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Baarman et al.

(10) **Patent No.: US 9,312,728 B2**
(45) **Date of Patent: Apr. 12, 2016**

(54) **PHYSICAL AND VIRTUAL IDENTIFICATION IN A WIRELESS POWER NETWORK**

(75) Inventors: **David W. Baarman**, Fennville, MI (US); **William T. Stoner, Jr.**, Ada, MI (US)

(73) Assignee: **Access Business Group International LLC**, Ada, MI (US)

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(51) **Int. Cl.**
G05B 19/00 (2006.01)
H02J 17/00 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H02J 17/00*** (2013.01); ***H02J 5/005*** (2013.01); ***H02J 7/025*** (2013.01); ***H04L 12/10*** (2013.01)

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CPC H02J 5/005; H02J 17/00; H02J 7/025; H04L 12/10; H01L 35/00; H01M 10/443; H01M 8/04007; B60L 11/002; B60L 11/185; B60L 11/1801; B60L 11/182; B60L 2270/32; F01N 3/2006; B01F 5/0614; B01F 13/002; B01F 2215/0039; Y02T 90/121; Y02T 90/168; Y02T 10/26; Y02T 90/14; Y02T 90/128; Y02T 90/122; Y02T 90/16; Y04S 30/12; Y02E 60/50
USPC ..... 340/5.8, 5.81, 5.85, 10.34; 455/127.1, 455/343.1; 320/108, 109, 137; 322/2 R
See application file for complete search history.

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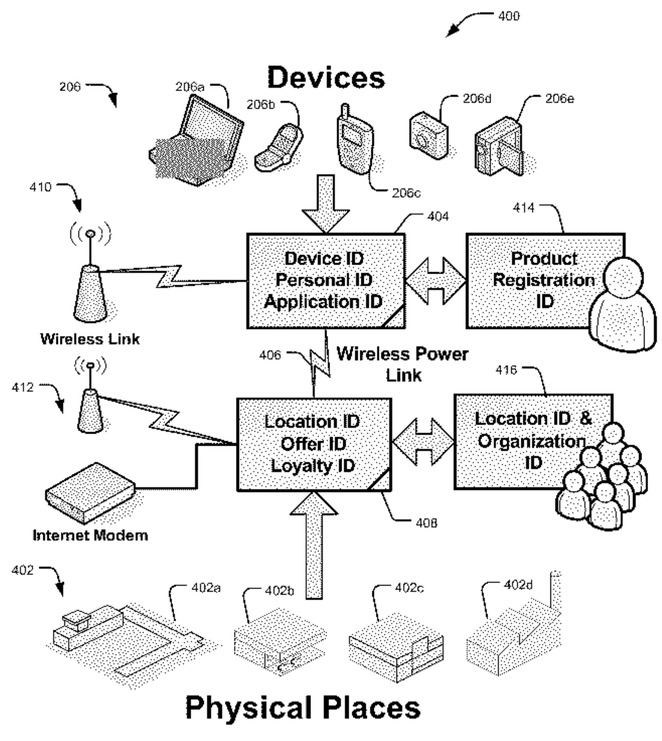
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Primary Examiner — Anh V La
(74) *Attorney, Agent, or Firm* — Brinks Gilson & Lione

(57) **ABSTRACT**

A wireless charging system is disclosed. The wireless charging system includes a detector configured to identify device information related to a device to be powered at a location, a location processor coupled with the detector and configured to deliver location-specific information related to the location to the device to be powered based on the detected device information, a power supply in communication with the location processor configured to wirelessly provide power to the device based on the detected device information, such that the location processor is configured to deliver the location specific information to the device via a first channel, and wherein the power supply is configured to wirelessly provide power to the device via a second channel.

24 Claims, 11 Drawing Sheets



(51) **Int. Cl.**

H02J 5/00	(2006.01)
H02J 7/02	(2006.01)
H04L 12/10	(2006.01)

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FIG. 1

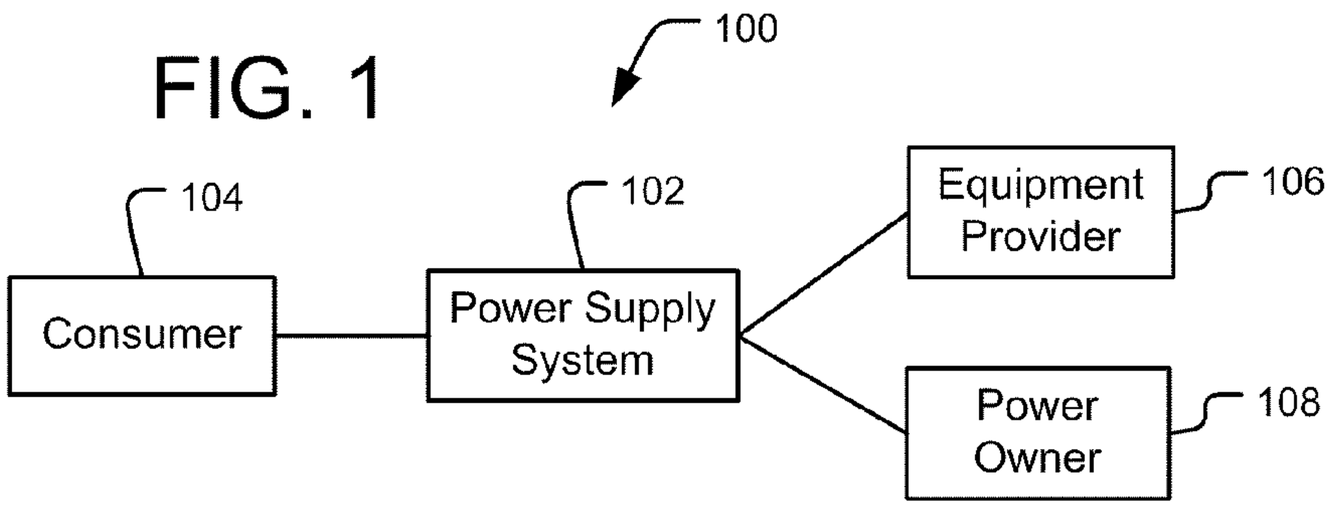


FIG. 2

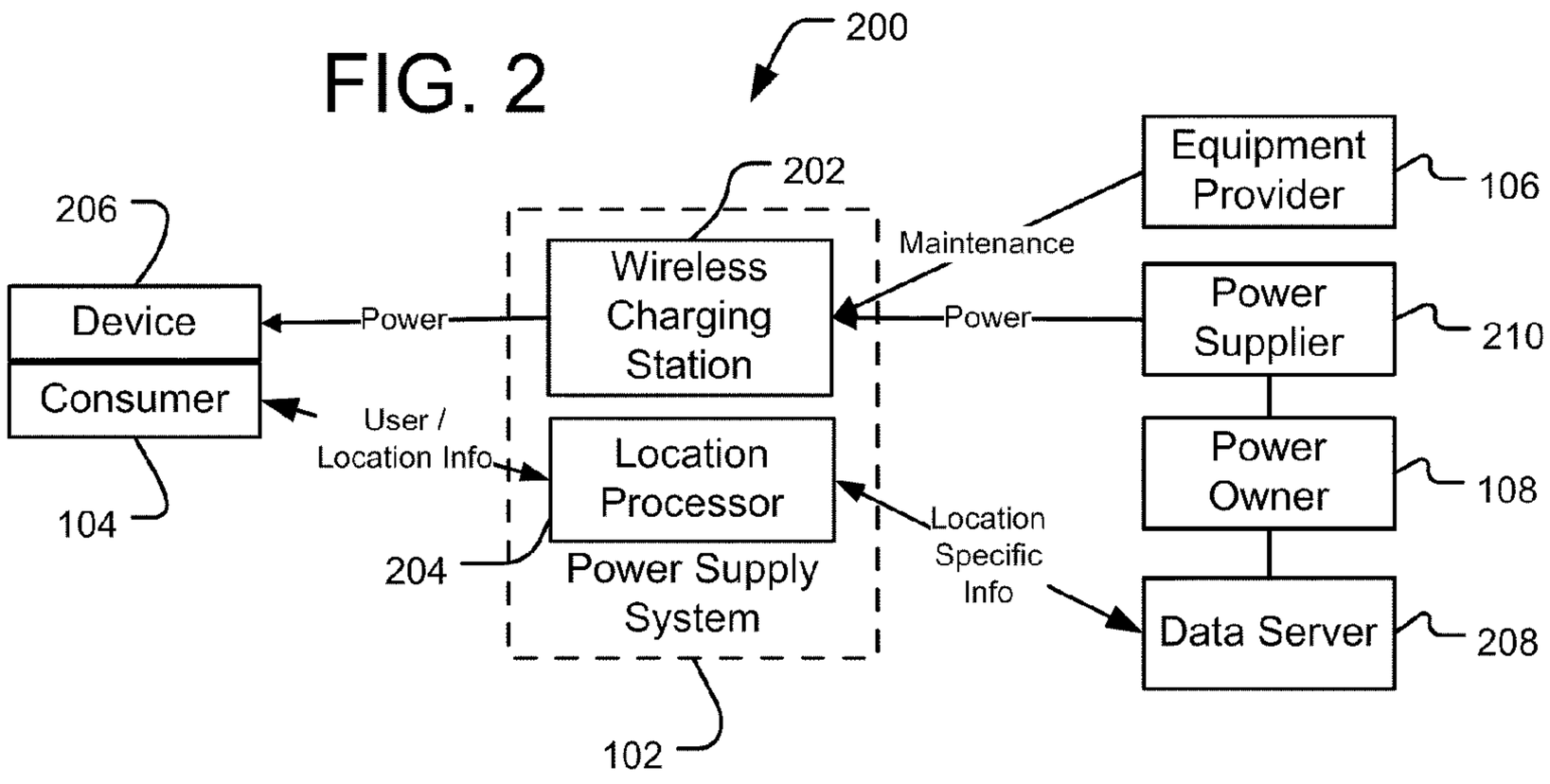
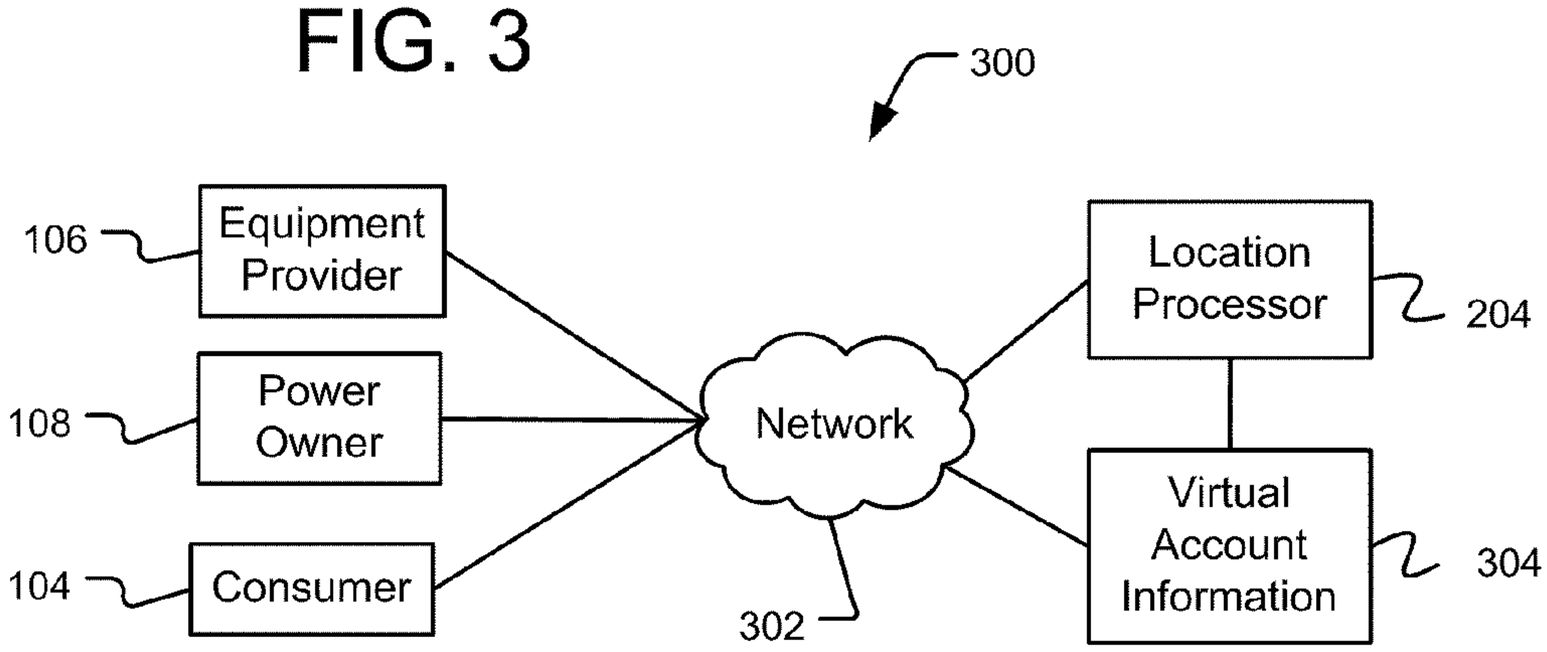


FIG. 3



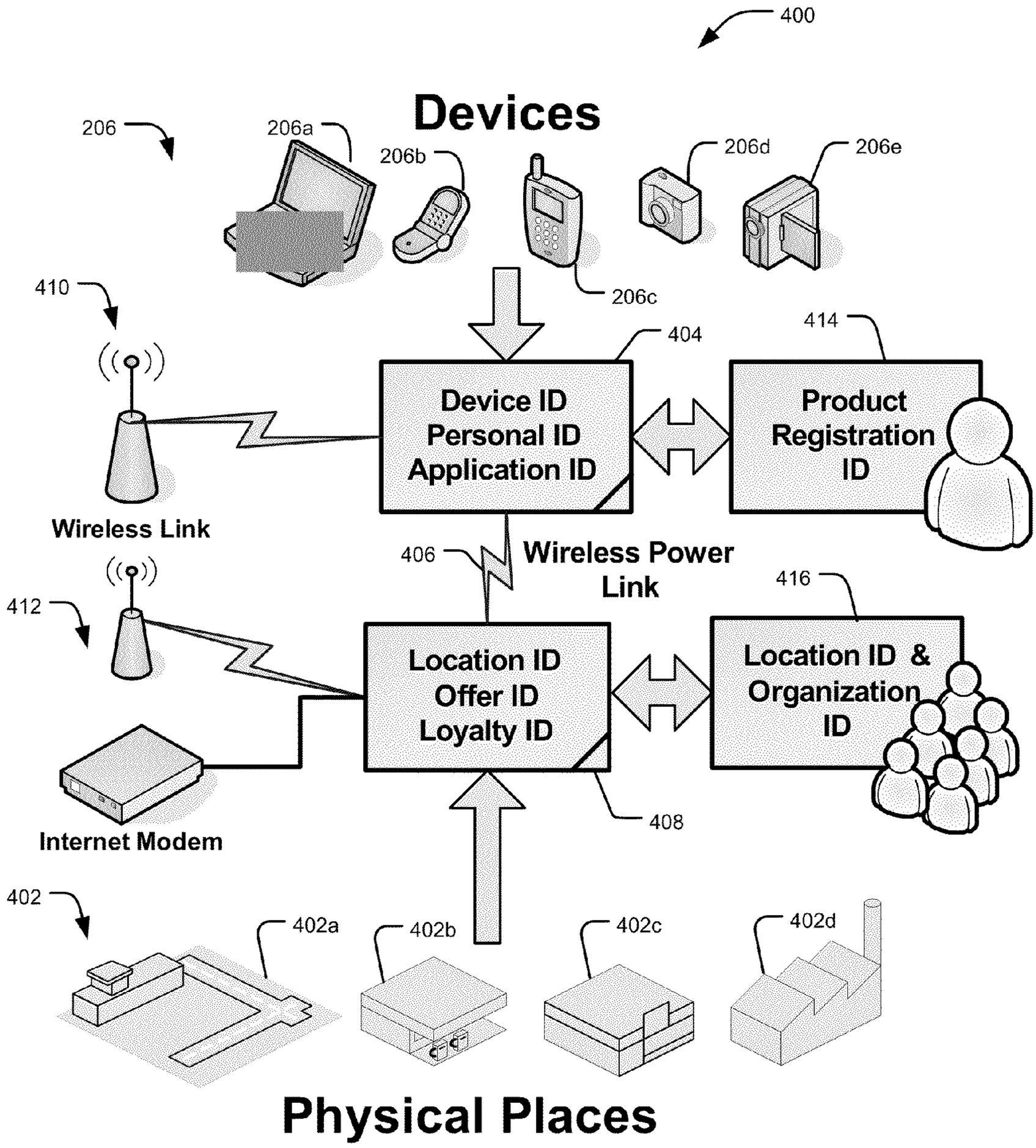

400
Devices
206
206a
206b
206c
206d
206e
410
404
414
Device ID
Personal ID
Application ID
Product
Registration
ID
Wireless Link
406
Wireless Power
Link
412
416
Location ID
Offer ID
Loyalty ID
Location ID &
Organization
ID
Internet Modem
408
402
402a
402b
402c
402d
Physical Places

FIG. 4

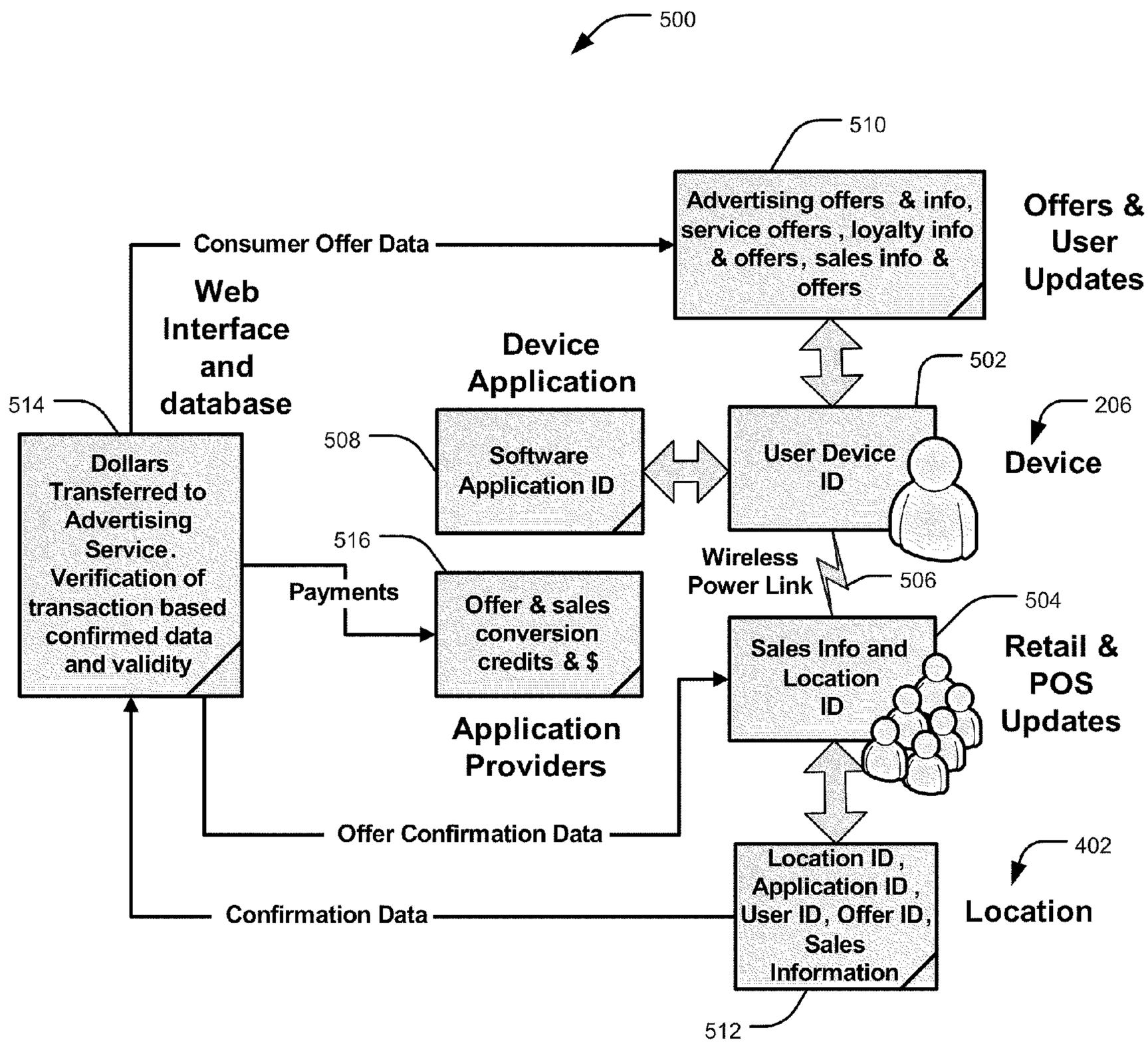

500
510
Advertising offers & info, service offers , loyalty info & offers, sales info & offers
Offers & User Updates
Consumer Offer Data
Web Interface and database
514
Device Application
502
206
Device
508
Software Application ID
User Device ID
Dollars Transferred to Advertising Service. Verification of transaction based confirmed data and validity
516
Payments
Offer & sales conversion credits & $
Application Providers
Wireless Power Link
506
504
Sales Info and Location ID
Retail & POS Updates
Offer Confirmation Data
Location ID , Application ID , User ID, Offer ID, Sales Information
402
Location
Confirmation Data
512

FIG. 5

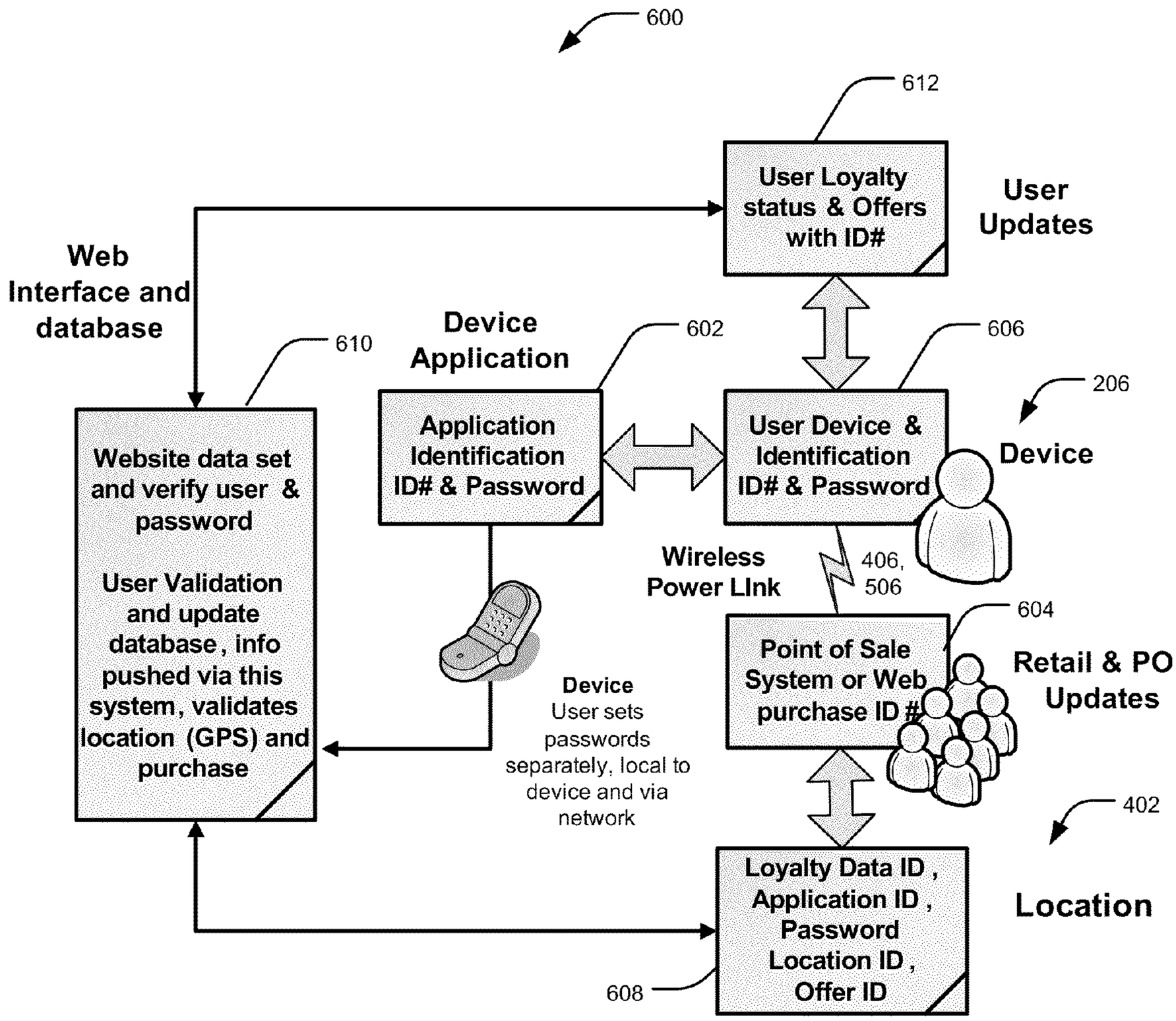

600
612
User Loyalty status & Offers with ID#
User Updates
Web Interface and database
610
Device Application
602
606
206
Website data set and verify user & password
User Validation and update database, info pushed via this system, validates location (GPS) and purchase
Application Identification ID# & Password
User Device & Identification ID# & Password
Device
Wireless Power LInk
406, 506
604
Point of Sale System or Web purchase ID #
Retail & PO Updates
Device
User sets passwords separately, local to device and via network
402
Loyalty Data ID , Application ID , Password Location ID , Offer ID
608
Location

FIG. 6

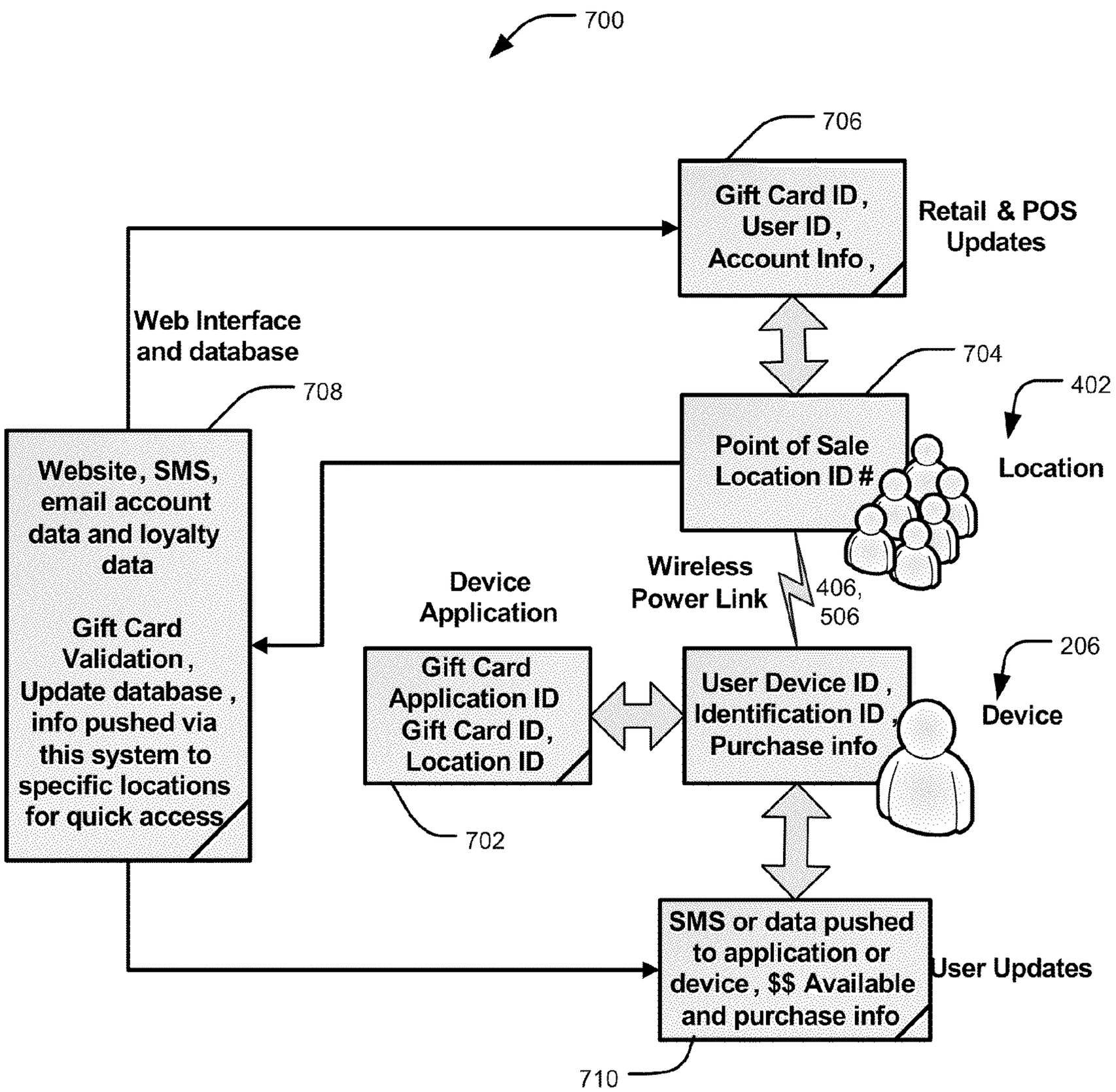

700
706
Gift Card ID,
User ID,
Account Info,
Retail & POS
Updates
Web Interface
and database
704
402
708
Point of Sale
Location ID #
Location
Website, SMS,
email account
data and loyalty
data
Gift Card
Validation,
Update database,
info pushed via
this system to
specific locations
for quick access
Device
Application
Wireless
Power Link
406,
506
206
Gift Card
Application ID
Gift Card ID,
Location ID
User Device ID,
Identification ID,
Purchase info
Device
702
SMS or data pushed
to application or
device, $$ Available
and purchase info
User Updates
710

FIG. 7

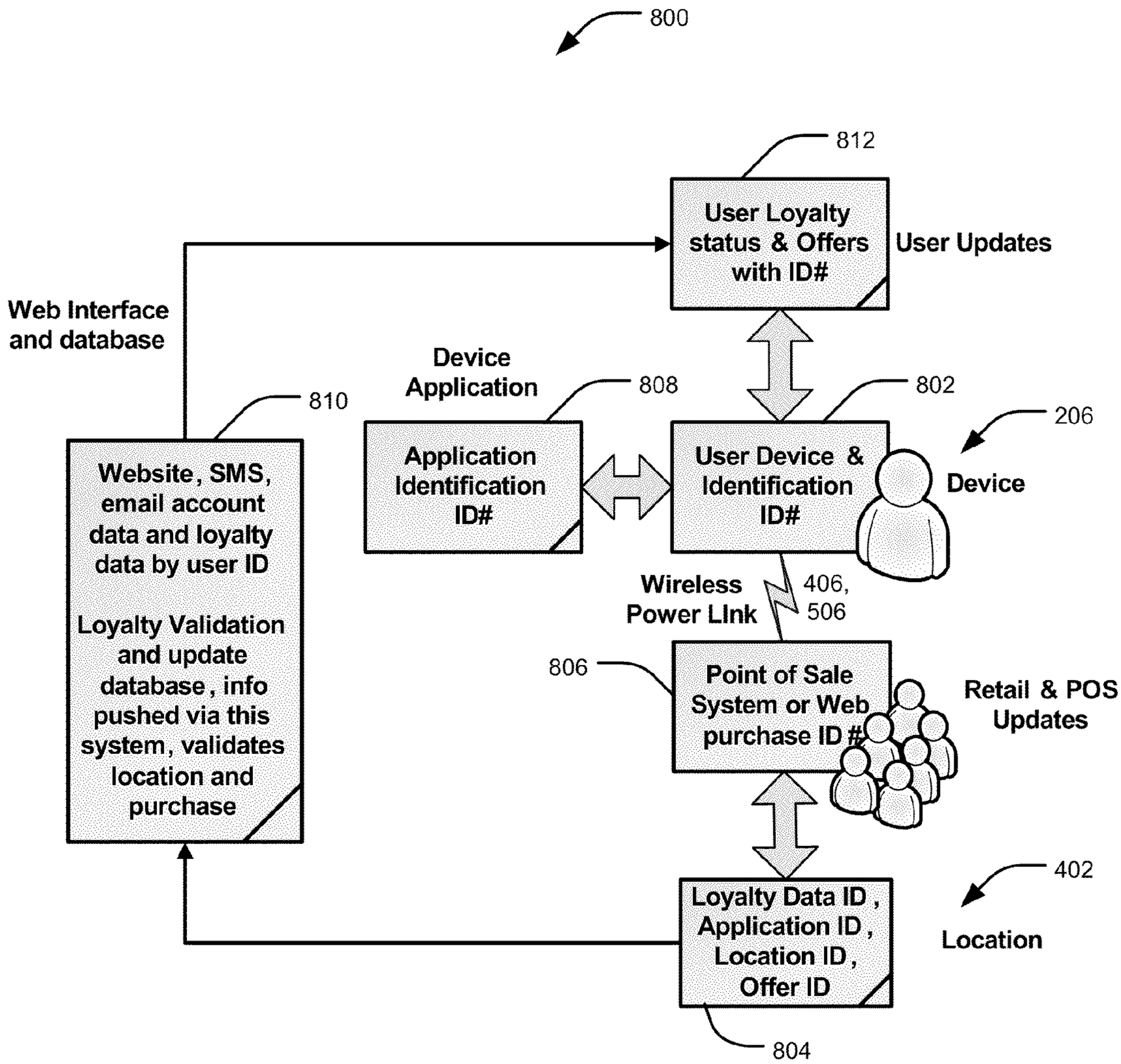

800
812
User Loyalty status & Offers with ID#
User Updates
Web Interface and database
Device Application
808
802
206
810
Website, SMS, email account data and loyalty data by user ID
Loyalty Validation and update database, info pushed via this system, validates location and purchase
Application Identification ID#
User Device & Identification ID#
Device
Wireless Power LInk
406, 506
806
Point of Sale System or Web purchase ID #
Retail & POS Updates
402
Loyalty Data ID, Application ID, Location ID, Offer ID
Location
804

FIG. 8A

FIG. 8B

820

User ID Device Database

Personal Identification	Device ID's	Device Types
USER ID	MFG-UNIQUE S/N-TYPE	MP3 Player
USER ID	MFG-UNIQUE S/N-TYPE	Camera
USER ID	MFG-UNIQUE S/N-TYPE	Cell Phone
USER ID	MFG-UNIQUE S/N-TYPE	Portable DVR
USER ID	MFG-UNIQUE S/N-TYPE	Bluetooth Headset
USER ID	MFG-UNIQUE S/N-TYPE	Laptop

822 824 826

840

Coffee Shop Loyalty Tracking

Location ID	Personal ID	Date	Time	Spend	Offer No.	Order No.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/10/2009	7:10am	$7.40		UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/11/2009	7:10am	$12.50		UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/12/2009	7:10am	$7.40		UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/13/2009	7:10am	$10.22		UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/14/2009	7:10am	$21.32		UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/15/2009	7:10am	$7.90	OFFER NO.	UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/16/2009	7:10am	$10.23		UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/17/2009	7:10am	$7.40		UNIQUE NO.
COFFEE SHOP-CITY-STORE NO-AREA	USER ID	1/18/2009	7:10am	$10.23		UNIQUE NO.
				$94.60		

822 844 846 848 850 852

842

FIG. 8C

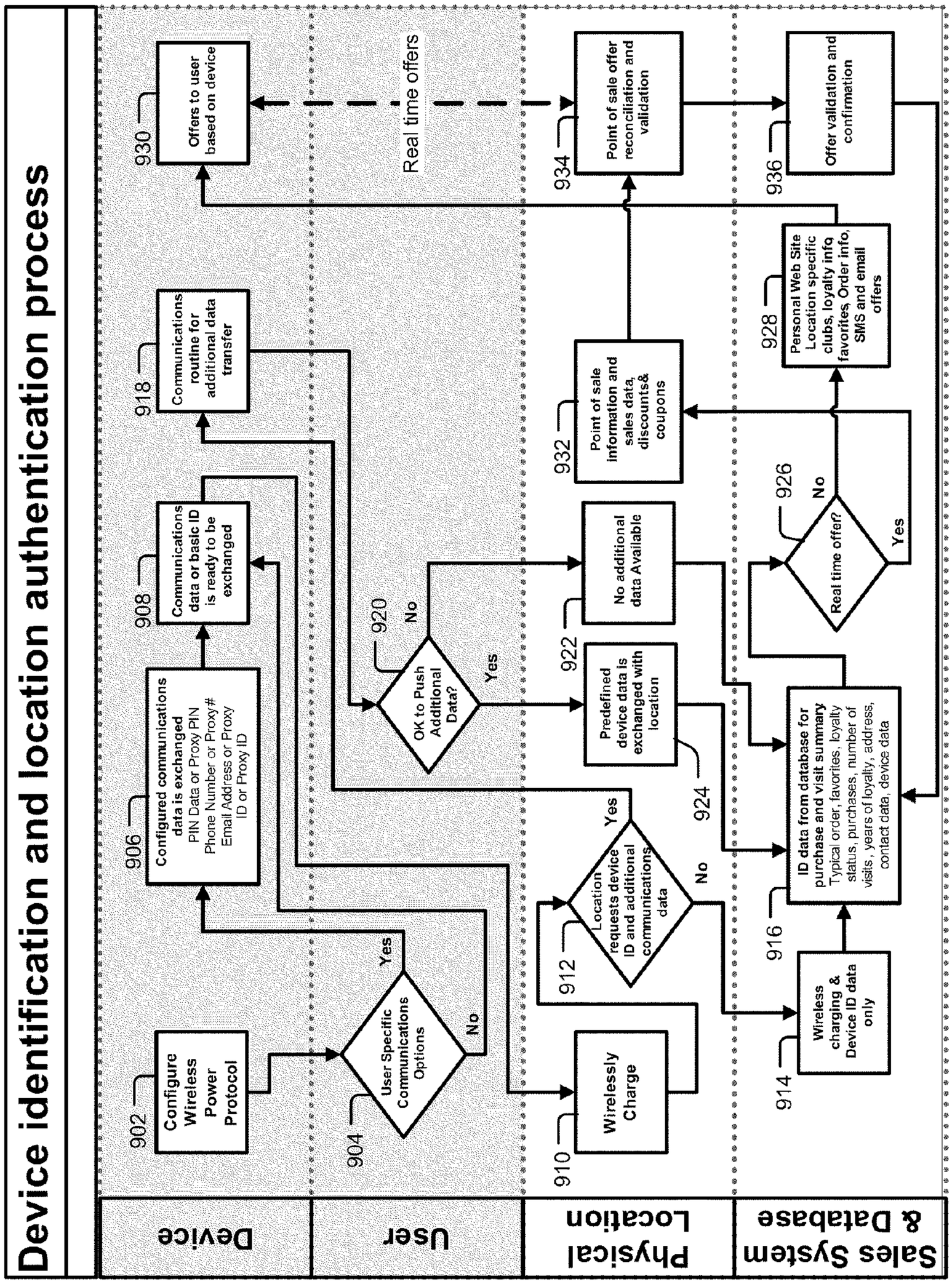

Device identification and location authentication process
Device
User
Physical Location
Sales System & Database
902 Configure Wireless Power Protocol
904 User Specific Communications Options
906 Configured communications data is exchanged PIN Data or Proxy PIN Phone Number or Proxy# Email Address or Proxy ID or Proxy ID
908 Communications data or basic ID is ready to be exchanged
910 Wirelessly Charge
912 Location requests device ID and additional communications data
914 Wireless charging & Device ID data only
916 ID data from database for purchase and visit summary Typical order, favorites, loyalty status, purchases, number of visits, years of loyalty, address, contact data, device data
918 Communications routine for additional data transfer
920 OK to Push Additional Data?
922 Predefined device data is exchanged with location
924 No additional data Available
926 Real time offer?
928 Personal Web Site Location specific clubs, loyalty info favorites, Order info, SMS and email offers
930 Offers to user based on device
932 Point of sale information and sales data, discounts& coupons
934 Point of sale offer reconciliation and validation
936 Offer validation and confirmation
Real time offers
Yes
No

FIG. 9

FIG. 12

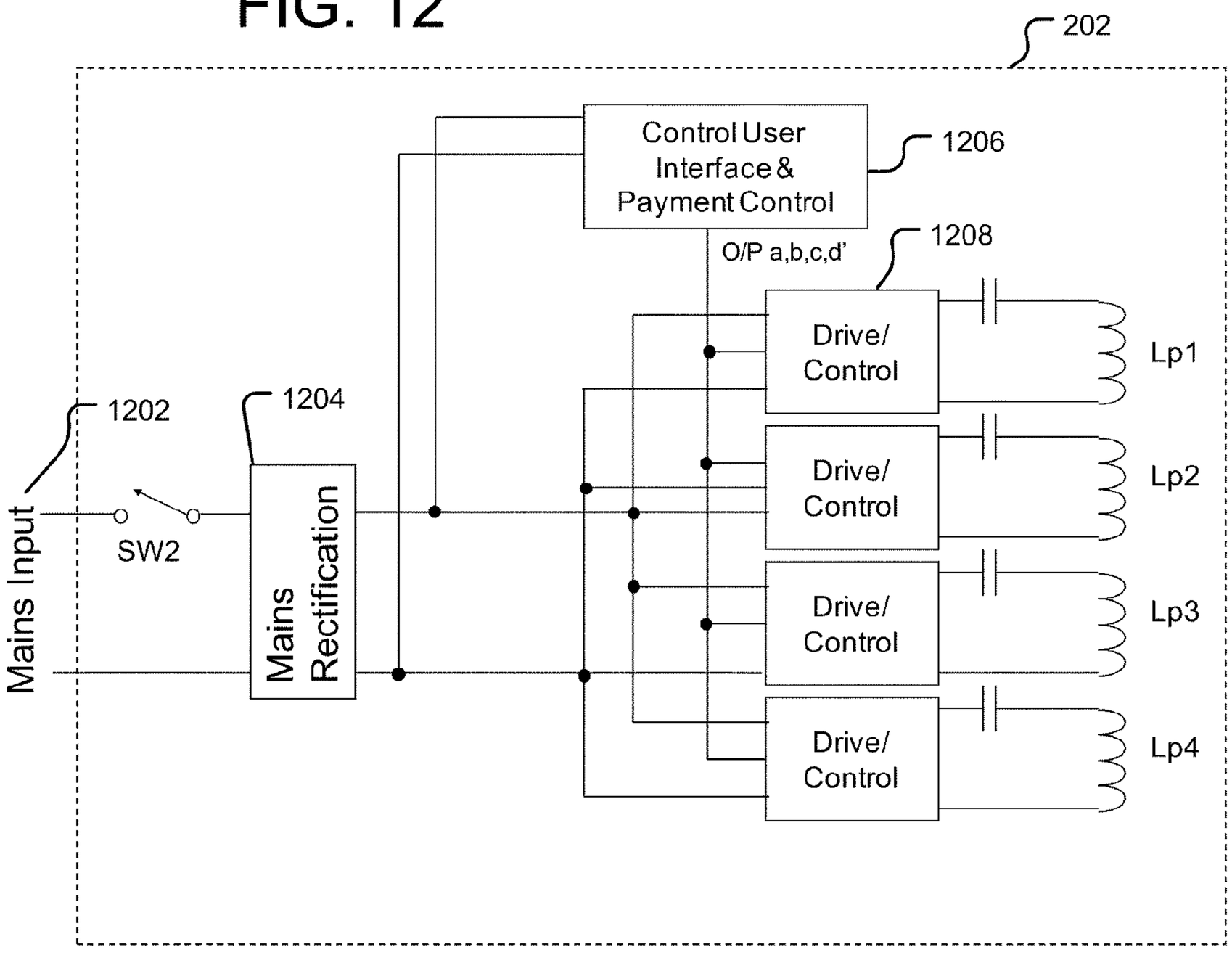
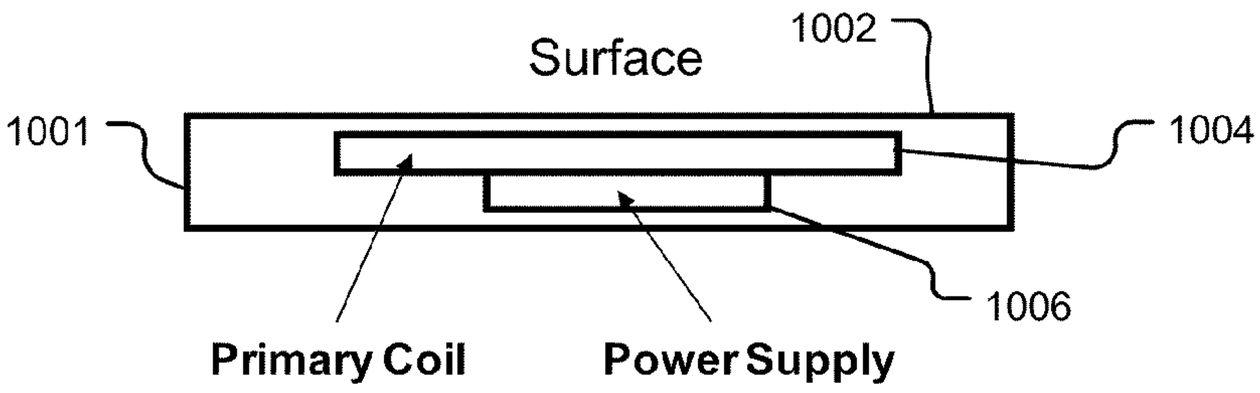

202
Control User Interface & Payment Control
1206
O/P a,b,c,d'
1208
Drive/ Control
Drive/ Control
Drive/ Control
Drive/ Control
Lp1
Lp2
Lp3
Lp4
1202
1204
Mains Input
SW2
Mains Rectification

FIG. 10


Surface
1002
1001
1004
1006
Primary Coil
Power Supply

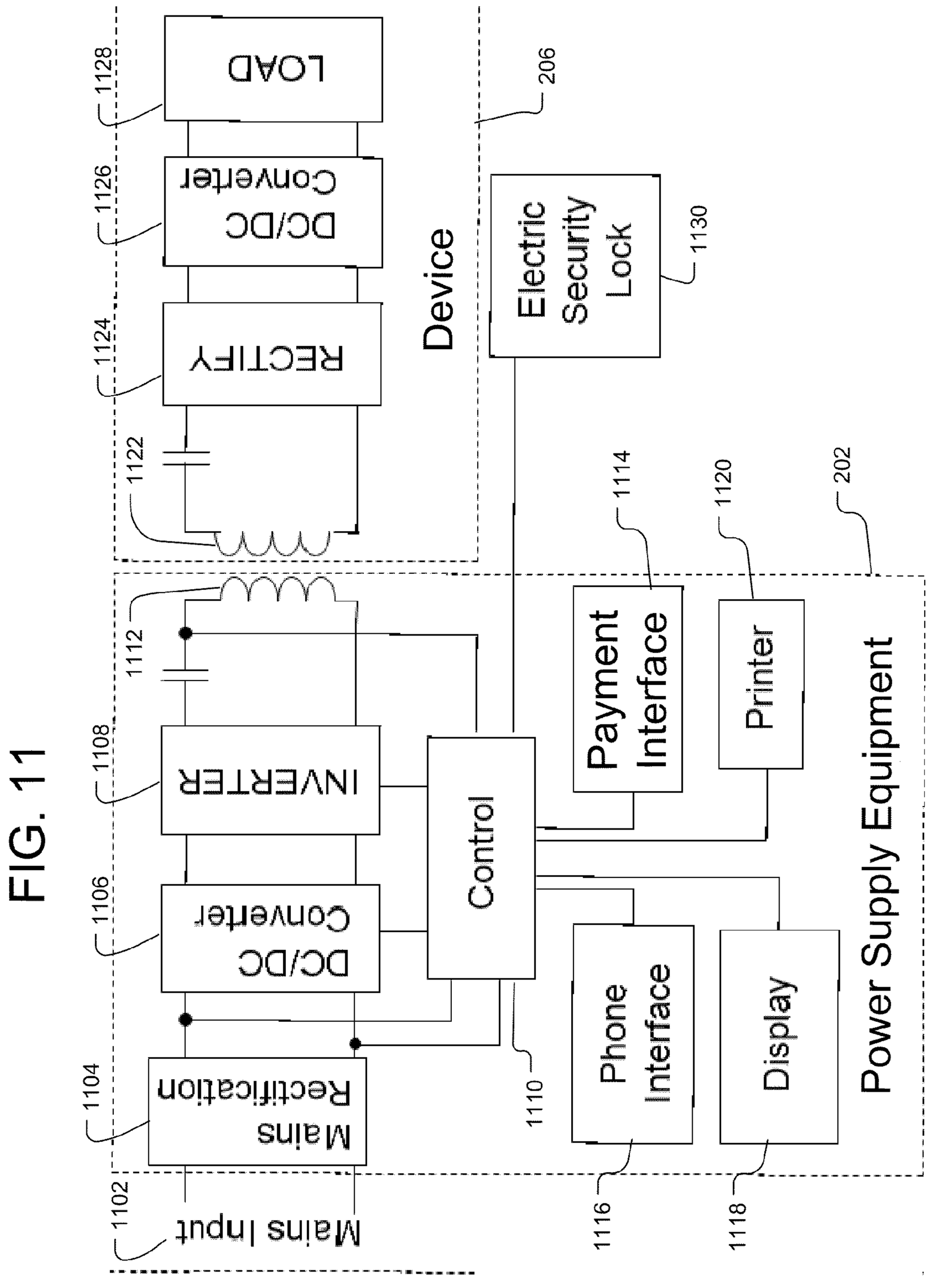

Mains Input
1102
Mains Rectification
1104
DC/DC Converter
1106
INVERTER
1108
1112
1122
RECTIFY
1124
DC/DC Converter
1126
LOAD
1128
206
Electric Security Lock
1130
Power Supply Equipment
202
Controller
1110
Phone Interface
1116
Display
1118
Printer
1120
Payment Interface
1114

FIG. 11

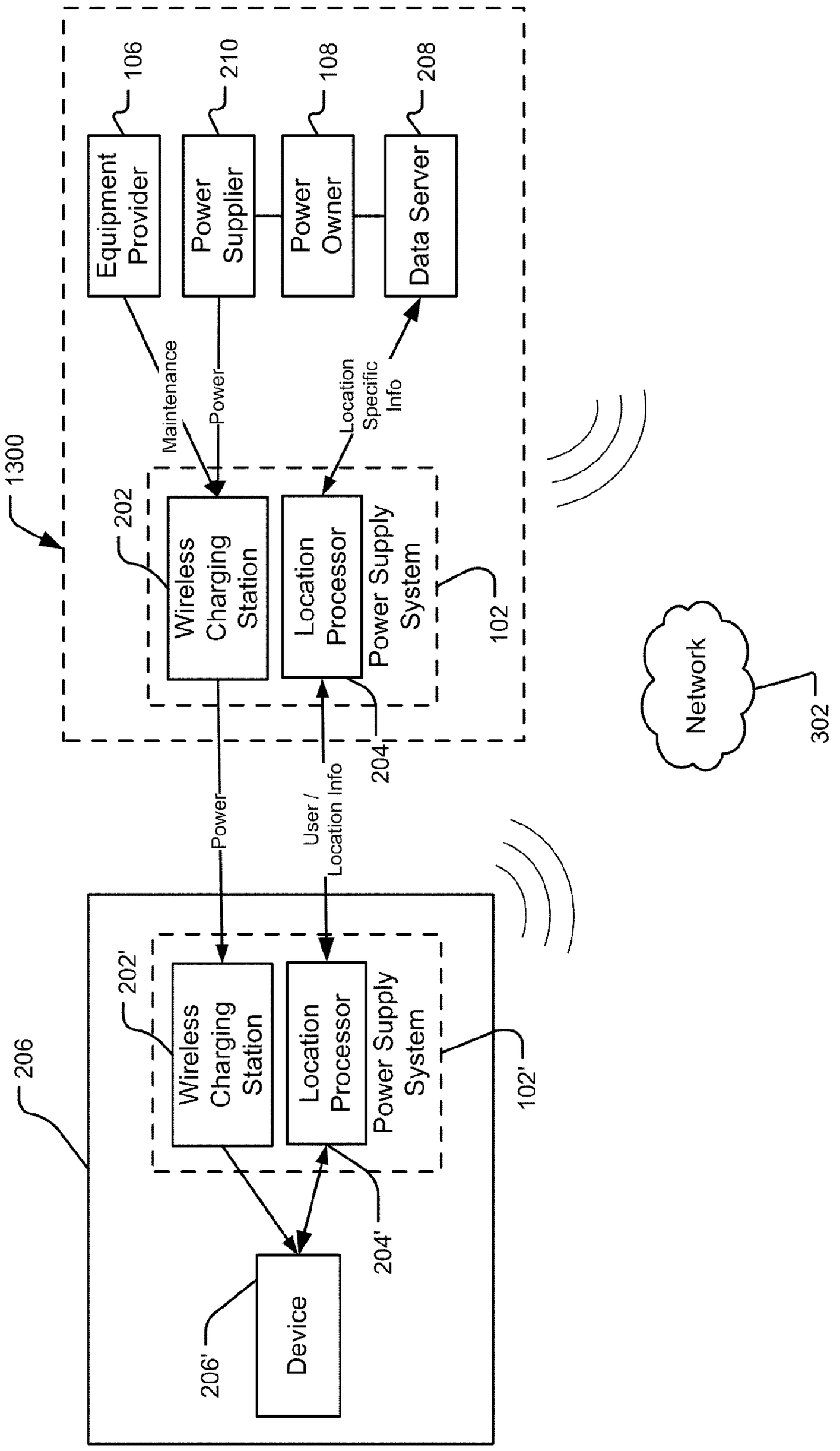

1300
Equipment Provider
106
Power Supplier
210
Power Owner
108
Data Server
208
Maintenance
Power
Location Specific Info
202
Wireless Charging Station
Location Processor
Power Supply System
102
204
Power
User / Location Info
Network
302
202'
Wireless Charging Station
Location Processor
Power Supply System
102'
204'
206
206'
Device

FIG. 13

PHYSICAL AND VIRTUAL IDENTIFICATION IN A WIRELESS POWER NETWORK

PRIORITY CLAIMS

This patent document claims the priority benefit provided under 35 U.S.C. §119(e) to U.S. Prov. Pat. App. No. 61/236,388, titled "WIRELESS POWER DISTRIBUTION AND CONTROL SYSTEM," filed on Aug. 24, 2009. The content of this provisional patent application is incorporated herein by reference for all purposes.

CROSS-REFERENCE TO RELATED APPLICATION

This patent document is related to commonly owned:

U.S. Pat. Pub. No. 2008/0231211, titled "POWER SUPPLY,"

U.S. Pat. Pub. No. 2008/0157603, titled "INDUCTIVE POWER SUPPLY WITH DEVICE IDENTIFICATION,"

U.S. Pat. Pub. No. 2008/0079392, titled "SYSTEM AND METHOD FOR INDUCTIVELY CHARGING A BATTERY,"

U.S. Pat. Pub. No. 2007/0042729, titled "Inductive power supply, remote device powered by inductive power supply and method for operating same,"

U.S. Pat. Pub. No. 2004/0150934, titled "ADAPTER," and

U.S. patent application Ser. No. 12/652,053, titled "WIRELESS CHARGING SYSTEM WITH DEVICE POWER COMPLIANCE" filed on Jan. 5, 2010.

The entire contents of these patent applications and/or the corresponding published patent applications are incorporated herein in their entirety for all purposes.

TECHNICAL FIELD

This patent document generally relates to wireless power delivery systems and more specifically to the physical and virtual identification of devices in a wireless power delivery system.

BACKGROUND

There is a significant and continually increasing need for widely available power, particularly in the field of consumer and business electronics, due to the proliferation of laptop computers, cell phones, music players, personal digital assistants and other self-powered rechargeable portable/remote devices that require periodic charging. In many public places, power may not be readily available to the general public because of the need for a power outlet for a wired connection. In the past, squatters may have plugged their devices into any available outlet and used power from the owner of the outlet. As devices become more power hungry the availability of outlets and the need for more power have become more common. The number of devices and the volume of usage per person further exacerbates the need for power. Electric vehicle charging now uses standard outlets, which contribute to the power supply needs of the public. Known power delivery systems are not be able to meet the demands for conveniently delivering power and other information.

BRIEF DESCRIPTION OF THE FIGURES

The system and method may be better understood with reference to the following drawings and description. Non-limiting and non-exhaustive embodiments are described with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention. In the drawings, like referenced numerals designate corresponding parts throughout the different views.

FIG. **1** illustrates a charging system;

FIG. **2** illustrates an alternative charging system;

FIG. **3** illustrates a communications and charging network for physical and virtual identification;

FIG. **4** illustrates an exemplary embodiment of a communications and charging network configured to provide location-specific information as disclosed herein;

FIG. **5** illustrates an exemplary embodiment of a communications and charging network configured to provide location-specific information in an electronic advertising system;

FIG. **6** illustrates an exemplary embodiment of a communications and charging network configured to provide location-specific information in a credit processing system;

FIG. **7** illustrates an exemplary embodiment of a communications and charging network configured to provide location-specific information in a gift card processing system;

FIG. **8**A illustrates an exemplary embodiment of a communications and charging network configured to provide location-specific information in a customer loyalty system;

FIGS. **8**B and **8**C illustrate an exemplary user identification database and an exemplary customer loyalty database;

FIG. **9** illustrates an exemplary operational flow of a communications and charging network configured to provide location-specific;

FIG. **10** illustrates an exemplary surface providing a wireless charge;

FIG. **11** illustrates an embodiment of a wireless power connection having an optional point-of-sale interface and an electronic security lock;

FIG. **12** illustrates alternative wireless power supply equipment; and

FIG. **13** illustrates an embodiment of a cascading communications and charging network for physical and virtual identification.

DETAILED DESCRIPTION

There is a significant and continually increasing interest in wireless power deliver/supply systems to satisfy consumers' needs for convenient power access. Wireless power supply systems provide a variety of benefits over conventional wired connections. Most notably, they eliminate the need for various charging cords and the need to repeatedly plug in and unplug electronic devices for recharging, thereby reducing cost and improving ease and convenience of use. Publicly available wireless charging may be very convenient and useful for consumers; and may provide retailers or vendors with an opportunity to directly target and market additional services and products that may be of interest to the consumer.

By way of introduction, the disclosed embodiments relate to systems and methods for providing location-specific information to consumers of a wireless power system. In one embodiment, the device requiring power manually or automatically connects and communicates with a wireless power or charging station provided by a power provider. The device and the wireless power station provide unique identification information which may, in turn, be linked to a virtual account (or accounts) associated with the owner of the device and the operator or location of the wireless power station. The device may further be required to provide a password and/or communicate in an encrypted manner to allow for secure access to the virtual account, billing information and/or payment

method. Upon establishing an encrypted or secure connection or an unencrypted or unverified connection, the wireless power or charging station and more specifically the wireless power connection may operate as a channel or conduit to provide additional information, offers and benefits to the consumer via their device.

In an alternate embodiment, the conduit may be established using the communications capabilities of the device. For example, the channel or conduit may provide additional information, offers and benefits to the consumer via their device utilizing existing cellular, Wi-Fi, Bluetooth, WiMax or other communication capabilities of the device. In another embodiment, the conduit or communications channel may be utilized to reprogram, upgrade or otherwise modify the device to add or change functionality. For example, the conduit or communications channel may be utilized by audio visual components to provide control codes to a universal remote, cell phone or personal digital assistant to allow the device to control the components. Further examples of this may be found in U.S. Prov. Pat. App. No. 61/236,388, titled "WIRELESS POWER DISTRIBUTION AND CONTROL SYSTEM," filed on Aug. 24, 2009. In this way, linked device, location and virtual account information may be verified and confirmed utilizing, for example, an application with configurable security, thereby increasing the value of the information to the consumer, retailers and other users and providers.

FIG. **1** illustrates a wireless charging and communication system **100**. The charging system includes at least one consumer **104** accessing a power supply system **102**. The power supply system **102** may provide wireless power to the consumer **104** in exchange for a payment. Alternatively, the power supply system **102** may provide power to the consumer **104** in conjunction with a loyalty or rewards program based on, for example, the type of product purchases, the quantity of the purchase, the amount of the purchase, frequency and location of visits, other special offers and/or at a reduced rate, price or combinations thereof. The power supply system **102** may be provided, maintained, and/or controlled by an equipment provider **106**, such as the owner or manager of a private, public or limited public space, and/or a power owner or supplier **108**, such as an independent franchise owner or an electrical utility. The consumer **104** may have a device, such as a cellular phone or laptop computer, that includes a battery, super-capacitor or other power storage mechanism that must be recharged or that requires a power supply for operation. The system **100** is further configured to share basic identification information that, in turn, can be references and utilized independently or in conjunction with network or virtual account information. It will be appreciated that the disclosed embodiments may be used to supply power to operate devices that do not have internal power storage means and require delivery of operating electrical power at the time of operation. Throughout this disclosure the term charge may be used to include providing power for recharging a battery or super-capacitor as well as providing or delivering power for reasons other than charging an energy storage component, such as powering the device. The power supply system **102** may provide the consumer **104** and an associated device **206** (see FIG. **2**) with power to charge or otherwise operate the device **206**. As described, the power or energy may be delivered as an electric current (AC or DC) that is passed from an electrical outlet or supply terminal to wirelessly power the device **206**.

The power supply system **102** may provide power wirelessly to the consumer **104**. The power may be provided through induction that generates an electrical current in the consumer's device that charges or powers the device. Wireless power transfer is further described in commonly owned U.S. Pat. Pub. No. 2008/0231211, titled "POWER SUPPLY," which is hereby incorporated by reference.

The power supply system **102** may be located at a location owned by the power owner **108**. In one embodiment, the power owner **108** may be a electricity distributor, such as an infrastructure owner who provides power through the power supply system **102**. The power owner **108** may utilize the equipment provider **106** for providing power to the consumer **104**, but also to receive payment for that power. The equipment provider **106** may be a manufacturer of products, such as furniture, that are produced with the power supply system **102** built in. For example, airport seating, airplane seating, desks, auditoriums, or kiosks may be manufactured to include the power supply system **102**. Since the power owner **108** may want to account for or recoup the expense for the power it provides to others, it may seek to utilize equipment from the equipment provider **106** that have the power supply system **102**, as a way to provide power and receive payment for it. The equipment provider **106** may control and maintain the power supply system **102** under an agreement with the power owner **108**, or the power owner **108** may control and maintain the power supply system **102**. In one example, the power owner **108** may include the equipment provider **106** as a single entity. It should also be noted that the power supply system **102** may also be deployed at a location for short power cycles and an authenticated information exchange. An example of this is a simple hot spot by a door to allow this system **100** and device **206** to act as a door lock, or a where-are-you-now marker that communicates location information to the device **206** to verify your location.

FIG. **2** illustrates an embodiment of a wireless charging system **200** configured to provide physical and virtual identification. The exemplary charging and identification system **200** is configured to wirelessly provide power or charge to a consumer **104** and more specifically to a consumer device **206**. The power supply system **102** includes wireless charging station **202** and a location processor **204**. The consumer device or device **206** may be any electronic device or system configured to receive a wireless charge. For example, the device **206** may include a battery (not shown) and the hardware and/or software necessary to wirelessly receive operating power and/or a battery charge via the wireless charging station **202**. The device **206** may include a cellular telephone, a Smartphone, Blackberry®, personal digital assistant (PDA), notebook/laptop computer, netbook, portable multimedia player (playing video/audio files, Blu-Ray, DVDs, CDs, etc.), video game player (e.g. Gameboy®, Playstation Portable®), mp3 player, iPod®, iPad® or any other device that may utilize a charge or power source. In another example, the device **206** may be a lighting element or bulb (not shown) configured to wirelessly receive power via the wireless charging station **202** in order to operate and provide illumination.

The device **206** may be configured to wirelessly couple to the power supply system **102** to receive power. For example, the device **206** may be fitted with, or coupled to, an adapter (not shown) that includes the hardware and/or software required to receive wireless power from the power supply system **102** and/or the wireless charging station **202**. The wireless charging station **202** may be manufactured with the hardware and software necessary for wireless power distribution or may be fitted with an adaptor (not shown) to provide or enable the desired functionality. In this example, the adapter coupled to the power supply system **102** may further connect to a standard electrical outlet in order to receive wired power and, in turn, wirelessly transmit the received power the device **206**. In alternate embodiments, an adaptor may be configured to identify and/or provide power to multiple

devices simultaneously. For example, the adapter may include multiple plugs or connectors configured to cooperate with different devices in order to effect a wireless power transfer. The wireless power transfer and adapter may be further described in U.S. Pat. Pub. No. 2004/0150934, entitled "ADAPTER," which is hereby incorporated by reference.

The power supply system **102** may perform other functions in addition to wirelessly delivering power to a consumer device **206**. The power supply system **102** may include a data server **208** configured to accessibly store geographic or location-specific information such as, for example, advertisements, coupons, loyalty points or information, weather information, local or nearby information or attractions, tourist information and travel or site information. The data server **208** may be coupled to, or in communication with, the location processor **204** to receive and process device information such as a unique device identifier, a serial name, a user name or other identification from the device **206**. The data server **208** may be a part of, or separate from, any of the power supplier **210**, the power owner **108**, or the equipment provider **106**. Alternatively, the data server **208** may be maintained at a different location or a part of a third party system provided by, for example, a marketing or advertising entity (not shown). The data server **208** may further operate as an authentication processor to verify, confirm correlate the received device and location information with virtual account information **304** stored therein which can be created in one or more systems. For added security, a credit system may store personal data and password information at a first location or server and credit provider password information at a second location or server.

The wireless charging station **202** may include an interface that provides wired or wireless access to the power at a particular location (presumably owned by the power owner **108**) and provided by a power supplier **210**. The interface may be an application resident or running on the device **206** or may be a GUI presented by the wireless charging station **202**. Alternatively, the interface may be accessed by the device **206** after a physical connection is made between the device **206** and the wireless charging station **202**. The physical or wired connection may initiate or authorize the information exchange as well as the wireless power transfer. Moreover, the physical or wired connection may be used to deliver power to the device **206** from the wireless charging station **202**. The wireless charging station **202** may identify the device that is being charged as described in, for example, U.S. patent application Ser. No. 12/652,053, entitled "WIRELESS CHARGING SYSTEM WITH DEVICE POWER COMPLIANCE" filed on Jan. 5, 2010, and U.S. Pat. Pub. No. 2008/0157603, entitled "INDUCTIVE POWER SUPPLY WITH DEVICE IDENTIFICATION," both of which are hereby incorporated by reference.

In another embodiment, the power supply system **102** may further include a separate detector (not shown) in communication with the location processor **204** that is configured to identify the device **206**. In other words, the detector may be a part of the power supply equipment **202**, or may be a separate component that connects with and provided the identity of the device **206**. The device information or identity may, in turn, be utilized by the location processor **204** and/or the offer database to determine a virtual account associated with the consumer **104**.

As described below, the power supply equipment **202** provides wireless power to the device **206**. The wireless power may be transmitted to the device **206** in conjunction with or separately from the transmission of location-specific information from the location processor **204** to the device **206**. For example, the communication of device information may be utilized by the wireless charging station **202** to authenticate and/or initiate the wireless transmission of power. Alternatively, the communication of device information may operate independently of the wireless power transmission to control and direct the communication of location-specific information from the data server **208** and location processor **204** to the device **206**.

FIG. **3** illustrates a communications and charging network for providing location-specific information **300**. The location processor **204** communicates with the consumer **104**, the equipment provider **106**, and/or the power owner **108** in order to link or otherwise correlate the physical location of the device **206** with a virtual account associated therewith. The consumer **104** (or the consumer's device **206**), equipment provider **106**, and power owner **108** may all be connected with the location processor **204** through a network **302**. The network **302** may connect any of the components to enable communication of data and may include wired networks, wireless networks, or combinations thereof. The wireless network may be one or a combination of a cellular telephone network, a network operating according to a standardized protocol such as IEEE 802.11, 802.16, 802.20, published by the Institute of Electrical and Electronics Engineers, Inc., or WiMax network. Further, the network **302** may be a public network, such as the Internet, a private network, such as an intranet, or combinations thereof, and may utilize a variety of networking protocols now available or later developed including, but not limited to TCP/IP based networking protocols. The network(s) may include one or more of a local area network (LAN), a wide area network (WAN), a direct connection such as through a Universal Serial Bus (USB) port, and the like, and may include the set of interconnected networks that make up the Internet. The network **302** may include any communication method or employ any form of machine-readable media for communicating information from one device or entity to another. For example, the consumer **104** may submit a password, device identification or other authentication over the network **302** to the location processor **204**. The location processor **204** may be coupled with additional networks or databases configured to store virtual account information for the consumer **104**, the power supply system **102** and/or the location of the wireless charging station **202**.

As previously discussed, virtual account information **304** may also be accessed over the network **302**. For example, the virtual account information **304** may be stored in a network accessible server or database such as the data server **208** or the location processor **204**. The virtual account information **304** may include a username and password associated with the consumer **104**. The virtual account information **304** may be associated with a particular power supply system **102** which, in turn, may be provided by a specific retailer or retail chain. For example, the virtual account information **304** may include information related to a customer reward program which provide benefits to encourage customer loyalty. Moreover, the virtual account information **304** could include information related to other partner retailers or other retail locations within the chain.

The virtual account information **304** may be utilized to analyze or track the shopping and buying habits of the consumer **104** to allow specific offers, deals or related products to be communicated to the device **206**. For example, if the consumer **104** purchases a product during a visit to a retailer, the consumer **104** may be suggested accessories to the product or coupons for upgrades, accessories or other related

products. In addition, the consumer **104** may access offers extended from the retailer through a virtual account such as a web page. The virtual account information **304** may further include customer demographics, devices owned, payment processing data, credit card or other account information, telephone number, or other information related to the consumer **104** and/or the device **206**.

In another embodiment, the virtual account information **304** may be a third party service to which multiple retailers could subscribe. For example, the virtual account information **304** could be linked to a social network to allow product reviews to be shared amount related groups of consumers **104**. Alternatively, the virtual account information **304** could include account information for different retailers offering different products and services to allow for cross-selling opportunities.

In yet another embodiment, the virtual account information **304** could include secure and/or encrypted information which may be verified by the data server **208** acting as an authentication processor. For example, the virtual account information **304** may be securely linked to a bank account or credit card to allow the consumer **104** to pay for merchandise or services via the device **206**. The virtual account information **304** may be accessible and editable to the consumer **104** through a web interface via the network **302**.

Moreover, the virtual account and virtual account information **304** may be utilized to alert the consumer **104** via their device **206** of charges made against their credit card, virtual account or other debit account. In this way, the consumer **104** may be made aware of any potentially fraudulent or unauthorized purchase. The device **206** may further include an application configured to the bank or credit card company immediately of the suspicious activity and request a new password, encryption code, or a new account number. The application may further allow the consumer **104** to create a new encrypted physical device ID and upload that new ID to be linked with the bank or credit account identified in their virtual account. The consumer **104** may be able to control the level of notifications through a setup screen (either on the device **206** or on a secure bank web site). For example, the consumer **104** may choose a threshold purchase amount, above which they will receive the notification message on their smart phone.

The virtual account information **304** in this exemplary embodiment is illustrated as a single logic entity; however, it will be understood that individual components or elements of the virtual account information **304** may be stored in different, communicatively connected, databases accessible via the networks **302**. For example, virtual account information related to a retailer or group of retailers may be stored in one database, while virtual account information for the consumer **104** may be stored in a different database and the account or payment information may be stored in a third secure database. In this way, each database or portion of a database may be defined with different access level and/or security while still allowing for the convenient transfer of information between authorized parties and/or entities.

FIG. **4** illustrates an exemplary embodiment of another communications and charging network for providing location-specific information **400** configured to link devices and their associated users to one or more virtual accounts based on their physical location. For example, the identification system **400** may include one or more devices **206** configured to interact with one or more physical locations **402**. The devices **206** may include, for example, a laptop or PDA **206***a*, a cell phone **206***b*, a global positioning system (GPS) device **206***c*, a digital camera **206***d* and/or a digital video camera **206***e* or any other device configured to receive power wirelessly and/or to communicate wirelessly. Similarly, the physical locations **402** may include, for example, an airport or other mass transit terminal **402***a*, a gas station **402***b*, a school or retail location **402***c*, an office or factory **402***d* or any other location that includes or provides a wireless charging station **202**.

The identification system **400** may, when one of the devices **206** comes into contact and/or communication range of a wireless charging station **202** deployed at one of the physical locations **402**, initiate an information transfer. For example, as the wireless charging station **202** begins providing power to the device **206** via a wireless inductive transfer; an information exchange may be carried out. The information exchange may be accomplished via the wireless or inductive power link or channel, or via a Bluetooth, WiFi, cellular connection provided by the device **206**. In particular, the device **206** may, as shown at block **404**, communicate a device identification (ID), a personal ID and/or an application ID via a wireless power link **406** or other communication or network link. The communicated information may be received by, for example, the location processor **204** and correlated with, as shown in block **408**, a location ID, an offer ID and/or a loyalty ID associated with one or more of the physical locations **402***a* to **402***d* represented by the communicated identification information. Communication modules or systems **410** and **412** may be coupled to the device **206** and the wireless charging station **202** deployed at one or more of the physical locations **402** for communication with, for example, the data server **208**. The communication modules or systems **410** and **412** may be wired or wireless devices that respectively provide the devices **206** and physical locations **402** a conduit for updating the data server **208**.

In operation, the cell or smartphone **206***b* may come into range of a retail location **402***c* and an information exchange may be automatically or manually initiated. In addition to the exchanged identification information, the wireless power link **406** may be utilized to exchange information on the transaction or services provided by the retail location **402***c*. For example, if a product is purchased at the retail location **402***c*, the product registration information, as shown in block **414**, may be communicated to the data server **208**. Alternatively or in addition to, and as shown in block **416**, the data server **208** may be queried for delivery information related to the consumer **104**, the physical location **402**, any special offers related to the purchased product or service, and/or information related to nearby events or places of interest. In this way, the wireless charging station **202** may be utilized to provide power to devices as well as providing enriching and/or value-added information to the consumer **104**. Data and power may be exchanged via different communication channels established between the device **206** and the wireless charging station **202**. For example, data and/or power may be exchanged via a first communication channel while data or other information and alerts may be exchanged via a second, independent, communication channel. Alternative, data and power may be communicate via the same communication channel by modulating or otherwise encoding the data within the power transfer signal or vice versa. It is becoming more popular for cell phone and GPS devices and associated services to provide wireless information about services at the customer's present location. These notifications may include information about where the customer is able to find the wireless charging station **102**. This also allows additional combined offers and recommendations to be made with past history being applied to new visits, locations and options presented to the consumer.

FIG. **5** illustrates another embodiment of a communications and charging network for providing location-specific

information **500** configured to link devices and their associated users to one or more virtual accounts based on their physical location and deliver targeted advertising based on the established links. As previously discussed, the device **206** may, when in range of the wireless charging station **202**, communicate and exchange a device identification (see block **502**) and a sales and location identification (see block **504**) associated with the physical location **402** via the wireless link **406**. In this way, the identification system **500** may determine that the consumer **104** and the device **206** are at or in range of the physical location **402**.

The device **206**, in this embodiment, may include or execute a software application (as shown in block **508**) to manage and protect data transfers such as, for example, electronic fund or payment transfers, device and personal information transfers. In this embodiment, the consumer **104** is assumed to have conducted a transaction via the device **206** (with or without the software application **508**). Thus, the location processor **204** has received and linked the device identification **502** and the location identification **504**. The location processor **204** may query a location virtual account (see block **512**) stored on the data server **208** (or otherwise accessible) to determine and offer location-specific information (see block **510**) to the device **206** and the consumer **104**. In this example, the location-specific information **510** may be advertising offers that may or may not be related to the product or service that was the basis of the transaction. The location-specific information **510** may further includes service information, customer loyalty and reward information, sales information, coupons and other offers. The location-specific information **510** may be displayed or accessible directly via the device **206** or via the software application **508**. The data server **208** alone, or in cooperation with, the location processor **204** may track the type any frequency of the location-specific information **510** provided to the device **204**. The data server **208** alone or in cooperation with the location processor **204** may further verify the transaction and exchanged information (see block **514**). The data server **208** alone or in cooperation with the location processor **204** may further debit or credit advertisers and the consumer **104** based on the delivered and/or utilized location-specific information (see block **516**).

FIGS. **6** to **8** illustrate alternate embodiments of communications and charging networks **600**, **700** and **800** for providing location-specific information. As previously discussed in connection with FIGS. **4** and **5**, the device **206** and the physical location **402** communicate and exchange location information via the wireless power link **406**. FIG. **6** illustrates an embodiment in which device **206** is presumed to include and execute a bill payment or transaction application (see block **602**) operable within the communication and charging network **600**. The application **602** may be configured to provide for password protected and secured financial transactions. For example, the application **602** may be configured to access the consumer's **104** credit or bank account to affect payment at a point-of-sale device (see block **604**) contained at the physical location **402**. The consumer **104** may enter or provide a password to the device **206** and the application **604** may initiate or authorize payment for the goods or services provided at the physical location **402**.

The communication and charging network **600** may, in response to the password or authentication, attempt to confirm the transaction. For example, the data server **208** may access virtual accounts for both the consumer **104** and the location **402** (see blocks **606** and **608**, respectively) to attempt to identify and verify the transactions. The device and location identification information within the virtual accounts as well as additional password, identification and position information may be provided to the data server **208** and/or the location servers **202**. The data server **208** and/or the location servers **202** may, in turn, confirm stored location information with the present location of the device **206**, update stored information and confirm stored user credentials (see block **610**). The data server **208** and/or the location servers **202** may further communicate updated loyalty point information, sales offers and/or confirmation to the device **206** (see block **612**).

FIG. **7** illustrates the communication and charging network **700** configured to process electronic gift card information provided via the device **206** and/or an application (see block **702**) executed thereby. For example, in order to complete a transaction for goods or services, the consumer **104** may provide or authorize transmission of gift card information via the application **702**. The gift card information may be communicated by the wireless link **406** to a point-of-sale device (see block **704**) at the location **402**. The received information **304** may be correlated against stored virtual account information containing the consumer's payment information, account information and/or user or device identification (see block **706**). The gathered and correlated information may be communicated to the data server **208** where the gift card information can be confirmed, account information updated and confirmation alerts, messages, texts, etc, (see block **708**) can be communicated to the point-of-sale device at block **704** and/or the virtual user account (see block **710**). The information provided at block **710** may be used to update the device **206** and application **702** with, for example, a remaining gift card balance, purchase confirmation, store location or other pushed information from the data server **208**.

FIG. **8**A illustrates the communication and charging network **800** configured to implement a loyalty tracking and/or rewards program based on link device and location information provided via the device **206** and wireless charging station **202**. As previously discussed and shown at blocks **802** and **804**, device information and location information may be exchanged via the wireless link **406** and a point-of-sale system (see block **806**). Alternatively or in addition to, the device **206** may employ a software or security application to control access to the consumer's loyalty identification, password(s) and/or other personal information (see block **808**). In this way, when a device **206** and consumer are within range of the wireless charging station **202**, device and location information (see blocks **802** and **804**) may be linked and exchanged therebetween. Thus, the communication and charging network **800** can confirm the presence of the device **206**, and presumably the consumer **104**, at the location **402** and reward or loyalty points may be awarded (see block **810**). At block **812**, the rewarded or updated loyalty information may be communicated to the device **206** along with any offers or other location-specific information. It should be noted that reward or loyalty points may be awarded based on the exchange of information, when a transaction is completed or a combination of thereof.

FIGS. **8**B and **8**C illustrates information that may be exchanged and eventually correlated. FIG. **8**B illustrates a user device identification database **820** that includes personal identification or user information **822**, a corresponding unique device information or identifier **824** and an associated device type **826**. The user device identification database **820** may be stored in the location processor **204** and/or the data server **208**. FIG. **8**C illustrates a loyalty tracking database **840** for an exemplary coffee shop. The loyalty tracking database **840**, in this exemplary embodiment, location information or identification **842** is correlated with personal identification or user information **822**. The loyalty tracking database **840** may

further track the date **844**, time **846** and amount **848** of transactions associated with the location information **842**. Offer information **850** and order information **852** may further be stored and correlated based on location information **842** and the personal identification or user information **822**. In this way, user patterns and purchasing habits, offer history and other patterns may be determined and evaluated.

The device **206** in some embodiments may or may not include networking or communication capabilities. If the device **206** does not include additional communication capabilities, and information is not communicated via a wireless power link, then transaction records and updates may be stored locally on the device **206**. In this way, information and records may be stored on the device **206** until and alternate communication mechanism or method may be established. For example, transaction records and updates may be stored within the device **206** until a wired communication link is established allowing information to be uploaded or provided to the location processor **204** and/or the data server **208**.

The device **206** may in other embodiments be configured to communicate and cooperate with a wireless charging station **202** deployed or integrated within an automobile. For example, when the consumer **104** is within range of the automobile, the wireless charging station **202** may inductively couple with the device **206** to wirelessly deliver power. The device **206**, as previously discussed, may include a software application configured to allow the device **206** and the automobile to exchange and authenticate information. In this way, the automobile and the device **206** may communicate and confirm identity information that, in turn, may allow location-specific information to be exchanged via the wireless power link. The location-specific information could, in this exemplary embodiment, be commands and information related to the automobiles environmental controls or entertainment controls. For example, the consumer **104** may use the application loaded onto the device **206** to control music or video displayed within the automobile, or to control the climate within the automobile. Alternatively, the location-specific information exchanged via the wireless power link could be used to access the automobiles locks and/or ignition. The automobile may be configured to provide power to, and receive input from, multiple devices via the wireless charging station **202** deployed therein. Multiple devices may allow passengers to control adjust individual climate control or entertainment settings. Moreover, the activities of each of the multiple devices may be tracked and stored via their interaction with the wireless charging station within the automobile.

In another embodiment, device **206** may be the automobile (as opposed to a device within an automobile). The device **206**, e.g., the automobile in this embodiment, includes or is assigned a unique physical ID code or device identification. The power supply **102** may be installed or deployed in a public or private parking structure and configured to communicate with the automobile. For example, in this embodiment, the device **206** may provide the physical ID code associated with the automobile to authenticate account information, authorize power delivery and link the physical ID code or information to the virtual user account and the equipment provider/power owner (e.g., location) virtual account. The automobile (device **206** in this embodiment) may further include data uplink capabilities through a cellular or WiFi network. Alternatively, the automobile may communicate through the power supply **102** to the network **302**.

FIG. **13** illustrates another embodiment in which the power supply **102** may be deployed in a cascading manner with one or more other power supplies **102'**. For example a first power supply may be located in a parking structure **1300** with communicates with and charges an electric vehicle. The vehicle may contain a second power supply **102'**, for example in the dash board or console, that communicates with an at least one secondary device **206'** such as cell phones, MP3 players or other device carried within the automobile (e.g, device **206**). Moreover, the automobile **206**, may communicate, authenticate and/or update the exchanged information with the data server **208** via the location processors **204**, **204'** and the wireless power link. Alternatively, the automobile **206** may be configured with cellular or other communication capabilities or may be configured to utilize the communication capabilities of the device **206'** to communicate, authenticate and/or update the exchanged information with the data server **208** via the network **302**. In another embodiment, the device **206'** may execute a stored application to authenticate and link the device information associated with the device **206'** to the device information associated with the device **206**. The application may then be utilized to authenticate and link both the device **206** and the device **206'** to the location information associated with the power supply **102** deployed within the parking structure **1300**. It will be understood that the described cascade or nested configuration may be implemented for other types of vehicles such as, for example, boats and boat slips, or air planes and terminals.

The device **206** in another embodiment may be configured to communicate and cooperate with a wireless charging station **202** deployed or integrated in a hotel or home. As will be understood, after the device **206** is authenticated to the wireless charging station **202** of a hotel, location-specific information related to the hotel may be provided to the device **206** and/or an application executed by the device **206**. For example, at check-in, the consumer **104** may access and communicate with the wireless charging station **202** and receive a location-specific locking code via the wireless power link. The location-specific locking code may, for example, control access to a room within the hotel, facilities within the hotel and/or services. Moreover, the location-specific information could include information regarding nearby restaurants, entertainment, services of other points of interest for travelers staying at the hotel.

FIG. **9** illustrates a device identification and authentication process **900** that may be implemented in accordance with the disclosure provided herein. At block **902**, a device may be configured accordingly to a wireless power delivery protocol. For example, the device **206** may be configured with the necessary settings, passwords and/or permissions to establish a wireless power link **406** with the wireless charging station **202** deployed at the location **402**.

At block **904**, the consumer **104** may be prompted provide, via the device **204** or a web-based interface, passwords, account information and other authentication information. If authentication information is required and provided, then at block **906**, data may be exchanged utilizing the provided personal identification number (PIN), identification information and/r proxy information. If authentication is not required, then at block **908**, the device **206** is ready to exchange information or data based on the configuration established at block **902**.

At block **910**, a wireless power link may be established between the device **206** and the wireless charging station **202**. The wireless power link may, in turn, transfer power from the wireless charging station **202** to the device **206**.

At block **912**, the wireless charging station **202** and the associate location processor **204** may request additional device information and/or identification as well as communication and security protocol information.

At block **914**, if additional information is not required, wireless charging may continue based on the initially provided device identification information.

At block **916**, the device identification information may be provided to the data sever **208** and/or the location processor **202** to update the virtual account associated with the consumer **10**.

If additional information and communication is required, then at block **918**, a communication routine or process may be authorized to transmit or provide the additional communications data gathered at block **906**.

At block **920**, the consumer **104** may be prompted to authorize the push communication of the additional communication data. If, at block **922**, authorization is not provided, then no information is communicated and the process continues to block **916**. If, at block **924**, authorization is granted by the consumer **204**, then the additional communication data, passwords, configuration information, etc may be pushed to, for example, the location processor **204** and/or the data server **208** and the process continues to block **916**.

As previously discussed, at block **916**, the device identification information, with or without the additional communication data, may be provided to the data sever **208** and/or the location processor **202** to update the virtual account information associated with the consumer **104**.

At block **926**, the data sever **208** and/or the location processor **202** determine whether an offer or other location-specific information may be communicated to the device **206** in real time. If no real time offer or update is available, then at block **928**, the location-specific information may be provided to the virtual account associated with the consumer **104**. Alternatively, the location-specific information may be communicated to the device **206** via, for example, a secure web page, a text or email message. At block **930**, the non-real time offer and/or location-specific information may be received and displayed by the device **206**. If a real time offer or update is available, then at block **932**, the location-specific information may be provided to a point-of-sale device at the physical location **402** (see block **934**). At block **936**, the point-of-sale device may generate an offer validation and confirmation of the same may be communicated to the process at block **916** for recordation and updating of the location processor **202** and/or data server **208**. Moreover, the real-time location-specific and/or location-specific information may be received and displayed by the device **206** as shown at block **930**.

FIG. **10** illustrates an exemplary surface providing a wireless charge. The power supply equipment **202** may include a wireless charger **1001** with a surface **1002** that is adjacent a primary coil **1004** coupled with a power supply **1006**. The power supply **1006** provides current to the primary coil **1004** for generating a magnetic field. When a device is disposed on or near the surface **1002**, a charge is induced in a secondary coil in the device (not shown) from the primary coil **1004**. In alternative embodiments, a single wireless charger **1001** may charge multiple devices. The power supply equipment **202** may include a single large wireless charger **1001** that charges multiple devices. The wireless charger **1001** may be, for example, located in auditorium seating, airport seating, train seating, airplane seating, fold down tables, or restaurant tables for providing a wireless charge. In particular, the wireless charger **1001** may be disposed in the armrest of one of the seats, such that the device is placed on or near the armrest surface for a wireless charge. Alternatively, other surfaces, such as a desktop, work surface, or table may also be equipped with the wireless charger **1001**.

FIG. **11** illustrates a wireless power connection. Power from the power provider enters **1102** and is then rectified to DC by **1104**. The power supply **1106** allows a variable power supply to alter the DC voltage required as selected by **1110**. This information is passed from the device **206** through the wireless power link **1112**. The capacitor adjacent to **1112** in the device **206** is optional depending on design considerations. Device limits, charge or power needs are transferred from the device **206** to the power supply equipment **202** using a simple control that varies the load **1128** by the device **206** control to allow detailed communications. This control may be the microprocessor located within the device and can switch an additional load or change the voltage level using **1126** to send information to the control **1110**. Alternatively, the control **1110** may also alter the signal send through the wireless power link **1112** using the converter **1106** changing the voltage into the inverter **1108**. A voltage or frequency input at **1122** or **1124** to the device **206** microprocessor control may allow this information to be decoded. Wireless power charging is further described in U.S. Pat. Pub. No. 2008/0079392, entitled "SYSTEM AND METHOD FOR INDUCTIVELY CHARGING A BATTERY," and U.S. Pat. Pub. No. 2007/0042729, entitled "INDUCTIVE POWER SUPPLY, REMOTE DEVICE POWERED BY INDUCTIVE POWER SUPPLY AND METHOD FOR OPERATING SAME," both of which are hereby incorporated by reference.

FIG. **11** shows the power supply equipment **202** inductively coupled with the device **206**. In one embodiment, the device **206** is charged inductively by the power supply equipment **202**. The power supply equipment **202** may include the wireless charger **1001** described with respect to FIG. **10**. The power supply equipment **202** may receive main inputs **1102** of power. The power may be paid for by the power owner **108**. The main input is rectified **1104** before going through a DC/DC converter **1106** and an inverter **1108**. A control **1110** controls the incoming power and regulates the primary coil **1112**. As described above with respect to FIG. **2**, the billing processor **204** may be a separate component from the power supply equipment **202**. Alternatively, the power supply equipment **202** may include a payment interface **1114** for receiving the payment from the consumer. The power supply equipment **202** may further include a phone interface **1116** for coupling with a cellular network. The phone interface **1116** may debit a consumer's minutes for charging of a cell phone device. A display **1118** may display for the consumer the elapsed time of the charging along with the current cost. Additional device and/or account information may be shown on the display **1118** to the consumer. A printer **1120** may print out a receipt for bill payment and/or print out a code (such as a PIN) for retrieving a charging device.

The device **206** may include a secondary coil **1122** disposed adjacent or near the primary coil **1112** for generating a current that passes through a rectifier **1124** and a DC/DC converter **1126**. The wireless inductive transfer between the power supply equipment **202** and the device **206** feeds a load **1128** that is charged by the power supply equipment **202**. As discussed above with respect to the lockers **702** in FIG. **7**, an electric security lock **1130** may secure the device **206** to prevent access except for the device owner. The electric security lock **1130** may require a code, PIN, or other identifying material for access to the device.

FIG. **12** illustrates alternative wireless power supply equipment **202**. The components in the power supply equipment **202** may be similar to the power unit illustrated in FIG. **11**. The power supply equipment **202** may include a control that powers four wireless power devices with one controller **1206**. This system may be easily scaled to as many units as required for an installation by adding drive controls **1208** as system speed allows or adding parallel systems as required. The main

input **1202** is received and passed through a rectifier **1204**. A control user interface **1206** may monitor/control the charging that is provided by the coils Lp**1**, Lp**2**, Lp**3**, and Lp**4**. Each of the coils may be coupled with a separate drive/control **1208** that pass current through the coils. The power supply equipment **202** illustrated in FIG. **12** may configured to charge multiple devices simultaneously with the plurality of coils. The controller **1206** multiplexes monitoring each of the drive controls **1208**. The drive control to the coil Lpx is handled by each drive control **1208** respectively, in order to share processing requirements. The controller **1206** may maintain communications and basic power parameters for each of the controls **1208** while the controller **1206** drive controls each coil Lp**1**-Lp**4** respectively.

In one embodiment, the wireless power may be transferred to a device automatically with limited or no user interaction. For example, when a consumer with his/her device enters into a wireless charge area, the device may automatically begin receiving wireless power after the device or account is identified and a form of payment is verified. The device may identify itself to the wireless charge system. The wireless charge area may include the range that the wireless power is available over. When the device is within range, it may automatically receive power until it is fully charged, at which time, it may stop receiving power. Alternatively, this automatic charging may request confirmation from the consumer on whether the device should be wirelessly charged. For example, an SMS communication/response or other validation may be required on the device or at a source of the wireless power in order to begin the wireless power transfer. The device may detect that it is within the wireless power range and provide a Yes/No option for the consumer to decide whether to receive wireless power to the device. The validation may also include the price that must be paid for the wireless power.

The system and process described above may be encoded in a signal bearing medium, a computer readable medium such as a memory, programmed within a device such as one or more integrated circuits, one or more processors or processed by a controller or a computer. That data may be analyzed in a computer system and used to generate a spectrum. If the methods are performed by software, the software may reside in a memory resident to or interfaced to a storage device, synchronizer, a communication interface, or non-volatile or volatile memory in communication with a transmitter. A circuit or electronic device designed to send data to another location. The memory may include an ordered listing of executable instructions for implementing logical functions. A logical function or any system element described may be implemented through optic circuitry, digital circuitry, through source code, through analog circuitry, through an analog source such as an analog electrical, audio, or video signal or a combination. The software may be embodied in any computer-readable or signal-bearing medium, for use by, or in connection with an instruction executable system, apparatus, or device. Such a system may include a computer-based system, a processor-containing system, or another system that may selectively fetch instructions from an instruction executable system, apparatus, or device that may also execute instructions.

A "computer-readable medium," "machine readable medium," "propagated-signal" medium, and/or "signal-bearing medium" may comprise any device that includes, stores, communicates, propagates, or transports software for use by or in connection with an instruction executable system, apparatus, or device. The machine-readable medium may selectively be, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. A non-exhaustive list of examples of a machine-readable medium would include: an electrical connection "electronic" having one or more wires, a portable magnetic or optical disk, a volatile memory such as a Random Access Memory "RAM", a Read-Only Memory "ROM", an Erasable Programmable Read-Only Memory (EPROM or Flash memory), or an optical fiber. A machine-readable medium may also include a tangible medium upon which software is printed, as the software may be electronically stored as an image or in another format (e.g., through an optical scan), then compiled, and/or interpreted or otherwise processed. The processed medium may then be stored in a computer and/or machine memory.

The illustrations of the embodiments described herein are intended to provide a general understanding of the structure of the various embodiments. The illustrations are not intended to serve as a complete description of all of the elements and features of apparatus and systems that utilize the structures or methods described herein. Many other embodiments may be apparent to those of skill in the art upon reviewing the disclosure. Other embodiments may be utilized and derived from the disclosure, such that structural and logical substitutions and changes may be made without departing from the scope of the disclosure. Additionally, the illustrations are merely representational and may not be drawn to scale. Certain proportions within the illustrations may be exaggerated, while other proportions may be minimized.

The disclosed embodiments provide an accurate and reliable mechanism by which a device's physical location or presence may be determined via the one to one wireless coupling of the device with a power source whose location and parameters are known. The disclosed embodiments may be utilized in any application where such information may be used to augment an existing service or provide a new service via the device or otherwise. Accordingly, the disclosure and the figures are to be regarded as illustrative rather than restrictive.

One or more embodiments of the disclosure may be referred to herein, individually and/or collectively, by the term "invention" merely for convenience and without intending to voluntarily limit the scope of this application to any particular invention or inventive concept. Moreover, although specific embodiments have been illustrated and described herein, it should be appreciated that any subsequent arrangement designed to achieve the same or similar purpose may be substituted for the specific embodiments shown. This disclosure is intended to cover any and all subsequent adaptations or variations of various embodiments. Combinations of the above embodiments, and other embodiments not specifically described herein, will be apparent to those of skill in the art upon reviewing the description.

The above-disclosed subject matter is to be considered illustrative, and not restrictive, and the appended claims are intended to cover all such modifications, enhancements, and other embodiments, which fall within the true spirit and scope of the present invention. Thus, to the maximum extent allowed by law, the scope of the present invention is to be determined by the broadest permissible interpretation of the following claims and their equivalents, and shall not be restricted or limited by the foregoing detailed description. While various embodiments of the invention have been described, it will be apparent to those of ordinary skill in the art that many more embodiments and implementations are

possible within the scope of the invention. Accordingly, the invention is not to be restricted except in light of the attached claims and their equivalents.

What is claimed is:

1. A wireless charging system comprising:

a detector configured to identify device information related to a device to be powered at a location;

a location processor coupled with the detector and configured to deliver location-specific information to the device to be powered, wherein the location-specific information is related to the location of the device to be powered and is based on the identified device information; and

a power supply in communication with the location processor configured to wirelessly provide power to the device to be powered based on the detected device information;

wherein the location processor is configured to deliver the location-specific information to the device to be powered via a first channel, and further wherein the power supply is configured to wirelessly provide power to the device to be powered via a second channel.

2. The wireless charging system of claim **1**, wherein the first and second channels are wireless inductive channels.

3. The wireless charging system of claim **1**, wherein the first channel is a wireless communication channel selected from the group consisting of: a Wi-Fi channel, a cellular channel, and a Bluetooth channel.

4. The wireless charging system of claim **1** further comprising:

an authentication processor configured to verify the device information,

wherein the authentication processor is coupled to the detector and receives the device information from the detector, and wherein the authentication processor directs the location processor to deliver the location-specific information.

5. The wireless charging system of claim **4**, wherein the authentication processor verifies the device information and location information received from the location processor against a virtual account.

6. The wireless charging system of claim **1**, wherein the power supply is an induction power supply.

7. The wireless charging system of claim **1**, wherein the power supply is disposed in an armrest of a chair and the device is charged when placed adjacent the armrest.

8. In a non-transitory computer readable storage medium having stored therein data representing instructions executable by a programmed processor configured to control a wireless charging station, the storage medium comprising instructions operative for:

receiving, at the wireless charging station, device information from a device;

identifying the device based on both the received device information and a virtual account associated with the device; and

communicating, from the wireless charging station, location-specific information to the device via a wireless connection established by the wireless charging station wherein the location-specific information is related to a location of the device at the wireless charging station.

9. The computer readable storage medium of claim **8**, wherein the virtual account includes customer account information.

10. The computer readable storage medium of claim **8**, wherein the virtual account includes a user virtual account and a location virtual account.

11. The computer readable storage medium of claim **8**, wherein the wireless connection is a connection selected from the group consisting of: a cellular connection, a Wi-Fi connection, a Bluetooth connection and an inductive power connection.

12. The computer readable storage medium of claim **8**, wherein the location-specific information is information selected from the group consisting of: product information, loyalty information, and point-of-sale offers.

13. The computer readable storage medium of claim **8** further comprising:

authenticating the received device information against information stored in the virtual account.

14. The computer readable storage medium of claim **13**, wherein authenticating the received device information includes receiving a password from the device.

15. The computer readable storage medium of claim **8** further comprising:

automatically establishing a connection between the device and the wireless charging station when the device is within range of the wireless charging station.

16. A method for providing a wireless charge comprising:

storing user account information in a virtual account, wherein the user account information includes a device identification;

receiving a request for a wireless charge from a device at a wireless charging station deployed at a location;

communicating the device information to the wireless charging station;

verifying the received device information against the stored device information in the virtual account;

communicating, from the wireless charging station, location-specific information to the device based on the received device information, wherein the location-specific information is related to the location;

providing wireless power to the device; and

updating the virtual account to reflect the communicated location-specific information.

17. The method of claim **16**, wherein the location-specific information is information selected from the group consisting of: product information, loyalty information, and point-of-sale offers, each of which is specific to the location.

18. The method of claim **16** further comprising:

authenticating the received device information against information stored in the virtual account.

19. The method of claim **18**, wherein authenticating the received device information includes receiving a password from the device.

20. The method of claim **16** further comprising:

automatically establishing a connection between the device and the wireless charging station when the device is within range of the wireless charging station.

21. The method of claim **16**, wherein verifying the received device information against the stored device information in the virtual account includes authenticating the device information against a location stored in the virtual account.

22. The method of claim **21**, wherein the authenticated device and location information cooperate to access a door lock.

23. The method of claim **16** further comprising:

receiving a second request for the wireless charge from a second device at a second wireless charging station;

communicating device information associated with the second device to the second wireless charging station; and

providing wireless power to the second device via the second wireless charging station.

24. The method of claim **23** further comprising:

appending the second device information to the device information;

communicating the appended device information to the wireless charging station; and

updating the virtual account to reflect the communicated appended device information.

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