Examiner CRISTINA OWEN SHERR	Art Unit 3685	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/21/2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-30* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☐ Claim(s) _____ is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☒ Claim(s) *1-30* are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Petitioner Samsung Ex-1004, 0328

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

2. This Office Action is in response to the Application filed 21 September 2016. Claims 1-30 are pending in this case.

Election/Restrictions

3. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-23 and 25-30, drawn to location monitoring, classified in H04W 4/22.

II. Claim 24, drawn to transmitting advertisements, classified in G06Q 30/02.

4. The inventions are distinct, each from the other because of the following reasons:

5. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II has separate utility such as advertising. See MPEP § 806.05(d).

6. The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a

continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

7. Restriction for examination purposes as indicated is proper because all the inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because one or more of the following reasons apply:

- The various groups of claims are separately classified.

8. **Applicant is advised that the reply to this requirement to be complete must include (i) an election of an invention to be examined** even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention**.

9. The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

10. Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other invention.

11. In the event Applicant chooses Group I, the claims are further distinguishable as follows --

This application contains claims directed to the following patentably distinct species

Claims 1 and 25 are generic to the following disclosed patentably distinct species:

A. First embodiment as disclosed on pages 31-32 of the Specification, as filed.

B. Third Embodiment (designated “another embodiment”), as disclosed on pages 33-35 of the Specification, as filed.

12. The species are independent or distinct because they are mutually exclusive. In addition, these species are not obvious variants of each other based on the current record.

13. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which

the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1 and 25 are generic.

14. There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply: the species are mutually exclusive.

15. **Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined** even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

16. The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

17. Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them

to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other species.

18. Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

19. A telephone call was made to David Thibodeau, Reg.No. 31,671 on 5 December, 2016, to request an oral election to the above restriction requirement, but did not result in an election being made.

20. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be corrected in compliance with 37 CFR 1.48(a) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. A request to correct inventorship under 37 CFR 1.48(a) must be accompanied by an application data sheet in accordance with 37 CFR 1.76 that identifies each inventor by his or her legal name and by the processing fee required under 37 CFR 1.17(i).

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRISTINA OWEN SHERR whose telephone number is (571)272-6711. The examiner can normally be reached on 8:30-5:00 Monday through Friday.

22. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Calvin L. Hewitt, II can be reached on (571)272-6709. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CRISTINA OWEN SHERR/
Examiner, Art Unit 3685

/CALVIN L HEWITT II/
Supervisory Patent Examiner, Art Unit 3685

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/271,410	09/21/2016	James Arthur Proctor JR.	111054-0001U4C7

CONFIRMATION NO. 7653

24267
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BOSTON, MA 02210

PUBLICATION NOTICE

OC000000088465673

Title:EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Publication No.US-2017-0011425-A1
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NOTICE OF PUBLICATION OF APPLICATION

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Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Petitioner Samsung Ex-1004, 0335

REMARKS

In response to the office action dated December 14, 2016, Applicant provisionally elects Group I, claims 1-23 and 25-30. This election is made with traverse.

With entry of the foregoing amendments, claim 24 has been cancelled. Applicant retains all rights to present claim 24 and other claims in a divisional application or other continuation application.

Claims 1 and 25 are being amended to delete the word "of" in the second to last line, which was a typographical error. No new matter is being added.

Paragraph 11 of the Office Action indicated that "Claims 1 and 25 are generic" to the species styled "A. First embodiment as disclosed on pages 31-32 of the Specification as filed" and to the species styled "B. Third embodiment (designated 'another embodiment'), as disclosed on pages 33-35 of the Specification as filed."

The Office Action thus refers to two possible embodiments that are described in the specification as filed. By electing claims 1 and 25, the Applicant does not intend that the elected claims be limited in their interpretation to only those two embodiments. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) ("[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.") and *Inline Plastics Corp. v. Easypak, LLC,* 799 F.3d 1364, 1368 (Fed. Cir 2015).

No explanation of the scope of, or reason for, the further distinction of species A and B in paragraph 11 was given by the Examiner, other than "the species are independent or distinct because they are mutually exclusive".

Claims 2-23 depend from claim 1 and contain all features thereof. Likewise, claims 26-30 depend from claim 25 and also contain all the same features thereof. It is

Petitioner Samsung Ex-1004, 0336

therefore understood that Applicant is entitled to have dependent claims 2-23 and 26-30 examined in this application, given that the dependent claims contain all of the limitations of the generic claims from which they depend. See 37 CFR 1.75 and 1.141. To the extent that one or more of the claims that depend from claim 1 or claim 25 are also being restricted, clarification of the scope of the restriction and/or reconsideration is respectfully requested.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/David J Thibodeau Jr Reg No 31671/

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Petitioner Samsung Ex-1004, 0337

IN THE CLAIMS:

1. (Currently Amended) A mobile wireless device for facilitating the use of proximity beacons comprising:

a first radio for communicating with one or more servers and receiving identifier related information;

a second radio for receiving proximity beacon transmissions from a plurality of beacon transmitter devices and for providing proximity beacon information derived from the proximity beacon transmissions; and

a data processor for determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions from the plurality of beacon transmitter devices and identifies [[of]] each of the plurality of proximity beacon transmitter devices as being enabled with the proximity beacon service.

2. (Original) The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit number matching the format of a MAC address.

3. (Original) The mobile wireless device of Claim 2, wherein the MAC address is a Bluetooth BD_ADDR.

4. (Original) The wireless device of claim 3 wherein both the MAC address and the unique identifier received by the second radio occasionally change, for security reasons.

Petitioner Samsung Ex-1004, 0338

5. (Original) The wireless device of claim 2 wherein both the MAC address and the unique identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more central server to access the identifier information.

6. (Original) The mobile wireless device of Claim 1, wherein at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices.

7. (Original) The mobile wireless device of Claim 6, wherein the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

8. (Original) The mobile wireless device of Claim 1, wherein the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers.

9. (Original) The mobile wireless device of Claim 1, wherein the data processor determines the proximity by comparing the proximity beacon information with the identifier related information.

10. (Original) The mobile wireless device of Claim 1, wherein the data processor determines the proximity by sending at least the unique identifier associated with the at least one beacon transmitter to at least one of the one or more servers using the first radio, and receives at least a portion of the identifier related information usable to make the proximity determination.

Petitioner Samsung Ex-1004, 0339

11. (Original) The mobile wireless device of Claim 10, wherein the unique identifier associated with the at least one beacon transmitter is associated at the at least one of the one or more servers with being a broadcast device having a known location.

12. (Original) The mobile wireless device of Claim 1, wherein the data processor further determines, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a known location.

13. (Original) The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device, downloaded in reaction to the sending of a unique identifier by the mobile wireless device to the at least one server, wherein the mobile wireless device first received the unique identifier as part of the proximity beacon information.

14. (Original) The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device.

15. (Original) The mobile wireless device of Claim 1 wherein

the identifier related information comprises a list of contact information, and the data processor performs the proximity determination of a beacon transmitter device associated with an entity included within the list of contact information based upon comparing a contact information related unique identifier with at least the portion of the proximity beacon information, and wherein the mobile wireless device, upon determining there is a match, engages in further steps to allow further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio, and further

wherein the both the MAC address and the identifier associated with proximity beacon transmissions from the detected proximity beacon transmitter associated with

Petitioner Samsung Ex-1004, 0340

entity included within the list of contact information change from time to time, but remains identifiable by the wireless mobile device, but anonymous to other devices not having required permissions to make such an identification.

16. (Original) The wireless device of claim 1 wherein the changing of the MAC address and the unique identifier associated with the at least one beacon transmitter is coordinated with the at least one of the one or more remote central servers.

17. (Original) The wireless device of claim 1 wherein the unique identifier of at least the portion of the proximity beacon transmissions changes over time based upon an algorithm in synchronization with at least one server of the one or more remote central servers.

18. (Original) The wireless device of claim 1 wherein the unique identifier associated with at least one beacon transmitter is associated with a single beacon transmitter and is generated algorithmically and only known to at least one the central servers and the one beacon transmitter, and updated based, at least in part, upon a clock interval within the beacon transmitter, and further

wherein the MAC address associated with the beacon transmitter is changed as well, so as to prevent the identity of the beacon transmitter from being determined by unauthorized devices.

19. (Original) The mobile wireless device of Claim 1, wherein the second radio is a Bluetooth based radio.

20. (Original) The mobile wireless device of Claim 1, wherein the second radio is a Wi-Fi based radio.

21. (Original) The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit BD_ADDR, wherein both the MAC address and the unique

Petitioner Samsung Ex-1004, 0341

identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more central server to access the identifier related information, and wherein at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices, wherein the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

22. (Original) The mobile wireless device of Claim 21, wherein the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers.

23. (Original) The mobile wireless device of Claim 1, wherein the proximity beacon service utilizes a standards based protocol derived from Bluetooth and including unsolicited automatically repetitive advertisements, and wherein the proximity beacon transmissions are transmitted within the format of the unsolicited automatically repetitive advertisements, and wherein the proximity beacon identification information is included within a configurable field of the unsolicited automatically repetitive advertisements while conforming to the standards based protocol and, wherein no connection is made between the mobile wireless device and the plurality of beacon transmitted receiving when receiving the unique identifier.

24. (Cancelled)

25. (Currently Amended) A system for facilitating the use of proximity beacons comprising:

Petitioner Samsung Ex-1004, 0342

one or more central servers for communicating with a plurality of wireless devices;

software residing on a wireless device of the plurality of wireless devices for:

utilizing a first radio of the wireless device to communicate with at least one of the one or more servers and for receiving identifier related information; and for,

utilizing a respective second radio of the wireless device for receiving proximity beacon transmissions from a plurality of beacon transmitter devices and for providing received proximity beacon information derived from the proximity beacon transmissions; and for,

determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions from the plurality of beacon transmitter devices and identifies [[of]] each of the plurality of proximity beacon transmitter devices as being enabled with the proximity beacon service.

26. (Original) The system of Claim 25, wherein the identifier related information comprises application software for execution upon the mobile wireless device.

27. (Original) The system of Claim 25, wherein the identifier related information is received in response to the software residing on the wireless device sending at least one unique identifier determined from the proximity beacon information.

Petitioner Samsung Ex-1004, 0343

28. (Original) The system of Claim 27 wherein after determining the at least one beacon transmitter device is in proximity, at least one server of the plurality of servers provides an identifying picture of a consumer to at least one device for use by an operator of the device for confirming the picture matches an individual in proximity as a step in a multi-step electronic commerce transaction.

29. (Original) The system of Claim 28, wherein the MAC address and unique identifier of the proximity beacon transmissions from each of the at least one beacon transmitter devices change from time to time, and wherein at least the unique identifiers of the at least one of beacon transmitter devices remain associated with an account associated with the consumer.

30. (Original) The system of Claim 25, wherein the second radio is a Bluetooth compliant radio.

Petitioner Samsung Ex-1004, 0344

Electronic Acknowledgement Receipt

EFS ID:	28151888
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	24267
Filer:	David J. Thibodeau/stephany deblois
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	24-JAN-2017
Filing Date:	21-SEP-2016
Time Stamp:	15:22:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2AF3656.PDF	49929 9be70cf00df39387ecd2d3b9fb3f1cb537786163	yes	10

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response to Election / Restriction Filed	1	1
	Claims	2	8
	Applicant Arguments/Remarks Made in an Amendment	9	10
Warnings:			
Information:			
	Total Files Size (in bytes):	49929	

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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PATENTS
111054–0001U4C7
1005-007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
James A. Proctor, Jr., et al.

Serial No.: 15/271,410

Filed: September 21, 2016

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Examiner: Sherr,Maria Cristi Owen

Art Unit: 3685

Confirmation No.: 7653

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
January 24, 2017

CERTIFICATE OF TRANSMISSION

I hereby certify that the following paper is being electronically transmitted to the Patent and Trademark Office by EFS-Web on January 24, 2017.

/Stephany DeBlois/
Stephany DeBlois

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

ELECTION/RESTRICTION UNDER 35 U.S.C. 121

In response to the Office action dated December 14, 2016, a restriction requirement, please find a selection of species and claims associated therewith. Also, please enter the following amendments:

Petitioner Samsung Ex-1004, 0347

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
15/271,410	09/21/2016	

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **01/24/2017**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 29	Minus	** 30	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
ERIC DANTZLER

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENTS
111054–0001U4C7
1005-007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
James A. Proctor, Jr., et al.

Serial No.: 15/271,410

Filed: September 21, 2016

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Examiner: Sherr, Maria Cristi Owen

Art Unit: 3685

Confirmation No.: 7653

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
May 23, 2017

CERTIFICATE OF TRANSMISSION

I hereby certify that the following paper is being electronically transmitted to the Patent and Trademark Office by EFS-Web on May 23, 2017.

/Stephany DeBlois/
Stephany DeBlois

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

APPLICANT SUMMARY OF INTERVIEW

Applicant thanks Examiner Sherr for the courtesy of several telephone calls on May 17 and May 22, 2017.

During the call on May 22, 2017, the Applicant explained it still believed that claims 1 and 25 should be examined together. Those claims have most of their features in common and not appear to place an undue search or examination burden on the Examiner.

Nonetheless, Applicant indicated that they would further provisionally elect claims 1-23 with traverse.

The Applicant also thanks the Examiner for indicating that the Applicant may submit software method claims of the same technical scope as claims 1-23 to be examined in this application.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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Electronic Acknowledgement Receipt

EFS ID:	29282971
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	24267
Filer:	David J. Thibodeau/stephany deblois
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	23-MAY-2017
Filing Date:	21-SEP-2016
Time Stamp:	10:16:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant summary of interview with examiner	2AQ9084.PDF	18174 4d0866429174 3d39b6318a57b0d97d158372dfef	no	2

Warnings:

Information:	
Total Files Size (in bytes):	18174

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS

Applicant submits this amendment to the claims. The Amendment cancels prior system claims 25-30 and presents new method claims 31-37, consistent with the conversation with the Examiner on May 22, 2107.

There are now a total of 30 claims in the application presented for examination. Thus the case is believed to still be properly considered under the Track On Prioritized Examination Request previously granted on November 22, 2016.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/David J Thibodeau Jr Reg No 31671/
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Petitioner Samsung Ex-1004, 0353

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
James A. Proctor, Jr., et al.

Serial No.: 15/271,410

Filed: September 21, 2016

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Examiner: Sherr,Maria Cristi Owen

Art Unit: 3685

Confirmation No.: 7653

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
June 1, 2017

CERTIFICATE OF TRANSMISSION

I hereby certify that the following paper is being electronically transmitted to the Patent and Trademark Office by EFS-Web on June 1, 2017.

/Stephany DeBlois/
Stephany DeBlois

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

SUPPLEMENTAL AMENDMENT

Please enter the following amendments before considering the above-identified patent application:

Petitioner Samsung Ex-1004, 0354

IN THE CLAIMS:

1. (Previously Presented) A mobile wireless device for facilitating the use of proximity beacons comprising:

a first radio for communicating with one or more servers and receiving identifier related information;

a second radio for receiving proximity beacon transmissions from a plurality of beacon transmitter devices and for providing proximity beacon information derived from the proximity beacon transmissions; and

a data processor for determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions from the plurality of beacon transmitter devices and identifies [[of]] each of the plurality of proximity beacon transmitter devices as being enabled with the proximity beacon service.

2. (Original) The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit number matching the format of a MAC address.

3. (Original) The mobile wireless device of Claim 2, wherein the MAC address is a Bluetooth BD_ADDR.

4. (Original) The wireless device of claim 3 wherein both the MAC address and the unique identifier received by the second radio occasionally change, for security reasons.

Petitioner Samsung Ex-1004, 0355

5. (Original) The wireless device of claim 2 wherein both the MAC address and the unique identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more central server to access the identifier information.

6. (Original) The mobile wireless device of Claim 1, wherein at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices.

7. (Original) The mobile wireless device of Claim 6, wherein the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

8. (Original) The mobile wireless device of Claim 1, wherein the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers.

9. (Original) The mobile wireless device of Claim 1, wherein the data processor determines the proximity by comparing the proximity beacon information with the identifier related information.

10. (Original) The mobile wireless device of Claim 1, wherein the data processor determines the proximity by sending at least the unique identifier associated with the at least one beacon transmitter to at least one of the one or more servers using the first radio, and receives at least a portion of the identifier related information usable to make the proximity determination.

Petitioner Samsung Ex-1004, 0356

11. (Original) The mobile wireless device of Claim 10, wherein the unique identifier associated with the at least one beacon transmitter is associated at the at least one of the one or more servers with being a broadcast device having a known location.

12. (Original) The mobile wireless device of Claim 1, wherein the data processor further determines, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a known location.

13. (Original) The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device, downloaded in reaction to the sending of a unique identifier by the mobile wireless device to the at least one server, wherein the mobile wireless device first received the unique identifier as part of the proximity beacon information.

14. (Original) The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device.

15. (Original) The mobile wireless device of Claim 1 wherein

the identifier related information comprises a list of contact information, and the data processor performs the proximity determination of a beacon transmitter device associated with an entity included within the list of contact information based upon comparing a contact information related unique identifier with at least the portion of the proximity beacon information, and wherein the mobile wireless device, upon determining there is a match, engages in further steps to allow further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio, and further

wherein the both the MAC address and the identifier associated with proximity beacon transmissions from the detected proximity beacon transmitter associated with

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entity included within the list of contact information change from time to time, but remains identifiable by the wireless mobile device, but anonymous to other devices not having required permissions to make such an identification.

16. (Original) The wireless device of claim 1 wherein the changing of the MAC address and the unique identifier associated with the at least one beacon transmitter is coordinated with the at least one of the one or more remote central servers.

17. (Original) The wireless device of claim 1 wherein the unique identifier of at least the portion of the proximity beacon transmissions changes over time based upon an algorithm in synchronization with at least one server of the one or more remote central servers.

18. (Original) The wireless device of claim 1 wherein the unique identifier associated with at least one beacon transmitter is associated with a single beacon transmitter and is generated algorithmically and only known to at least one the central servers and the one beacon transmitter, and updated based, at least in part, upon a clock interval within the beacon transmitter, and further

wherein the MAC address associated with the beacon transmitter is changed as well, so as to prevent the identity of the beacon transmitter from being determined by unauthorized devices.

19. (Original) The mobile wireless device of Claim 1, wherein the second radio is a Bluetooth based radio.

20. (Original) The mobile wireless device of Claim 1, wherein the second radio is a Wi-Fi based radio.

21. (Original) The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit BD_ADDR, wherein both the MAC address and the unique

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identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more central server to access the identifier related information, and wherein at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices, wherein the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

22. (Original) The mobile wireless device of Claim 21, wherein the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers.

23. (Original) The mobile wireless device of Claim 1, wherein the proximity beacon service utilizes a standards based protocol derived from Bluetooth and including unsolicited automatically repetitive advertisements, and wherein the proximity beacon transmissions are transmitted within the format of the unsolicited automatically repetitive advertisements, and wherein the proximity beacon identification information is included within a configurable field of the unsolicited automatically repetitive advertisements while conforming to the standards based protocol and, wherein no connection is made between the mobile wireless device and the plurality of beacon transmitted receiving when receiving the unique identifier.

24. – 30. (Cancelled)

31. (New) A method for facilitating the use of proximity beacons comprising:

communicating between a mobile device and one or more servers and receiving, at the mobile device, identifier related information, using a first radio;

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obtaining proximity beacon information derived from proximity beacon transmissions, wherein the proximity beacons transmissions were received from one or more beacon transmitter devices using a second radio; and

determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions associated with the proximity beacon service, transmitted from the plurality of beacon transmitter devices.

32. (New) The method of claim 31, additionally comprising:

performing one or more steps of the method under control of an application via a software interface; and

executing the application on at least one of the mobile devices.

33. (New) The method of claim 32 wherein the software interface is an NDIS driver.

34. (New) The method of claim 31 additionally comprising:

performing at least a portion of the steps on one or more servers.

35. (New) The method of claim 31, wherein both the MAC address and the unique identifier received via the second radio occasionally change between proximity beacon transmissions from one of the one or more beacon transmitter devices.

36. (New) The method of claim 31, wherein the identifier related information is received

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in response to the software residing on the mobile device sending at least one unique identifier determined from the proximity beacon information.

37. (New) The method of claim 31 wherein after determining the at least one beacon transmitter device is in proximity, at least one server of the one or more of servers provides an identifying picture of a consumer to at least one device for use by an operator of the device for confirming the picture matches an individual in proximity as a step in an electronic commerce transaction.

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Electronic Acknowledgement Receipt

EFS ID:	29372269
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	24267
Filer:	David J. Thibodeau/stephany deblois
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	01-JUN-2017
Filing Date:	21-SEP-2016
Time Stamp:	16:39:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2AS0281.PDF	41945 ac08bfaa0c8184a7a71af77788aa27cd188d4434	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Supplemental Response or Supplemental Amendment	1	1
	Claims	2	8
	Applicant Arguments/Remarks Made in an Amendment	9	9
Warnings:			
Information:			
	Total Files Size (in bytes):	41945	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/271,410	Filing Date 09/21/2016	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **06/01/2017**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 30	Minus	** 30	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
ANGELA s. WHITE

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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Electronic Acknowledgement Receipt

EFS ID:	30109097
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	24267
Filer:	David J. Thibodeau/Roberta Fels
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	17-AUG-2017
Filing Date:	21-SEP-2016
Time Stamp:	14:43:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	20170817-111054-0001U4C7_TPO_Executed_Power_of_Attorney.pdf	207947 36ce3a0ecee5c86119d82568cda2ec73a838a5a0	no	1

Warnings:

Information:					
2	Assignee showing of ownership per 37 CFR 3.73	20170817-111054-0001U4C7_TPO_Assignee_Statement.pdf	422160 9187d7a9cd1fb123ba05aed9d742cc6cc9be5071	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	630107		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Proxicom Wireless, LLC

Application No./Patent No.: 15/271,410 Filed/Issue Date: September 21, 2016

Titled:

Proxicom Wireless, LLC , a Limited Liability Company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 040275, Frame 0722, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/David J Thibodeau Jr Reg No 3167/ 17 August 2017

Signature Date

David J. Thibodeau, Jr. Reg. No. 31671

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/80 (11-08)
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 86012

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 86012

OR

☐ Firm or Individual Name	VLP Law Group LLP		
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Proxicom Wireless LLC
1680 N. Riverside Drive
Indialantic, FL 32903

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	James A. Proctor	Date	4/17/2017
Name	James A. Proctor	Telephone	321.252.8411
Title	Managing Director		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/271,410	09/21/2016	James Arthur Proctor JR.	111054-0001U4C7

CONFIRMATION NO. 7653

POA ACCEPTANCE LETTER

86012
VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

OC000000093569328

Date Mailed: 08/21/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/17/2017.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/dtdinh/

Petitioner Samsung Ex-1004, 0370

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UNITED STATES DEPARTMENT OF COMMERCE
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/271,410	09/21/2016	James Arthur Proctor JR.	111054-0001U4C7

CONFIRMATION NO. 7653

POWER OF ATTORNEY NOTICE

24267
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

OC000000093569304

Date Mailed: 08/21/2017

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/17/2017.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/dtdinh/

Petitioner Samsung Ex-1004, 0371

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James Arthur Proctor, Jr.
Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
Attorney Docket Number	111054-0001U4C7

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8229458	B2	2012-07-24	Busch	
	2	8185133	B2	2012-05-22	Billmaier et al.	
	3	7965983	B1	2011-06-21	Swan et al.	
	4	7962369	B2	2011-06-14	Rosenberg	
	5	7877082	B2	2011-01-25	Eagle et al.	
	6	7647024	B2	2010-01-12	Wang et al.	
	7					

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(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James Arthur Proctor, Jr.
Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
Attorney Docket Number	111054-0001U4C7

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100138481	A1	2010-06-03	Behrens	
	2	20090219132	A1	2009-09-03	Maytal et al.	
	3	20080139114	A1	2008-06-12	Ranganathan	
	4	20080109843	A1	2008-05-08	Ullah	
	5	20080039020	A1	2008-02-14	Eskin	
	6	20070270099	A1	2007-11-22	Le Gars	
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(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James Arthur Proctor, Jr.
Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
Attorney Docket Number	111054-0001U4C7

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James Arthur Proctor, Jr.
Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
Attorney Docket Number	111054-0001U4C7

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/David J Thibodeau Jr Reg No 31671/	Date (YYYY-MM-DD)	2017-08-23
Name/Print	David J. Thibodeau, Jr.	Registration Number	31,671

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	30157720
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	86012
Filer:	David J. Thibodeau/Roberta Fels
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	23-AUG-2017
Filing Date:	21-SEP-2016
Time Stamp:	11:13:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
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Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	20170823_111054-0001U4C7_TPO_SB08_Form.pdf	612379 63f1f10f40b330a06d9d3639dde64f464805a4fc	no	5
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Electronic Patent Application Fee Transmittal

Application Number:	15271410
Filing Date:	21-Sep-2016
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Filer:	David J. Thibodeau/Roberta Fels
Attorney Docket Number:	111054-0001U4C7

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	90	90
		Total in USD ($)		**90**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
Proctor, James A., Jr., et al.

Serial No.: 15/271,410

Filed: September 21, 2016

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Examiner: Sherr, Maria Cristi Owen

Art Unit: 3685

Confirmation No.: 7653

VLP Law Group LLP
37 Governor Wentworth Road
Amherst, NH 03031
August 23, 2017

CERTIFICATE OF TRANSMISSION

I hereby certify that the following paper is being electronically transmitted to the Patent and Trademark Office by EFS-Web on August 23, 2017.

/Roberta Fels/
Roberta Fels

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

In keeping with the duty of candor and good faith owed to the Patent and Trademark Office, Applicant wishes to bring to the Examiner's attention the reference listed on the accompanying form PTO/SB/08.

Petitioner Samsung Ex-1004, 0382

This submission is accompanied by the $90.00 fee set forth in 37 C.F.R. § 1.17(p).

Please charge any additional fee occasioned by this paper to our Deposit Account No. 50-4929.

Respectfully submitted,

/David J Thibodeau Jr Reg No 31671 /
David J. Thibodeau, Jr.
Reg. No. 31,671
VLP Law Group LLP
Telephone: (617) 925-5520
Facsimile: (617) 925-5530

Petitioner Samsung Ex-1004, 0383

Notice of References Cited	Application/Control No. 15/271,410	Applicant(s)/Patent Under Reexamination PROCTOR ET AL.	
	Examiner CRISTINA OWEN SHERR	Art Unit 3685	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
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*	B	US-2005/0114654 A1	05-2005	Brackett, Charles Cameron	G06F21/32	713/161
*	C	US-2013/0217332 A1	08-2013	Altman; Steven R.	H04H60/90	455/41.2
*	D	US-2016/0025837 A1	01-2016	Hillier; Peter M.	G01S5/0054	342/386
	E	US-				
	F	US-				
	G	US-				
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	N					
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NON-PATENT DOCUMENTS

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 2

Complete if Known	
Application Number	**15/271,410**
Filing Date	**September 21, 2016**
First Named Inventor	**James A. Proctor, Jr., et al.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C7**

U.S. PATENT DOCUMENTS

Examiner Initials'	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2002/0101993		08-01-2002	Eskin	
		6,629,149		09-30-2003	Fraser et al.	
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Examiner Initials'	Cite No.[1]	Foreign Patent Document Country Code[3]–Number[4]–Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		CA 2 766 024	08-08-2002	ACK Ventures Holdings, LLC		
		CA 2 766 184	08-08-2002	ACK Ventures Holdings, LLC		
		WO 2009050322	04-23-2009	Nokia Corporation		
		WO 2009063272	05-22-2009	Nokia Corporation		

Examiner Signature	/Cristina Owen Sherr/	Date Considered	09/03/2017

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	2	of	2

Complete if Known	
Application Number	**15/271,410**
Filing Date	**September 21, 2016**
First Named Inventor	**James A. Proctor, Jr., et al.**
Group Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C7**

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		Hunn, Nick, "EZURiO – An Introduction to Wibree" November 2006, 7 pages.	
		Shruthi et al., "Wibree Using Digital Radio Technology" International Journal of Advanced Trends in Computer Science and Engineering, Vol. 3 , No.1, Pages : 260 – 264 (2014), Special Issue of ICETETS 2014 - Held on 24-25 February, 2014 in Malla Reddy Institute of Engineering and Technology, Secunderabad– 14, AP, India	
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Examiner Signature	/Cristina Owen Sherr/	Date Considered	09/03/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing the this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.*** ***If you need assistance in completing the form, call 1-800-PTO-9199 and select option2***

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.O.S/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James Arthur Proctor, Jr.
Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
Attorney Docket Number	111054-0001U4C7

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8229458	B2	2012-07-24	Busch	
	2	8185133	B2	2012-05-22	Billmaier et al.	
	3	7965983	B1	2011-06-21	Swan et al.	
	4	7962369	B2	2011-06-14	Rosenberg	
	5	7877082	B2	2011-01-25	Eagle et al.	
	6	7647024	B2	2010-01-12	Wang et al.	
	7					

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James Arthur Proctor, Jr.
Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
Attorney Docket Number	111054-0001U4C7

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100138481	A1	2010-06-03	Behrens	
	2	20090219132	A1	2009-09-03	Maytal et al.	
	3	20080139114	A1	2008-06-12	Ranganathan	
	4	20080109843	A1	2008-05-08	Ullah	
	5	20080039020	A1	2008-02-14	Eskin	
	6	20070270099	A1	2007-11-22	Le Gars	
	7					

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

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Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

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EXAMINER SIGNATURE

Examiner Signature	/Cristina Owen Sherr/	Date Considered	09/03/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
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First Named Inventor	James Arthur Proctor, Jr.
Art Unit	3685
Examiner Name	Maria Cristi Owen Sherr
Attorney Docket Number	111054-0001U4C7

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/David J Thibodeau Jr Reg No 31671/	Date (YYYY-MM-DD)	2017-08-23
Name/Print	David J. Thibodeau, Jr.	Registration Number	31,671

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/271,410	09/21/2016	James Arthur Proctor JR.	111054-0001U4C7	7653

86012 7590 09/25/2017

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

EXAMINER
SHERR, MARIA CRISTI OWEN

ART UNIT	PAPER NUMBER
3685	

NOTIFICATION DATE	DELIVERY MODE
09/25/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@vlplawgroup.com

Office Action Summary	Application No. 15/271,410	Applicant(s) PROCTOR ET AL.	
	Examiner CRISTINA OWEN SHERR	Art Unit 3685	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/1/2017*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-21 and 31-37* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-21 and 31-37* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *September 21, 2016, September 29, 2016, and August 23, 2017*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Petitioner Samsung Ex-1004, 0393

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

2. This Office Action is in response to the Application filed 21 September 2016. Claims 1-23 and 31-37 are pending in this case.

3. Claims 31-37 are newly-added. Claims 24-30 are canceled pursuant to a Requirement for Restriction issued December 14, 2016.

Election/Restrictions

4. Applicant's election without traverse of claims 1-23 in the reply filed on June 1, 2017 is acknowledged.

Priority

5. This application claims a continuation of pending U.S. Patent Application No. 14/861,563, filed September 22, 2015 which is a continuation of pending U.S. Patent Application No. 14/472,477, filed August 29, 2014 which is a continuation of U.S. Patent Application No. 13/775,435, filed February 25, 2013, now issued as U.S. Patent No. 8,849,698 on September 30, 2014 which is a continuation of U.S. Patent Application No. 13/212,723, filed August 18, 2011, now issued as U.S. Patent No. 8,374,592 on February 12, 2013 which is a continuation of U.S. Application No. 12/364,828, filed February 3, 2009, now issued as U.S. Patent No. 8,090,359 on January 3, 2012 which claims the benefit of U.S. Provisional Application No. 61/095,001, entitled "Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios", filed on September 8, 2008 and U.S. Provisional Application No.

61/095,359, entitled “Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios”, filed on September 9, 2008. However, in reviewing the various continuations, at least the limitation of claim 1 “determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information” is not found in the previous Applications.

6. For this reason, Priority is set at 21 September 2016.

Information Disclosure Statement

7. The information disclosure statements (IDS) submitted on September 21, 2016, September 29, 2016, and August 23, 2017, are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Remarks

8. Statements of intended use do not serve to distinguish from the prior art. MPEP 2103 I C.

9. In this case, claim 1 recites “a first radio”, “a second radio”, and “a data processor”. We note that the said terms do not invoke 35 U.S.C.112 (6) or 35 U.S.C.112 (f). For this reason, what each is "for" does not have patentable weight.

10. Additionally, the claims recite multiple instances of intended use –

a. claim 13 “…for execution”

b. claim 14 “for execution…”

c. claim 15 "wherein… to allow further communication… wherein the further communication …"

d. claim 37 "for use by an operator…"

11. Nonfunctional descriptive material does not serve to distinguish from the prior art. *In re Kao*, 639 F.3d1057, ___, 98 USPQ2d 1799, 1811-12 (Fed. Cir. 2011); King *Pharmaceuticals Inc. v. Eon Labs Inc.*, 616 F.3d1267, ___, 95 USPQ2d 1833, 1842 (Fed. Cir. 2010); *In re Gulack*, 217 USPQ 401 (Fed. Cir. 1983), *In re Ngai*, 70 USPQ2d (Fed. Cir. 2004), *In re Lowry*, 32 USPQ2d 1031 (Fed. Cir. 1994); MPEP 2111.05.

12. Claims 1 and 31 recite "wherein the proximity beacon identification information indicates…" "wherein the proximity beacon identification information is the same…". The said recitations constitute nonfunctional descriptive material which does not serve to distinguish from the prior art.

13. Limitations not positively recited do not serve to distinguish from the prior art.

14. In this case, claim 31 recites "transmissions were received from . . .second radio". The said recitation does not serve to distinguish from the prior art.

Claim Rejections - 35 USC § 101

15. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

16. Claims 1-23 and 31-37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

17. Regarding claims 1-23 and 31-37 –

18. Claims 1-23 and 31-37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more.

19. The claims are directed to the abstract idea of determining distance.

Subject Matter Eligibility Standard

20. When considering subject matter eligibility under 35 U.S.C. 101, it must be determined whether the claim is directed to one of the four statutory categories of invention, i.e., process, machine, manufacture, or composition of matter. If the claim does fall within one of the statutory categories, it must then be determined whether the claim is directed to a judicial exception (*i.e.*, law of nature, natural phenomenon, and abstract idea), and if so, it must additionally be determined whether the claim is a patent-eligible application of the exception. If an abstract idea is present in the claim, any element or combination of elements in the claim must be sufficient to ensure that the claim amounts to significantly more than the abstract idea itself. Examples of abstract ideas include fundamental economic practices; certain methods of organizing human activities; an idea itself; and mathematical relationships/formulas. (*Alice Corporation Pty. Ltd. v. CLS Bank International, et al* US Supreme Court, No. 13-298, June 19, 2014).

Analysis

21. In this case, claim 31 recites a method.

22. Additionally, the claim is directed to the abstract idea of determining distance. (*Alice Corporation Pty. Ltd. v. CLS Bank International, et al* US Supreme Court, No. 13-298, June 19, 2014) The transaction device in this claim merely automates an algorithm via basic computer functions, and therefore, the claim does not include additional elements that are sufficient to amount to significantly more than the judicial exception because additional claim elements do not provide meaningful limitations to transform the abstract idea into a patent eligible application of the abstract idea such that the claim amounts to significantly more than the abstract idea itself.

23. Taking the claim elements separately, the functions performed by the machine at each step of the process are purely conventional. Receiving data, transmitting data, and comparing data ---one of the most basic functions of a computer. All of these computer functions are well-understood, routine, conventional activities previously known to the industry. In short, each step does no more than require a generic computer to perform generic computer functions.

24. The claims do not, for example, purport to improve the functioning of the computer itself. Nor do they effect an improvement in any other technology or technical field. Instead, the claims at issue amount to nothing significantly more than an instruction to apply the abstract idea of advertising using some unspecified, generic computer. "Under our precedents, that is not 'enough' to transform an abstract idea into a patent--eligible invention." See *Alice Corp. Pty. Ltd.*, 134 S.Ct. at 2360.

Conclusion

25. The claims, as a whole, do not amount to significantly more than the abstract idea itself. This is because the claims do not effect an improvement to another technology or technical filed; the claims do not amount to an improvement to the functioning of a computer system itself; and the claims do not move beyond a general link of the use of an abstract idea to a particular technological environment.

26. Accordingly, the Examiner concludes that there are no meaningful limitations in the claims that transform the judicial exception into a patent eligible application such that the claims amount to significantly more than the judicial exception itself.

27. The dependent claims 32-37 do not resolve the deficiency of independent claims and accordingly stand rejected under 35 USC 101 based on the same rationale.

28. Independent claim 1 and its dependent claims 2-23 merely implement the abstract idea of claim 31.

Claim Rejections - 35 USC § 112

29. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

30. The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

31. Claims 1-23 and 31-37 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

32. Regarding claims 1 and 31 –

33. The claims recite a "mobile wireless device" comprising… a first radio and second radio. The Specification, as filed, does not support the said recitation. (See, *Katz*).

34. The claims recite a "radio for communicating with one or more servers" however, the PgPub US 2017/0011425 at par 11 and 78 teaches short range radios. There is no support for a computer communicating with a server via radio. (See, *Katz*).

35. Regarding claim 4 –

36. The claim recites "occasionally change for security reasons", wherein the said limitation is broader than the Specification, as filed (See PgPub US 2017/0011425 at par 44), (*LizardTech Inc. v. Earth Resource Mapping Inc.*, 76 USPQ2d 1724 (Fed. Cir. 2005)) (MPEP 2163 (A)).

37. Regarding claim 18 –

38. The claim recites "is changed as well as to prevent . . .". wherein the said limitation is broader than the Specification, as filed (See PgPub US 2017/0011425 at

par 44), (*LizardTech Inc. v. Earth Resource Mapping Inc.*, 76 USPQ2d 1724 (Fed. Cir. 2005)) (also, MPEP 2161 (1) lack of algorithm).

39. Regarding claim 32 –

40. The claim recites multiple mobile devices. The Specification, as filed, does not support the said recitation. (*Katz*, MPEP 2161.01)

41. Regarding claim 34 –

42. The claim recites multiple servers as well as a server with radios (*e.g.*, using a first radio . . using a second radio . . .). The Specification, as filed, does not support the said recitation. (*Katz*, MPEP 2161.01).

43. Claim 41 recites, in newly-added language "programmatically categorizing… that are *detected*…" wherein the said limitation is broader than the Specification, as filed (See PgPub US 2009/0171730 at par 414-416, detection is done in the IT infrastructure), (*LizardTech Inc. v. Earth Resource Mapping Inc.*, 76 USPQ2d 1724 (Fed. Cir. 2005)) (MPEP 2163 (A)).

44. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

45. The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

46. Claims 1-23 and 31-37 rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

47. Claims 1-23 and 31-37 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph.

48. The claims are narrative in form and replete with indefinite language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. For example, the claims contain excessive functional language. The claims must be in one sentence form only. Note the format of the claims in the patents cited.

49. A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. *In re Katz* Interactive Call Processing Patent Litigation, 639 F.3d 1303 (Fed. Cir. 2011).

50. The claims recite multiple instances of apparatus and method steps of using the apparatus –

Claim 1 --- “a second radio… information derived… “ (*Katz, UltimatePointer*).

Claim 2 --- “a randomly generated” (*Katz, UltimatePointer*).

Claim 4 --- “occasionally change”.

Claim 5 --- “… change from time to time”, “… making… anonymous over time…”.

Claim 6 --- “which is used…”.

Claim 11 --- “is associated at the at least one of the one more servers with being…”

Claim 13 --- "downloaded in reaction to… wherein the mobile wireless device first received… as part of the proximity beacon information".

Claim 15 --- "wherein the mobile wireless device, upon determining…", "wherein the further communications utilize the first radio…, but remains identifiable by the wireless mobile device…", "upon determining there is a match…"

Claim 16 --- "wherein the changing… is coordinated with the at least one of the one more remote central servers…"

Claim 17 --- "wherein the unique identifier… changes over time based upon an algorithm in synchronization…"

Claim 18 --- "… and is generated algorithmically and only known to at least one of the central servers… and updated based… upon a clock interval…" "wherein the MAC address … is changed as well…"

Claim 21 --- "wherein the MAC address is a randomly generated… change from time to time, making one or more of an entity's identity associated with… anonymous over time… which is used to determine a downloaded unique identifier… "

Claim 22 --- "one or more previously downloaded unique identifiers…"

Claim 23 --- "wherein no connection is made between the mobile wireless device …"

51. Please note that the language of the hybrid limitations does not carry patentable weight.

52. Regarding claim 1 –

53. The claim recites “each of the proximity beacon transmitter devices as being enabled with the proximity beacon device” and “wherein the proximity beacon id. However, the claim is directed to a mobile wireless device. It is unclear whether the claim is directed to the mobile wireless device or combination mobile wireless device and proximity beacon transmitter devices. The scope of the claims is therefore rendered unclear.

54. Regarding claim 11 –

55. The claim recites “is associated at the at least one of the one more servers with being…”. However, the claim is directed to a mobile wireless device. The scope of the claims is therefore rendered unclear.

56. Regarding claim 23 –

57. The claim recites “wherein the proximity beacon service utilizes . . .”. However, the claim is directed to a mobile wireless device. The scope of the claims is therefore rendered unclear.

58. Regarding claim 31 –

59. The claim recites “were received… using a second radio” It is unclear who received the beacon transmissions, and where the second radio is. The scope of the claims is therefore rendered unclear.

60. Regarding claim 12 –

61. The term "known location" in claim 12 is a relative term which renders the claim indefinite. The term "known location" is not defined by the claim, the specification does

not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

62. Regarding claim 23 –

63. The term "standards based protocol" in claim 23 is a relative term which renders the claim indefinite. The term "standards based protocol" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

64. Regarding claim 13 –

65. The claim recites “upon the mobile wireless device”, “by the mobile wireless device”, “wherein the mobile wireless device”, thereby engaging in circular reasoning and rendering the claim unclear.

66. Regarding claim 14 –

67. The claim recites “for execution upon the mobile wireless device”, thereby engaging in circular reasoning and rendering the claim unclear.

68. Regarding claim 15 –

69. The claim recites “wherein the mobile wireless device”, thereby engaging in circular reasoning and rendering the claim unclear.

70. Regarding claim 23 –

71. The claim recites “between the mobile wireless device”, thereby engaging in circular reasoning and rendering the claim unclear.

72. Regarding claim 32 –

73. Note that claim 31 is already performed, and the first limitation of claim 32 says claim 31 is performed under control of an application. So executing is unclear as the first limitation suggests that it was already executed.

74. Regarding claim 32 –

75. Claim 32 recites the limitation "… at least one of the mobile devices". There is insufficient antecedent basis for this limitation in the claim.

76. For the above reasons, claims 1-23 and 31-37 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 USC § 102

77. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

78. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

79. Claims 1, 6-14, 19, 20, 23, 31, and 34-36 are rejected under pre-AIA 35 U.S.C. 102(a) as being anticipated by Hillier (US 2016/0025837).

80. Regarding claims 1 and 31-

81. Hillier teaches a mobile wireless device for facilitating the use of proximity beacons (abs) comprising:

a first radio for communicating with one or more servers and receiving identifier related information; (par 49)

a second radio for receiving proximity beacon transmissions from a plurality of beacon transmitter devices and for providing proximity beacon information derived from the proximity beacon transmissions (par 53-54); and

a data processor for determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information; (par 49)

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information. (par 45, 75)

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; (par 49-54) and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions from the plurality of beacon transmitter devices and identifies each of the plurality of proximity beacon transmitter devices as being enabled with the proximity beacon service. (par 49-54)

82. Regarding claims 6 and 35 –

83. Hillier teaches that at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a

downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices. (par 49)

84. Regarding claim 7 –

85. Hillier teaches that the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object. (par 49-54)

86. Regarding claim 8 –

87. Hillier teaches that the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers. (par 49-54)

88. Regarding claim 9 –

89. Hillier teaches that the data processor determines the proximity by comparing the proximity beacon information with the identifier related information. (par 49-54)

90. Regarding claim 10 –

91. Hillier teaches that the data processor determines the proximity by sending at least the unique identifier associated with the at least one beacon transmitter to at least one of the one or more servers using the first radio, and receives at least a portion of the identifier related information usable to make the proximity determination. (par 45)

92. Regarding claim 11 –

93. Hillier teaches that the unique identifier associated with the at least one beacon transmitter is associated at the at least one of the one or more servers with being a broadcast device having a known location. (par 45)

94. Regarding claim 12 –

95. Hillier teaches that the data processor further determines, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a known location. (par 45-54)

96. Regarding claim 13 –

97. Hillier teaches that the identifier related information comprises application software for execution upon the mobile wireless device, downloaded in reaction to the sending of a unique identifier by the mobile wireless device to the at least one server, wherein the mobile wireless device first received the unique identifier as part of the proximity beacon information. (par 45)

98. Regarding claim 14 –

99. Hillier teaches that the identifier related information comprises application software for execution upon the mobile wireless device. (par 45)

100. Regarding claim 19 –

101. Hillier teaches that the second radio is a Bluetooth based radio. (par 45-54)

102. Regarding claim 20 –

103. Hillier teaches that the second radio is a Wi-Fi based radio. (par 49)

104. Regarding claim 23 –

105. Hillier teaches that the proximity beacon service utilizes a standards based protocol derived from Bluetooth and including unsolicited automatically repetitive advertisements, and wherein the proximity beacon transmissions are transmitted within the format of the unsolicited automatically repetitive advertisements, and wherein the

proximity beacon identification information is included within a configurable field of the unsolicited automatically repetitive advertisements while conforming to the standards based protocol and, wherein no connection is made between the mobile wireless device and the plurality of beacon transmitted receiving when receiving the unique identifier. (par 43)

106.

107. Regarding claim 34 –

108. Hillier teaches performing at least a portion of the steps on one or more servers. (par 45).

109. Regarding claim 36 –

110. Hillier teaches that the identifier related information is received in response to the software residing on the mobile device sending at least one unique identifier determined from the proximity beacon information. (par 45-54)

Claim Rejections - 35 USC § 103

111. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

112. Claims 2-5, 15-18, and 21-22 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Altman et al (US 2013/0217332)

113. Hillier teaches as above

114. Regarding claim 2 –

115. Altman teaches that the MAC address is a randomly generated 48 bit number matching the format of a MAC address. (par 166).

116. It would be obvious to one of ordinary skill in the art to combine Hillier and Altman in order to obtain greater transaction security.

117. Regarding claim 3 –

118. Altman teaches wherein the MAC address is a Bluetooth BD_ADDR. (par 159, 166).

119. Regarding claim 4 –

120. Altman teaches that both the MAC address and the unique identifier received by the second radio occasionally change, for security reasons. (par 166)

121. Regarding claim 5 –

122. Altman teaches that both the MAC address and the unique identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more central server to access the identifier information. (par 166)

123. Regarding claim 15 –

124. Hillier teaches that the identifier related information comprises a list of contact information, and the data processor performs the proximity determination of a beacon transmitter device associated with an entity included within the list of contact information

based upon comparing a contact information related unique identifier with at least the portion of the proximity beacon information, and wherein the mobile wireless device, upon determining there is a match, engages in further steps to allow further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio, (par 45-54) and further

wherein the identifier associated with proximity beacon transmissions from the detected proximity beacon transmitter associated with entity included within the list of contact information remains identifiable by the wireless mobile device, but anonymous to other devices not having required permissions to make such an identification. (par 45-54)

125. Altman teaches a MAC address that changes from time to time. (par 166)

126. Regarding claim 16 –

127. Altman teaches that the changing of the MAC address and the unique identifier is coordinated with the at least one of the one or more remote central servers. (par 166, 159)

128. Regarding claim 17 –

129. Altman teaches that then the unique identifier changes over time based upon an algorithm in synchronization with at least one server of the one or more remote central servers. (par 159, 166)

130. Regarding claim 18 –

131. Altman teaches that the unique identifier is generated algorithmically and only known to at least one the central servers and the one beacon transmitter, and updated based, at least in part, upon a clock interval, and further wherein the MAC address is changed as well, so as to prevent the identity of the beacon transmitter from being determined by unauthorized devices. (par 166)

132. Regarding claim 21 –

133. Altman teaches that the MAC address is a randomly generated 48 bit BD_ADDR, wherein both the MAC address and the unique identifier change from time to time (par 159, 166)

134. Hillier teaches one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more central server to access the identifier related information, and wherein at least the portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices, wherein the data processor determines the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object. (par 45-54)

135. Regarding claim 22 –

136. Hiller teaches that the data processor determines the proximity utilizing an action function including one or more previously downloaded unique identifiers. (par 45-54)

137. Claims 32-33 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Sorenson et al (US 2003/0053484).

138. Regarding claim 32 –

139. Hillier teaches as above teach as above.

140. Sorenson teaches performing one or more steps of the method under control of an application via a software interface; and executing the application on at least one of the mobile devices. (par 135)

141. It would be obvious to one of ordinary skill in the art to combine Hillier with Sorenson in order to achieve a more user-friendly method.

142. Regarding claim 33 –

143. Sorenson teaches that the software interface is an NDIS driver. (par 135).

144. Claim 37 is are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Brackett et al (US 2005/0114654)

145. Regarding claim 37 –

146. Hillier teaches determining the at least one beacon transmitter device is in proximity. (par 45-54).

147. Brackett teaches at least one server of the one or more of servers provides an identifying picture of a consumer to at least one device for use by an operator of the device for confirming the picture matches an individual in proximity as a step in an electronic commerce transaction. (par 20)

148. It would be obvious to one of ordinary skill in the art to combine Hillier with the facial recognition feature of Brackett in order to obtain greater transaction security.

Conclusion

149. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRISTINA OWEN SHERR whose telephone number is (571)272-6711. The examiner can normally be reached on 8:30-5:00 Monday through Friday.

150. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

151. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Calvin L. Hewitt, II can be reached on (571)272-6709. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

152. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

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/CALVIN L HEWITT II/
Supervisory Patent Examiner, Art Unit 3685

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	1	of	9

Complete if Known	
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Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM/DD/YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	6,487,601		11/26/2002	Hubacher et al.	
	2	6,629,149		9/30/2003	Fraser et al.	
	3	6,675,153		1/6/2004	Cook et al.	
	4	6,700,535		3/2/2004	Gilkes et al.	
	5	6,929,149		8/6/2005	Selfridge et al.	
	6	6,978,165		12/20/2005	Martinez et al.	
	7	7,177,594		2/13/2007	Burr	
	8	7,185,204		2/27/2007	Narayanaswami et al.	
	9	7,207,480		4/24/2007	Geddes	
	10	7,213,742		5/8/2007	Birch et al.	
	11	7,213,743		5/8/2007	Carlson et al.	
	12	7,233,960		6/19/2007	Boris et al.	
	13	7,254,406		8/7/2007	Beros et al.	
	14	7,280,847		10/9/2007	Goldthwaite et al.	
	15	7,289,810		10/30/2007	Jagadeesan et al.	
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	25	7,433,649		10/7/2008	Toulis et al.	
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	27	7,434,723		10/14/2008	White et al.	

Examiner Signature	/Cristina Owen Sherr/	Date Considered	09/03/2017

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Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
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	46	2003/0074259		04/17/2003	Slyman et al.	
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First Named Inventor	**James A. Proctor, Jr.**
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	80	2008/0167961		7/10/2008	Wentker et al.	
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	82	2008/0182591		7/31/2008	Krikorian, Raffi	
	83	2008/0182592		7/31/2008	Cha et al.	
	84	2008/0189394		8/7/2008	Ross et al.	
	85	2008/0214166		9/4/2008	Ramer et al.	
	86	2008/0222711		9/11/2008	Michaelis, Oliver	
	87	2008/0261564		10/23/2008	Logan, James D.	
	88	2008/0262928		10/23/2008	MICHAELIS, Oliver	
	89	2008/0288408		11/20/2008	Jacobsen, Jeffrey J.	
	90	2008/0306825		12/11/2008	Schick et al.	
	91	2008/0313079		12/18/2008	VAN BOSCH et al.	
	92	2008/0313082		12/18/2008	VAN BOSCH et al.	
	93	2009/0016248		1/15/2009	Li et al.	
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	95	2009/0016255		1/15/2009	Park, Vincent D.	
	96	2009/0016315		1/15/2009	Laroia et al.	
	97	2009/0016353		1/15/2009	Li et al.	
	98	2009/0016524		1/15/2009	Park et al.	
	99	2009/0019168		1/15/2009	Wu et al.	
	100	2009/0022096		1/22/2009	Walley et al.	
	101	2009/0037286		2/5/2009	Foster, Brian Edward	
	102	2009/0061901		3/5/2009	Arrasvuori et al.	
	103	2009/0063624		3/5/2009	Nordstrom et al.	
	104	2009/0170559		7/2/2009	Phillips, Simon	
	105	2009/0177530		7/9/2009	KING et al.	
	106	2009/0197681		8/6/2009	Krishnamoorthy et al.	
	107	2009/0270120		10/29/2009	Park, Vincent	
	108	2009/0271211		10/29/2009	Hammad, Ayman	

Examiner Signature	/Cristina Owen Sherr/	Date Considered	09/03/2017

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 5 of 9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	109	2009/0281904		11/12/2009	PHARRIS, DENNIS J.	
	110	2009/0282130		11/12/2009	ANTONIOU et al.	
	111	2009/0285119		11/19/2009	Horn et al.	
	112	2009/0287827		11/19/2009	Horn et al .	
	113	2009/0303250		12/10/2009	Phillips, Simon	
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Examiner Signature	/Cristina Owen Sherr/	Date Considered	09/03/2017

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 6 of 9

Complete if Known	
Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

U.S. PATENT DOCUMENTS

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Examiner Initials'	Cite No.[1]	Foreign Patent Document Country Code[3]–Number[4]–Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	1	SG 134837	10/29/2007	SKYHOOK WIRELESS, INC.		
	2	SE 0702686-7	12/4/2007	Accumulate AB		
	3	WO 2007/081356	7/19/2007	SKYHOOK WIRELESS, INC.		

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Sheet	7	of	9

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Application Number	**Not Yet Assigned**
Filing Date	**September 22, 2015**
First Named Inventor	**James A. Proctor, Jr.**
Group Art Unit	**Not Yet Assigned**
Examiner Name	**Not Yet Assigned**
Attorney Docket Number	**111054–0001U4C6**

NON PATENT LITERATURE DOCUMENTS

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	1	Heeger, David, "Signal Detection Theory Handout," University of Stanford, 1998, www.psych.stanford.edu/~lera/psych115s/notes/signal/, 7 pages.	
	2	Wauters, R., "TC50: Gift Card Auction Site Rackup Aims To Shake Up Market" [online], September 14, 2009. Retrieved from the Internet URL: http://techcrunch.com/2009/09/14/tc50-gift-card-auction-site-rackup-aims-to-shake-up-market/, one page.	
	3	Rusli, E., "Gift card marketplace Cardpool Introduces Instand Redemption, Attracts Super Angels" [online], September 7, 2010. Retrieved from the Internet URL: http://techcrunch.com/2010/09/07/gift-card-marketplace-cardpool-plasticjungle/, one page.	
	4	Office Action, U.S. Application No. 12/364,823, mail date December 28, 2010.	
	5	Office Action, U.S. Application No. 12/364,828, mail date September 15, 2010.	
	6	Notice of Allowance, U.S. Application No. 12/364,828, mail date July 1, 2010.	
	7	Office Action, U.S. Application No. 12/364,938, mail date September 14, 2010.	
	8	Office Action, U.S. Application No. 12/364,938, mail date July 21, 2011.	
	9	Office Action, U.S. Application No. 12/364,819, mail date November 15, 2010.	
	10	Final Office Action, U.S. Application No. 12/364,819, mail date June 28, 2011.	
	11	U.S. Provisional Application No. 60/758,010 filed on January 11, 2006 by Rajiv Laroia for Methods and apparatus for facilitating identification, synchronization or acquisition using beacon signals, 30 pages.	
	12	U.S. Provisional Application No. 60/758,011 filed on January 11, 2006 by Rajiv Laroia for Methods and apparatus for using beacon signals for identification, synchronization or acquisition in an ad hoc wireless network, 26 pages.	
	13	U.S. Provisional Application No. 60/758,012 filed on January 11, 2006 by Rajiv Laroia for Methods and apparatus for using beacon signals in a cognitive radio network, 24 pages.	
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	15	U.S. Provisional Application No. 60/845,052 filed on September 15, 2006 by Aleksandar Jovicic for Beacons in a mixed wireless communication system, 29 pages.	

Examiner Signature	/Cristina Owen Sherr/	Date Considered	09/03/2017

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Substitute for form 1449/PTO				*Complete if Known*	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	**Not Yet Assigned**
				Filing Date	**September 22, 2015**
(use as many sheets as necessary)				First Named Inventor	**James A. Proctor, Jr.**
				Group Art Unit	**Not Yet Assigned**
				Examiner Name	**Not Yet Assigned**
Sheet	8	of	9	Attorney Docket Number	**111054–0001U4C6**

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	16	U.S. Provisional Application No. 60/863,304 filed on October 27, 2006 by Rajiv Laroia for POWER ALLOCATION SCHEME, 15 pages.	
	17	Ortiz-Yepes, "Enhancing Authentication in eBanking with NFC enabled mobile phones;" Masters Thesis, Department of Mathematics and Computer Science, Eihdhoven University of Technology; August 11, 2008.	
	18	Office Action, U.S. Application No. 12/364,819, mail date April 16, 2012.	
	19	Office Action, U.S. Application No. 13/212,766, mail date April 26, 2012.	
	20	Office Action, U.S. Application No. 13/213,028, mail date May 5, 2012.	
	21	http://www.smartcardalliance.org/resources/lib/Proximity_Mobile_Payments_200709.pdf; "Smart Card Alliance" 39 pages, September 2007, retrieved from Internet March 21, 2012.	
	22	http://www.ietf.org/rfc/rfc4793.txt; "The EAP Protected One-Time Password Protocol (EAP-POTP); 77 pages, February 2007; retrieved from Internet March 21, 2012.	
	23	Office Action, U.S. Application No. 12/364,819, mail date August 26, 2010.	
	24	Office Action, U.S. Application No. 12/364,823, mail date June 16, 2010.	
	25	Office Action, U.S. Application No. 12/364,828, mail date May 14, 2010.	
	26	Office Action, U.S. Application No. 12/364,938, mail date May 13, 2010.	
	27	Office Action, U.S. Application 13/015,306 mail date June 17, 2011.	
	28	Office Action, U.S. Application 13/015,306 mail date July 17, 2012.	
	29	Notice of Allowance, U.S. Application 13/015,306 mail date November 8, 2012.	
	30	Office Action, U.S. Application 13/015,306 mail date January 9, 2012.	
	31	Notice of Allowance, U.S. Application 13/212,723 mail date January 16, 2013.	

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Sheet	9	of	9

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	32	S. S. (Peter) Wang et al., E-911 LOCATION STANDARDS AND LOCATION COMMERCIAL SERVICES, Nokia Research Center (2000) 5 pages.	
	33	Jonathan P. Munson & Vineet K. Gupta, Location-Based Notification as a General-Purpose Service, Proceedings of the 2nd International Workshop on Mobile Commerce (2002) 5 pages.	
	34	File History of U.S. Provisional Patent Application No. 60/814,254, filed on June 16, 2006, 44 pages.	

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VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

Courtesy Reminder for
Application Serial No: 15/271,410

Attorney Docket No: 111054-0001U4C7
Customer Number: 86012
Date of Electronic Notification: 09/25/2017

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:
patents@vlplawgroup.com

To view your correspondence online or update your email addresses, please visit us anytime at **https://sportal.uspto.gov/secure/myportal/privatepair.** If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Nov 3 2017

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
David J Thibodeau Jr

S-signature:
/David J Thibodeau Jr/

Registration Number:
31671

U.S. Application Number:
15271410

Confirmation Number:
7653

E-mail Address:
DThibodeau@VLPLawGroup.com

Phone Number:
6179255520

Proposed Time of Interview:
11-13-2017 11:00 AM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

uspto UNITED STATES PATENT AND TRADEMARK OFFICE
PALM-SILVER

IN THE CLAIMS:

1. (Currently Amended) A mobile wireless device ~~for facilitating the use of proximity beacons~~ comprising:

a first radio ~~for communicating with one or more servers and receiving identifier related information~~;

a second radio ~~for receiving proximity beacon transmissions from a plurality of beacon transmitter devices and for providing proximity beacon information derived from the proximity beacon transmissions~~;

one or more processors;

one or more non-transitory memory devices coupled to the one or more processors, the one or more non-transitory memory devices storing a set of instructions that when executed by the one or more processors cause the one or more processors to perform operations including:

receiving, using the first radio, identifier related information associated with a proximity beacon service, from one or more servers;

~~and~~

~~a data processor for determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;~~

receiving, using the second radio, proximity beacon transmissions when the device is located within a detection range of each of a plurality of beacon transmitter devices, ~~wherein~~ each of the proximity beacon transmissions ~~comprises~~ including a MAC address, a unique identifier, and proximity beacon identification information, and ~~;wherein~~ the proximity beacon identification information ~~indicates~~ indicating the proximity beacon transmissions are associated with the [[a]] proximity beacon service;

deriving proximity beacon information from the proximity beacon transmissions;

determining a proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information; and

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[[wherein]] the proximity beacon identification information [[is]] being the same for all proximity beacon transmissions ~~from the plurality of beacon transmitter devices and identifies each of the plurality of proximity beacon transmitter devices as being enabled~~ associated with the proximity beacon service.

2. (Original) The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit number matching [[the]] a format of a MAC address.

3. (Original) The mobile wireless device of Claim 2, wherein the MAC address is a Bluetooth BD_ADDR.

4. (Currently Amended) The mobile wireless device of claim 3 wherein both the MAC address and the unique identifier received by the second radio from a single beacon transmitter device occasionally change, for security reasons.

5. (Currently Amended) The wireless device of claim 2 wherein both the MAC address and the unique identifier change from time to time, making one or more of an entity's identity associated with a beacon transmitter device ~~the at least one beacon transmitter~~ and the ~~at least one~~ beacon transmitter device's identity anonymous over time to other devices or entities not having permissions at the one or more servers ~~central server~~ to access the identifier information.

6. (Currently Amended) The mobile wireless device of Claim 1, wherein at least a[[the]] portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices.

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7. (Currently Amended) The mobile wireless device of Claim 6, wherein the [[data]] one or more processors ~~processor~~ further execute the instructions to perform operations including:

further ~~determines~~ determining the proximity of the at least one beacon transmitter device by comparing the downloaded unique identifier with the portion of the proximity beacon information, the portion comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

8. (Currently Amended) The mobile wireless device of Claim 1, wherein the one or more processors ~~data processor~~ further execute the instructions to perform operations including:

further determining ~~determines~~ the proximity of the at least one beacon transmitter device by utilizing an action function including one or more previously downloaded unique identifiers.

9. (Currently Amended) The mobile wireless device of Claim 1, wherein the one or more processors ~~data processor~~ further execute the instructions to perform operations including:

~~determines~~ further determining the proximity of a specific beacon transmitter device by comparing the proximity beacon information with the identifier related information.

10. (Currently Amended) The mobile wireless device of Claim 1, wherein the one or more processors ~~data processor~~ further execute the instructions to perform operations including:

~~determines~~ further determining the proximity of at least one beacon transmitter device by sending at least the unique identifier associated with the at least one beacon transmitter to at least one of the one or more servers using the first radio, and receiving[[ives]] at least a portion of the identifier related information usable to make the proximity determination.

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11. (Currently Amended) The mobile wireless device of Claim 10, wherein the unique identifier associated with the at least one beacon transmitter is associated ~~at the at least one of the one or more servers~~ with ~~being~~ a broadcast device having a predetermined ~~known~~ location.

12. (Currently Amended) The mobile wireless device of Claim 1, wherein the one or more processors ~~data processor~~ further execute the instructions to perform operations including

determining~~determines~~, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a predetermined ~~known~~ location.

13. (Currently Amended) The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device, downloaded in reaction to [[the]] sending of a unique identifier by the mobile wireless device to [[the]] at least one server of the one or more servers, and wherein the mobile wireless device first received the unique identifier as part of the proximity beacon information.

14. (Original) The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device.

15. (Currently Amended) The mobile wireless device of Claim 1 wherein

the identifier related information comprises a list of contact information, and the one or more processors further execute the instructions to perform operations including:

further determining the proximity of a beacon transmitter device associated with an entity included within the list of contact information based upon comparing a contact

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identifier information ~~related unique identifier~~ with at least the portion of the proximity beacon information, and the mobile wireless device, upon determining there is a match, engaging ~~engages~~ in further steps to allow further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio, and further

wherein [[the]] both the MAC address and the identifier associated with proximity beacon transmissions from the detected proximity beacon transmitter associated with entity included within the list of contact information change from time to time, but remain ~~remains~~ identifiable by the wireless mobile device, but anonymous to other devices not having required permissions to make such an identification.

16. (Currently Amended) The mobile wireless device of claim [[1]] 4 wherein the changing of the MAC address and the unique identifier associated with the single ~~at least one~~ beacon transmitter device is coordinated with [[the]]at least one of the one or more ~~remote central~~ servers.

17. (Currently Amended) The mobile wireless device of claim 1 wherein the unique identifier of at least a [[the]] portion of the proximity beacon transmissions changes over time based upon an algorithm in synchronization with at least one server of the one or more ~~remote central~~ servers.

18. (Currently Amended) The mobile wireless device of claim 1 wherein the unique identifier associated with at least one beacon transmitter is associated with a single beacon transmitter and is generated algorithmically and only known to at least one of the ~~central~~ servers and the one beacon transmitter, and updated based, at least in part, upon a clock interval within the beacon transmitter, and further

wherein the MAC address associated with the beacon transmitter is changed as well, so as to prevent the identity of the beacon transmitter from being determined by unauthorized devices.

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19. (Original) The mobile wireless device of Claim 1, wherein the second radio is a Bluetooth based radio.

20. (Original) The mobile wireless device of Claim 1, wherein the second radio is a Wi-Fi based radio.

21. (Currently Amended) The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit BD_ADDR, wherein both the MAC address and the unique identifier change from time to time, making one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more ~~central~~ servers to access the identifier related information, and with ~~wherein~~ at least the portion of the identifier related information ~~includes~~ including a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter ~~of the plurality of beacon transmitter devices~~, and

wherein the one or more processors further execute the instructions to perform additional operations, including determining ~~data processor determines~~ the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object.

22. (Currently Amended) The mobile wireless device of Claim 21, wherein the one or more processors further execute the instructions to perform additional operations, including determining ~~data processor determines~~ the proximity by utilizing an action function including one or more previously downloaded unique identifiers.

23. (Currently Amended) The mobile wireless device of Claim 1, wherein the proximity beacon service utilizes a standards based protocol derived from Bluetooth and including unsolicited automatically repetitive advertisements, and wherein the proximity

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beacon transmissions are transmitted within the format of the unsolicited automatically repetitive advertisements, and wherein the proximity beacon identification information is included within one or more [[a]] configurable fields of the unsolicited automatically repetitive advertisements while conforming to the standards based protocol and, wherein no connection is made between the mobile wireless device and the plurality of ~~beacon transmitted receiving when receiving~~ beacons transmitter devices in order to receive the unique identifier.

24. – 30. (Cancelled)

31. (Currently Amended) A method for facilitating [[the]]use of proximity beacons comprising:

communicating between a mobile device and one or more servers and receiving, at the mobile device, identifier related information, using a first radio;

receiving, at the mobile device using a second radio, proximity beacon transmissions from one or more beacon transmitter devices

~~obtaining~~ deriving, at the mobile device, proximity beacon information ~~derived~~ from the proximity beacon transmissions~~, wherein the proximity beacons transmissions were received fromone or more beacon transmitter devices using a second radio~~; and [[ ]] determining, at the mobile device, a [[the]]proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information;

wherein each of the proximity beacon transmissions comprises a MAC address, a unique identifier, and proximity beacon identification information;

wherein the proximity beacon identification information indicates the proximity beacon transmissions are associated with a proximity beacon service; and

wherein the proximity beacon identification information is the same for all proximity beacon transmissions associated with the proximity beacon service, transmitted from the plurality of beacon transmitter devices.

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32. (Currently Amended) The method of claim 31, additionally comprising:

performing one or more steps of the method, by one or more processors of the mobile device, under control of an application via a software interface; and

executing the application on ~~at least one of~~ the mobile device[[s]].

33. (Previously Presented) The method of claim 32 wherein the software interface is an NDIS driver.

34. (Currently Amended) The method of claim 31 additionally comprising:

performing at least a portion of the steps on one or more processors of the one or more ~~that are~~ servers.

35. (Previously Presented) The method of claim 31, wherein both the MAC address and the unique identifier received via the second radio occasionally change between proximity beacon transmissions from one of the one or more beacon transmitter devices.

36. (Currently Amended) The method of claim 31, wherein the identifier related information is received in response to [[the]]software residing on the mobile device sending at least one unique identifier determined from the proximity beacon information.

37. (Currently Amended) The method of claim 31 wherein after determining the at least one beacon transmitter device is in proximity, at least one server of the one or more of servers providing[[es]] an identifying picture of a consumer to at least one device ~~for use by an operator of the device~~ for confirming the picture matches an individual in proximity as a step in an electronic commerce transaction.

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REMARKS

Status of the Claims

With entry of the foregoing amendments, claims 1-23 and 31-37 remain in the application. No claim has been allowed.

As more fully explained below, the application is entitled to a filing date of September 8, 2008 and should therefore be treated under the law as a pre-America Invents Act (pre-AIA) application.

Examiner Interview

The Applicant thanks Examiner Sherr for the courtesy of a telephone interview on Thursday, November 16, 2017. During the interview, proposed claim amendments to address the rejections and objections were discussed. Although no agreement was reached, the discussion was helpful in making the amendments entered herein.

Elections / Restrictions

The Applicant's January 24, 2017 response to the restriction requirement was a provisional election of the Group I claims (claims 1-23 and 25-30) *with traverse*. The amendment filed June 1, 2017 was not made in response to any subsequent further restriction by the Examiner, and thus did not change the status of the Applicant's original election with traverse.

The Applicant reserves all rights to reinstate the non-elected claims upon indication of an allowable generic claim.

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Prioirty

The Office Action begins with a conclusion that one of the limitations of claim 1, namely

> "determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information"

was supposedly not found in any of the previous Applications. Reconsideration and confirmation of the entitlement to a priority date of September 8, 2008 (the filing date of U.S. Provisional Patent Application No. 61/095,001, referred to herein as "the '001 application"), or at least September 9, 2008 (the filing date of U.S. Provisional Patent Application No. 61/095,359, the "'359 application"), and certainly not later than January 28, 2009 (the filing date of U.S. Patent Application No. 12/364,828 (the '828 application) is respectfully requested.

Each of these prior applications explains how the Applicant uses the detection of identifiers to determine when two devices are in close proximity to each other, that is, are "present" with respect to one another. In one example implementation described in all three prior applications, if an identifier is detected on a short range wireless link, then it is determined that the two devices are close enough together to engage in a further information exchange on a second, longer range wireless link.

For example, a first reference using beacon devices to transmit wireless identifier[s] to facilitate proximity decision first appears on page 1 of the '001 provisional application at page 1, lines 9-11 and lines 21-24 where it was stated that:

> Title 2:
>
> Wireless beacon device for transmitting a wireless identified to facilitate proximity detection
>
> ...

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> The present invention is generally concerned with facilitating communications between two wireless devices when they are in close proximity to each other, and using a central server to determine if one or more of the devices should be notified of the other device's presence or other related information such as advertising.

and it is further explained in the '001 application at page 2, lines 11-16 that:

> Specifically, the current invention utilizes the short range wireless communication to detect the presence of other devices, and the wide area wireless network to perform communications to a central server, and perform the actual communications between the wireless devices. The distinction being that the short range wireless is ONLY used for the detection process, and to advertise a device's presence by transmitting an identifier, or receiving identifiers from other devices.

The '001 application also makes reference to using the detected identifiers at page 3, lines 8-14:

> When a receiving device detects one or more identifier, it will use the WWAN link to communicate with the central server. The device will pass along a list of currently detected identifiers and request that the server provide the device with the information related to any identifier that is 1) relevant to that device, and 2) that device is authorized to receive. As an example, a detected identifier may be relevant to the receiving device if

Finally, page 9 of the '001 application neatly maps to the elements of claim 1 as well:

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More Detailed Key Concepts to protect

1) A device capable of operating two wireless protocols simultaneously, utilizing a first wireless protocol in the device to detect the proximity of another wireless device and the second wireless protocol to communicate with a remote server, where

   a. One or more of the devices are mobile devices
   b. Where the first wireless protocol is a local, or personal area network wireless protocol such as 802.11, Bluetooth, UWB or other local connectivity protocol
   c. Where the first wireless capability is re-purposed using a modified or enhanced protocol for
      i. Advertising the presence of the devices or,
      ii. Detecting the presence of another device
   d. Where the method of detecting or advertising the presence of another device utilizing the modified protocol involves embedding or detecting messaging in the standard based broadcasts from the standards based wireless modem, where the standards based protocol is based on, related to, or otherwise derived from IEEE802.11, Bluetooth
   e. Utilizing a wireless wide area data link from one or more of the wireless devices to
      i. Connect to a central server
      ii. Perform user authorization functions
      iii. Perform download of information associated with account identifiers utilizing the short range wireless capability

For these reasons, the application is entitled to the filing date of the '001 application.

Support for the element of claim 1 in question is also found in the second provisional application '359 filed on September 9, 2008. The second provisional application has all of the same language quoted above, as well as other supporting language. We refer at least to the statement at page 22 that references the use of "beacons" to broadcast the presence of identifiers:

- **Using the fields in the NDIS driver in a non-standard way such as using the SSID of the beacons to broadcast, or advertize the presence of your associated account identifier registered to the central server**

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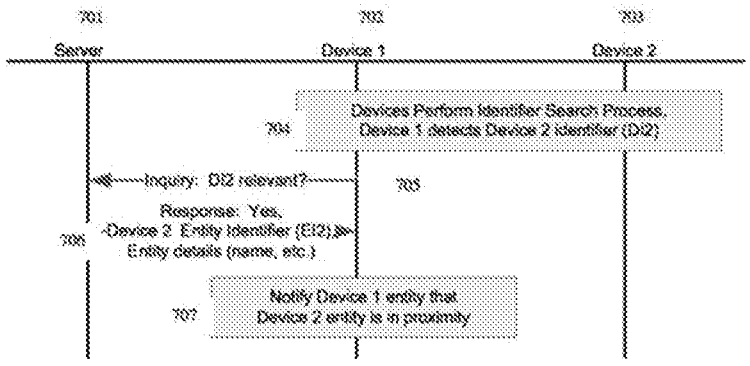
Certainly the '828 application, with its January 28, 2009 filing date, removes all doubt of there being support in the prior applications. For it was said at page 18 lines 5-26 of the '828 application:

> *Preferred embodiments of the present invention are generally concerned with facilitating the exchange of information and transactions between two entities associated with two wireless devices when the devices are in close proximity to each other. In one embodiment, this can be accomplished by a first device using a first short range wireless capability to detect an identifier transmitted from a second device in proximity to the first device, ideally using existing short range radio communication standard capabilities such as Bluetooth (IEEE802.15.1-2002) or Wi-Fi (IEEE802.11). The detected identifier, being associated with the device, is also associated with an entity. Rather than directly exchanging application data flow between the two devices using the short range wireless capability, a second wireless capability then allows for one or more of the devices to communicate with a central server via the internet, and perform an exchange of application data flow. By using a central server to draw on stored information and content associated with the entity or entities, the server can broker the exchange of information between the entities and the devices. (page 4, lines 10-22)*
>
> *…..More particularly, a given device 106, 108 uses a short range wireless link 107 such as a Bluetooth (IEEE802.15.1) or Wi-Fi (IEEE802.11) link to detect the presence of other devices such as device 108, and uses the wide area wireless network connections 103, 104 such as IS-2000, WCDMA, GPRS, EDGE, LTE, Wi-Max (IEEE802.16), or the like to perform communications to central server 100, and to perform the actual substantive communications between the wireless devices 106 and 108. Device 108 typically uses the short range wireless link 107 and wide area wireless link 103 in a similar manner to locate and initiate communicate with device 106. One distinction relative to prior art is that the short range wireless 107 is only used for the detection process, or to advertise a device's presence. In this embodiment, specific information called "wireless identifier" or simply "identify" (described in more detail below) is passed between devices 106 and 108 over the short range link 107. By transmitting a wireless identifier using the short range Wi-Fi, Bluetooth or other short range wireless link 107 and receiving wireless identifiers from other devices, this short range wireless link 107 will allow for a proximity detection process. (page 11, lines 6-20)*
>
> *Figure 3 is a block diagram with further detail of this operation. A device 106, 108, or 202 after performing a search (Fig 3, step 301) for identifiers on the WPAN or WLAN, will subsequently use the WWAN link to communicate with the central server 100. If the device does not find identifiers 302 it will either continue to search, or search at a later time 301. If identifiers are found in 302, the device may employ an action function 303, which would act as a filter that determines which of the detected identifiers should be passed to the server. (page 13, lines 8-14)*

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Figure 7 shows an example of a message flow diagram for an embodiment where an individual is in a library for example, and a friend arrives. The individual is notified by their device receiving an identifier that their friend is present and they enter a chat session. Each person has a device (Figure 1, 106 and 108 respectively) that implements the preferred embodiments described above. The first individual associated with Device 1 (702) referred to as Entity 1 (EI1) performs a detection process as described in Figure 4, 5, and 6 previously (step 704) . The device identifier associated with Device 2 (703), DI2 is thereby detected. Device 1 (702) then transmits an inquiry message 705 using the WWAN (cellular data link such as GPRS, EDGE, 1xEV-DO, IS-2000, Wi-Max, LTE, or the like) to the server 701 inquiring if information related to the account and entity associated with DI2 is relevant, and available to the entity EI1 associated with Device 1 (702). The server 701 retrieves the account information related to EI1 and determines that EI2 is listed in a friends list in the account associated with EI1 and that EI1 should be notified when EI2 is detected. Next the server retrieves the account information associated with EI2 and determines that EI1 is on a list of entities which are allowed to be notified of EI2 being present and personal information such a the name of the individual, their phone number and the like. The server having determined that EI1 wants to be notified and is allowed to be notified responds in Step 706 to Device 1 (702) with a message indicating the DI2 is relevant to EI1 and including information such as Entity Identifier EI2 and associated details. A user application on Device 1 (702) notifies the user that the entity associated with Device 2 is in proximity in step 707.

Step 707 of Figure 7 in the '828 application also illustrates a sequence of steps performed, subsequent to the identifier search and detection steps (705 and 706), to notify the "Device 1 entity" that the "Device 2 entity" is "in proximity":



Claim 1 is also supported by at least page 33, line 11 to page 34 line 3 of the '828 application:

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2. In a second embodiment,

A device is capable of operating two wireless protocols simultaneously, utilizing a first wireless protocol in the device to detect the proximity of another wireless device and using the second wireless protocol to communicate with a remote server, where:

a. One or more of the devices are mobile devices;

b. Where the first wireless protocol is a local, or personal area network wireless protocol such as 802.11, Bluetooth, UWB or other local connectivity protocol;

c. Where the first wireless capability used for detecting the presence of another device, or advertising the presence or a device;

d. Utilizing a wireless wide area data link from one or more of the wireless devices to, optionally:

i. Connect to a central server;

ii. Perform user authorization functions;

iii. Perform download of information associated with account identifiers utilizing the short range wireless capability;

The above citations to the specification are meant to be examples, and not a complete list of all supporting material, or a description of all possible embodiments of the Applicant's claims.

Acknowledgment of the Applicant's priority claim to the three prior applications is respectfully requested.

INFORMATION DISCLOSURE STATEMENTS

Applicant thanks the Examiner for consideration of the prior art in the information disclosure statements (IDS) submitted on September 21, 2016, September 29, 2016, and August 23, 2017. A supplemental Information Disclosure Statement is being filed herewith.

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REMARKS ON "STATEMENTS OF INTENDED USE" AND "NON-FUNCTIONAL DESCRIPTIVE MATERIAL"

A. The Office Action's unqualified conclusion that "statements of intended use do not serve to distinguish from the prior art" is an incomplete citation to MPEP 2103(I)(C)

In this case, Claim 1 indeed recites "a first radio", "a second radio", and "one or more data processors" and then ascribes certain functions to each of these hardware components. Similar recitations are provided in claims 13-15 and 37.

The Applicant agrees that these terms do not invoke the "means plus function" construct permitted by 35 U.S.C.112(6) or 35 U.S.C.112 f). However, the Examiner has erred in concluding that no patentable weight may ever be given to any claim recitations that indicate the functions performed by the claim elements.

The cited portion of the MPEP actually describes:

> USPTO personnel are to correlate each claim limitation to all portions of the disclosure that describe the claim limitation. This is to be done in all cases, regardless of whether the claimed invention is defined using means- (or step-) plus- function language. The correlation step will ensure that USPTO personnel correctly interpret each claim limitation.
>
> The subject matter of a properly construed claim is defined by the terms that limit its scope. It is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation.

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MPEP § 2103(C) (emphasis supplied). Thus the MPEP requires the Examiner to first (1) correlate all portions of the disclosure that describe the claim limitation in question and the (2) construe the claim by any language that limits its scope.

Here, the Examiner has made no attempt to correlate the claim limitations in question to the corresponding parts of the disclosure. In contrast to the Examiner's apparent conclusion, the claim recitations are not "merely optional or suggestive."

It appears the Examiner is confusing functional claim recitations, which are common in claims directed to computer-related inventions, with "intended use" recitations of the kind which normally occur in claim preambles. The Examiner has even explicitly considered the other claim limitations on the record (for example, in the later rejections under 35 USC 102 and 103) when concluding that the recited processor, for example, "has the ability to determine the proximity of at least one beacon transmitter…by utilizing the identifier related information" and uses that information in particular ways (see at least paragraphs 81, 85, 87 and 91 of the Office Action).

Nonetheless, and without agreeing that the rejection is proper, the Applicant has now amended the apparatus claims to a form that recites "one or more data processors" that execute instructions to perform the specified operations.

This format for a claim was recently considered permissible in issued U.S. Patent 9,805,347. This format has been recognized as a proper way to recite a computer-related invention by the courts, as more fully discussed below.

Because claim 1 recites a capability of the first radio, the second radio, and the data processor, and because those capabilities are recited as being present (and not optional), and because the recitation of a processor performing instructions is not per se intended use according to the law, Applicant submits that the Examiner has erred in alleging that the recitations are "merely intended use".

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B. The office action also mistakenly concludes that "nonfunctional descriptive material" can never serve to distinguish from the prior art", citing to MPEP 2111.05 and various cases referred to therein.

The claim elements in question are claim 1's recitation of "wherein the proximity beacon identification information indicates..." and "wherein the proximity beacon identification information is the same..."; and claim 31's recitation of "transmissions were received from ...second radio".

As per MPEP 2111.05,

> "USPTO personnel must consider all claim limitations when determining patentability of an invention over the prior art. In re Gulack, 703 F.2d 1381, 1385, 217 USPQ 401, 403-04 (Fed. Cir. 1983). Since a claim must be read as a whole, USPTO personnel may not disregard claim limitations comprised of printed matter. See Id. at 1384, 217 USPQ at 403; see also Diamond v. Diehr, 450 U.S. 175, 191, 209 USPQ 1, 10 (1981).

Applicant does recognize that USPTO personnel need not give patentable weight to printed matter absent a new and unobvious functional relationship between the "printed matter" and the substrate. But when such a functional relationship exists, patentable weight must be ascribed.

The Court of Appeals for the Federal Circuit has repeatedly stated that "[d]uring examination, 'claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.'" *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (other citations omitted); *In re Morris*, 127 F.3d 1048, 1053-54 (Fed. Cir. 1997. *In re Smith International, Inc.*, (Appeal No. 2016-2303 decided September 27, 2017) is a recent case where the CAFC held that

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> The correct inquiry in giving a claim term its broadest reasonable interpretation in light of the specification is not whether the specification proscribes or precludes some broad reading of the claim term adopted by the examiner. And it is not simply an interpretation that is not inconsistent with the specification. It is an interpretation that corresponds with what and how the inventor describes his invention in the specification, i.e., an interpretation that is "consistent with the specification." (citing also to *In re Suitco Surface*, 603 F.3d 1255, 1259–60 (Fed. Cir. 2010).

The prohibition against using non-functional descriptive material as the distinguishing feature of a claim is based on the "printed matter" doctrine in which matter that has no functional relationship to the "substrate" upon which is it is "printed" does not provide a patentable distinction to the substrate. For example, information, messages, indicia, raw data, colors, etc. can be considered such descriptive material. However, patentable weight *will be given* when such descriptive material has a functional relationship to the substrate.

The later sections of the MPEP 2111.05, such as MPEP 2111.05(I) provide further guidance:

> A. Evidence Supporting a Functional Relationship
>
> To be given patentable weight, the printed matter and associated product must be in a functional relationship. A functional relationship can be found where the printed matter performs some function with respect to the product to which it is associated. See Lowry, 32 F.3d at 1584, 32 USPQ2d at 1035 (citing Gulack, 703 F.2d at 1386, 217 USPQ at 404). For instance, indicia on a measuring cup perform the function of indicating volume within that measuring cup. See In re Miller, 418 F.2d 1392, 1396, 164 USPQ 46, 49 (CCPA 1969). A functional relationship can also be found where the product performs some function with respect to the printed matter to which it is associated. For instance, where a hatband places a string of numbers in a certain physical relationship to each other such that a claimed algorithm is satisfied due to the physical structure of the hatband, the hatband performs a function with respect to the string of numbers. See Gulack, 703 F.2d at 1386-87, 217 USPQ at 405.
> ...
>
> II. FUNCTIONAL RELATIONSHIP BETWEEN PRINTED MATTER AND ASSOCIATED PRODUCT (OR PROCESS) MUST BE NEW AND UNOBVIOUS
>
> Once a functional relationship between the product and associated printed matter is found, the investigation shifts to the determination of whether the relationship is new and unobvious.

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In the computer-related invention context, as in this case, where programming performs some function with respect to the computer or computer component with which it is associated, the programming can create a patentable distinction. (See at least slide 22 of "Examining Functional Claim Limitations: Focus on Computer/Software-Related Claims", May 2015, United States Patent and Trademark Office, available at: https://www.uspto.gov/sites/default/files/documents/fnctnllnggcmptr.pptx)

For instance, a claim to computer storage medium programmed with attribute data objects that perform the function of facilitating retrieval, addition, and removal of information in the intended computer system, ***establishes a functional relationship*** such that the claimed attribute data objects are given patentable weight. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035, as cited in MPEP 2111.05 B(III).

The Court of Appeals for the Federal Circuit has most recently spoken on this topic in *MasterMine Software, Inc. v. Microsoft Corp.*, 2017 U.S. App. LEXIS 21479 (Fed. Cir. Oct. 30, 2017) (Newman, O'Malley, Stoll) recognizing that "apparatus claims are not necessarily indefinite for using functional language", citing to *Microprocessor Enhancement Corp. v. Tex. Instruments Inc. (MEC)*, 520 F.3d 1367, 1375 (Fed. Cir. 2008), finding that a claimed "processor" programmed "for executing instructions" was proper form, and not indefinite (See *MasterMine*, slip op. at 14).

In the present case, the claims as a whole are not merely directed to the format of the proximity beacon transmissions. Rather, the claims recite how the identifiers and beacon transmissions are received via two different radios, and how one or more processors then determine proximity of the beacon transmitter device, or entity, or object using the identifiers, and how the beacon transmissions identify an associated beacon service, and

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how the proximity beacon identifiers are then used to identify which beacon transmitters are enabled with the same proximity beacon service[1].

Certainly with the foregoing amendments, claim 1 now requires one or more processors programmed to perform detection of a very specific type of identifier (namely one comprising a MAC address, a unique identifier, and proximity beacon information, and where the proximity beacon information is associated with a proximity beacon service, and where the beacon identification information is the same for all proximity beacon transmissions from the beacon transmitter devices that are enabled with a selected proximity beacon service).

For the reasons stated below, these functions are also not anticipated by, or obvious, in view of the prior art.

The elements of claim 1 are therefore not directed to nonfunctional descriptive language, but are exactly the type of positive recitations of the functions performed by a data processor permitted under the law.

[1] Pages 13 and 14 of the '828 application describe one implementation of the data processor executed code which is referred to as an "action function".... "If the device does not find identifiers 302 it will either continue to search, or search at a later time 301. If identifiers are found in 302, the device may employ an action function 303, which would act as a filter that determines which of the detected identifiers should be passed to the server.....If the identifiers for the individuals within the friends list have been passed to the device, the action function 303 may make this determination. "

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CLAIM REJECTIONS - 35 USC 101

Claims 1-23 and 31-37 stand rejected under 35 U.S.C. 101 as supposedly being directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more. The Applicant must respectfully disagree that the claims are directed to the types of inventions excluded from patentability.

a) There is no evidence on the record to establish that the claims are merely an abstract idea under part one of the *Alice* test

The Examiner has alleged, without providing any evidentiary support, that the claims are directed towards the supposedly abstract idea of "determining distance". The U.S. Supreme Court, in *Alice Corporation Pty., Ltd. v. CLS Bank International*, ____ U.S. _____, 134 S. Ct. 2347 (2014) listed four examples of abstract ideas, including:

> fundamental economic practices;
> certain methods of organizing human activities;
> an idea itself; and
> mathematical relationships/formulas.

A claim that requires "determining distance" falls into none of these categories.

Indeed, the Examiner has not even indicated which of these categories applies to the Applicant's claims, or given any reason at all for why the claims are merely "abstract ideas". It appears that all the Examiner did was to characterize a portion of the language of the claim, and then conclude the claim is an abstract idea (with no evidentiary or legal proof). The Examiner then glosses over, apparently without any further consideration,

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the remaining specifics delineated in the claims[2]. The Examiner has therefore not met the Patent Office's burden of setting forth a prima facie case of unpatentability, and the rejection should be withdrawn.

It is a well know scientific principal that determination of distance can only be carried out by a physical apparatus, or method operating on a physical apparatus, that observes or detects phenomena occurring in the physical world. For that reason alone, any method or apparatus that determines distance cannot possibly be a merely abstract idea.

In addition, the claimed invention as a whole does not merely relate to "determining distance". Indeed, the word "distance" appears nowhere in the claims. The claims actually require a first radio that receives specific information (that is, identifier related information), a second radio that receives a second type of transmission (that is, proximity beacon transmissions) and provides further proximity beacon information from those received transmissions, and a processor that determines *proximity* of a beacon transmitter device, entity, or object from the identifiers in a particular way.

A device that includes two different radios – a type of hardware -- with a computer that processes the information received by the radios to determine which other radios are in proximity cannot reasonably be considered to be a merely abstract idea.

The rejection under Step 1 of the *Alice* test is thus prima facie deficient and should be withdrawn.

b) The claims are not for a mere abstract idea due to presence of particular limitations that confine their scope to being much narrower than merely "determining distance" and provide enough "extra" to pass the *Alice* test

[2] Paragraph 22 of the office action, in considering claim 31, concluded the "transaction device" "merely automates an algorithm". But no "transaction device" appears anywhere in claim 31 or any other claim.

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The Examiner also concluded that the claims do not recite any limitations that are "significantly more" than the abstract idea. The Examiner reaches this conclusion, but offers no actual consideration of whether the claims recite an improvement to another technology or technical field, an improvement to the functioning of a computer itself, meaningful limitations beyond generally linking the use of an abstract idea to a particular technological environment, or why they do not preempt all implementations of the abstract idea. These further considerations are a necessary part, the so-called "Part Two", of a proper analysis under the *Alice* case.

It is respectfully submitted that the Applicant's claims act to narrow, confine, and otherwise tie down the claim so as not to cover all ways of determining distance. Per the Applicant's claim 1, a specific mobile wireless device is used – one that has two radios – (a first radio that receives identifier related information, and a second radio that receives a second type of transmission (that is, proximity beacon transmissions) and provides further proximity beacon information from those transmissions. The device also includes a processor that determines proximity of a beacon transmitter device, entity, or object from those special types of identifiers. The Applicant's claim 31 is a method claim that contains analogous limitations that specify a specific sequence of steps to be carried out, at least in part, by a mobile device receiving these special types of transmissions and determining proximity from them.

In another field of endeavor, it is well known that a radio ranging system determines distance by transmitting pulses, and making time of flight measurements on received reflections. Thus, the claims as recited also do not pre-empt all apparatus and methods for "determining distance." [3]

[3] As mentioned above, this format for a claim has been recognized by the Courts as a proper way to recite a computer-related invention.

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The Applicant's claimed invention also provides an improvement to the operation of an electronic system itself, and solves several technical problems that would otherwise occur. The claimed beacon transmissions are used to inform the mobile wireless devices of the availability of services that depend upon the proximity of two devices. As explained in the specification:

> *The present embodiment has the advantage that communication between two devices may continue after the devices have left proximity of each other, but in the same manner as they had been communicating previously. As a result, a user who detects a short range transmission of an identifier, then begins a conversation or some other interaction with that device via the wireless wide area network may continue that conversation even in the case where the two devices move out of the proximity of the each other, and are no longer within the reception range of the {original} short range wireless communication protocol. (page 11, line 23- page 12 line 1)*
>
> *A distinguishing feature of this approach relative to prior art is that the patron device 202 in this example may move out of proximity of broadcast device 204, yet continue to view the content being provided by the server 100 related to the detected broadcast device 204. (page 12 lines 22-25)*

A further technical advantage is provided by the invention recited in certain dependent claims, such as claim 5, which require changing both the MAC address and the unique identifier over time:

> *Further, since it is contemplated that the wireless identifiers transmitted on the short range wireless link from the devices would occasionally change, for security reasons, the present embodiment has the advantage that ongoing communications between mobile devices will not be interrupted despite a change in one of the device's identifier. In the case where the identifier is a MAC address of the short range wireless network adapter for one of the devices, it is not otherwise possible to change this address and easily maintain on going communications in a true peer to peer topology. (page 12, lines 1-7)*

For these several reasons, the rejections under 35 USC 101 should be withdrawn.

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CLAIM REJECTIONS – 35 USC 112

Claims 1-23 and 31-37 stand rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as supposedly failing to comply with the written description requirement.

Regarding claims 1 and 31, and the recitation of a "mobile wireless device comprising… a first radio … and a second radio", Figure 1 of all three prior applications show the "first radio" as the mobile device's local link 107 described as being a Wi-Fi, Bluetooth, etc. radio and a "second radio" as the link 104 described as being a wireless wide area network link / connection. See also the '828 specification as filed at page 11 lines 6-17, which describes using the short-range wireless link 107 for certain functions such as detecting the presence of other devices such as device 108 and using the wireless wide-area wireless network connections 103, 104 to perform communications to the central server 100.

Regarding claim 4, the '828 specification at page 12 lines 11 indicates that the wireless identifiers transmitted on the short-range wireless link occasionally change for security reasons.

Regarding claim 18, reference is made to '828 application and the chart of Figure 11 which lists a "dynamic MAC address", as well as the text on page 40 lines 17 through 20 where it explained that the identifiers are occasionally changed, and that the identifiers may be a MAC address.

Regarding claim 32, Figure 1 shows multiple mobile devices.

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Regarding claim 34, the statement at page 28 lines 15-19 of the '828 priority application explained that the central server may be implemented as a collection of servers.

The Examiner's reference to a "claim 41", "programmatically categorizing", "IT infrastructure" as well as the reference to U.S. Patent Publication 2009/0171730 all appear to be in error and are thus understood to have no relation to the present case. Confirmation of that understanding is requested.

Claims 1-23 and 31-37 were also rejected as failing to define the invention in the manner required by 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph.

The Examiner makes several general statements that the "claims are in narrative form", "replete with indefinite language", that "the structure which makes up the device must be clearly and positively recited", that "the claims contain excessive functional language", and that "the claims must be in one sentence form only." These general assertions, without further explanation, do not meet the Patent Office's burden for making formal rejection of the claims on a proper legal basis. Furthermore, it is not understood what is meant by "excessive functional language" - and since the claims are indeed all in the one sentence form only, the Applicant has to question whether these rejections were also made in error.

If the Examiner intends to make a rejection of the claims on these bases, an actual rejection of the claims, and an indication of which claims are involved, the language or claim elements in question, and specific reasons for failure to meet the statutory requirement, is respectfully requested.

The Examiner also appears to conclude that any claim which recites both an apparatus and method steps of using the apparatus is indefinite. That is not the law. With regard to the comments made above, it is certainly proper form to recite a radio, and that the

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radio is "configured to" perform certain functions. It is also proper form to recite a data processor that executes program code for performing certain functions.

More particularly, paragraph 53 of the office action refers to certain portions of claim 1, namely the recitation of "each of the proximity beacon transmitter devices as being enabled with the beacon service" and "wherein proximity Beacon identification information..." as being unclear.

It is indeed the case that claim 1 recites a mobile wireless device. However, the aspects of the claim called into question by the Examiner serve to further describe attributes of the proximity beacon identification information that is received and processed by the mobile wireless device. That is, those proximity beacon transmissions have the precise format recited in the claim – including a MAC address, a unique identifier and proximity beacon identification information.

Claim 11 depends from claim 1 and further requires the unique identifier to be associated with a certain type of broadcast device – namely, a broadcast device having a predetermined location.

Claim 23 depends from claim 1 and serves to further define attributes of the beacon service. In particular, the beacon service is one that sends unsolicited, automatically repetitive advertisements, and where the beacon identification information is included within a configurable field of those repetitive beacon advertisements.

Regarding claim 31, it is sufficient for the claim to recite that the method involves receiving proximity beacon information using a second radio.

Claim 12 is now amended to refer to a "predetermined location" – that is, any location that is known in advance. There is no need to define a format for the location data; one of skill in the art recognizes that the claims are simply specifying that the data processor can

Petitioner Samsung Ex-1004, 0455

determine that the beacon transmitter is a broadcast device having a location that the processor already knows.

Regarding the recitation of a "standards-based protocol" in claim 23, the claim as a whole makes reference to a Bluetooth protocol. One of skill in the art knows that the claimed protocols must be those that derive from the well-known Bluetooth standard.

Claim 13 depends from claim 1 and requires that the identifier related information comprise application software, and that the application software is downloaded in reaction to the sending of unique identifier to the at least one server. There is no circular reasoning or indefiniteness.

Similarly, claim 14 does not involve circular reasoning; the claim is just further defining what is included in the identifier-related information.

Claim 15 depends from claim 1 and has further limitations for how the proximity of the beacon transmitter is determined, namely by comparing contact information with the proximity beacon information, and when there is a match, allowing further communications utilizing the second radio.

Claim 23 has been amended.

Claim 32 does further define claim 31, since it requires that the steps of the method of claim 31 be performed under control of an application that is executing on one of the mobile devices. Claim 32 does not carry with it any requirement that any or all of the steps of claim 31 be first performed or performed in any particular order.

Claim 32 has also been amended to indicate that the mobile device of claim 31 is the device referred to.

Petitioner Samsung Ex-1004, 0456

CLAIM REJECTIONS – 35 USC 102

Claims 1, 6-14, 19, 20, 23, 31, and 34-36 stand rejected under pre-AIA 35 U.S.C. 102(a) as being anticipated by Hillier (US 2016/0025837).

For the reasons stated above, this application rightfully claims priority to U.S. Provisional Patent Application 61/095,001 and a filing date of September 8, 2008. Therefore, the Hillier publication is not prior art and the rejections should be withdrawn.

CLAIM REJECTIONS – 35 USC 103

Claims 2-5, 15-18, and 21-22 stand rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Altman et al (US 2013/0217332)

Claims 32-33 also stand rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Sorenson et al (US 2003/0053484)

Neither Hillier nor Altman are prior art. All of these rejections should also be withdrawn.

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CONCLUSION

In view of the foregoing amendments and remarks, reconsideration and allowance of the application is respectfully requested.

Respectfully submitted,

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James A. Proctor
Art Unit	3685
Examiner Name	SHERR, MARIA CRISTI OWEN
Attorney Docket Number	111054-0001U4C7

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	2	9659285	B2	2017-05-23	Hunter et al.	

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Art Unit	3685
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Attorney Docket Number	111054-0001U4C7

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James A. Proctor
Art Unit	3685
Examiner Name	SHERR, MARIA CRISTI OWEN
Attorney Docket Number	111054-0001U4C7

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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☒ See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/David J Thibodeau Jr Reg No 31671/	Date (YYYY-MM-DD)	2017-11-27
Name/Print	David J. Thibodeau, Jr.	Registration Number	31671

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EFS ID:	31041628
Application Number:	15271410
International Application Number:	
Confirmation Number:	7653
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	86012
Filer:	David J. Thibodeau/Elisabeth Smith
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7
Receipt Date:	27-NOV-2017
Filing Date:	21-SEP-2016
Time Stamp:	10:43:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		20171127_111054-0001U4C7_TPO_amendment-signed--.pdf	9688341 cdded5d7a0230bdb4c2d6faa8e9b6800944c9e47	yes	32

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Applicant Arguments/Remarks Made in an Amendment	10	32
	Claims	2	9
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1

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2	Information Disclosure Statement (IDS) Form (SB08)	20171127_111054-0001U4C7_TPO_IDS.pdf	1035009 0709e033ee3d6ab05deb9f146e6c757712a7058d	no	4
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/271,410	Filing Date 09/21/2016	☑ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	11/27/2017	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 30	Minus	** 30	= 0		x $40 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	lisa thomas
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
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PATENTS
111054-0001U4C7
1005-007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
James A. Proctor, Jr., et al.

Serial No.: 15/271,410

Filed: September 21, 2016

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

Examiner: Sherr,Maria Cristi Owen

Art Unit: 3685

Confirmation No.: 7653

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

AMENDMENT

Please enter the following amendments before considering the above-identified patent application:

Petitioner Samsung Ex-1004, 0466

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James A. Proctor
Art Unit	3685
Examiner Name	SHERR, MARIA CRISTI OWEN
Attorney Docket Number	111054-0001U4C7

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	9805347	B2	2017-10-31	Hurry	
	2	9659285	B2	2017-05-23	Hunter et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James A. Proctor
Art Unit	3685
Examiner Name	SHERR, MARIA CRISTI OWEN
Attorney Docket Number	111054-0001U4C7

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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EXAMINER SIGNATURE

Examiner Signature	/Cristina Owen Sherr/	Date Considered	03/13/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15271410
Filing Date	2016-09-21
First Named Inventor	James A. Proctor
Art Unit	3685
Examiner Name	SHERR, MARIA CRISTI OWEN
Attorney Docket Number	111054-0001U4C7

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/David J Thibodeau Jr Reg No 31671/	Date (YYYY-MM-DD)	2017-11-27
Name/Print	David J. Thibodeau, Jr.	Registration Number	31671

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/271,410	09/21/2016	James Arthur Proctor JR.	111054-0001U4C7	7653

86012 7590 03/22/2018

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CALIFORNIA 94301
UNITED STATES OF AMERICA

EXAMINER
SHERR, MARIA CRISTI OWEN

ART UNIT	PAPER NUMBER
3685	

NOTIFICATION DATE	DELIVERY MODE
03/22/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@vlplawgroup.com

Petitioner Samsung Ex-1004, 0471

Office Action Summary	Application No. 15/271,410	Applicant(s) Proctor et al.	
	Examiner CRISTINA O SHERR	Art Unit 3685	AIA Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 11/27/17.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-23 and 31-37 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-23 and 31-37 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 11/27/17.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

2. This Office Action is in response to the Applicant's Amendment filed 27 November 2017. Claims 1-23 and 31-37 are currently pending in this case. Claims 24-30 were previously canceled. Claims 1, 4-13, 1518, 21-23, 31-32, 34, 36, and 37 are currently amended.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 27 November 2017, is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to Arguments

4. Applicant's arguments filed November 27, 2017, have been fully considered but they are not persuasive.

5. Applicant argues, regarding claim 1, as currently amended, that the limitations of claim 1 are entitled to a priority date of January 28, 2009.

6. Examiner respectfully disagrees.

7. In reviewing the various continuations, at least the limitation of claim 1 "determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information" in the context of the claims, where identifier related information is received from a server using a first radio, the proximity beacon transmissions are received using a second radio, the proximity beacon information is derived from the proximity beacon transmissions, and then a proximity of a device associated with the derived proximity beacon information is determined by the mobile device using the identifier related information received from the server is not found in the previous Applications. Note that at least U.S. Patent Application No. 14/861,563, filed September 22, 2015 and U.S. Patent Application

No. 14/472,477 do not support the limitation "determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information"

8. For this reason, Priority is set at 21 September 2016.

9. Applicant argues, regarding claims 1 -23 and 31-37, as currently amended, that the claims recite statutory subject matter.

10. Examiner respectfully disagrees.

11. The claims, as a whole, do not amount to significantly more than the abstract idea itself. This is because the claims do not effect an improvement to another technology or technical filed; the claims do not amount to an improvement to the functioning of a computer system itself; and the claims do not move beyond a general link of the use of an abstract idea to a particular technological environment.

12. Applicant argues, regarding claim 4, as currently amended, that the claims is properly supported by U.S. Application No. 12/364,828.

13. Examiner respectfully disagrees. The prior applications do not support the limitation of "determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information" in the context of the claims, where identifier related information is received from a server using a first radio, the proximity beacon transmissions are received using a second radio, the proximity beacon information is derived from the proximity beacon transmissions, and then a proximity of a device associated with the derived proximity beacon information is determined by the mobile device using the identifier related information received from the server.

14. Priority, therefore, is set at 21 September 2016.

15. Applicant argues, regarding claim 18, as currently amended, that the claims is properly supported by U.S. Application No. 12/364,828.

16. Examiner respectfully disagrees.

17. Note that, as above, Priority is set at 21 September 2016.

Priority

18. This application claims a continuation of pending U.S. Patent Application No. 14/861,563, filed September 22, 2015 which is a continuation of pending U.S. Patent Application No. 14/472,477, filed August 29, 2014 which is a continuation of U.S. Patent Application No. 13/775,435, filed February 25, 2013, now issued as U.S. Patent No. 8,849,698 on September 30, 2014 which is a continuation of U.S. Patent Application No. 13/212,723, filed August 18, 2011, now issued as U.S. Patent No. 8,374,592 on February 12, 2013 which is a continuation of U.S. Application No. 12/364,828, filed February 3, 2009, now issued as U.S. Patent No. 8,090,359 on January 3, 2012 which claims the benefit of U.S. Provisional Application No. 61/095,001, entitled "Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios", filed on September 8, 2008 and U.S. Provisional Application No. 61/095,359, entitled "Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios", filed on September 9, 2008. However, in reviewing the various continuations, the prior applications do not support the limitation of "determining the proximity of at least one beacon transmitter device, entity, or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information" in the context of the claims, where identifier related information is received from a server using a first radio, the proximity beacon transmissions are received using a second radio, the proximity beacon information is derived from the proximity beacon transmissions, and then a proximity of a device associated with the derived proximity beacon information is determined by the mobile device using the identifier related information received from the server.

19. For this reason, Priority is set at 21 September 2016.

Claim Rejections - 35 USC § 101

20. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

21. Claims 1-23 and 31-37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

22. Regarding claims 1-23 and 31-37 –

23. Claims 1-23 and 31-37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more.

24. The claims are directed to the abstract idea of determining distance.

Subject Matter Eligibility Standard

25. When considering subject matter eligibility under 35 U.S.C. 101, it must be determined whether the claim is directed to one of the four statutory categories of invention, i.e., process, machine, manufacture, or composition of matter. If the claim does fall within one of the statutory categories, it must then be determined whether the claim is directed to a judicial exception (*i.e.*, law of nature, natural phenomenon, and abstract idea), and if so, it must additionally be determined whether the claim is a patent-eligible application of the exception. If an abstract idea is present in the claim, any element or combination of elements in the claim must be sufficient to ensure that the claim amounts to significantly more than the abstract idea itself. Examples of abstract ideas include fundamental economic practices; certain methods of organizing human activities; an idea itself; and mathematical relationships/formulas. (*Alice Corporation Pty. Ltd. v. CLS Bank International, et al* US Supreme Court, No. 13-298, June 19, 2014).

Analysis

26. In this case, claim 31 recites a method.

27. Additionally, the claim is directed to the abstract idea of determining distance. (*Alice Corporation Pty. Ltd. v. CLS Bank International, et al* US Supreme Court, No. 13-298, June 19, 2014) The transaction device in this claim merely automates an algorithm via basic computer functions, and therefore, the claim does not include additional elements that are sufficient to amount to significantly more than the judicial exception because additional claim elements do not provide meaningful limitations to transform the abstract idea into a patent eligible application of the abstract idea such that the claim amounts to significantly more than the abstract idea itself.

28. Taking the claim elements separately, the functions performed by the machine at each step of the process are purely conventional. Receiving data, transmitting data, and comparing data ---one of the most basic functions of a computer. All of these computer functions are well-understood, routine, conventional activities previously known to the industry. In short, each step does no more than require a generic computer to perform generic computer functions.

29. The claims do not, for example, purport to improve the functioning of the computer itself. Nor do they effect an improvement in any other technology or technical field. Instead, the claims at issue amount to nothing significantly more than an instruction to apply the abstract idea of advertising using some unspecified, generic computer. "Under our precedents, that is not 'enough' to transform an abstract idea into a patent--eligible invention." See *Alice Corp. Pty. Ltd*., 134 S.Ct. at 2360.

Conclusion

30. The claims, as a whole, do not amount to significantly more than the abstract idea itself. This is because the claims do not effect an improvement to another technology or technical filed; the claims do not amount to an improvement to the functioning of a computer system itself; and the claims do not move beyond a general link of the use of an abstract idea to a particular technological environment.

31. Accordingly, the Examiner concludes that there are no meaningful limitations in the claims that transform the judicial exception into a patent eligible application such that the claims amount to significantly more than the judicial exception itself.

32. The dependent claims 32-37 do not resolve the deficiency of independent claims and accordingly stand rejected under 35 USC 101 based on the same rationale.

33. Independent claim 1 and its dependent claims 2-23 merely implement the abstract idea of claim 31.

Claim Rejections - 35 USC § 112

34. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

35. The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

36. Claims 4 and 18 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

37. Regarding claim 4 –

38. The claim recites "occasionally change for security reasons", wherein the said limitation is broader than the Specification, as filed (See PgPub US 2017/0011425 at par 44), (*LizardTech Inc. v. Earth Resource Mapping Inc.*, 76 USPQ2d 1724 (Fed. Cir. 2005)) (MPEP 2163 (A)).

39. Regarding claim 18 –

40. The claim recites "is changed as well as to prevent . . .". wherein the said limitation is broader than the Specification, as filed (See PgPub US 2017/0011425 at par 44), (*LizardTech Inc. v. Earth Resource Mapping Inc.*, 76 USPQ2d 1724 (Fed. Cir. 2005)) (also, MPEP 2161 (1) lack of algorithm).

41. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

42. The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

43. Claims 1-23 and 31-37 rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

44. Claims 1-23 and 31-37 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph.

45. The claims are narrative in form and replete with indefinite language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. For example, the claims contain excessive functional language. The claims must be in one sentence form only. Note the format of the claims in the patents cited.

46. A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. *In re Katz* Interactive Call Processing Patent Litigation, 639 F.3d 1303 (Fed. Cir. 2011).

47. The claims recite multiple instances of apparatus and method steps of using the apparatus –

- Claim 2 --- "a randomly generated" (*Katz, UltimatePointer*).
- Claim 4 --- "occasionally change".
- Claim 5 --- "… change from time to time", "… making… anonymous over time…".
- Claim 6 --- "which is used…".
- Claim 13 --- "downloaded in reaction to… wherein the mobile wireless device first received… as part of the proximity beacon information".
- Claim 15 --- "wherein the mobile wireless device, upon determining…", "wherein the further communications utilize the first radio…, but remains identifiable by the wireless mobile device…", "upon determining there is a match…"
- 17 --- "wherein the unique identifier… changes over time based upon an algorithm in synchronization…"
- Claim 18 --- "… and is generated algorithmically and only known to at least one of the servers… and updated based… upon a clock interval…" "wherein the MAC address … is changed as well…"
- 23 --- "wherein no connection is made between the mobile wireless device …"

48. Please note that the language of the hybrid limitations does not carry patentable weight.

49. Regarding claim 23 –

50. The term "standards based protocol" in claim 23 is a relative term which renders the claim indefinite. The term "standards based protocol" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

51. Regarding claim 13 –

52. The claim recites "upon the mobile wireless device", "by the mobile wireless device", "wherein the mobile wireless device", thereby engaging in circular reasoning and rendering the claim unclear.

53. Regarding claim 14 –

54. The claim recites "for execution upon the mobile wireless device", thereby engaging in circular reasoning and rendering the claim unclear.

55. Regarding claim 15 –

56. The claim recites "wherein . . . . the mobile wireless device", thereby engaging in circular reasoning and rendering the claim unclear.

57. Regarding claim 23 –

58. The claim recites "between the mobile wireless device", thereby engaging in circular reasoning and rendering the claim unclear.

59. Regarding claim 32 –

60. Note that claim 31 is already performed, and the first limitation of claim 32 says claim 31 is performed under control of an application. So executing is unclear as the first limitation suggests that it was already executed.

61. Regarding claim 34 –

62. Claim 34 recites the limitation of "performing at least a portion of the steps on one or more processor of the one or more servers." Claim 31, on which claim 34 depends, recites that all of the steps are performed at the mobile device. It is unclear to one of ordinary skill how at least a portion of the steps can be performed on a processor of a server when the steps are performed on a mobile device.

Claim Rejections - 35 USC § 102

63. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory

basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

64. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

65. Claims 1, 6-14, 19, 20, 23, 31, and 34-36 are rejected under pre-AIA 35 U.S.C. 102(a) as being anticipated by Hillier (US 2016/0025837).

66. Regarding claims 1 and 31-

67. Hillier teaches a mobile wireless device (abs) comprising:

a first radio; (par 49)

a second radio; (par 53-54)

one or more processors: (par 49)

one or more non-transitory memory devices coupled to the one or more processors, (par 49) the one or more non-transitory memory devices storing a set of instructions that, when executed by the one or more processors cause the one or more processors to perform operations including:

receiving, using the first radio, identifier related information associated with a proximity beacon service, from one or more servers; (par 49, 45, 75)

receiving, using the second radio, proximity beacon transmissions when the device is located within a detection range of each of a plurality of beacon transmitter devices, each of the proximity beacon transmissions including a MAC address, a. unique identifier, and proximity beacon identification information, and the proximity beacon identification information indicating the proximity beacon transmissions are associated with the proximity beacon service; (par 53-54, 49, 45, 75)

deriving proximity beacon information from the proximity beacon, transmissions; determining a proximity of at least one transmitter device, entity or object associated with at least a portion of the proximity beacon information by utilizing the identifier related information; (par 49-54) and

the proximity beacon identification information being the same for all proximity beacon transmissions associated with the proximity beacon service. (par 49-54)

68. Regarding claims 6 and 35 –

69. Hillier teaches that at least a portion of the identifier related information includes a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter of the plurality of beacon transmitter devices. (par 49)

70. Regarding claim 7 –

71. Hillier teaches that the one or more processors further execute the instructions to perform operations including further determining the proximity of the at least one beacon transmitter device by comparing the downloaded unique identifier with the portion of the proximity beacon information, the portion comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object. (par 49-54)

72. Regarding claim 8 –

73. Hillier teaches that the one or more processors further execute the instructions to perform operations including further determining the proximity of a specific beacon transmitter device by comparing the proximity beacon information with the identifier related information. (par 49-54)

74. Regarding claim 9 –

75. Hillier teaches that the one or more processors further execute the instructions to perform operations including further determining the proximity of a specific beacon transmitter device by comparing the proximity beacon information with the identifier related information. . (par 49-54)

76. Regarding claim 10 –

77. Hillier teaches that the one or more processors further execute the instructions to perform operations including further determining the proximity of at least one beacon transmitter device by sending at least the unique identifier associated with the at least one beacon transmitter to at least one of the one or more servers using the first radio, and receiving at least a portion of die identifier related information usable to make the proximity determination. (par 45)

78. Regarding claim 11 –

79. Hillier teaches that the unique identifier associated with the at least one beacon transmitter is associated with a broadcast device having a predetermined location. (par 45)

80. Regarding claim 12 –

81. Hillier teaches that the one or more processors further execute the instructions to perform operations including determining, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a predetermined location. (par 45-54)

82. Regarding claim 13 –

83. Hillier teaches that the identifier related information comprises application software for execution upon the mobile wireless device, downloaded in reaction to sending of a unique identifier by the mobile wireless device to at least one server of the one or more servers, and wherein the mobile wireless device first received the unique identifier as part of the proximity beacon information. (par 45)

84. Regarding claim 14 –

85. Hillier teaches that the identifier related information comprises application software for execution upon the mobile wireless device. (par 45)

86. Regarding claim 19 –

87. Hillier teaches that the second radio is a Bluetooth based radio. (par 45-54)

88. Regarding claim 20 –

89. Hillier teaches that the second radio is a Wi-Fi based radio. (par 49)

90. Regarding claim 23 –

91. Hillier teaches that the proximity beacon service utilizes a standards based protocol derived from Bluetooth and including unsolicited automatically repetitive advertisements, and wherein the proximity beacon transmissions are transmitted within the format of the unsolicited automatically repetitive advertisements, and wherein the proximity beacon identification information is included within one or more configurable fields of the unsolicited automatically repetitive advertisements while conforming to the standards based protocol and, wherein no connection is made between the mobile wireless device and the plurality of beacons transmitter devices in order to receive the unique identifier. (par 43)

92. Regarding claim 34 –

93. Hillier teaches performing at least a portion of the steps on one or more processors of the one or more servers. (par 45).

94. Regarding claim 36 –

95. Hillier teaches that the identifier related information is received in response to software residing on the mobile device sending at least one unique identifier determined from the proximity beacon information. (par 45-54)

Claim Rejections - 35 USC § 103

96. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

97. Claims 2-5, 15-18, and 21-22 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Altman et al (US 2013/0217332)

98. Hillier teaches as above

99. Regarding claim 2 –

100. Altman teaches that the MAC address is a randomly generated 48 bit number matching the format of a MAC address. (par 166).

101. It would be obvious to one of ordinary skill in the art to combine Hillier and Altman in order to obtain greater transaction security.

102. Regarding claim 3 –

103. Altman teaches wherein the MAC address is a Bluetooth BD_ADDR. (par 159, 166).

104. Regarding claim 4 –

105. Altman teaches that both the MAC address and the unique identifier received by the second radio from a single beacon transmitter device occasionally change, for security reasons. (par 166)

106. Regarding claim 5 –

107. Altman teaches that both the M AC address and the unique identifier change from time to time, making one or more of an entity's identity associated with a beacon transmitter device and the beacon transmitter device's identity anonymous over time to other devices or entitles not having permissions at the one or more servers to access the identifier information. (par 166)

108. Regarding claim 15 –

109. Hillier teaches that the Identifier related information comprises a list of contact information, and the one or more processors further execute the instructions to perform operations including;

further determining the proximity of a beacon transmitter device associated with an entity included within the list of contact information based upon comparing a contact identifier Information with at least the portion of the proximity beacon information, and the mobile wireless device, upon determining there is a match engaging further steps to allow farther communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio, (par 45-54) and further

wherein both the MAC address and the identifier associated with proximity beacon transmissions from the detected proximity beacon transmitter associated with entity included within the list of contact information change from time to time, but remain identifiable by the wireless mobile device, but anonymous to other devices not having required permissions to make such an identification. (par 45-54).

110. Altman teaches a MAC address that changes from time to time. (par 166)

111. Regarding claim 16 –

112. Altman teaches that the changing of the MAC address and the unique identifier associated with the single beacon transmitter device is coordinated with at least one of the one or more servers. (par 166, 159)

113. Regarding claim 17 –

114. Altman teaches that the unique identifier of at least a portion of the proximity beacon transmissions changes over time based upon an algorithm in synchronization with at least one sewer of the one or more servers. (par 159, 166)

115. Regarding claim 18 –

116. Altman teaches that the unique identifier associated with at least one beacon transmitter is associated with a single beacon transmitter and is generated algorithmically and only known to at least one of the servers and the one beacon transmitter, and updated based, at least in part, upon a clock interval within the beacon transmitter, and further wherein, the MAC address associated with the beacon transmitter is changed as well, so as to prevent the identity of the beacon transmitter from being determined by unauthorized devices. (par 166)

117. Regarding claim 21 –

118. Altman teaches that teaches that the MAC address is a randomly generated 48 bit BD_ADDR, wherein both the MAC address and the unique identifier change from time to time (par 159, 166)

119. Hillier teaches one or more of an entity's identity associated with the at least one beacon transmitter and the at least one beacon transmitter's identity anonymous over time to other devices or entities not having permissions at the one or more servers to access the identifier related information, and with at least the portion of the identifier related information including a downloaded unique identifier or information which is used to determine a downloaded unique identifier associated with the least one beacon transmitter ; and wherein the one or more processors further execute the instructions to perform operations, including determining the proximity by comparing the downloaded unique identifier with the portion of the proximity beacon information comprising the unique identifier associated with the at least one beacon transmitter device, entity, or object. (par 45-54)

120. Regarding claim 22 –

121. Hiller teaches that the one or more processors further execute the instructions to perform additional operations, including determining the proximity by utilizing an action function including one or more previously downloaded unique identifiers. (par 45-54)

122. Claims 32-33 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Sorenson et al (US 2003/0053484).

123. Regarding claim 32 –

124. Hillier teaches as above.

125. Sorenson teaches performing one or more steps of the method under control of an application via a software interface; and executing the application on the mobile device. (par 135)

126. It would be obvious to one of ordinary skill in the art to combine Hillier with Sorenson in order to achieve a more user-friendly method.

127. Regarding claim 33 –

128. Sorenson teaches that the software interface is an NDIS driver. (par 135).

129. Claim 37 is are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hillier (US 2016/0025837) in view of Brackett et al (US 2005/0114654)

130. Regarding claim 37 –

131. Hillier teaches determining the at least one beacon transmitter device is in proximity. (par 45-54).

132. Brackett teaches at least one server of the one or more of servers providing an identifying picture of a consumer to at least one device for confirming the picture matches an individual in proximity as a step in an electronic commerce transaction. (par 20)

133. It would be obvious to one of ordinary skill in the art to combine Hillier with the facial recognition feature of Brackett in order to obtain greater transaction security.

Conclusion

134. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

135. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

136. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRISTINA OWEN SHERR whose telephone number is (571)272-6711. The examiner can normally be reached on 8:30 - 5:30.

137. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

138. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Calvin L Hewitt can be reached on 571-272-6709. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

139. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohammad A. Nilforoush/
Primary Examiner, Art Unit 3685

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Apr 24 2018

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
Dav id J Thibodeau Jr

S-signature:
/David J Thibodeau Jr/

Registration Number:
31671

U.S. Application Number:
15271410

Confirmation Number:
7653

E-mail Address:
dthibodeau@vlplawgroup.com

Phone Number:
6179255520

Proposed Time of Interview:
5-2-2018 11:00 AM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

uspto UNITED STATES PATENT AND TRADEMARK OFFICE
PALM-SILVER

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/271,410	Filing Date 09/21/2016	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **07/20/2018**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 30	Minus	** 30	= 0	X $50 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $230 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
LORRAINE E. WALDEN

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	15271410	Filing Date	2016-09-21	Docket Number (if applicable)	111054-0001U4C7	Art Unit	3685
First Named Inventor	James Arthur Proctor			Examiner Name	SHERR, MARIA CRISTI OWEN		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the orde in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☒ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☒ Other Exhibits A - G

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 504929

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

EFS - Web 2.1.16

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/David J Thibodeau Jr Reg No 31671/	Date (YYYY-MM-DD)	2018-07-20
Name	David J. Thibodeau, Jr.	Registration Number	31671

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is t file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Tim will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions fo reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the informatio solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record ma be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

EXHIBIT F Claim 31 feature	Context in U.S. Patent Application 61/095,359 filed September 9, 2008	Citation to the text of the '359 Application
communicating between a mobile device and one or more servers and receiving, at the mobile device, identifier related information, using a first radio;	a device identifier is detected by a wireless device; and the detected identifier is sent to the server the server then responds with information related to those detected identifers; the wireless device receives this response from the server via a first radio (Figure 1, the WWAN link)	When a receiving device detects one or more identifier, it will use the WWAN link to communicate with the central server. The device will pass along a list of currently detected identi ers and request that the server provide the device with the information related to any identifier that is 1) levant to that device, and 2) that device is authorized to receive. (p. 3, second par.) As the server contains the personal information, and performs the association of an account with a particular identifier, it can inherently enforce the security of the policies. In this way, the central server controls the process of passing information related to an account to a particular requesting device. (p. 4, last two lines, and p. 5, first two lines)
receiving, at the mobile device using a second radio, proximity beacon transmissions from one or more beacon transmitter devices	the wireless device receives beacon transmissions (e.g., the IBSS beacons) from other nearby wireless devices using a second radio the beacons are received via the second radio (Figure 1, the Bluetooth connection)	Title 2: Wireless beacon device for transmitting a wireless identifier to facilitate proximity detection (p. 1 l. 11-12) Using Bluetooth to perform the local WLAN connection, where that device is a Bluetooth device Where the interface is an NDIS driver or the like, Using the fields in the NDIS driver in a non standard way such as using the SSID of the beacons to broadcast, or advertize the presence of associated account identifier gistered to the central server (p.22, l.3-9) An NDIS driver interfaced to an application which will put a Bluetooth or Wi-Fi or other device into a mode in which it will broadcast it's identity, where that identity contains an account or device identier (know to the central server), and report back all other broadcasted identifiers from other devices. The application then provide the reported identifiers the server, which will make decisions regarding a users interest in these detected identifiers, and policy regard privacy other identifiers. (p. 22 l. 12-16) ... the shorange wireless is ONLY used for the detection process, and to advertise a device's presence by transmitting an identifier, or receiving identifiers from other devices. (p.2 last par.)
deriving, at the mobile device, proximity beacon information from the proximity beacon transmissions; and	the beacons are processed to derive further information about the proximity beacon transmissions (e.g., the beacon transmissions include information related to an associated identifier)	Using the fields in the NDIS driver in a non-standard way such as using the SSID of the beacons to broadcast, or advertize the presence of your associated account identifier registered to the central server (p.22 l. 7-9)
determining, at the mobile device, that at least one beacon transmitter device associated with the proximity beacon service is in proximity to the mobile device by utilizing the identifier related information;	"identifier related informaton" is the information returned from the server. That information is then used as part of a further determination that another device is in proximity (e.g., where a mobile application called an "action function" is given a friends list)	a detected identifier may be· relevant to the receiving device if the user associated with the detected identifier is listed in a "friends list" for the owner of the receiving device. If the identifiers for the individuals within the friends list have been passed to the device, the action function may make this determination. (p. 3, last par.) For example, when the server receives an inquiry from a device with a list of identifiers, it may only respond with information which the users associated with the identifirrs are on that device's friends list AND on each of the individual's friend lists as well. These friends' lists and policies would be stored within an account which allows to disclose of a user's presence only to individuals on this list.(p. 4, third par.)

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
61/095,359	09/09/2008		105	PRO08-02		

CONFIRMATION NO. 9670

82506
James Arthur Proctor, Jr
258 Seaview Street
Melbourne Beach, FL 32951

FILING RECEIPT



Date Mailed: 09/17/2008

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

James Arthur Proctor JR., Melbourne Beach, FL;
James Arthur Proctor III, Indialantic, FL;

Power of Attorney: None

If Required, Foreign Filing License Granted: 09/15/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/095,359**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Central server enabled proximity based applications utilizing both short range, and wide area wireless radios

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Petitioner Samsung Ex-1004, 0499

Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (04-07)
Approved for use through 06/30/2010 OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1 — Remove

Given Name	Middle Name	Family Name	City	State	Country
James	Arthur	Proctor Jr.	Melbourne Beacl	FL	US

Inventor 2 — Remove

Given Name	Middle Name	Family Name	City	State	Country
James	Arthur	Proctor III	Indialantic	FL	US

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

Title of Invention	Central server enabled proximity based applications utilizing both short range, and wide area wireless radios
Attorney Docket Number (if applicable)	PRO08-02

Correspondence Address

Direct all correspondence to (select one):

(•) The address corresponding to Customer Number	( ) Firm or Individual Name
Customer Number	82506

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

(•) No.

( ) Yes, the name of the U.S. Government agency and the Government contract number are:

Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (04-07)
Approved for use through 06/30/2010 OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

Entity Status

Applicant claims small entity status under 37 CFR 1.27

(•) Yes, applicant qualifies for small entity status under 37 CFR 1.27

( ) No

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	// James A Proctor Jr //			Date (YYYY-MM-DD)	2008-09-09
First Name	James	Last Name	Proctor	Registration Number (If appropriate)	

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

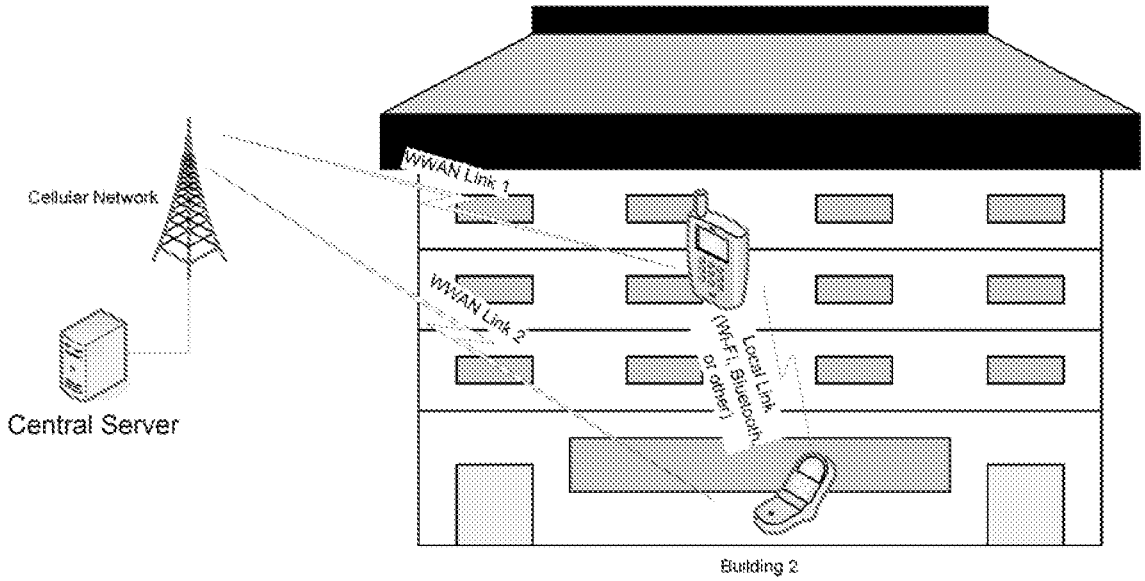
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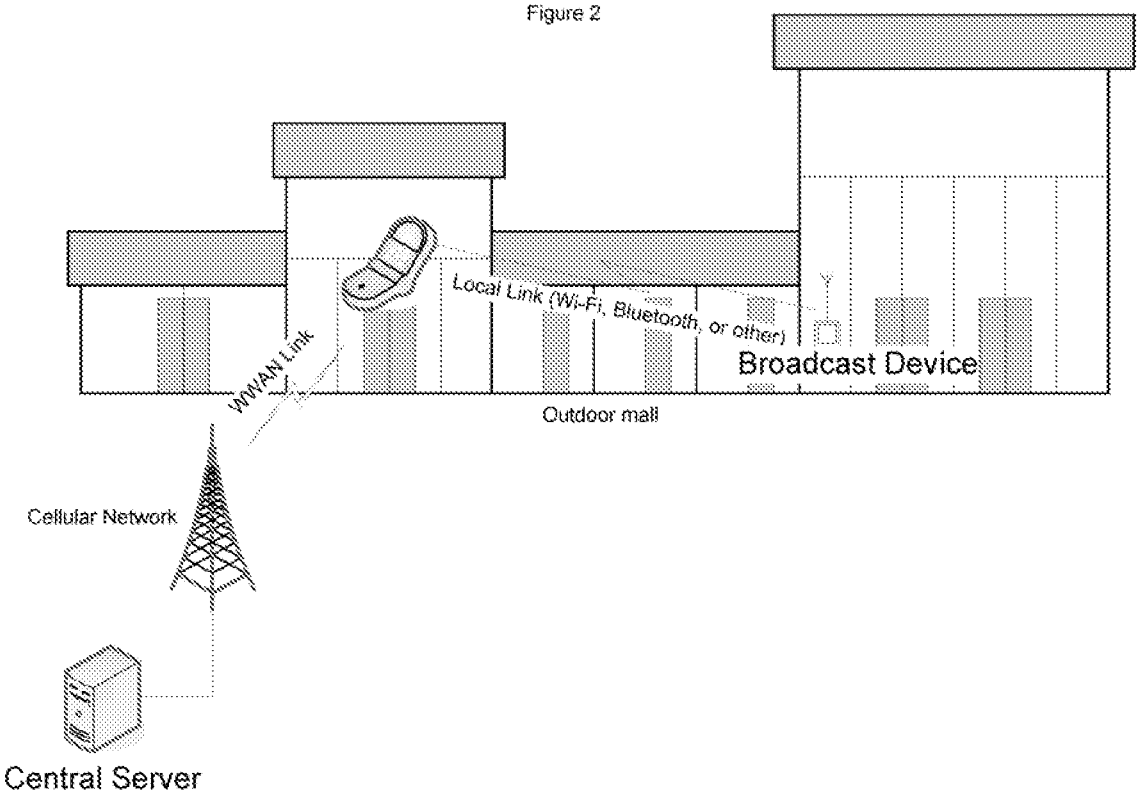
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Figure 1



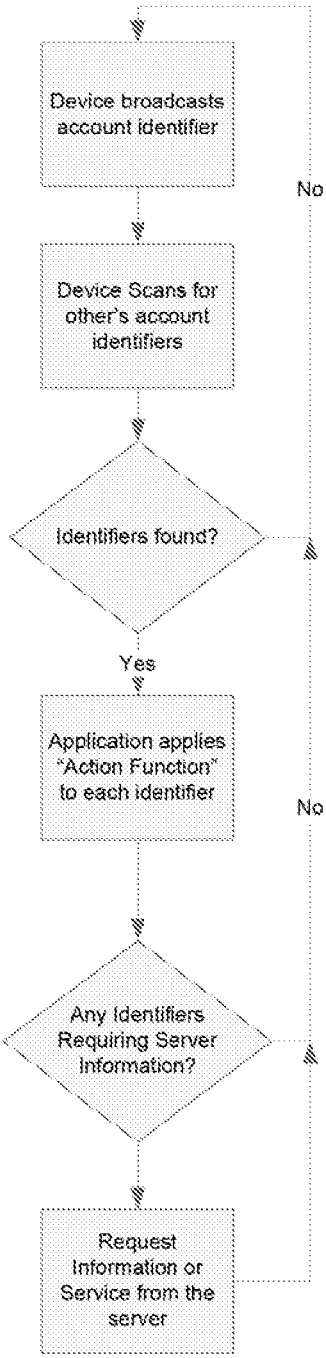
Petitioner Samsung Ex-1004, 0503

Figure 2



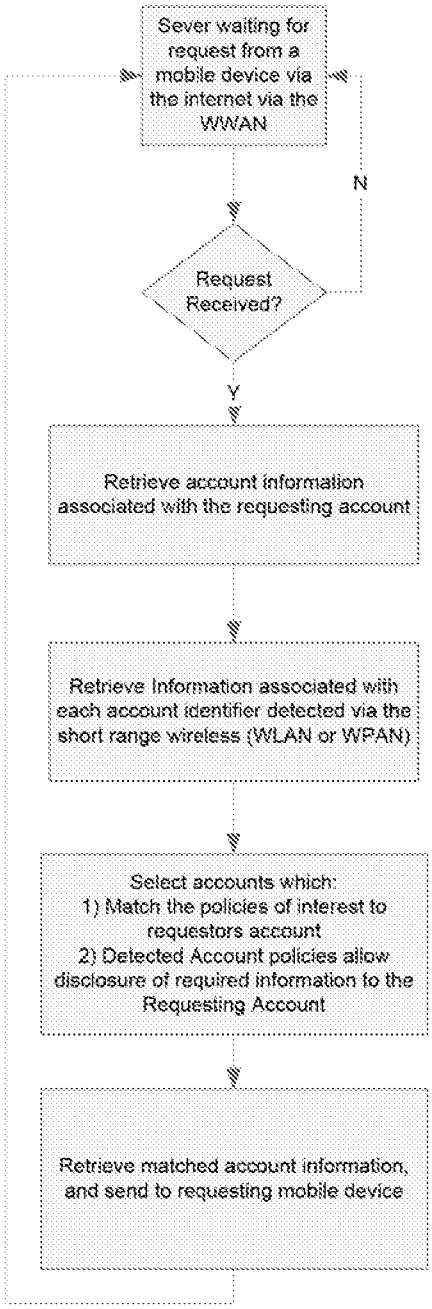
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Figure 3



Petitioner Samsung Ex-1004, 0505

Figure 4 – Server Processing



Petitioner Samsung Ex-1004, 0506

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Central server enabled proximity based applications utilizing both short range, and wide area wireless radios
First Named Inventor/Applicant Name:	James Arthur Proctor
Filer:	James Proctor
Attorney Docket Number:	PRO08-02

Filed as Small Entity

Provisional Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Provisional Application filing fee	2005	1	105	105
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**105**

Electronic Acknowledgement Receipt

EFS ID:	3909660
Application Number:	61095359
International Application Number:	
Confirmation Number:	9670
Title of Invention:	Central server enabled proximity based applications utilizing both short range, and wide area wireless radios
First Named Inventor/Applicant Name:	James Arthur Proctor
Customer Number:	82506
Filer:	James Proctor
Filer Authorized By:	
Attorney Docket Number:	PRO08-02
Receipt Date:	09-SEP-2008
Filing Date:	
Time Stamp:	13:07:05
Application Type:	Provisional

Payment information:

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Payment Type	Credit Card
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Provisional Cover Sheet (SB16)	ProvisionalSB-PRO08-02.pdf	1000431 fc1b23d33b92a9c1525e26830618adf5ebbdce1c	no	3
Warnings:					
Information:					
2		PRO08-02-ASFILED-09092008-IMG.pdf	5020000 48e14c5e84c225d103caa192e7d12a5fbd6e842a	yes	28

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	24
	Drawings-only black and white line drawings	25	28

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James A. Proctor Jr. – Invention Disclosure

Invention Disclosure:

Inventor(s): James A. Proctor Jr.

James A. Proctor III

The following are a list of potential titles for this provisional application Invention Disclosure.

Title 1:

Central server enabled proximity based applications utilizing both short range, and wide area wireless radios

Title 2:

Wireless beacon device for transmitting a wireless identifier to facilitate proximity detection

Title 3:

Anonymity method associated with a wireless proximity detection process utilizing a central server.

Title 4:

Wireless Advertising, Point of Sale, and associated infrastructure using wireless device proximity detection and a central server

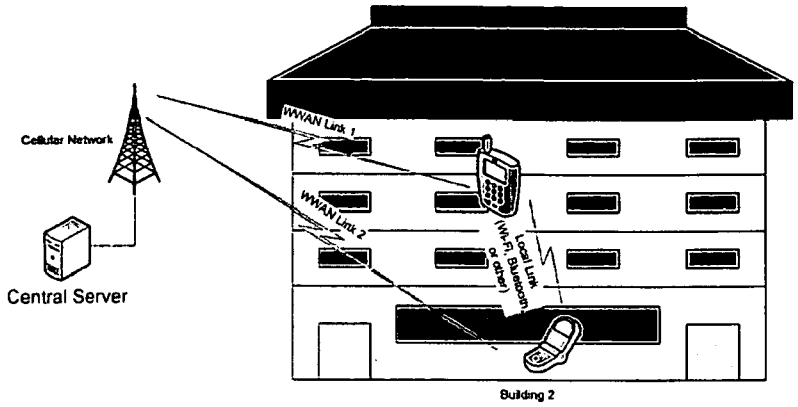
Introduction:

This disclosure provides support for multiple patent applications of both a technical, and business model nature.

The present invention is generally concerned with facilitating communications between two wireless devices when they are in close proximity to each other, and using a central server to determine if one or more of the devices should be notified of the other device's presence or other related information such as advertising.

Petitioner Samsung Ex-1004, 0511

Figure 1



Description

Most mobile phones on the market today support at least two wireless standards; one for the cellular wireless wide area network connection (WWAN) and one for a wireless personal or local area network (WPAN, WLAN). The cellular connection or WWAN is utilized for voice and data and can adhere to many different standards such as CDMA (IS-2000), GSM, or W-CDMA. The WPAN or WLAN connection is typically for short range communications and is often used for wireless hands free devices, such as headsets, peripherals, or higher speed internet connections. The typical standards using for the sort range wireless communications include Bluetooth, Wi-Fi, and in some cases Ultra-Wide-Band (UWB).

Specifically, the current invention utilizes the short range wireless communication to detect the presence of other devices, and the wide area wireless network to perform communications to a central server, and perform the actual communications between the wireless devices. The distinction being that the short range wireless is ONLY used for the detection process, and to advertise a device's presence by transmitting an identifier, or receiving identifiers from other devices.

Petitioner Samsung Ex-1004, 0512

The transmitted identifiers associated with any given device are only known to the central server and the device transmitting it. These identifiers may change from time to time, making a user's or a device's identity anonymous over time. The central server and any particular device must be coordinated such that the identifier and any device is transmitting it, remains identifiable by the central server. This process is coordinated between the handset or other wireless device, and the central server utilizing the WWAN or cellular data link, carrying messaging between them. Of course, it is contemplated that the WWAN may be replaced with another internet connection such as Wireless LAN to an internet enabled gateway or access point, and the short range wireless function would be performed by Bluetooth or the like (even a wired internet connecting in some cases).

When a receiving device detects one or more identifier, it will use the WWAN link to communicate with the central server. The device will pass along a list of currently detected identifiers and request that the server provide the device with the information related to any identifier that is 1) relevant to that device, and 2) that device is authorized to receive.

The device may employ an action function, which would act as a filter that determines which of the detected identifiers should be passed to the server. This function may be omitted and all identifiers passed to the server. The idealized effect of the action function would be to reduce the number of requests to the server by not re-requesting recently requested identifiers which have already been passed to the server, for some period of time.

As an example of the overall process, a detected identifier may be relevant to the receiving device if the user associated with the detected identifier is listed in a "friends list" for the owner of the receiving device. If the identifiers for the individuals within the friends list have been passed to the device, the action function may make this determination. In the preferred embodiment, the server would determine the identity and the relevance of the detected identifiers, and the action function would work to reduce frequency of re-requests to the server.

Petitioner Samsung Ex-1004, 0513

To enable this process, each device or user associated with an identifier has an account on the server associated with the user and/or device, and the current identifier. There will be various information associated with each account. When the account is associated with an individual, there may be personal information such as the individuals name, contact information, information allowing communication, such as chat or IM, links to their other social networking services, and the like.

There will also be policy based permissions stored in the account and applied to any information associated with this account. The stored policy permissions will determine what information and under which situations information may be disclosed to another device or user associated with another account.

Just as in the case of an identifier being deemed relevant to a user based on a friends list, the permission of disclosing a device's presence may require being on a friends list as well. For example, when the server receives an inquiry from a device with a list of identifiers, it may only respond with information for which the users associated with the identifiers are on that device's friends list AND on each of the individual's friend lists as well. These friends' lists and policies would be stored within an account which allows for disclose of a user's presence only to individuals on this list.

Of course it is contemplated that the permissions not be an "all or nothing", but that different classes of information may be assigned different permissions and mechanisms. An example of this might be a user's presence, identity, and chart services being made available to only one set of other accounts (or users), while the presence of an anonymous individual being made available to anyone, but with other services available such as multi-player games. Additionally multiple contacts may be included in the account, each given customized permissions. An example would be any user may be notified of an anonymous user or other information based on additional policies.

As the server contains the personal information, and performs the association of an account with a particular identifier, it can inherently enforce the security of the policies.

Petitioner Samsung Ex-1004, 0514

In this way, the central server controls the process of passing information related to an account to a particular requesting device.

A device may also simply broadcast an identifier, with no WWAN connection to facilitate advertising or local information. For instance, an account associated with one or more identifiers may belong to a museum. As a museum patron walks to an exhibit, they receive an identifier. The device passes the identifier to the central server, which in-turn recognizes it as being associated with that exhibit within that museum and passes relevant information back to the user's device. Applications such as games, informative display applications, or content such as audio or video may be offered to the user's device as well. Other examples might include electronic coupons in a grocery store, menus or special offers in a restaurant. A process of steps, enabled by this proximity infrastructure invention, for performing a step by step electronic e-commerce transition with two party confirmations will be described later in this invention disclosure as well.

Main Enabling Infrastructure Concepts (more elaboration on in the key concepts to protect section, as well as invention disclosure associated with enabled applications...)

- One device transmitting a wireless identifier using a wireless protocol capable of peer to peer communication
- The wireless identifier being associated with a specific account on a server connected to the internet
- A second device receiving the wireless identifier
- The second device capable of communicating with the server over an internet connection
- The second device requesting information from the service associated with the first identifier
    - The second device having a second identifier associated with a second account on the server
    - The server providing different amounts of information related to the first account based on the parameters associated with one or both of the first and second accounts

Petitioner Samsung Ex-1004, 0515

- The identifiers associated with the accounts being updated such that the identifiers would no longer be recognized as being associated with specific accounts without past or current interaction with the server
- Using one or more of cellular network timing information, and information from the central server to coordinate the broadcast and search times amongst the devices. (to reduce power and resource consumption)

Petitioner Samsung Ex-1004, 0516

Prior Art:

To date the prior art has been concerned with several areas:

- Utilizing GPS to determine the proximity of one mobile wireless user to another to facilitate mobile social networking. An example of an existing application utilizing this approach is Loopt, which is a coordinates location based social interaction based on GPS.
- Using standards such as IEEE802.11 (Wi-Fi) or Bluetooth to facilitate peer to peer communications or Mesh Networking. These are also referred to a MANETs or Mobile Ad-hoc Networks.
- Using peer to peer networks to facilitate communication between wireless devices. Examples of such existing applications include Mobile-Cheddar, Peer-2-Me, and Flobbi.

The present invention differs from these approaches in that first, no GPS is used to determine when one device is in proximity to another, as GPS will often not operate indoors where the GPS signal is weak

Secondly, utilizing a peer to peer based network, supporting an application such as social networking, the information flow between the devices running the applications are carried over the peer to peer network itself. An example of this is a service called Flobbi, where community members can identify each other via Bluetooth transmissions, then interact with chat. The messaging in this case is carried over Bluetooth itself. This approach creates complexity in a handset, and unnecessary additional resources are utilized. Further, in most cases, it reduces or eliminates the dependency on a central server to "broker" the transaction, reducing the ability to manage security and information disclosure. This approach further eliminates the opportunity to customize the content to include elements such as advertising or other content customized to the recipient based on additional information such as known personal purchasing history, or

Petitioner Samsung Ex-1004, 0517

interests. The complexity also is increased because one of the main devices targeted by the present invention is the phone. In this case of performing peer to peer networking using Bluetooth in a phone significant resources including memory and application software processing would be required to support full IP protocol networking over such a connection. The support for IP based networking already is including for WWAN connections and as a result, communication between one device to another using the WWAN is currently supported in many devices with no modification. The use of simple detection of one or more identifiers requires significantly less resources in a phone than performing a complete peer to peer based communication network with dynamic configuration of nodes being added and dropped continuously.

Finally, Mesh networking requires that a mesh node act like a router after the reception. A node receives a packet in using a peer to peer protocol, then performs a routing function to facilitate the forwarding of packets to other wireless nodes, or to connected wired devices, then it transmits the packet with modified addressing information. In a mobile phone environment, such a topology has similar disadvantages to the case of a pure Peer to Peer topology. Using the broadcast identifiers for detection allows for no complex management of routs, or the addition and removal of addresses to other detected mobiles. It is noted that the IP address, or other user contact information allowing communication is NOT location dependent in the present invention, but IS location dependent when true Peer to Peer or Mesh topologies are used. The present invention has the advantage that communication between two devices may continue after the devices have left proximity of each other, but in the same manner as they had been conversing previously. As a result a user who detects a short range transmission of an identifier, then begins a conversation or some other interaction with that device via the wireless wide area network may continue that conversation even in the case where the two devices move out of the proximity of the each other, and are no longer within the reception range of the short range wireless communication protocol.

Additionally, since in the current invention, the server and the WWAN is involved with all mobile devices utilizing this approach, a coordination of the broadcasting periods and the searching periods for the short range radios is possible. This will allow for reduced

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power consumption and other resource consumption in the devices. If no coordination is achieved, then the short range receivers in each device must be scanning of transmitted identifiers much more often and for longer durations. Utilizing the a common timing base, and the central server to notify the devices of a coordination approach for "active times" and "non-active times" will allow for the devices to minimize the power consumption they consume in the transmission of and scanning for identifiers. It will also allow for a synchronized approach for the update of each device's identifier, as described previously to enhance anonymity and security, coordinated with the central server. The "non-active times" may be used as "boundaries" over which the changing identifiers may be updated. This update may be based on either direct communication with the server, or rule and algorithm based updates previously coordinated with the central server so as to minimize server messaging, but allowing the updates to remain synchronized to the server such that the device and the server are always associating the same identifier between them. As will be recognized by an individual skilled in the area of information technology, the concept of a central server may well be implemented as a collection of servers to allow for load balancing, redundancy, and the like in a manor common to the information technology industry.

Requiring the brokering of the communication via a central server will also allow a mobile device to receive information associated with a "broadcast only" device, such as in the museum example discussed previously. This is important as broadcast devices can enable a vast set of new applications built upon the infrastructure developed in this application, beyond the museum like application. Some of these applications may involve an electronic commerce aspect.

Electronic Commerce Applications and Disclosure

E-commerce (e-proximity) between two mobile devices

An example is that of two individuals performing a transaction on the street, a customer and a street vendor. In this example, an individual would see a vendor and their device (enabled with the current invention) would notify them that the vendor was enabled with

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a device supporting the current invention as well, and capable of electronic payments. The customer, having an account enabled with electronic payments, and wanting an item the vendor has, would walk up to the merchant and place their order. Additionally, the customer would press a button on the phone (or other device) which would indicate they would like to make a purchase and pay using their device. The customer's device would then send a message to the central server indicating the customer would like to make an electronic payment to the merchant detected by the device. In return, the server would send a picture of the merchant, their establishment, or other identifying information (even a commonly shared code in some cases) to the customer's device and ask them to confirm the identity of the merchant. In the case where the identifying information is a picture the user would look at the merchant, and press a button on the device if their picture was correct. As an alternative, the information may be a picture of the establishment, or the vendor's name for their establishment. In some cases, the identifying information might even be a password sent to the merchant, the merchant would need to provide this password to the customer to be confirmed by the server or by the user themselves, or visa versa. The picture approach is expected to be the most common approach.

Next, the server requests the list of identifiers the merchant's device has detected, and determines if one of those identifiers is associated with the customer, further confirming that the customer is near the merchant, and to reduce fraudulent activity.

Assuming the two way proximity detection, the server would send a request to the merchant's device indicating the desire for the electronic payment, and a picture of the customer associated with the account on the device. The merchant would conform, on their device, that they have identified the customer and would provide the price or the item (with the price previously inputted) to the device, which would relay this information to the server. Alternatively, a point of sale device like a cash register could be interfaced to the enabled device and receive the list of purchased items, to use for this step.

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The server would them send a message to the customer's device. The customer would then conform they payment amount to be paid to the merchant, and that the inventory list is correct. The funds may likely be in a escrow like state at that point, in a manor similar to a Paypal payment or utilizing a stored credit card number, which could be reversed if the transaction were not consummated. The merchant would receive an indication from the server via their device that the payment has been made, and provide the purchased item to the customer. The merchant may optionally select an "item delivered" indication on their device, which would rely this information to the server over the internet connection. Upon charging of the customer's account by the server, the server would request a confirmation form the customer (via their device) that they have received their purchased goods or services. The customer would then select an indication they have received the purchased item(s) and the transaction would be complete. Further, if the customer does not deny the reception of the goods the funds may be paid regardless. Additionally, the server would keep track of the transactions and any negative feedback provided by any past participants in transactions for judging the character of each particular account holder. Further, the server involved in allowing the payment process between these two parties would have the capability to interface to third parties to determine if each of the parties were reputable in terms of being able to pay and consistently providing desired goods and services in an ethical way. Again, an example of such a third party would be PayPal or a credit card company, or other electronic service.

Finally, this transaction may be stored by the server, or sent to a thirdly party server for tracking spending habits of that account holder, or customers of that merchant allowing the merchant to track that specific customer's behavior and cater to them in the future with various specials delivered via email, or during their next visit via their device in the form of an electronic coupon. This process would be performed with a goal to help the merchant expose the customer to other products or services the merchant believes the customer might find desirable.

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Ecommerce between a fixed broadcast device and a mobile device

Football stadium application example

In another example of an embodiment of a transaction model, enabled by the infrastructure of the present invention, would be in an event such as a concert, or sporting event (particularly when it is an indoor venue where no GPS is available). A number of the broadcast only devices would be placed through out the seating areas. The devices would be very short range, and only transmit intermittently and as a result may be battery powered and would remain active a very long time period. Each device would be placed in a known location, in a predicable manor.

An attendee at the event would have a device enabled with the present invention. The device would detect a broadcast device, and interact over the internet with the server via the WWAN connection. The server would receive an indication of the broadcast device's identifier and the identifier of the account associated with the device which detected the broadcast device. The server would retrieve content associated with the service provider's account and provide that content to the application on the requesting mobile device that this venue has a product delivery service. The user may press an indication on their device that they would like to see a menu or list of items for sale from the merchant or merchants in the venue. The application on the user's device would then allow them to see a menu for instance and select items to purchase. The user then would be asked to confirm the purchase. The server would then indicate to the merchant that a user located near a specific broadcast device has ordered something. In this case, it is expected that a delivery fee would also be charged for the enhanced service. The server would facilitate the purchasing of the goods or services from the merchant and payment from customer's account, and provide confirmation to each. Such confirmation would include an electronic receipt provided to the customer, for user upon arrival of the delivery person of the good or service. The customer would then select an indication on their device confirming receipt of the good or service via the mobile device, thereby completing the transfer of funds and the transition. Optionally, the delivery person of the good or service may have an enabled mobile device as well. In this case the identifiers

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may be detected by the customer's device and reported to the server to confirm that the provider's delivery person was present. Further, the delivery person's device would be able to detect the broadcast devices identifier and reported to the server confirming the deliver person was in the correct area independently. Even further proximity confirmation may be achieved by the customer's device's transmitted identifier being detected by the delivery person's device and reported to the central server further confirming the physical proximity of the parties involved in the transaction. Upon arrival of the delivery person, the customer may be notified that the delivery person is looking for them, and has arrived. These cross confirmations would allow for the central server evidence to justify payments both in completed transactions and in disputed or failed transactions. Further, the delivery person may receive a picture of the requesting customer. Once the customer is found, the delivery person would confirm the delivery of the good or service to the customer via the user input on their mobile device, and that confirmation being reported to the central server. The customer would have the option to report confirmation or denial of the reception of the product or service as well, as in the last example.

In another embodiment, the merchant device may be fixed, but have an internet connection (wireless or otherwise). Further, in some embodiments the merchant may be an automated device such as a vending machine. In such a model, a customer may use their enabled cell phone to purchase an item such as a beverage from the machine without the need to insert currency into the machine. This would be accomplished by the customer's cell phone detecting the vending machine transmission of the identifier or visa-versa. Following the detection of either the customer's identifier by the vending machine, or the customer detecting the vending machine identifier, the respective device would notify the server, who intern would provide notification (assuming the account settings allow for notification) to the potential customer via their device. Assuming the customer selects to purchase an item from the vending machine using their account associated with their device, the customer may be presented a menu as in the example above. The customer may further be presented information to ensure the identity of the vending machine, such as a description of the machine, a machine identification number,

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or a (most likely) a picture of the machine where it is located. The customer would confirm this is the machine they are interfacing with, and select to pay via their account. The customer may in one model select the item to dispense on their phone, or they may simply select to provide payment to the machine allowing them to make the selection manually as is the typical mode of operation today. The vending machine would interact with the server via it's internet connection, and participate in the transaction in a manor similar to the mode described above allowing for step by step conformations as previously described.

Electronic opinion polling, tied to a known location.

In a much simpler example, such a capability might be used to tie a survey to a known location in such a way as to provide an e-coupon to the survey taker on their device in return for completion of the survey. Alternatively, this type of interaction would enable a very large crowd to interact with a Jumbo-Tron like display to provide input to polls or to participate in group activities. Users at different locations in a audience may form teams and interact with other teams for group activities.

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Key Concepts to protect:

Top level Key Concepts:

- One device transmitting a wireless identifier using a wireless protocol capable of peer to peer communication
- The wireless identifier being associated with a specific account on a server connected to the internet
- A second device receiving the wireless identifier
- The second device capable of communicating with the server over an internet connection
- The second device requesting information from the service associated with the first identifier
    - The second device having a second identifier associated with a second account on the server
    - The server providing different amounts of information related to the first account based on the parameters associated with one or both of the first and second accounts
- The identifiers associated with the accounts being updated such that the identifiers would no longer recognized as being associated with specific accounts without past or current interaction with the server
- Using one or more of Cellular network timing information, and information form the central server to coordinate the broadcast and search times amongst the devices. (to reduce power and resource consumption)

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More Detailed Key Concepts to protect

1) A device capable of operating two wireless protocols simultaneously, utilizing a first wireless protocol in the device to detect the proximity of another wireless device and the second wireless protocol to communicate with a remote server, where:

    a. One or more of the devices are mobile devices
    b. Where the first wireless protocol is a local, or personal area network wireless protocol such as 802.11, Bluetooth, UWB or other local connectivity protocol
    c. Where the first wireless capability is re-purposed using a modified or enhanced protocol for
        i. Advertising the presence of the devices or,
        ii. Detecting the presence of another device
    d. Where the method of detecting or advertising the presence of another device utilizing the modified protocol involves embedding or detecting messaging in the standard based broadcasts from the standards based wireless modem, where the standards based protocol is based on, related to, or otherwise derived from IEEE802.11, Bluetooth
    e. Utilizing a wireless wide area data link from one or more of the wireless devices to:
        i. Connect to a central server
        ii. Perform user authorization functions
        iii. Perform download of information associated with account identifiers utilizing the short range wireless capability
        iv. Request forwarding of messages / packets to the other active account
    f. Utilizing the messaging with a mobile proximity based social networking capability
        i. The messaging being performed via the WWAN

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g. The server providing a centrally assigned user identity, with relationship brokering or identification capability

h.

2) A central serving capability to mobile devices utilizing a wireless WAN connection to provide and exchange information between one or more application on one or more wireless devices and the central server

- where the information passed to the central server is collected by one wireless device from another wireless device via a separate local wireless reception from the other wireless device
- where the separate local wireless reception from the second wireless device contains information directly assigned by, derived from, or known to the central server associated with the identity of the second wireless device.
- Where this identity is related to certain information and preferences of an account holder associated with an application operating on the second wireless device
- Where this application is operating on both wireless devices
- Where the application operating on the first device also provides it's own identifying information to the central server as well as detected identifiers from devices with applications on them.
- The central server containing the account information registered to the applications running on each wireless device
- Where the preferences associated with the account information also contains policies related to the disclosure of one account's stored information to other accounts and hence to their application on their devises
- These policies including a classification of other accounts each classification having different policies some of these policies being:
  - no not allow notification of my presence
  - allow notification of my presence

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- disclose my name/ do not disclose my name
- disclose age / do not disclose age
- disclose personal details
- allow interaction such as
    - chat
    - file exchange
    - photo push
    - Voip
    - Voip push
    - Invitations to engage in shared applications such as games
        - Games may be networked trivia games and the like
        - Using other resources on the device such as an accelerometer to play active games link ping pong or other multi player games using either the WWAN or more desirably the local wireless link to perform the inter-device interaction.
- Performing anonymous interaction
- Where an application running on each device performs point of sale transitions coordinated via the central server, over the WWAN, utilizing user input on each device as confirmation of successive steps in the transition.
    - Further, where at least one of the confirmation steps additionally involves displaying an identifying picture related to one of the devices, on the other device
    - Additionally the server performing an authorization for the transition to a third party
    - Additionally, the server providing a participant confidence indication to one of the participant in the transaction to the other participant in the transaction
        - Where the participant confidence indication is related to past transactions for the participant

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- Where the participant confidence is related to ratings by other past participants of the current participant
- A device interacting with a point of sale device to associate an itemized list of items with a detected second device
- The service performing a confirmation with the application on the second device requiring user input that the inventory list is correct
- The server storing the information related to the second devices detected account identity and inventory in a database for later use

3) A device in the present invention with a wireless capability with no WWAN capability, but only with the ability to broadcast a unique identifier.

- The server having the broadcasts device's details. And when the first device provides these detail to the server, authorized and current information about the broadcast device are provided to the first wireless device.
- Where this information includes advertising information or information related to "e-coupons" for special offers for products or services
  - Where the content of the e-coupons are customized based on the identity of the requesting device or account holder
    - Where the content is further customized based on other information known by the server related to the user's account
    - Where the other information is related to the user's past purchasing practices or previous requests
- A mobile device, upon detecting a broadcast device and if enabled to do so, will report that broadcast Id to the server over a WWAN, and retrieve the current content from the server associated with that device and:
  - Display it to the user on their device

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- Execute instructions associated with the information retrieved from the server.

- Pre-authorizing difference classes of broadcast devices such that different levels of authentication are required
- One of the levels of authentication being no authentication

4) A good or service delivery model utilizing the above described broadcast device, placed in a known location,
   a. The mobile device detecting the fixed device's identifier via the WPAM/WLAN
   b. The mobile device reporting this identifier and passing an identifier associated with itself, or the account associated with the user utilizing the device.
   c. The server determining that the detected broadcast device is associated with the broadcast device with a known location
   d. The server further determining that the identifier is associated with a service, and further associated with an account or that service
   e. The server retrieving content associated with the service provider's account and providing that content to the application on the requesting mobile device.
   f. Where that content may be a list of items for sale, services for sale, a opinion pole, food menu, or other menu style content which allows for user selection of items. This could be implemented in java code, xml, simple text, or other for example optionally including active code elements.
   g. The application on the mobile device displaying the content to the user display with the itemized list of goods, services, or other selection items.

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h. A user providing selection of one or more of the items, and confirming they wish to purchase said items, and take delivery at or near the location of the fixed broadcast device
i. The server facilitating the purchasing of the goods or services from the merchant's account and the customer's account, and providing confirmation to each. Such confirmation including an electronic receipt provided to the customer, for user upon arrival of the deliverer of the good to or service.
j. The customer confirming receipt of the good or service via the mobile device, thereby completing the transfer of funds and the transition
k. The deliverer of the good or service optionally having a mobile device supporting the current invention,
    i. such that identifiers from that device may be detected by the customers device and reported to the server to confirm that the provider's delivery person was present
    ii. such that the broadcast devices identifier is detected by the delivery person's mobile device and reported to the server confirming the deliver person was in the correct area
    iii. such that the customer's device's transmitted identifier is detected by the delivery persons device and reported to the central server further confirming the physical proximity of the parties involved in the transaction
    iv. The delivery person confirming the delivery of the good or service to the customer via the user input on their mobile device, and that confirmation being reported to the central server.

5) Generating an application to operate at the application layer, which interfaces to a standard driver interface or using a proprietary modified driver on a device

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- Using wi-fi 802.11 to perform the WLAN operation, but in a modified protocol.
- Where that device is a 802.11 device
- Using Bluetooth to perform the local WLAN connection, where that device is a Bluetooth device
- Where the interface is an NDIS driver or the like
- Using the fields in the NDIS driver in a non-standard way such as using the SSID of the beacons to broadcast, or advertize the presence of your associated account identifier registered to the central server
- Using 1xEVDO, HSDPA, GPRS, EDGE or the like for the WWAN interface.
- An NDIS driver interfaced to an application which will put a Bluetooth or Wi-Fi or other device into a mode in which it will broadcast it's identity, where that identity contains an account or device identifier (know to the central server), and report back all other broadcasted identifiers from other devices.
- The application then provide the reported identifiers the server, which will make decisions regarding a users interest in these detected identifiers, and policy regard privacy other identifiers.
    - The decision process may be based on priority of the identifier, the class an identifier belongs to, a list the identifier is, or is not including on, other functions currently being performed on the device such as:
        - Music being played
        - Video being played
        - A phone conversation currently being engaged in
        - The time of day
    - Based on the result of the action function, sending at least one detected identifier to the network, potentially with additional information from the action function, and retrieving information

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back from the server related to that identifiers' account information stored on that server.

- The server receiving a request from a device's application, with a detected identifier
    - The server examining both the requesting and the requested identifier's identity and making a policy decision regarding the release of the requested identifiers information related to their account
    - The decision may be:
        - Implicit: always provide the information
        - Explicit: only provide the information to a specific list of other identifiers
        - Limited: only specific information may be released to specific accounts, or classes of accounts
    - The server in some cases providing a continuously or periodically changing account or device identifier to a specific application on a device to enhance the privacy of the identity of that device
        - The changing of the identifier may be effected by a rule based generation local to the application, or may be downloaded from the server directly
        - The update of the identifier being synchronized to such that it is coordinated with predetermined scanning and broadcasting periods allowing for a known update boundary.
- The information provided from the server to the application resident on the device may include:
    - The identity of the user with the specified account identifier
    - Applications that user / device is able to use
    - Capabilities of that user / device

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- Actual applications which are shared with other users, for use with that user in a joint manor

6) Using the mobile device's time of day derived from the network or other reference synchronize the PAN/WLAN discovery and advertisement times to save battery life. Doing this in a synchronized way among multiple devices. Coordinating the timing information utilizing the WWAN and a central server available commonly to the devices.

   - o Synchronize the heartbeats and or ping / echo timing to save power from WWAN network parameters obtained for the server
   - o Coordinating any identifier updates to this same timing source

Business Processes to protect:

- Using the above described application to push content to the user's device.
- Providing paid advertising content to a mobile device based on a request from that device for the information associated with a detected identifier, which is associated with a broadcast device.

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Electronic Patent Application Fee Transmittal

Application Number:	15271410
Filing Date:	21-Sep-2016
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor
Filer:	David J. Thibodeau
Attorney Docket Number:	111054-0001U4C7

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	100	100
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	650	650
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**2940**

Exhibit D Claim 1 feature	Context in U.S. Provisonal Patent Application 61/095,359 filed September 9, 2008	Citation to the supporting text of the '359 Application
determining that at least one beacon transmitter device associated the proximity beacon service is in proximity to the wireless device by utilizing the identifier related information	wireless device receives beacon transmissions the beacons include identifiers (e.g., an SSID) the identifiers are used to determine which devices (or related entities such as other users) are in proximity	As an example of the overall process, a detected identifier may be· relevant to the receiving device if the user associated with the detected identifier is listed in a "friends list" for the owner of the receiving device. If the identifiers for theindividuals within the friends list have been passed to the device, the action function may make this determination. In the preferred embodiment, the server would determine the identity and the relevance of the detected identifiers, and the action function would work to reduce frequency of requests to the server.(p. 3 last par.) For example, when the server receives an inquiry from a device with a list of identifiers, it may only respond with infomation which the users associated with the identifiers are on that device's friends list AND on each of the individual's friend lists as well. These friends' lists and policies would be stored within an account which allows r disclose of a user's presence only to individuals on this lis (p.4 third par.)
identifier related information associated with a proximity beacon service is received from a server using a first radio,	a device identifier is detected by a wireless device; and the detected identifier is sent to the server the server then responds with information related to those detected identifers; the wireless device receives this response from the server via a first radio (Figure 1, the WWAN link)	When a receiving device detects one or more identifier, it will use the WWAN link to communicate with the central server. The device will pass along a list of currently detected identifiers and request that the server provide the device with the information related to any identifier that is 1) relevant to that device, and 2) that device is authorized to receive. (p. 3, second par.) As the server contains the personal information, and performs the association of an account with a particular identifier, it can inherently enforce the security of the policies. In this way, the central server controls the process of passing information related to an account to a particular requesting device. (p. 4, last two lines, and p. 5, first two lines)
the proximity beacon transmissions are received using a second radio,	the wireless device receives beacon transmissions (e.g., the IBSS beacons) from other nearby wireless devices using a second radio the beacons are received via the second radio (Figure 1, the Bluetooth connection)	Title 2: Wireless beacon device for transmitting a wireless identifier to facilitate proximity detection (p. 1 l. 11-12) Using Bluetooth to perform the local WLAN connection, where that device is a Bluetooth device Where the interface is an NDIS driver or the like, Using the fields in the NDIS driver in a non-standard way such as using the SSID of the beacons to broadcast, or advertize the presence of associated account identifier gistered to the central server (p.22, l.3-9) An NDIS driver interfaced to an application which will put a Bluetooth or Wi-Fi or other device into a mode in which it will broadcast it's identity, where that identity contains an account or device identier (know to the central server), and report back all other broadcasted identifiers om other devices. The application then provide the reported identifiers the server, which will make decisions regarding a users interest in these detected identifiers, and policy regard privacy other identifiers. (p. 22 l. 12-16) ... the short range wireless is ONLY used for the detection process, and to advertise a device's presence by transmitting an identifier, or receiving identifiers from other devices. (p.2 last par.)
the proximity beacon information is derived from the proximity beacon transmissions, and	the beacons are processed to derive further information about the proximity beacon transmissions (e.g., the beacon transmissions include information related to an associated identifier)	Using the fields in the NDIS driver in a non-standard way such as using the SSID of the beacons to broadcast, or advertize the presence of your associated account identifier registered to the central server (p.22 l. 7-9)
a proximity of a device associated with the proximity beacon service is determined by the mobile device using the identifier related information	"identifier related informaton" is the information returned from the server. That information is then used as part of a further determination that another device is in proximity (e.g., where a mobile application called an "action function" is given a friends list)	a detected identifier may be· relevant to the receiving device if the user associated with the detected identifier is listed in a "friends list" for the owner of the receiving device. If the identifiers for the individuals within the friends list have been passed to the device, the action function may make this determination. (p. 3, las par.) For example, when the server receives an inquiry from a device with a list of identifiers, it may only respond with information which the users associated with the identifirrs are on that device's friends list AND on each of the individual's friend lists as well. These friends' lists and policies would be stored within an account which allows to disclose of a user's presence only to individuals on this list.(p. 4, third par.)

EXHIBIT E Claim 31 feature	Context in U.S. Patent Application 12/364,828 filed February 3, 2009	Citation to the text of the '828 Application
communicating between a mobile device and one or more servers and receiving, at the mobile device, identifier related information, using a first radio;	the wireless device communicates with a server via a first radio (Fig. 1, the WWAN link 103) "detected identifiers are sent to the server (Fig. 7, step 705); the server then responds with "identifier related informaton" (Fig. 7 step 706).	a given device 106, 108 ... uses the wide area wireless network connections 103, 104 such as IS-2000, WCDMA, GPRS, EDGE, LTE, Wi-Max (IEEE802.16), or the like to perform communications to central server 100 (p.11, l.10-12) The device identifier associated with Device 2 (703), DI2 is thereby detected. Device 1 (702) then transmits an inquiry message 705 using the WWAN (cellular data link such as GPRS, EDGE, 1×EV-DO, IS-2000, Wi-Max, LTE, or the like) to the server 701 inquiring if information related to the account and entity associated with DI2 is relevant, and available to the entity EI1 associated with Device 1 (702). ... "The server having determined that EI1 wants to be notified and is allowed to be notified responds in Step 706 to Device 1 (702) with a message indicating the DI2 is relevant to EI1 and including information such as Entity Identifier EI2 and associated details." (p.18, l.9-26)
receiving, at the mobile device using a second radio, proximity beacon transmissions from one or more beacon transmitter devices	the wireless device receives beacon transmissions (e.g., the IBSS beacons) from the other nearby wireless devices using a second radio (e.g., Fig. 1, the short range wireless connection 107)	"a given device 106, 108 uses a short range wireless link 107 such as a Bluetooth (IEEE802.15.1) or Wi-Fi (IEEE802.11) link to detect the presence of other devices such as device 108" (p.11, l.6-8) "In an IBSS all devices participating or advertising their interest in participating in an ad-hoc network transmit identifiers called beacons" (p.17, l 10-12) a wireless device receives beacon transmissions from other wireless devices (Fig. 6 items 604, 605, 606)
deriving, at the mobile device, proximity beacon information from the proximity beacon transmissions; and	the beacons are processed to derive further information about the proximity beacon transmissions (e.g., the beacon transmissions include an associated identifier (step 704))	"..one or more of the BSSID and the SSID may be used as the identifier. (p.17, l.18-22). "delivery of the identifier in an IBSS beacon..." (p.17, l.22-23)
determining, at the mobile device, that at least one beacon transmitter device associated with the proximity beacon service is in proximity to the mobile device by utilizing the identifier related information;	the identifiers are then used to determine which devices (or related entities or objects) in proximity are have relevance (Fig. 7 step 706 and 707) That information returned from the server then further processed by the mobile device (e.g., step 707 where a user application notifies the user that an entity associated with device 2 is in proximity)	"The server having determined that EI1 wants to be notified and is allowed to be notified responds in Step 706 to Device 1 (702) with a message indicating the DI2 is relevant to EI1 and including information such as Entity Identifier EI2 and associated details. A user application on Device 1 (702) notifies the user that the entity associated with Device 2 is in proximity in step 707. (p.18, l.18-26)
wherein each of the proximity beacon transmissions comprises a MACaddress, a unique identifier, and proximity beacon service identifier;	The beacons contain a MAC address, unique identifier, and proximity beacon information	"These beacons contain the MAC address of the transmitting network adapter, the basic service set identifier (BSSID), and ad-hoc network name or service set identity (SSID)" (p.12-14); "...one or more of the BSSID and the SSID may be used as the identifier." (p.17,l.21-22)
wherein the proximity beacon service identifier is the same for two or more proximity beacon transmissions associated with the proximity beacon service	the beacons (e.g., IBSS beacons) and the beacon transmissions include identifiers (e.g., a BSSID or SSID) the identifiers may be the same for different devices participating in the same particular service	..one or both the BSSID and the SSID may be used to indicate those particular beacons are associatec with a service (p. 17, l 20-21) In the preferred embodiment, where the MAC address is used for the identifier, all the devices participating would likely have the same network name and SSID" (p.17 l.25-27)

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

FEE TRANSMITTAL FOR PATENT APPLICATIONS	Attorney Docket Number	4394.1005-000
	Application Number	
	First Named Inventor	James Arthur Proctor, Jr.

CLAIM CALCULATION (includes any preliminary amendment)

CLAIMS	(1) FOR	(2) NUMBER FILED		(3) NUMBER EXTRA	(4) RATE		(5) CALCULATIONS	
	TOTAL CLAIMS (37 CFR 1.16(c) or (j))	26	– 20 =	6	X $ 52 =	X $ 26 =	$	156
	INDEPENDENT CLAIMS (37 CFR 1.16(b) or (i))	2	– 3 =	0	X$220 =	X $110 =	$	0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))				+ $390 =	+ $195 =	$	
		BASIC FEE Paper or Electronic Filing - Large Entity Paper Filing - Small Entity Electronic filing - Small Entity					$	82
	APPLICATION SIZE FEE $270 for each add'l 50 sheets exceeding 100 **IF FILED ELECTRONICALLY:** Total No. Pages/Sheets X .75 (If a fraction remains, add 1 page to the total thereby including the fraction). Using the total after calculation, the fee is $270 for each additional 50 sheets over 100.	Specification: 52 Pages Drawings: 14 Sheets Sequence Listing: 0 pages Total No. Pages/Sheets 66					$	0
		SEARCH FEE					$	270
		EXAMINATION FEE					$	110
	Surcharge - Late Filing of Declaration or Filing Fees (37 CFR 1.16(f)) =						$	
	Petition for Extension of Time Fee (37 CFR 1.17) =						$	
	Petition to Make Special Under 37 C.F.R. 1.102(c)(1)]						$	
	Assignment Recordation Fee = (only when filed with application)						$	
	TOTAL =						$	618.00

1. Small entity status:
   - a. ☒ A small entity statement is enclosed.
   - b. ☐ A small entity statement was filed in the prior non-provisional application and such status is still proper and desired.
   - c. ☐ Is no longer claimed.
2. ☒ Please charge any deficiency or credit any overpayment in the fees that may be due in this matter to Deposit Account No. 08-0380.
3. ☐ A check is enclosed for **$** ☒ Please charge **$618.00** to Deposit Account No. 08-0380.
4. ☐ Other: _____

Signature	/David J. Thibodeau, Jr., Reg. No. 31,671/	Date	February 3, 2009
Submitted by Typed or Printed Name	David J. Thibodeau, Jr.	Reg. Number	31,671

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: James Arthur Proctor, Jr. and James Arthur Proctor, III

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Information Disclosure Statement is submitted:

☒ under 37 CFR 1.97(b), or
(Within any one of the following time periods: three months of filing national application (other than a CPA) or date of entry of the national stage in an international application; or before the mailing date of a first office action on the merits; or before the mailing of a first office action after the filing of a Request for Continued Examination).

☐ under 37 CFR 1.97(c) together with either:
- ☐ a Statement under 37 CFR 1.97(e), as checked below, or
- ☐ a $180.00 fee under 37 CFR 1.17(p), or

(After the 37 CFR 1.97(b) time period, but before any of a final action, notice of allowance, or an action that closes prosecution, whichever occurs first)

☐ under 37 CFR 1.97(d) together with:
- ☐ a Statement under 37 CFR 1.97(e), as checked below, and
- ☐ a $180.00 fee under 37 CFR 1.17(p), or

(Filed after final action, notice of allowance, whichever occurs first, or if prosecution otherwise closes, but on or before payment of the issue fee)

☐ under 37 CFR 1.97(i):
Applicant requests that the IDS and cited reference(s) be placed in the application file.
(Filed after payment of issue fee)

Statement Under 37 CFR 1.97(e)

☐ Each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement; or

☐ No item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned, after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

Statement Under 37 CFR 1.704(d) (Patent Term Adjustment)
Applies to original applications (other than design) filed on or after May 29, 2000

☐ Each item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the Information Disclosure Statement.

☒ Enclosed herewith is a Listing of References:

- ☐ Copies of the cited references are enclosed except as indicated below.
- ☒ Copies of issued U.S. patents and published U.S. applications are not required and are not being provided.
- ☐ Copies of the cited references submitted with an Information Disclosure Statement in prior application, U.S. Application No. [ ], to which priority under 35 U.S.C. 120 is claimed, are not required under 37 CFR 1.98(d)(1) and (2) and are thus not provided.

☐ The listed references were cited in the enclosed Search Report in counterpart foreign application [add application number], which is listed in the attached Listing of References.

☐ The "concise explanation" requirement (non-English references) for reference(s) [ ] under 37 CFR 1.98(a)(3) is satisfied by:

- ☐ the explanation provided on the attached sheet.
- ☐ the explanation provided in the Specification.
- ☐ submission of the enclosed International Search Report.
- ☐ submission of the enclosed English-language version of a foreign Search Report and/or foreign Office Action.
- ☐ the enclosed English language abstract.

☐ Applicant requests that the following non-published pending applications be considered:
(Affix a label or apply the stamp "Non-Published IDS Reference - Do Not Scan" to the front of each unpublished pending appl'n.)

U.S. Patent Application No. [ ], by [inventor(s)], filed [ ], Docket No.: [ ]

U.S. Patent Application No. [ ], by [inventor(s)], filed [ ], Docket No.: [ ]

U.S. Patent Application No. [ ], by [inventor(s)], filed [ ], Docket No.: [ ]

☐ A copy of each above-cited application, including the current claims, is enclosed, except any application filed on or after June 30, 2003, which has been scanned into the PTO's Image File Wrapper (IFW) system and is available to the examiner.

☐ A copy of each above-cited application, including the current claims, is enclosed, except those entered in prior application, U.S. Application No. [ ], to which priority under 35 U.S.C. 120 is claimed.

It is requested that the information disclosed herein be made of record in this application.

Method of payment:

☐ A check for the fee noted above is enclosed, or the fee has been included in the check with the accompanying Reply.

☐ Please charge Deposit Account 08-0380 in the amount of $[ ].

☒ Please charge any deficiency in fees and credit any overpayment to Deposit Account 08-0380.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /David J. Thibodeau, Jr., Reg. No. 31,671/
David J. Thibodeau, Jr.
Registration No. 31,671
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
Dated: February 3, 2009

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor, Jr.
Filer:	David J. Thibodeau/Nicole Isabelle
Attorney Docket Number:	4394.1005-000

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Claims in excess of 20	2202	6	26	156
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**618**

Electronic Acknowledgement Receipt

EFS ID:	4725905
Application Number:	12364828
International Application Number:	
Confirmation Number:	4798
Title of Invention:	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED
First Named Inventor/Applicant Name:	James Arthur Proctor, Jr.
Customer Number:	21005
Filer:	David J. Thibodeau/Nicole Isabelle
Filer Authorized By:	David J. Thibodeau
Attorney Docket Number:	4394.1005-000
Receipt Date:	03-FEB-2009
Filing Date:	
Time Stamp:	15:48:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$618
RAM confirmation Number	1041
Deposit Account	080380
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	43941005000TRANS.pdf	121932 2f5c8d5add0e16fd3fa2f460316cb7472ddfcef5	no	1
Warnings:					
Information:					
2		43941005000SPEC.pdf	214957 87faf9aad72cf59c9c58b851e5fe37d678bd3984	yes	52

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	41
	Claims	42	51
	Abstract	52	52

Warnings:					
Information:					
3	Drawings-only black and white line drawings	43941005000DRWS.pdf	789949 7e5da5f99226b2f72912831e07c7074833d5e853	no	14
Warnings:					
Information:					
4	Miscellaneous Incoming Letter	43941005000SES.PDF	123721 f7619b0bb1ed2b7b50675fe821daa103a0bb1562	no	1
Warnings:					
Information:					
5	Oath or Declaration filed	43941005000DEC.pdf	246018 33526afbc7afffc9bd1df1e0df6bc275afbf088d	no	2
Warnings:					
Information:					
6	Petition to make special based on Age/ Health	43941005000PETITION.pdf	42615 066fa43eb161b91343ae13bb305ce202be00bbf5	no	1
Warnings:					
Information:					
7	Fee Worksheet (PTO-06)	43941005000FEETRANS.pdf	65195 54a14a39d8bb03d154ffe00082bc0ffcb4ea6946	no	1

Warnings:					
Information:					
8	Information Disclosure Statement Letter	43941005000IDS.pdf	94906 ff05706d948b5ae8d4b3193f24eb8b6174858ae4	no	3
Warnings:					
Information:					
9	Information Disclosure Statement (IDS) Filed (SB/08)	43941005000LOR.pdf	73027 3e9bc14191bb665403a81130aedd79c5aa952d64	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
10	Fee Worksheet (PTO-06)	fee-info.pdf	37314 9e51e4cfd4aae43c5680e8a176f3d0fb60a55cfc	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1809634		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

UTILITY PATENT APPLICATION TRANSMITTAL *(Only for new nonprovisional applications under 37 CFR 1.53(b))*	Attorney Docket No.	4394.1005-000
	First Named Inventor	James Arthur Proctor, Jr.
	Express Mail Label No.	

Title of Invention	EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED		
Name of Assignee for Publication Purposes		City and State for Publication Purposes	

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: **Commissioner for Patents**
P.O. Box 1450
Alexandria, VA 22313-1450

1. ☒ Fee Transmittal Form
2. ☒ Specification **Total Pages 52**
   Both the claims and the abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
3. ☒ Drawing(s) (35 U.S.C. 113) **Total Sheets 14**
   ☒ Fig. of the Drawings for Publication **10**
   ☐ No Figure to be Published
4. ☒ Oath or Declaration **Total Pages 2**
   a. ☒ Newly executed (original or copy)
   b. ☐ Copy from a prior application (37 C.F.R. 1.63(d))
   (for continuation/divisional with Box 18 completed)
   i. ☐ DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
5. ☐ CD-ROM or CD-R in duplicate ☐ Text file attached herewith
   Large table or Computer Program *(Appendix)*
6. ☐ Nucleotide and/or Amino Acid Sequence Submission
   (if applicable, items a.-c. are required)
   a. ☐ Computer Readable Form (CRF)
   i. ☐ Computer Readable Form (CRF)
   ii. ☐ Transfer Request (37 CFR 1.821(e))
   b. ☐ Specification Sequence Listing on:
   i. ☐ CD-ROM or CD-R (2 copies); or
   ii. ☐ Text file attached herewith *(electronic filing)*
   iii. ☐ Paper [ ] **Pages**
   c. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☐ Assignment Papers *(Do not submit when e-filing application)*
8. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
   (when there is an assignee)
9. ☐ English Translation Document *(if applicable)*
10. ☒ Information Disclosure Statement
    (Listing of References *(formerly PTO-1449)*)
    ☐ Copies of foreign patent docs., publications, and other info.
11. ☐ Preliminary Amendment
12. ☐ Return Receipt Postcard *(Check this box if going by express mail)*
13a. ☐ A Foreign Priority Claim under 35 U.S.C. § 119 or 365
    i. ☐ is made to [country], [app. #], filed [ ]
    ii. ☐ is presented in the attached
    ☐ Specification ☐ Preliminary Amendment
    ☐ Separate Sheet ☐ Declaration
13b. ☐ A Certified Copy of each Priority Document
    i. ☐ is enclosed
    ii. ☐ was filed in U.S. Application No. [ ]
14. ☐ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i).
    Applicant must attach form PTO/SB/35 or equivalent.
15. ☐ Remarks [/ Change of Correspondence Address]
16. ☒ Small Entity Statement(s)
17. ☒ Other: Petition to Make Special under 37 C.F.R.§1.102(c)(1)

18. **If a CONTINUING APPLICATION,** check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title:
☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.:
Prior application information: Examiner: Group Art Unit:

The entire disclosure of the prior application is considered a part of the disclosure of the accompanying application and is hereby incorporated by reference. ***(Add standard Related Applications section with incorporation by reference to specification or update same)***

19. **CORRESPONDENCE ADDRESS**

NAME	Customer No. 021005				
	HAMILTON, BROOK, SMITH & REYNOLDS, P.C.				
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Signature	/David J. Thibodeau, Jr., Reg. No. 31,671/	Date	February 3, 2009
Submitted by Typed or Printed Name	David J. Thibodeau, Jr.	Reg. Number	31,671

864994_1

Inventor(s): James Arthur Proctor, Jr. and James Arthur Proctor, III

Attorney's Docket No.: 4394.1005-000

EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

RELATED APPLICATION(S)

This application claims the benefit of U.S. Provisional Application No. 61/095,001, entitled "Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios", filed on September 8, 2008 and U.S. Provisional Application No. 61/095,359, entitled "Central Server Enabled Proximity Based Applications Utilizing Both Short Range, and Wide Area Wireless Radios", filed on September 9, 2008. The entire teachings of the above applications are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Several key internet applications have become increasingly popular in recent years. A current trend in internet usage involves social networking. Social networking involves making use of internet services which allow for the interaction and sharing of information between users of service.

Recently, mobile wireless communication standards have progressed to the point where relatively high speed data connections are possible to the phone over the wireless wide area network (WWAN). These standards include 1xEV-DO, HSDPA, EDGE, GPRS, Wi-Max (IEEE802.16e) and the like. Some social networking sites have included interfaces to their web sites optimized to make use of such high data rate mobile services for use on a mobile phone. These services are referred to as mobile social networking. For the most part, these services are simply versions of the standard

social networking, redesigned to be usable on a mobile phone, adding little in the way of increased capability.

With the common capability of global positioning system (GPS) receivers being incorporated into phones, some additional capabilities have been added to some mobile social networking interfaces by incorporating location information for the user and that of the individual they interact with.

These services are utilizing GPS to determine the location of one mobile wireless user and to another to facilitate mobile social networking. An example of an existing application utilizing this approach is Loopt (www.loopt.com), which coordinates location based social interaction. One problem with GPS based mobile application involves the GPS receiver not receiving sufficient signal strength in many indoor locations. As a result these enhanced capabilities have typically been targeted at either navigation to a specified location, or as in the case with Loopt, allowing a user to see where their friends are located in a relatively large geographic location, on a map.

Another popular application for the internet is electronic commerce. Just as with social network, e-commerce services have provided interfaces optimized for use on mobile phones which provide basically the same capabilities as the standard interfaces. Very little location or proximity information has been used to enhance the mobile e-commerce experience.

Some attempts have been made to utilize RFID (Radio Frequency Identification) chips to perform mobile payments. This approach requires the additional hardware on a phone in the form of a RFID chip, or other specialized features. As a result, mobile electronic commerce has mostly allowed users to perform transaction with a remote party, such as purchasing an item on ebay (www.ebay.com). To date mobile electronic payments for individuals who are in close proximity to each other have not been practical for a number of reasons. First there is a need for the individuals to have a third trusted party to help facilitate the electronic transaction. Secondly, there needs to be a

convenient, electronically secure, personally secure and anonymous method for each of the individuals to specify the party with which they wish to engage in a transaction. Thirdly, there is a need to cross validate the identities of the individuals engaged in the transaction. Finally, this method must work in indoors locations.

Most mobile phones on the market today support at least two wireless standards; one for the cellular wireless wide area network connection (WWAN) and one for a wireless personal or local area network (WPAN, WLAN). The cellular connection or WWAN is utilized for voice and data and can adhere to many different standards such as CDMA (IS-2000), GSM, W-CDMA, WiMax, etc.. The WPAN or WLAN connection is typically for short range communications and is often used for wireless hands free devices, such as headsets, peripherals, or higher speed internet connections. The typical standards used for the sort range wireless communications include Bluetooth, Wi-Fi, and in some cases Ultra-Wide-Band (UWB).

In another approach to mobile social networking some services have attempted to utilize short range wireless capabilities often available on phones such as IEEE802.11 (Wi-Fi) or Bluetooth to facilitate peer to peer communications. These are also referred to a MANETs or Mobile Ad-hoc Networks. These services typically consist of a software application operating on a mobile phone using peer to peer networks to facilitate communication between wireless devices. Examples of such existing applications include Mobile-Cheddar, Peer-2-Me, and Flobbi. Published US Patent application US 2008/0182591 A1 filed December 13, 2007 describes one such peer to peer approach. One issue with these approaches is that one can not communicate with a peer once the devices are no longer in proximity. A further disadvantage is that all information to be exchanged must be stored locally on each of the peer devices as the communication occurs directly between the two devices and any policy for the delivery of locally stored content is difficult to enforce without the potential for fraud such as spoofing identities between the peers. Such fraud may lead to concerns of personal safety or privacy allowing the identity of an individual to be determined when it is not desired. Further this peer to peer model is inadequate for

mobile electronic commerce in part due to the lack of an independent third party to facilitate the services required for a secure proximity based mobile electronic transaction as previously mentioned.

SUMMARY OF THE INVENTION

The present invention is generally concerned with facilitating the exchange of information and transactions between two entities associated with two wireless devices when the devices are in close proximity to each other utilizing both a short range and a long range wireless capability.

Preferred embodiments of the present invention are generally concerned with facilitating the exchange of information and transactions between two entities associated with two wireless devices when the devices are in close proximity to each other. In one embodiment, this can be accomplished by a first device using a first short range wireless capability to detect an identifier transmitted from a second device in proximity to the first device, ideally using existing short range radio communication standard capabilities such as Bluetooth (IEEE802.15.1-2002) or Wi-Fi (IEEE802.11). The detected identifier, being associated with the device, is also associated with an entity. Rather than directly exchanging application data flow between the two devices using the short range wireless capability, a second wireless capability then allows for one or more of the devices to communicate with a central server via the internet, and perform an exchange of application data flow. By using a central server to draw on stored information and content associated with the entity or entities, the server can broker the exchange of information between the entities and the devices. In a preferred embodiment, this exchange may be comprised of information stored on the server associated with a detected entity, and it may be comprised of information received from the detected device via the second wireless capability and facilitated by the server.

In addition, the server can also allow for a brokering service, ideally independent of the entities, to enable the application of policy based on the identity of

the two entities for the disclosure of stored information associated with the entities, the flow in information between the devices and the entities, and the enablement of procedures such as security verification between the entities.

Applications running on a device may also interact with the server to perform various functions, for example retrieving information associated with an entity or device, by utilizing a detected identifier. Such information may include stored content associated with the entity's account record such as music, pictures, links to social networking sites, instant messaging addresses, advertising content, and even executable scripts or application such as in AJAX. An example of such an application may include the detection of a device's identifier in a fixed location allowing for tour guide like information to be provided for that location.

As the server may be running applications which perform more function than just the retrieval of content, a pre-defined interaction process may also be applied by the server to the devices such as allowing the approval to share private content with the entity associated with the detected device. This process may eventually allow or disallow the sharing of information and to facilitate the interacting with another entity.

As a more complex example, in other embodiments, the devices may utilize the server as a third party to provide for new capabilities such as a secure three way e-commerce transaction between two entities. In this more complex process, the server may require confirmation of each party's identity with visual cross verification of the parties using pictures or other unique identifiers. The server may use this visual cross verification in conjunction with detecting that the individuals are in proximity with each other. The server may verify the proximity using GPS or using the peer to peer detection process in another embodiment. Further, the server may facilitate a process requiring each party to perform a step by step confirmation during the transaction including the stages of: the request for purchase, the payment, the receipt of goods and services, and the providing of payment receipt.

This differs from the approaches employed by prior art location aware mobile social networking techniques in that no GPS is needed to determine when one device is in proximity to another. Many wireless devices in use are not GPS-capable, and even when they are, GPS will often not operate indoors or where the GPS signal is weak. Using a peer to peer detection process to locate nearby devices allows for the operation of proximity detection indoors.

Preferred embodiments of the present invention can also differ from known peer to peer based social networking in that the information flow between the devices running the applications are over the wide area network via a central server, rather than carried over the peer to peer network itself. An example of this is a service called Flobbi, as discussed previously, where community members can identify each other via Bluetooth transmissions, then interact with chat. The messaging in this case is carried over Bluetooth itself. A distinction from such peer to peer approaches is the use of a central server to "broker" the transactions between peers, enhancing the ability to manage security and information disclosure. Such use allows for the opportunity to customize delivered content to include elements such as advertising or other content customized to the recipient based on additional information such as known personal purchasing history, or interests.

A further distinction of the preferred embodiment is the use of a central server to determine identities of detected peer devices, which additionally allows for secure and fraud resistant application of policies for the disclosure of information and content. An issue with the existing pure peer to peer approaches is that they are not capable of enforcing policy associated with the disclosure of information to unknown entities in a secure and fraud resistant manor. One reason for this is that information related to a user's device must be disclosed in the process of detection in the form of a static identifier. By the nature of the identifier, it must be static or peers would not be able to directly determine the identity of a friend over time with the information stored on their device. By using a central server, the system may coordinate the change of the identifiers from time to time such that the disclosure of an identifier by one device to

another does not compromise the identity of the device. In this case the identifier may be assigned from a central server and such server coordinate the identifier's change from time to time.

Reliance on a central server also allows the secure and fraud resistant application of disclosure policy. Such policy might include the verification of the identity of the party to which information (identity and presence for instance) or content (pictures of the account owner) is to be provided. Such verification is performed in an anonymous way such that in the process of verifying information associated with each party, no personal information is disclosed between the parties prior to satisfaction of some pre-set policy such as inclusion on a friend list or belonging to a specific group or organization. Another important policy required for such services would be the determination of any past negative feed back ratings by other past peers for behavior for the particular user to which the information is to be provided. An individual with significant poor ratings having detected a peer, may be denied access to personal information or even notification of arrival of the detected peer based on the server policy setting by the detected peer or the server in general.

A further distinction is to enable electronic payments for individuals who are in close proximity to each other. The central server can act as a third trusted party to help facilitate the electronic transaction between the individuals. Secondly, the server allows for a convenient, electronically secure, personally secure and anonymous method for each of the individuals to specify the party with which they wish to engage in a transaction. Thirdly, participants in a transaction can cross validate the identities of the individuals engaged in the transaction. Finally, because this method is proximity based it will also work indoors or in other situations where GPS location information is not available.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing will be apparent from the following more particular description of example embodiments of the invention, as illustrated in the accompanying drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating embodiments of the present invention.

Figure 1 is a block diagram of two mobile devices utilizing a preferred embodiment.

Figure 2 is a block diagram of a fixed broadcast device and a mobile device.

Figure 3 is a flow diagram of the operation of an application on the mobile devices.

Figure 4 is a message sequence chart showing the Bluetooth discovery process using in one embodiment.

Figure 5 is a message sequence chart showing the Bluetooth Remote Name Request Process.

Figure 6 is a message sequence chart showing the IBSS beacon process.

Figure 7 is a message sequence chart showing the interaction between the server and two devices performing a detection and entering a chat application.

Figure 8A is a message sequence chart showing an E-commerce example.

Figure 8B is a continued example message sequence chart showing an E-commerce example.

Figure 9 is a message sequence chart showing an example of a mobile device and a fixed broadcast device interaction.

Figure 10 is a flow diagram for the server processing associated with the detection process.

Figure 11 is an example individual account record stored in the server associated with an Entity.

Figure 12 illustrates a timing reference for intermittent active and dormant times.

Figure 13 shows a diagram of functional blocks associated with management of dynamically assigned device identifiers.

DETAILED DESCRIPTION OF THE INVENTION

A description of example embodiments of the invention follows.

The teachings of all patents, published applications and references cited herein are incorporated by reference in their entirety.

Figure 1 is a block diagram of two mobile devices utilizing a preferred embodiment.

Referring to Figure 1, a central server 100 is connected to devices 106 and 108 by an internet protocol (IP) based network, carried over a series of connections, at least one of which is a wireless connection. For example, the server 100 has a connection allowing IP based communications to a cellular network 102 using connection 101. The cellular network is connected to devices 106 and 108 by wide area wireless links 104 and 103 respectively, allowing for IP based communications between the devices (106 and 108) and the server 100.

Devices 106, 108 can be considered "client(s)" of the server 100. The clients 106, 108 and server 100 provide processing, storage, and input/output devices for executing wireless system protocols, interfaces, and application level programs according to the invention. Client devices 106, 108 can also be linked through various communications networks to other computing devices, including other client devices/processes and other server computer(s). Communications network(s) providing the connection 101 can typically be part of a remote access network, a global network (e.g., the Internet), a worldwide collection of computers, Local area or Wide area networks, and gateways that currently use respective protocols (TCP/IP, 3G Wireless, Bluetooth, etc.). Other electronic device/computer network architectures are suitable.

The internal structure of devices 106, 108 or server 100 includes one or more data processors (not shown in detail) that are well known in the art to include a system bus for data transfer among the other internal components of a computer system (e.g., processor, disk storage, memory, input/output ports, network ports, etc.). Attached to the bus are other input/output devices (e.g., keyboard, mouse, displays, printers, speakers, network interfaces, etc.). Network interfaces allow the computer to connect to various other devices attached to a network. Memory provides volatile storage for computer software instructions and data used to implement an embodiment of the present invention (e.g., applications programs and the like). Disk storage can provide non-volatile storage for computer software instructions and data used to implement an embodiment of the present invention.

In one embodiment, the invention may include a computer program product including a computer readable medium (e.g., a removable storage medium such as one or more DVD-ROM's, CD-ROM's, diskettes, tapes, etc.) that provides at least a portion of the software instructions for the invention system. Computer program product can be installed by any suitable software installation procedure, as is well known in the art. In another embodiment, at least a portion of the software instructions may also be downloaded over a cable, communication and/or wireless connection. In other embodiments, the invention programs are a computer program propagated signal

product 107 embodied on a propagated signal on a propagation medium (e.g., a radio wave, an infrared wave, a laser wave, a sound wave, or an electrical wave propagated over a global network such as the Internet, or other network(s)). Such carrier medium or signals provide at least a portion of the software instructions for the present invention.

More particularly, a given device 106, 108 uses a short range wireless link 107 such as a Bluetooth (IEEE802.15.1) or Wi-Fi (IEEE802.11) link to detect the presence of other devices such as device 108, and uses the wide area wireless network connections 103, 104 such as IS-2000, WCDMA, GPRS, EDGE, LTE, Wi-Max (IEEE802.16), or the like to perform communications to central server 100, and to perform the actual substantive communications between the wireless devices 106 and 108. Device 108 typically uses the short range wireless link 107 and wide area wireless link 103 in a similar manner to locate and initiate communicate with device 106. One distinction relative to prior art is that the short range wireless 107 is only used for the detection process, or to advertise a device's presence. In this embodiment, specific information called "wireless identifier" or simply "identify" (described in more detail below) is passed between devices 106 and 108 over the short range link 107. By transmitting a wireless identifier using the short range Wi-Fi, Bluetooth or other short range wireless link 107 and receiving wireless identifiers from other devices, this short range wireless link 107 will allow for a proximity detection process.

The support for IP based networking is standard for WWAN or 3G connections such as 1xEV-DO or HSPA, and as a result, communication between one device to another using the WWAN is currently supported in many devices with no modification. The use of simple detection of one or more identifiers requires significantly less resources in a phone than performing a complete peer to peer based communication network protocol, which accommodates dynamic configuration of nodes being added and dropped continuously. It is noted that the IP address on the WWAN interface is not location dependent in the present embodiment, but is addressing approaches are location dependent when true Peer to Peer topologies are used. The present embodiment has the

advantage that communication between two devices may continue after the devices have left proximity of each other, but in the same manner as they had been communicating previously. As a result, a user who detects a short range transmission of an identifier, then begins a conversation or some other interaction with that device via the wireless wide area network may continue that conversation even in the case where the two devices move out of the proximity of the each other, and are no longer within the reception range of the short range wireless communication protocol. Further, since it is contemplated that the wireless identifiers transmitted on the short range wireless link from the devices would occasionally change, for security reasons, the present embodiment has the advantage that ongoing communications between mobile devices will not be interrupted despite a change in one of the device's identifier. In the case where the identifier is a MAC address of the short range wireless network adapter for one of the devices, it is not otherwise possible to change this address and easily maintain on going communications in a true peer to peer topology.

Referring to Figure 2, central server 100 is connected to the cellular network 101, and is able to communicate information to and from wireless device 202 using a wide area wireless link such as IS-2000, WCDMA, GPRS, EDGE, LTE, Wi-Max (IEEE802.16), or the like within structure 205. Device 204 does not have a wide area wireless or cellular link, but transmits identifying information using short range wireless link 203. Device 202 is capable of receiving the indentifying information and requesting information related to that device from server 100.

An example of an application using this infrastructure follows. The device 204 will simply broadcast an identifier, with no WWAN connection but may facilitate advertising or local information. For instance, an account associated with one or more identifiers may belong to a museum. As a museum patron walks to an exhibit, the patron's device 202 will receive an identifier sent from museum broadcast device 204 operated by the museum. The patron device 202 passes the identifier or museum device 204 to the central server 100, which in-turn recognizes it as being associated with that exhibit within that museum and passes relevant information back to the user's

device 202. A distinguishing feature of this approach relative to prior art is that the patron device 202 in this example may move out of proximity of broadcast device 204, yet continue to view the content being provided by the server 100 related to the detected broadcast device 204. Content may include text, pictures, web pages, application software such as games, informative display applications, or other content such as audio or video to be offered to the user's device as well. Other examples might include electronic coupons (such as in a grocery store), menus or special offers in a restaurant.

Figure 3 is a block diagram with further detail of this operation. A device 106, 108, or 202 after performing a search (Fig 3, step 301) for identifiers on the WPAN or WLAN, will subsequently use the WWAN link to communicate with the central server 100. If the device does not find identifiers 302 it will either continue to search, or search at a later time 301. If identifiers are found in 302, the device may employ an action function 303, which would act as a filter that determines which of the detected identifiers should be passed to the server. This function may instead be omitted and all identifiers passed to the server 100. The idealized effect of the action function would be to reduce the number of requests to the server by not re-requesting recently requested identifiers which have already been passed to the server, for some period of time. In step 304, if no identifiers require server information, searching is continued in step 301.

Assuming there are identifiers which are new to the device, the device will pass along a list of currently detected identifiers and request 305 that the server return information related to any other local device. The server will return the information related to any identifier that meets certain policy requirements. For instance, information is returned which is 1) relevant to that device, and 2) that the device is authorized to receive.

As an example of the overall process, a detected identifier may be relevant to the receiving device if the user associated with the detected identifier is listed in a "friends list" for the owner of the receiving device. If the identifiers for the individuals within the friends list have been passed to the device, the action function 303 may make this

determination. In the preferred embodiment, the server would determine the identity and the relevance of the detected identifiers, and the action function 303 would work to reduce frequency of re-requests to the server. Figure 7 describes an example of how to use this for messaging associated with the device and server interaction during the detection and identifier inquiry process, with a more detailed explanation to follow.

To enable server 100 to associate an identifier with an entity, each device or entity (such as the museum) associated with an identifier has an account on server 100 or a related server as is common in information technology. The account is associated with the entity and the device and the current identifier.

As used herein, an "entity" may be a legal entity, such as an individual person or a business.

An "object" is intended to include a physical thing, such as a product that is being offered for sale, and may include a tangible article or intangible such as an electronic music or video file or photograph.

There is various information associated with each account. An example data record for an account is shown in Figure 11. When the account is associated with an individual or (other entity), there may be personal information such as the individual's name, contact information, information regarding allowed communication, such as chat or IM, links to their other social networking services, and the like. When the account is associated with a broadcast device 204 the account may contain content to be displayed to the detecting device 202. By utilizing the central server 100, broadcast devices may be tied to a location or product thereby providing relevant information about the location such as in the museum tour example previously discussed. In this situation, the content delivered to device 202 may be informative information about an exhibit including pictures, text, audio, or video and the like. In the case of a broadcast device being in a supermarket and near a specific product, advertisement or discounts with electronic coupons my be stored in the account and provided to device 202.

There can also be policy based permissions associated with each account and applied to any information associated with that account. The stored policy permissions can be used to determine what information and under which situations information may be disclosed to another device or user associated with another account. For example, the entity (person in this case) associated with device 202 may have set a policy in their account to not receive any unsolicited information from a broadcast device so as to not be disturbed. However, the person associated with 202 may see the broadcast device and a sign stating a discount is available, and provide input to their device to request any broadcast information on a one time exception basis. The messaging associated with an example mobile and broadcast device process will be described in more detail to follow associated with Figure 9.

As already mentioned above, in step 301 of Figure 3, each device performs a search function looking for identifiers sent from other devices utilizing a short range wireless capability. The following describes the process of devices detecting identifiers from other devices in more detail.

The identifiers themselves may be a hardware address such as the MAC address of the wireless device, or they may be another label such as the SSID for a IEEE802.11 device, or the device name for a Bluetooth device. Referring to Figure 4, in the case where a Bluetooth wireless personal area network device is utilized, a first device 401 transmits an inquiry (ID_Packet) message 404, and any proximal Bluetooth devices 402, 403 respond with messages identifying the MAC address, called BD_ADDR in IEEE802.15.1 of each device using a message referred to as an "Inquiry Response" FHS message 405 containing the BD_ADDR or Bluetooth device address of the detected device. In the Bluetooth standard all devices 402, 403 are required to respond in this manner assuming they are enabled to be discoverable. To enable this, an application on the mobile device ensures the Bluetooth device is set to discoverable mode. Device 1 (401) will attempt to locate Devices on different channels by scanning the channels and transmitting multiple Inquiry (ID_Packet) messages. Such an example is shown with inquiry exchange 406 and 407 to discover Device N (403).

In one embodiment the BD_ADDR or MAC address of the Bluetooth device can be used as the Identifier and no further Bluetooth interaction is required until the next scan process is performed.

In another embodiment, the Bluetooth "Device Name" is used as the identifier. Figure 5 shows the process of a first device "Device 1" (501) determining another Bluetooth enabled device's (502) Bluetooth Device Name. Following the device discovery process completion from Figure 4, Device 1 501 sends a Page message 503 to another device (Device L 502). Message 504 is sent in response to create a temporary Asynchronous Connectionless Link (ACL) to be established between Device 1 501 and Device L 502, without an explicit connection request. Not having an explicit connection request indications the Entity associated with Device L would not have to provide explicit approval for a connection from their user input on the device, as would be the case if other services were requested from the device such as might be the case with a wireless headset or remotely connected GPS receiver to a phone. An ACL connection allows link management packets to be exchanged, and following interchanges of messages 505 and 506 to determine features of the devices, a temporary connection is established between the two devices. A name request message (507) is then sent by Device 1 to Device L, and Device L responds with at least one LMS_name_res message 508 containing the Bluetooth device name of Device L 502. If the name is longer than that allowed within the LMS_name_res message, additional messages follow to allow for the entire name to be delivered. Finally the connection is ended with message 509, LMP_detach.

The transmitted identifiers associated with any given device are only known to the central server and the device transmitting the identifiers. These identifiers may change from time to time, making a user's or a device's identity anonymous over time. The central server and any particular device must be coordinated such that the identifier and any device transmitting it, remains identifiable by the central server. This process is coordinated between the wireless device, and the central server utilizing the WWAN or cellular data link, carrying messaging between them and using an identifier manager

1303 to maintain a list of device identifiers 1302 in a central but secure location. This is shown in more detail in Figure 13.

Referring to Figure 6, an example of using on IEEE802.11 link as the short range wireless capability is discussed. Generally, Wi-Fi devices operation in a so-called infrastructure mode which utilizes a BSS or basic service set. One component of a infrastructure network based wireless LAN is the use of a central access point or AP. In a mobile network the use of a central AP is not practical, as only the AP transmits an identifier, which does not meet the requirements of the preferred embodiment. The second topology for Wi-Fi networks is the so-called Ad-Hoc mode of operations, referred to as an independent basic service set or IBSS. In an IBSS all devices participating or advertising their interest in participating in an ad-hoc network transmit identifiers called beacons. These beacons contain the MAC address of the transmitting network adapter, the basic service set identifier (BSSID), and ad-hoc network name or service set identity (SSID). The BSSID in a typical ad-hoc network is generated by the first station to enter the BSSID and is locally administered, typically a randomly generated 48 bit number matching the format of a MAC address. In an ad-hoc network, each device 601, 602, 603 participating or desiring to participate transmits a beacon. There are several embodiments related using the IBSS beacons and the identifiers. First the identifier may be used as the MAC address of the station device or network adapter, and one or both the BSSID and the SSID may be used to indicate these particular beacons are associated with a service. In other embodiments, one or more of the BSSID and the SSID may be used as the identifier. In any of the embodiments for delivery of the identifier in an IBSS beacon, it is possible to coordinate the change of those identifiers with the server 100. As the MAC address is always broadcast in any operation of a Bluetooth or Wi-FI link, the use of a MAC address as an identifier provides for an additional level of security for the device 601, 602, 603, when identifier is changed from time to time as devices may be detected and identities tracked using a constant MAC address. In the preferred embodiment, where the MAC address is used for the identifier, all the devices participating would likely have the same network name

and SSID to aid in the identification of the device as being enabled, although not necessarily required. Examples using an 802.11 network in ad-hoc mode transmitting beacons are showed as messages 604, 605, and 606.

Chat Example between two mobile devices

Figure 7 shows an example of a message flow diagram for an embodiment where an individual is in a library for example, and a friend arrives. The individual is notified by their device receiving an identifier that their friend is present and they enter a chat session. Each person has a device (Figure 1, 106 and 108 respectively) that implements the preferred embodiments described above. The first individual associated with Device 1 (702) referred to as Entity 1 (EI1) performs a detection process as described in Figure 4, 5, and 6 previously (step 704) . The device identifier associated with Device 2 (703), DI2 is thereby detected. Device 1 (702) then transmits an inquiry message 705 using the WWAN (cellular data link such as GPRS, EDGE, 1xEV-DO, IS-2000, Wi-Max, LTE, or the like) to the server 701 inquiring if information related to the account and entity associated with DI2 is relevant, and available to the entity EI1 associated with Device 1 (702). The server 701 retrieves the account information related to EI1 and determines that EI2 is listed in a friends list in the account associated with EI1 and that EI1 should be notified when EI2 is detected. Next the server retrieves the account information associated with EI2 and determines that EI1 is on a list of entities which are allowed to be notified of EI2 being present and personal information such a the name of the individual, their phone number and the like. The server having determined that EI1 wants to be notified and is allowed to be notified responds in Step 706 to Device 1 (702) with a message indicating the DI2 is relevant to EI1 and including information such as Entity Identifier EI2 and associated details. A user application on Device 1 (702) notifies the user that the entity associated with Device 2 is in proximity in step 707. The user of Device 1 provides input to the device directing it to request a chat session with the entity associated with Device 2 (703), and a message 708 is sent the server 701 commanding "send 'Hello' to EI2". The server acknowledges reception of the message with a "ACK" message 709, in return. Next

server 701 sends "Request Chat: 'Hello' from EI1" to Device 2 703. The user of Device 2 accepts the chat and returns a message "I'm by the front door" with message 711, sending it to the server to be relayed to device 1 (702).

E-commerce between two mobile devices

Figures 8A and 8B show a message flow diagram for an embodiment where two individuals are performing a financial transaction on the street (for example, a customer and a street vendor). Each has a device (Figure 1, 106 and 108 respectively) enabled with the preferred embodiments described above. In this example, an individual's device would see a vendor and the vendor's device (enabled with the current invention) would notify them that the vendor was also enabled with a device supporting the identifier search and other protocols described above, as well as being capable of electronic payments. These steps are performed in the following way. In step 804 the customer's device 802 (Device 1) performs an identifier search process as previously described, and detects a device identifier 2 (DI2) sent from Device 2 (803) belonging to the merchant. Device 1 will send a message to the server 801 (also represented by 100 in Figure 1) using the WWAN (cellular data link such as GPRS, EDGE, 1xEV-DO, IS-2000, Wi-Max, LTE, or the like) 104 requesting information related to DI2 and its relevance to the entity related to device 1 802. The server 801 then determines the relevance of DI2 based on the account properties stored in the account associated with the consumer Device 1. In this case, the account settings only allow messages from or notifications of entities on a friends list stored in the account record (represented in Figure 10) associated with the consumer. Server 801 responds to device 802 with "no" indicating that DI2 is not relevant to the Consumer.

The customer, having an account enabled with electronic payments, and wanting an item the vendor has, would press a button or make other input to his phone (or other device) which would indicate they would like to make a purchase and pay using their device (808). In this case the input selection would be "search for merchants." The customer's device would then send a message (809) to the central

server directing the server to perform a one time search for merchants, despite the current account settings. In one embodiment, the server would then direct the consumer's device 802 to initiate another search (809). Other embodiments may not include the server commanding Device 1 (802) to perform the search, but rather the search may be performed automatically, or use results from a recent search. In Step 811, Device 1 (802) performs another search and detects the identifier from Device 2 (803), DI2. Device 1 then sends a message 812 to the server again requesting information for all relevant devices detected, which will include at least DI2. In Step 813 the server, having received the request and list including DI2, looks up account information associated with DI2 and determines that the associated entity is a merchant. As the settings of the account associated Device 1 now allow for the notification of the user when a merchant is detected in proximity, DI2 is determined to be relevant to Device 1 and the Entity 1 (EI1) should be notified. The server then sends a message 814 to Device 1 (802) stating merchant services are available in proximity with a list of available merchant's information including information related to the entity (EI2). The user of device 1, Entity 1 (EI1) then provides input in step 815, (pressing a soft key on a touch screen for instance), selecting the specific merchant EI2 to engage with in a transaction. Device 1 (802) will then send a message (816) to the server requesting a transaction with EI2 associated with Device 2 (803). The server (801) will then respond in this embodiment with a message 817 to Device 1 confirming receipt of the requested transaction and providing information to allow the EI1 associated with Device 1 to independently confirm the identity of EI2 associated with Device 2 (803). In this embodiment the identifying information can include the name of the merchant, the merchant's logo, a picture of the vendor, or their mobile shopping cart. In other embodiments, the picture may be of a specific unattended vending machine in the location it is currently operating. It may also include other information such as the address of the merchant in cases where a fixed store location is provided. As this particular merchant in this example is a street vendor, an address may not be used. GPS information stored in the account associated with Device 2 may be used as further confirmation in some instances. However, in this example, GPS coordinates are not be

available on Device 2 due to lack of capability, or Device 2 being indoors and without sufficient signal to determine a location. Further GPS information from Device 1 (802) may be used to provide further confirmation information. In this embodiment the photograph sent in message 817 shows a picture of the particular merchant and also his city issued business license in text and as a picture of where it is displayed on the cart. The consumer entity EI1 provides input to Device 1 in step 818 confirming the identity of EI2, the merchant entity associated with Device 2 (803). Device 1 then sends a message 819 to the server 801 confirming the identity of the merchant.

Server 801 then sends a message 820 to the merchant's device 803 notifying them of the request for a transaction with EI1. Device 2 (803) then indicates to the merchant that a customer with the capability and desire to pay electronically is in proximity. In step 821 the customer associated with Device 1 (802) places an order with the merchant associated with Device 2 (803) and a list of products to be purchased is generated and the merchant provides input to Device 2 (803) to proceed with a electronic transaction. In step 822 Device 2 performs a scan of identifiers and DI1 associated with device 1 (802) and the Consumer is detected. A request is sent to the server 801 with a list of identifiers which were detected to determine if any of them are relevant to the merchant. Note that while the merchant device 803, (and the merchant) have now been notified of the desire for EI1 to enter a transaction, they do not necessarily know the identifier for EI1 yet. In other embodiments, the identifier associated with EI1 and Device 1 (802) may be sent in message 819, and a confirmation that this identifier is detected during the scan process 821 may be performed at the device. In the preferred embodiment, further security may be provided by the having the server perform this function independently. The server performs this confirmation in step 824 may matching the device 1 identifier DI1 with the information stored in the account associated with Entity 1 (EI1) also referred to as the Consumer.

The server than generates a message 825 to Device 2 (803) indicating that EI1 is relevant, and the transaction participant is present. The message in the preferred embodiment can also include a picture of the Consumer. Additionally, the message

could also include other pictures of other individuals allowed to use this device for purchases. If more than one identifier was detected in step 822 and matched in step 824 to entities having requested transactions previously which are pending for that merchant, a list of information for each entity involved with a pending transaction request can be provided in message 825. The merchant then selects the correct consumer using the picture of that consumer, confirming the identity of the part to the transaction in step 826. The consumer information provided in message 825 in another embodiment may simply be the name of the customer and the merchant may either ask their name, or request identification such as a driver's license. In the preferred embodiment, where a picture is passed in message 825, it is not necessary that the individual's name be passed to the merchant for the merchant to be able to provide confirmation of the identity of the Consumer thus providing a level of anonymity to the transaction such as may be present when cash is used.

Following the confirmation by the merchant of the identity of the Consumer participating in the current transaction in step 826, Device 2 sends a message 827 to the server confirming the identity of the Consumer as Entity 1 (E1), and with information required for the transaction including the list of products to be purchased, their prices, the total price, and a request to charge E1 this total amount. Server 801 then confirms receipt of this message in step 828. The server then sends a message 829 to Device 1 requesting the Consumer to confirm the list of goods to be purchased and the total price to be paid. In step 830, the Consumer (Entity 1) reviews the list and amount to be paid and provides input to device 1 confirming the accuracy of the information and they the authorizing the server to pay. In step 832 the server charges E1 utilizing stored preferred charge card information, stored credit, or other payment methiod such as a PalPal™ user name (PayPal is a trademark of Ebay, Inc.) and password stored in the account associated with E1, and charges the consumer. In the case where a stored credit is used, the Consumer's account can be debited, and the credits not applied to the merchants account until a later step. In the case of a credit card, or PalPal™ transaction, the server provides payment to E2 (the merchant) utilizing information

stored in the account associated with Device 2. The server then indicates payment is made to the merchant, and instructing the merchant to deliver the goods with message 833. E2 (the Merchant) then provides the goods and provides input to Device 2 that the goods have been delivered in step 834. Message 835 is generated by Device 2 (803) to the server confirming product delivery, and acknowledging the receipt of the payment confirmation message 833. The server can then send message 836 requesting the Consumer to confirm they received the goods. If a confirmation is not received in response to this request, this information may later be used to settle any dispute that might arise. In step 837 the consumer confirms receipt of the products, and message 838 is generated to the server confirming the receipt of goods by the consumer. In Step 839 the server concludes the transaction by completing any steps required to credit the Merchant with the payment amount from the Consumer, if required. The server then sends a message 840 to the Merchant indication the transaction is complete, which is acknowledges in message 841. The Consumer is notified of the completed transaction with message 842, which is acknowledged with message 843.

Finally, the transaction details may be stored by the server, or sent to a thirdly party server for tracking spending habits of that account holder, or customers of that merchant allowing the merchant to track that specific customer's behavior and cater to them in the future with various specials delivered via email, or during their next visit via their device in the form of an electronic coupon. This process can be performed with a goal to help the merchant expose the customer to other products or services the merchant believes the customer might find desirable.

The present invention can be extended to facilitate other types of transactions as well. In one specific application, consider use of the invention to facilitate a transaction such as the rental of an automobile. A well known business called ZipCar ™, presently operating in several major urban areas in the United States, makes available a fleet of vehicles for shared use by their club members who pay a monthly fee plus a per use charge. Using the present invention, the club member would have a wireless device that serves as the "Consumer device" (Device 1) and the ZipCar vehicle would be

equipped with a wireless device serving as the "Merchant" device (Device 2). The consumer would walk up to an available ZipCar vehicle and, using their wireless device, start an initial exchange of identifiers with the desired Merchant device, for example, using the short range local wireless network. The Consumer device and/or Merchant device would send a message to an application running on the Server requesting that a person associated with an account for the Consumer be granted access to a specific vehicle (e.g., an "object") that is in the vicinity of and associated with the Merchant device. A set of confirmatory messages (such as to exchange access codes, to confirm the location of the vehicle, the per-use fee due, and payment for the same, etc.), are then typically also exchanged between the Consumer and the Merchant device with the assistance of the Server and the long range wireless network. Upon confirmation of the necessary transaction information, the Server sends a message to the Merchant device to unlock the vehicle requested (which may be sent over the second long range wireless network or a yet another network, such as a satellite network).

Example of a Mobile Device and a Broadcast Device.

Figure 9 shows a message flow diagram for an embodiment where an individual is in the presence of a broadcast device, such as for the museum example of Figure 2. As with Figure 2, the individual device 202 and the broadcast device 204 are present and enabled. In this example, an individual 902 is in a grocery store and their device 902 (Device 1) performs a scan for identifiers in step 904, as described previously. DI2 is detected having been transmitted from device 2 (903). Device 1 (902) sends a message to server 901 inquiring if DI2 is relevant to the entity associated with Device 1 and if the information associated with that device identifier (DI2) is available to be returned. In step 906, the server retrieves the accounts associated with both DI2 and Device 1 (EI1). The server detects that the entity associated with DI2 is an advertisement company, and that this device is a broadcast device only, and that there is an electronic coupon available for download to Device 1, and multimedia content available to be played if desired. Additionally, the account settings associated with EI1 allow for the notification of broadcast devices in proximity.

Server 901 then transmits a Response message 907 indicated the presence of the detected device and the content available. The device 902 requests input from the entity associated with the device 901 for permission to download the coupon, and the availability to play content such as video about how to prepare a recipe using the vendors product. In this case the individual associated with Device 1 accepts the content, and a message 909 is sent to the server accepting the content. Response message 910 begins the delivery of the content.

As previously mentioned, several key distinctions of this embodiment include that the user of device 902 may walk away out of range form the broadcast device 903 and continue to receive the content using their cellular link, or may choose to play the content at a later time having stored the detected like in a favorites list. Additionally, the content stored in the account associated with the broadcast device 2 (903) is relevant to the placement of the device and the products near it. Further, as the content is stored in the server 901 rather than in the broadcast device 903, the content may be updated, modified, or deleted at anytime. For example the server 901 knowing that the consumer has never been detected previously, may customize the electronic coupon to provide a deeper discount than a regularly detected consumer. In the case where the devices are used for electronic commerce as in Figure 8, knowledge of the user's past purchases may be used to induce the consumer to try a new product. Alternatively if the consumer is a regular purchaser a loyalty program may provide a coupon upon a particular number of repeated purchases.

Figure 10 is a processing flow chart performed by the server receiving a request from a device inquiring about the relevant and availability of information associated with detected device identifiers. In step 1001 the server is waiting for a request from a device. When a request is received in decision 1002, step 1003 is performed. In this step the account information associated with the requesting device is retrieved. In step 1004 the information associated with the accounts for each of the detected device identifiers is retrieved. In step 1005 the server performs a matching process between the policies of the requesting account and each of the policies for each account

associated with each detected device identifier. In step 1006 the information related to the matched policies for the associated entities will be sent to the requesting mobile device.

Just as in the previous example of an identifier being deemed relevant to a user based on a friends list, permission for disclosing a device's presence may require being on a friends list as well. For example, when a server receives an inquiry from a device with a list of identifiers, it may only respond with information for users associated with the identifiers that are on that device's friends list, and on each of the individual's friend lists as well. These friends' lists and policies can be stored within a user account which allows for disclosure of a user's presence only to individuals on this list, such as described in Figure 11 (to be described below.)

It is contemplated that the permissions not be an "all or nothing" decision, but that different classes of information may be assigned different permissions and mechanisms. An example of this might be a user's presence, identity, and cart services being made available to only one set of other accounts (or users), while the presence of an anonymous individual being made available to anyone, but with other classes services available such as multi-player games being treated differently. Additionally multiple contacts may be included in the account, each given customized permissions. An example can be that any user may be notified of an anonymous user or other information based on additional policies.

As only the server contains personal information, and performs the association of an account with a particular identifier, it can inherently enforce the security of the policies as a distinct advantage relative to true peer to peer services. In this way, the central server controls the process of passing information related to an account to a particular requesting device.

Figure 11 shows an example account record to be associated with an entity and at least one device. The columns of the account record can consist of a Record Index

which will be used to described the account, a Field which is a descriptive name for the contents stored in the record, and a Field Information Group Disclosure Policy Assignment List (PAL). The PAL provides rules for the disclosure of the information in the associated row in the Field column. The following list are possible PAL entries:

ALL:	may be disclosed to any requesting entity
EXPLICIT APPROVAL:	the Entity associated with the account must provide input approving the disclosure of the information
NONE:	Do not disclose this information to any other entity
M:	where M is a integer from 1 to N indicating a Information Group Disclosure Policy which may consist of a list of contacts, friends, groups, characteristics, and the like.

Most of the fields in Figure 11 are self explanatory and typical in the industry such as the account number, however a few fields are worth a clarifying discussion. The Device identifier is in record index 2, with a Identifier type in record 4. The identifier type can define what type of identifier the device associated with this account would use. Record index 10 is the Entity Type Field. This describes is the entity is a Merchant, Individual, or if the device associated with this account is a broadcast only device.

Referring now to Figure 12 a timing map reference for scanning times and dormant times for devices is shown. In one embodiment, it is desired that the power consumption and scan timing for the devices in a cellular network be reduced. Since the server and the WWAN is involved with all mobile devices, coordination of the broadcasting periods and the searching periods for the short range radios is possible. This can be based on a common reference time such as that provided by most cellular systems, any the time of day clocks inherently within mobile devices. This allows for

reduced power consumption and other resource consumption in the devices. If no coordination is achieved, then the short range receivers in each device must be scanning for transmitted identifiers much more often and for longer durations. Utilizing a common timing base, and the central server to notify the devices of a coordination approach for "active times" and "non-active times" and will allow for the devices to minimize the power consumption in the transmission of and scanning for identifiers. This approach also allows for synchronizing the update of each device's identifier (as described previously) to enhance anonymity and security, coordinated with the central server. The "non-active times" may be used as "boundaries" over which the changing identifiers may be updated. This update may be based on either direct communication with the server, or rule and algorithm based updates previously coordinated with the central server so as to minimize server messaging, but allowing the updates to remain synchronized to the server such that the device and the server are always associating the same identifier between them.

As will be recognized by an individual skilled in the area of information technology, the concept of a central server may well be implemented as a collection of servers to allow for load balancing, redundancy, and the like in a manor common to the information technology industry.

Figure 13 shows a diagram of functional blocks associated with the management of dynamically assigned device identifiers. The Server 1301 has an application agent called an Identifier Manager (1303) which has access to a pool of device identifiers (1302). The Identifier Manager monitors timing information and determines when it is time to update a particular device's identifier. This time may be a regular interval, or a random generated time period by an algorithm such as a pseudo-random sequence generator, or a combination of both. When it is time to update a device identifier, Manager 1303 retrieves a new identifier form the pool 1302. The pool of identifiers may be a list or range of identifiers, or generated algorithmically. The new identifier is stored in the account associated with the entity determined to require updating and a message sent to the device 1305 associated with that account commanding it to update

its device identifier with the new one. This messge is sent over the WWAN Data network 1304 such as IS-2000, HSPA, GPRS, IS-95, Edge, Wi-Max, and the like. All devices 1305 to 1307 will eventually all be updated in a similar manner. This update process does not disrupt ongoing communication and interaction between devices despite the update as the communications are preformed based on the identity of the entities following the detection of the device identifiers which are no longer utilized. This unique capability allows for the updating process to be implemented and not impact the applications being utilized concurrently.

Other example applications utilizing still other embodiments follow below.

Requiring the brokering of the communication via a central server can also allow a mobile device to receive information associated with a "broadcast only" device, such as in the museum example discussed previously. This is important, as such broadcast devices can enable a vast set of new applications built upon the infrastructure developed in this application, beyond the museum application. Some of these applications may involve an electronic commerce aspect, for example.

Electronic Commerce Applications

Ecommerce between a fixed broadcast device and a mobile device

Football stadium example

An embodiment of a transaction model, enabled by the infrastructure described above can be an event such as a concert, or sporting event (particularly when it is an indoor venue where no GPS is available). A number of the broadcast only devices are placed through out the seating areas. The devices are very short range, and only transmit intermittently and as a result may be battery powered and to remain active over a very long time period. Each device can be placed in a known location, in a predicable manner.

An attendee at the event has his or her device enabled with the identifier protocol and other embodiments described above. The device detects a broadcast device, and interacts over the internet with the server via the WWAN connection (as already described above). The server receives an indication of the broadcast device's identifier and the identifier of the account associated with the device which detected the broadcast device. The server retrieves content associated with the service provider's account and provide that content to the application on the requesting mobile device. The content may indicate that the venue has a product delivery service. The user may then press an indication on their device that they would like to see a menu or list of items for sale from the merchant(s) in the venue. The application on the user's device would then allow them to see a menu, for instance, and select items to purchase. The user then would be asked to confirm the purchase. The server would then indicate to the merchant that a user located near a specific broadcast device has ordered something. In this case, it is expected that a delivery fee could also be charged for the enhanced service. The server would facilitate the purchasing of the goods or services from the merchant and payment from customer's account, and provide confirmation to each. Such confirmation can include an electronic receipt provided to the customer, for user upon arrival of the delivery person of the good or service. The customer can then select an indication on their device confirming receipt of the good or service via the mobile device, thereby completing the transfer of funds and the transition. Optionally, the delivery person of the good or service may have an enabled mobile device as well. In this case the identifiers may be detected by the customer's device and reported to the server to confirm that the provider's delivery person was present. Further, the delivery person's device can be able to detect the broadcast device's identifier and reported to the server confirming the delivery person was in the correct area independently. Even further proximity confirmation may be achieved by the customer's device's transmitted identifier being detected by the delivery person's device and reported to the central server further confirming the physical proximity of the parties involved in the transaction. Upon arrival of the delivery person, the customer may be notified that the delivery person is looking for them, and has arrived. These cross confirmations can

allow for the central server evidence to justify payments both in completed transactions and in disputed or failed transactions. Further, the delivery person may receive a picture of the requesting customer assisting to identify the customer to whom the food is to be delivered. Once the customer is found, the delivery person can confirm the delivery of the good or service to the customer via the user input on their mobile device, and that confirmation being reported to the central server. The customer can have the option to report confirmation or denial of the reception of the product or service as well, as in the last example.

In another embodiment, the merchant device may be fixed, but have an internet connection (wireless or otherwise). Further, in some embodiments, the merchant may be an automated device such as a vending machine. In such a model, a customer may use their enabled cell phone to purchase an item such as a beverage from the machine without the need to insert currency into the machine. This can be accomplished by the customer's cell phone detecting the vending machine transmission of the identifier or visa-versa. Following the detection of either the customer's identifier by the vending machine, or the customer detecting the vending machine identifier, the respective device notifies the server, which in turn provides notification (assuming the account settings allow for notification) to the potential customer via their device. Assuming the customer selects to purchase an item from the vending machine using their account associated with their device, the customer may be presented a menu as in the example above. The customer may further be presented information to ensure the identity of the vending machine, such as a description of the machine, a machine identification number, or a (most likely) a picture of the machine where it is located. The customer can then confirm this is the machine they are interfacing with, and select to pay via their account. The customer may in one model select the item to dispense by input to their phone, or they may simply select to provide payment to the machine allowing them to make the selection manually as is the typical mode of operation today. The vending machine can then interact with the server via its own internet connection, and

participate in the transaction in a manner similar to the mode described above allowing for step by step confirmation as previously described.

Electronic opinion polling, tied to a known location.

In a much simpler example, such a capability might be used to tie a survey to a known location in such a way as to provide an e-coupon to the survey taker on their device in return for completion of the survey. Alternatively, this type of interaction can enable a very large crowd to interact with a Jumbo-Tron like display to provide input to polls or to participate in group activities. Users at different locations in a audience may form teams and interact with other teams for group activities.

Feature Summary of Preferred Embodiments

1. In a first embodiment:

One device is transmitting a wireless identifier using a wireless protocol capable of peer to peer communication;

The wireless identifier being associated with a specific account on a server connected to the internet;

A second device receiving the wireless identifier

The second device capable of communicating with the server over an internet connection;

The second device requesting information from the service associated with the first identifier

- The second device having a second identifier associated with a second account on the server; and/or

- The server providing different amounts of information related to the first account based on the parameters associated with one or both of the first and second accounts

The identifiers associated with the accounts being updated such that the identifiers would no longer be recognized as being associated with specific accounts without past or current interaction with the server ;

Using one or more of Cellular network timing information, and information form the central server to coordinate the broadcast and search times amongst the devices. (to reduce power and resource consumption); and/or

Data necessary to engage in an E-commerce transaction may be exchanged as well such as the identity verification such as via a picture and/or mutual identifier detection.

2. In a second embodiment,

A device is capable of operating two wireless protocols simultaneously, utilizing a first wireless protocol in the device to detect the proximity of another wireless device and using the second wireless protocol to communicate with a remote server, where:

a. One or more of the devices are mobile devices;
b. Where the first wireless protocol is a local, or personal area network wireless protocol such as 802.11, Bluetooth, UWB or other local connectivity protocol;
c. Where the first wireless capability used for detecting the presence of another device, or advertising the presence or a device;
d. Utilizing a wireless wide area data link from one or more of the wireless devices to, optionally:
    i. Connect to a central server;

ii. Perform user authorization functions;

iii. Perform download of information associated with account identifiers utilizing the short range wireless capability;

iv. Request forwarding of messages / packets to the other active account;

e. Utilizing the messaging with a mobile proximity based social networking capability; and optionally,

i. The messaging being performed via the WWAN; and/or

f. The server providing a centrally assigned user identity, with relationship brokering or identification capability.

3. In another embodiment,

A central serving capability is provided to mobile devices utilizing a wireless WAN connection to provide and exchange information between one or more application on one or more wireless devices and the central server where

- the information passed to the central server is collected by one wireless device from another wireless device via a separate local wireless reception from the other wireless device;
- the separate local wireless reception from the second wireless device contains information directly assigned by, derived from, or known to the central server associated with the identity of the second wireless device;
- this identity is related to certain information and preferences of an account holder associated with an application operating on the second wireless device;
- the application is operating on both wireless devices;

- the application operating on the first device also provides its own identifying information to the central server as well as detected identifiers from devices with applications on them;
- The central server contains account information registered to the applications running on each wireless device;
- The preferences associated with the account information also contain policies related to the disclosure of one account's stored information to other accounts and hence to their application on their devices;
- These policies including a classification of other accounts each classification having different policies some of these policies being one of:
  - no not allow notification of my presence
  - allow notification of my presence
  - disclose my name/ do not disclose my name
  - disclose age / do not disclose age
  - disclose personal details;
- Where an application running on each device can optionally perform point of sale transitions coordinated via the central server, over the WWAN, utilizing user input on each device as confirmation of successive steps in the transition;
- Further, where at least one of the confirmation steps additionally involves displaying an identifying picture related to one of the devices, on the other device;
- Additionally the server performing an authorization for the transition to a third party;
- Or, optionally, a device is interacting with a point of sale device to associate an itemized list of items with a detected second device;
- The service performing a confirmation with the application on the second device requiring user input that the bill of goods list is correct; and/or

- The server storing the information related to the second devices detected account identity and inventory in a database for later use

4. In still other embodiments, a device in the present invention has a wireless capability with no WWAN capability, but only with the ability to broadcast a unique identifier, and

- A central server stores having the broadcast device's details;
- And when the first device provides these detail to the server, authorized and current information about the broadcast device are provided to the first wireless device;
- Where this information optionally includes advertising information or information related to "e-coupons" for special offers for products or services; and/or
    - Where the content of the e-coupons might be customized based on the identity of the requesting device or account holder;
        - Where the content is further customized based on other information known by the server related to the user's account ; or
        - Where the other information is related to the user's past purchasing practices or previous requests; and/or
- A mobile device, upon detecting a broadcast device and if enabled to do so, will report that broadcast Id to the server over a WWAN, and retrieve the current content from the server associated with that device and:
    - Display it to the user on their device; or
    - Execute instructions associated with the information retrieved from the server.

5. In still further embodiments, a good or service delivery model utilizing the above described broadcast device, is placed in a known location, and further

a. A mobile device is for detecting the fixed device's identifier via the WPAM/WLAN;

b. The mobile device reporting this identifier and passing an identifier associated with itself, or the account associated with the user utilizing the device;

c. The server determining that the detected broadcast device is associated with the broadcast device with a known location;

d. The server further determining that the identifier is associated with a service, and further associated with an account or that service;

e. The server retrieving content associated with the service provider's account and providing that content to the application on the requesting mobile device;

f. Where that content may be a list of items for sale, services for sale, a opinion pole, food menu, or other menu style content which allows for user selection of items, which can be implemented in java code, xml, simple text, or other for example optionally including active code elements;

g. The application on the mobile device displaying the content to the user display with the itemized list of goods, services, or other selection items;

h. A user providing selection of one or more of the items, and confirming they wish to purchase said items, and take delivery at or near the location of the fixed broadcast device;

i. The server facilitating the purchasing of the goods or services from the merchant's account and the customer's account, and providing confirmation to each. Such confirmation including an electronic receipt

provided to the customer, for user upon arrival of the deliverer of the good to or service;

j. The customer confirming receipt of the good or service via the mobile device, thereby completing the transfer of funds and the transition; and/or

k. The deliverer of the good or service optionally having a mobile device and optionally:

i. such that identifiers from that device may be detected by the customers device and reported to the server to confirm that the provider's delivery person was present;

ii. such that the broadcast devices identifier is detected by the delivery person's mobile device and reported to the server confirming the deliver person was in the correct area

iii. such that the customer's device's transmitted identifier is detected by the delivery persons device and reported to the central server further confirming the physical proximity of the parties involved in the transaction; and/or

iv. The delivery person confirming the delivery of the good or service to the customer via the user input on their mobile device, and that confirmation being reported to the central server.

6. In another embodiment, a software program is arranged to operate at the application layer on a mobile device, which interfaces to a device driver interface:

- Using wi-fi 802.11 to perform a WLAN local connection protocol; or
- Using Bluetooth to perform the WLAN local connection;
- Where the device driver interface is an NDIS driver or the like;
- Using 1xEVDO, HSDPA, GPRS, EDGE or the like for a wide area WWAN interface;

- The application then providing the reported identifiers to a server, which will make decisions regarding a users interest in these detected identifiers, and policy regard privacy other identifiers;
    - The decision process optionally based on priority of the identifier, the class an identifier belongs to, a list the identifier is, or is not included on;
- Based on the result of the action function,
- Sending at least one detected identifier to the network, potentially with additional information from the action function, and retrieving information back from the server related to that identifiers' account information stored on that server;
- The server then receiving a request from a device's application, with a detected identifier
    - The server examining both the requesting and the requested identifier's identity and making a policy decision regarding the release of the requested identifiers information related to their account;
    - The server in some cases providing a continuously or periodically changing account or device identifier to a specific application on a device to enhance the privacy of the identity of that device;
        - The changing of the identifier may be effected by a rule based generation local to the application, or may be downloaded from the server directly; and/or
        - The update of the identifier being synchronized to such that it is coordinated with predetermined scanning and broadcasting periods allowing for a known update boundary;

7. In still another embodiment, a method uses the mobile device's time of day derived from the network or other reference for

synchronizing a PAN/WLAN discovery and advertisement times to save battery life;

doing the same in a synchronized way among multiple devices;

while coordinating the timing information utilizing the WWAN and a central server available commonly to the devices, such as by

- Synchronizing identifier transmission timing to save power from WWAN network parameters obtained for the server;
- Coordinating any identifier updates to this same timing source; and/or
- Using a pool of identifiers available to the central server to assign identifiers to devices changing the identifiers at some time interval derived for the common time reference

8. In another embodiment,

A central server uses an identity manager to assign identifiers to devices using a WWAN cellular data link, and wherein

identifiers are occasionally changed

identifiers are assigned from a pool of identifiers available to the servers;

identifiers are used as 48 bit media access control (MAC) addresses of the short range wireless network adapter

identifiers are optionally used as

an SSID in a IBSS in IEEE-802.11 network beacons