US010210501B2

(12) **United States Patent**
Low et al.

(10) **Patent No.: US 10,210,501 B2**
(45) **Date of Patent: Feb. 19, 2019**

(54) **ELECTRONIC PAYMENTS TO NON-INTERNET CONNECTED DEVICES SYSTEMS AND METHODS**

(71) Applicant: **PAYPAL, INC.**, San Jose, CA (US)

(72) Inventors: **Gak Wee Low**, San Jose, CA (US); **Michele Lee**, San Jose, CA (US); **Mark Wenger**, San Jose, CA (US); **Xin Sun**, San Jose, CA (US)

(73) Assignee: **PAYPAL, INC.**, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 55 days.

(21) Appl. No.: **13/951,322**

(22) Filed: **Jul. 25, 2013**

(65) **Prior Publication Data**

US 2014/0032413 A1 Jan. 30, 2014

Related U.S. Application Data

(60) Provisional application No. 61/675,694, filed on Jul. 25, 2012.

(51) **Int. Cl.**

G06Q 20/18	(2012.01)
G06Q 20/32	(2012.01)
G07F 9/02	(2006.01)

(52) **U.S. Cl.**

CPC ***G06Q 20/327*** (2013.01); ***G06Q 20/18*** (2013.01); ***G07F 9/026*** (2013.01)

(58) **Field of Classification Search**

CPC G06Q 20/00; G06Q 20/327
USPC 705/44
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,771,778	A *	6/1998	MacLean, IV	G07F 9/02 221/13
6,193,154	B1 *	2/2001	Phillips et al.	235/381
7,085,556	B2	8/2006	Offer	
2002/0099662	A1 *	7/2002	Joshi	705/64
2003/0120936	A1 *	6/2003	Farris	G06F 21/83 713/189
2003/0126046	A1 *	7/2003	Kataoka et al.	705/28
2004/0117262	A1	6/2004	Berger et al.	

(Continued)

FOREIGN PATENT DOCUMENTS

CN	1304240	7/2001
CN	1381806	11/2002

(Continued)

OTHER PUBLICATIONS

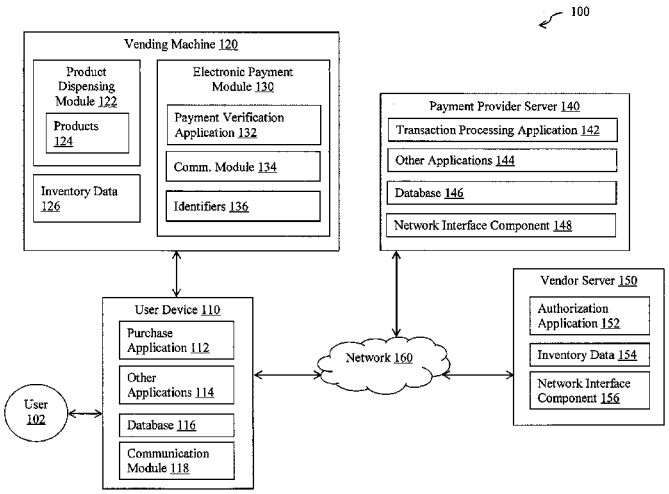
International Search Report for PCT Application No. PCT/US13/52130, dated Dec. 23, 2013.

Primary Examiner — Robert R Niquette
Assistant Examiner — Liz P Nguyen
(74) *Attorney, Agent, or Firm* — Haynes & Boone, LLP

(57) **ABSTRACT**

There is provided systems and method for an electronic payment to a non-Internet connected device. The methods include transmitting information corresponding to at least one item for sale at a non-Internet connected machine, receiving a purchase request from a user device for the at least one item from the non-Internet connected machine, and communicating, using a hardware processor of a payment provider server, an approval of the purchase request to the user device, wherein the user device is configured to transmit a purchase authorization to the non-Internet connected machine using a wireless connection.

18 Claims, 5 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

2004/0210486	A1*	10/2004	Carapelli	705/16
2004/0249712	A1*	12/2004	Brown	G06Q 30/02 705/14.19
2005/0131577	A1	6/2005	Ota et al.	
2006/0247824	A1*	11/2006	Walker	G06O 20/02 700/241
2008/0033594	A1*	2/2008	Packes, Jr.	G06Q 30/02 700/232
2008/0052175	A1*	2/2008	Walker	G06Q 10/087 705/16
2009/0055316	A1*	2/2009	Myers et al.	705/40
2009/0192935	A1*	7/2009	Griffin	G06Q 20/10 705/41
2011/0301983	A1*	12/2011	Guida	G06Q 40/00 705/4
2011/0320347	A1*	12/2011	Tumminaro et al.	705/39

FOREIGN PATENT DOCUMENTS

CN	1801228	7/2006
CN	101887610	11/2010
EP	1316928	6/2003
EP	1768071	3/2007
EP	2061001	5/2009
WO	WO 0145058	6/2001

* cited by examiner

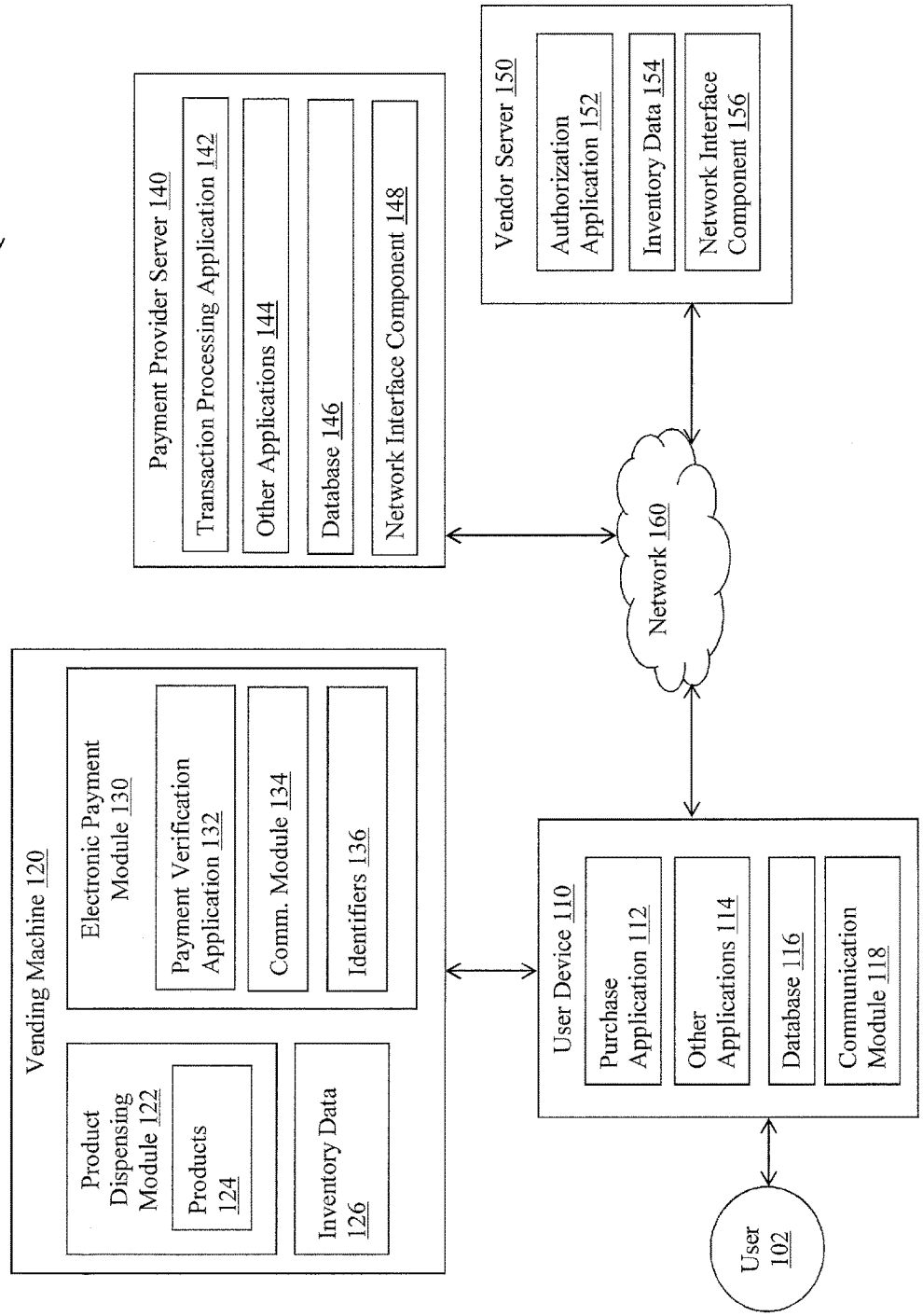

100
Payment Provider Server 140
Transaction Processing Application 142
Other Applications 144
Database 146
Network Interface Component 148
Vendor Server 150
Authorization Application 152
Inventory Data 154
Network Interface Component 156
Network 160
Vending Machine 120
Product Dispensing Module 122
Products 124
Electronic Payment Module 130
Payment Verification Application 132
Comm. Module 134
Identifiers 136
Inventory Data 126
User Device 110
Purchase Application 112
Other Applications 114
Database 116
Communication Module 118
User 102

FIG. 1

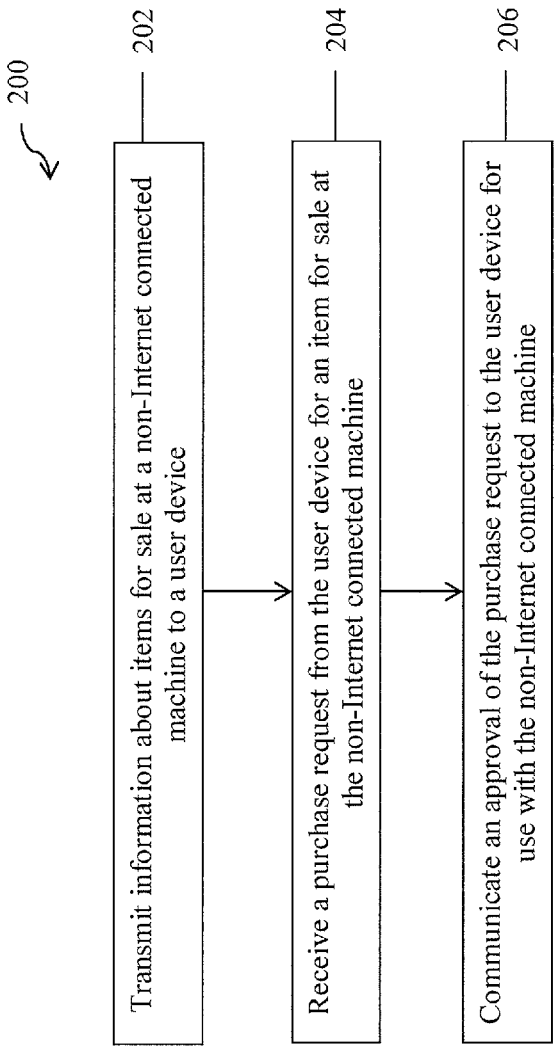
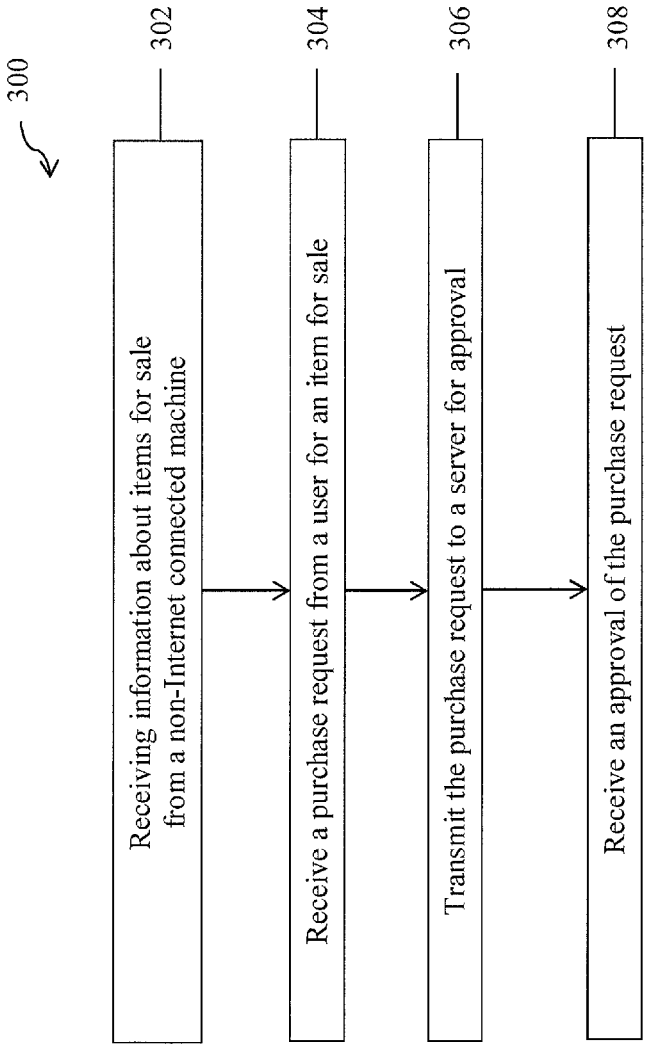

200
202
Transmit information about items for sale at a non-Internet connected machine to a user device
204
Receive a purchase request from the user device for an item for sale at the non-Internet connected machine
206
Communicate an approval of the purchase request to the user device for use with the non-Internet connected machine

FIG. 2

FIG. 3


300
302
Receiving information about items for sale from a non-Internet connected machine
304
Receive a purchase request from a user for an item for sale
306
Transmit the purchase request to a server for approval
308
Receive an approval of the purchase request

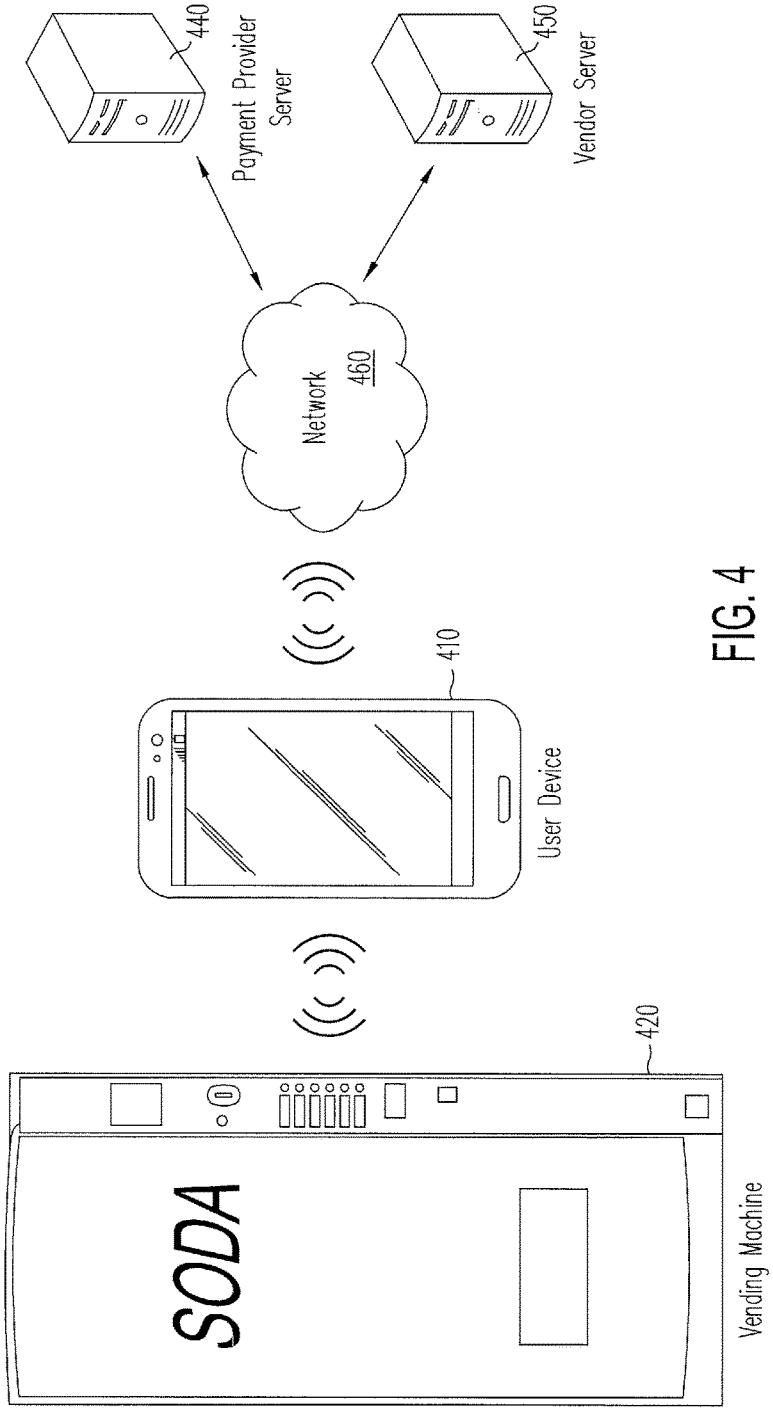

440
Payment Provider Server
450
Vendor Server
Network
460
410
User Device
420
SODA
Vending Machine

FIG. 4

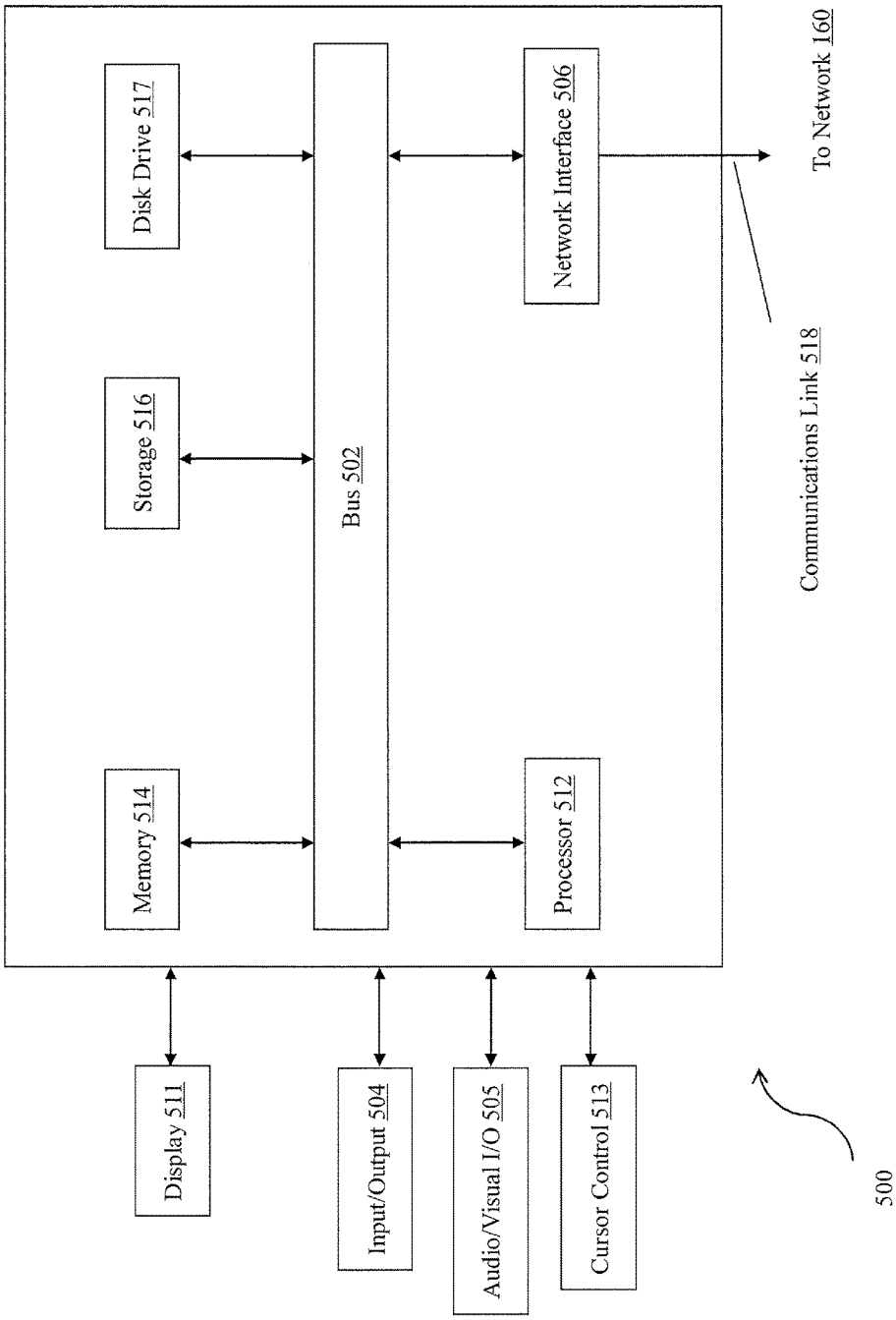

Disk Drive 517
Storage 516
Memory 514
Bus 502
Network Interface 506
Processor 512
Communications Link 518
To Network 160
Display 511
Input/Output 504
Audio/Visual I/O 505
Cursor Control 513
500

FIG. 5

ELECTRONIC PAYMENTS TO NON-INTERNET CONNECTED DEVICES SYSTEMS AND METHODS

CROSS REFERENCE TO RELATED APPLICATION

Pursuant to 35 U.S.C. § 119(e), this application claims priority to the filing date of U.S. Provisional Patent Application Ser. No. 61/675,694, filed Jul. 25, 2012, which is incorporated by reference in its entirety.

BACKGROUND

Technical Field

The present application generally relates to electronic payments, and more particularly, to wireless electronic payments to non-Internet connected machines through user devices.

Related Art

Currently, electronic payments can be made through various user devices, such as PCs, laptops, tablets, and smart phones. Such devices rely on communication between the user device and at least an electronic payment provider. For example, a consumer may make a purchase or provide payment details for a product through an online site by communicating information through an Internet connection. In addition to traditional online purchases/payments and more recently to payments made through smart phones, Internet-enabled unmanned devices, such as vending machines and kiosks, allow a consumer to make an electronic purchase. For example, the vending machine may read a payment card or other funding source information from a consumer, and process/authenticate the payment, such as through a communication with a payment provider. This eliminates the need for a consumer to carry cash and/or small bills in order to make a purchase from an unmanned machine.

However, as with other electronic payment methods, when the unmanned machine does not have or loses Internet connection, the electronic payment option may not be available for the consumer. Additionally, unmanned machines capable of internet connectivity are not widespread and require significant upgrading or replacement of the machine before being operational. Thus, complications may lead to lost sales for a merchant and inconvenience for the consumer.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of a networked system suitable for implementing the process described herein according to an embodiment;

FIG. **2** is a flowchart illustrating a method for use by a payment service server for an electronic payment to a non-Internet connected device according to one embodiment;

FIG. **3** is a flowchart illustrating a method for use by a user device for an electronic payment to a non-Internet connected device according to one embodiment;

FIG. **4** is an exemplary system environment flowchart for an electronic payment to a non-Internet connected device according to one embodiment; and

FIG. **5** is a block diagram of a computer system suitable for implementing one or more components in FIGS. **1** and **4** according to one embodiment of the present disclosure.

Embodiments of the present disclosure and their advantages are best understood by referring to the detailed description that follows. It should be appreciated that like reference numerals are used to identify like elements illustrated in one or more of the figures, wherein showings therein are for purposes of illustrating embodiments of the present disclosure and not for purposes of limiting the same.

DETAILED DESCRIPTION

According to various embodiments, a consumer device, such as a smart phone or computing tablet, communicates with a non-Internet connected unmanned device/machine via wireless communication, such as Bluetooth or NFC (Near Field Communication) means, for making a payment to the device utilizing a payment provider. The non-Internet connected machine (NICM) transmits a machine identifier to the user device, which allows the user device to retrieve a menu of items at the specific machine from the payment provider or an operator of the machine. In some embodiments, the NICM, the payment provider, and/or the operator of the machine may send product details to the user device to upsell or advertise products available on the NICM. The menu is then displayed on the user device, and the user selects desired item(s) for purchase. Note that in some embodiments, multiple machines may send their unique identifiers, such that the user is able to select one or more machines to purchase from.

The user may then add desired item(s) from one or more machines to a cart and make the purchase through a payment provider. The purchase request is communicated to the payment provider over a wireless network. The payment provider processes the request, and if approved, sends approval information back to the user device. In various embodiments, the user device communicates the approval information to the machine, which then dispenses the purchased item(s).

In other embodiments, a NICM and a user device are paired, e.g., through a NFC or Bluetooth communication. The user device transmits a user identifier to the machine for display. During display of the user identifier, the user can then select one or more items for purchase from the machine. The machine then transmits a purchase request, such as a product name, product price, product code, a machine identifier, and/or a transaction number back to the user device. The user device displays the purchase request and, if the information is correct, the user selects a payment button or option on the user device, which communicates the payment request to a payment provider. After processing, the payment provider may approve the payment request and communicate the approval directly to an operator of the machine, such as a vendor server, or may communicate the approval to the user device to be transmitted to the operator of the machine. The operator may, in response to the communication, transmit a purchase authorization to the user device. This purchase authorization may include a private key to encrypt a dispense message that includes the machine identifier, transaction number, and any other desired data. The user device may then communicate the purchase authorization to the machine, which may decrypt the information and dispense the purchased items(s) associated with the transaction number.

FIG. **1** is a block diagram of a networked system suitable for implementing the process described herein according to an embodiment. As shown, a networked system environment **100** may comprise or implement a plurality of networked devices, servers, and/or software components that

operate to perform various methodologies in accordance with the described embodiments. Exemplary devices and servers may include device, stand-alone, and enterprise-class servers, operating an OS such as a MICROSOFT® OS, a UNIX® OS, a LINUX® OS, or other suitable device and/or server based OS. It can be appreciated that the devices and/or servers illustrated in FIG. **1** may be deployed in other ways and that the operations performed and/or the services provided by such devices and/or servers may be combined or separated for a given embodiment and may be performed by a greater number or fewer number of devices and/or servers. Additionally, system environment **100** may include non-networked devices in communication with the networked devices and/or servers. One or more devices and/or servers may be operated and/or maintained by the same or different entities.

System environment **100** may be configured to handle processes in accordance with embodiments provided herein. System environment **100** includes a user **102** utilizing a user device **110** with a vending machine **120**, where user device **110** is in communication over a network **160** with a payment provider server **140** and a vendor server **150**. Additionally, payment provider server **140** and vendor server **150** may be in contact using network **160**.

User device **110**, vending machine **120**, payment provider server **140**, and vendor server **150** may each include one or more processors, memories, and other appropriate components for executing instructions such as program code and/or data stored on one or more computer readable mediums to implement the various applications, data, and steps described herein. For example, such instructions may be stored in one or more computer readable media such as memories or data storage devices internal and/or external to various components of system environment **100**, and/or accessible over network **160**.

User device **110** may be implemented using any appropriate hardware and software configured for wired and/or wireless communication over network **160**. For example, in one embodiment, user device **110** may be implemented as a personal computer (PC), a smart phone, personal digital assistant (PDA), laptop computer, and/or other types of computing devices capable of transmitting and/or receiving data, such as an IPAD® from APPLE®. Although a user device is shown, the user device may be managed or controlled by any suitable processing device. Although only one user device is shown, a plurality of user devices may be utilized.

User device **110** of FIG. **1** contains a purchase application **112**, other applications **114**, a database **116**, and a network interface component **118**. Purchase application **112** and other applications **114** may correspond to processes, procedures, and/or applications executable by a hardware processor, for example, a software program. In other embodiments, user device **110** may include additional or different software as required.

Purchase application **112** may be used, for example, to provide a convenient interface to permit user **102** to select, purchase, and dispense products for sale at a vending machine **120**. For example, in one embodiment, purchase application **112** may be implemented as a downloadable application having a user interface enabling the user to purchase products for sale at vending machine **120**. In some embodiments, purchase application **112** may correspond more generally to a web browser configured to view information available over the Internet or access a website corresponding to products purchasable at vending machine **120**. Thus, purchase application **112** may be utilized access marketplace websites and engage in online transactions.

In various embodiments, purchase application **112** may access a menu or other data of purchasable products at vending machine **120**. However, in other embodiments, purchase application may interface with a corresponding module at vending machine **120** and receive a purchase request containing, for example, a product name, product price, product code, a machine identifier, and/or a transaction number. Purchase application may further interface with the corresponding module at vending machine **120** to transmit approvals and/or purchase authorizations, thus dispensing the purchased product at a convenient time.

In various embodiments, user device **110** includes other applications **114** as may be desired in particular embodiments to provide desired features to user device **110**. For example, other applications **114** may include security applications for implementing client-side security features, programmatic client applications for interfacing with appropriate application programming interfaces (APIs) over network **160**, or other types of applications. Other applications **114** may also include email, texting, voice and IM applications that allow user **102** to send and receive emails, calls, texts, and other notifications. Other applications **114** may contain software programs, such as a graphical user interface (GUI), executable by a processor that is configured to provide an interface to a user.

User device **110** may further include one or more database **116** which may be implemented, for example, as operating system registry entries, cookies associated with purchase application **112** and/or other applications **114**, data associated with hardware of user device **110**, such as a device identifier, or other appropriate data used for authentication/identification of user device **110** and/or payment of products. In one embodiment, database **116** may include identifiers used by a service provider, such as payment provider server **140**, to associate user **102** with a particular account maintained by the service provider. Database **116**, in various embodiments, may further include information received from vending machine **120** through purchase application **120**, such as machine identifier. Additionally, database **116** may store user preferences related to purchase application **112**, such as past purchases, preferred products, or other desirable data.

In various embodiments, user device **110** includes at least one communication module **118** adapted to communicate with vending machine **120** and/or network **160** including payment provider server **140** and/or vendor server **150**. In various embodiments, communication module **118** may include a DSL (e.g., Digital Subscriber Line) modem, a PSTN (Public Switched Telephone Network) modem, an Ethernet device, a broadband device, a satellite device and/or various other types of wired and/or wireless network communication devices including microwave, radio frequency, infrared, Bluetooth, and near field communication devices.

Moving to a vending machine **120**, vending machine **120** may be a vending machine, kiosk, terminal, or other device for dispensing items that are purchased. Vending machine **120** does not have Internet connection with network **160**, but does have capability of wireline or wireless communication with user device **110**, for example using microwave, radio frequency, infrared, Bluetooth, and near field communication, as well as processing as described herein. In one embodiment, vending machine **120** includes an electronic payment module **130** having storage and communication interface to store and communicate a machine identifier and

other transaction information, as well as processing (including decrypting) information for dispensing purchased items from vending machine **120**, as discussed herein. Vending machine **120** may also include an product dispensing module **122** for accepting user input, such as for selecting desired items to purchase, and inventory data **126** corresponding to products sold and/or available. Vending machine **120** may be maintained, for example, by a retail product vendor, such as COCACOLA®.

Vending machine **120** of FIG. **1** is shown with a product dispensing module **122** having products **124**, inventory data **126**, and an electronic payment module **130** having a payment verification application **132**, communication module **134**, and identifiers **136**. Product dispensing module **122**, electronic payment module **130**, payment verification application **132**, and communication module **134** may correspond generally to hardware and/or software components necessary to implement the various features described herein.

Vending machine **120** includes generally a product payment and dispensing module, such as product dispensing module **122**, for a user to make selections, purchase, and dispense products **124**. Product dispensing module **122** may include means to select a product, such as using a keypad, touchscreen, display, or other selection means. Additionally, product dispensing module **122** may include payment means, such as a coin or bill accepting device. However, as described herein, in the event user **102** does not have sufficient money, product dispensing module **122** is further configured to interact with electronic payment module **130** to accept electronic payment for products **124**. Product dispensing module **122** may further contain dispensing means for use with products **124**. Products **124** may include purchasable products for user **102**, such as drinks, food, items, or other purchasable products included in vending machine **120**.

Inventory data **126** may correspond generally to data of purchased and purchasable products at vending machine **120**. Inventory data **126** may include current stocks of products **124**, sold out products of products **124**, purchase demands and/or rates of products **124**, or other desired data. Inventory data **126** may be utilized with user device **110** to display to user **102**, and/or with payment provider server **140** and vendor server **150** to provide analytics.

Electronic payment module **130** included with vending machine **120** enables user **102** to make electronic payments for products **124** in the absence of physical money. Thus, electronic payment module **130** contains a payment verification application **132**, a communication module **134**, and identifiers **136**. As previously discussed, electronic payment module **130** and communication module **134** may correspond generally to hardware and/or software components necessary to implement the various features described herein.

Electronic payment module **130** includes generally a payment verification application **132**, communication module **134**, and identifiers **136** necessary to effectuate and verify and electronic payment of products **124**. Thus, payment verification application **132** may include an interface application for use with purchase application **112** in order to transmit data necessary for an electronic payment and verify the payment. Payment verification application **132** may correspond to processes, procedures, and/or applications executable by a hardware processor, for example, a software program. In other embodiments, electronic payment module **130** may include additional or different software as required. Payment verification application **132**, in various embodiments, may receive an approval of a payment from user device **110**, verify the approval, and dispense items purchased from products **124** using product dispensing module **122**. In other embodiments, payment verification application **132** may first transmit a purchase request including a product name, product price, product code, a machine identifier, and/or a transaction number to user device **110** to transmission with a payment request to a service provider, such as payment service provider **140**.

In various embodiments, electronic payment module **130** includes at least one communication module **134** adapted to communicate with user device **110**. In various embodiments, communication module **134** may include various types of wired and/or wireless short range communication devices including microwave, radio frequency, infrared, Bluetooth, and near field communication devices.

User device **110** may further include one or more identifiers **136** which may be implemented, for example, as data associated with products **124**, data associated with hardware of vending machine **120** and/or electronic payment module **130**, or other appropriate data used for authentication/identification of vending machine **120**, products **124**, and/or electronic payment module **130**. In one embodiment, identifiers **136** may include identifiers used by a service provider, such as payment provider server **140**, to identify a product, a product price, a product information, vending machine **120**, and/or electronic payment module **130**. Additionally, identifiers **136** may store user identification corresponding to user device **110**, for example, to enable quick pairing of user device **110** and electronic payment module **130** using a wireless short range communication means.

Payment provider server **140** may be maintained, for example, by an online payment service provider, which may provide processing for online financial and information transactions on behalf of a user with a NICM. In this regard, payment provider server **140** includes one or more processing applications which may be configured to interact with user device **110** over network **160** to facilitate payments between user device **110** and vending machine **120**. In one example, payment service provider **170** may be provided by PayPal®, Inc. of San Jose, Calif., USA.

Payment provider server **140** of FIG. **1** includes a transaction processing application **142**, other applications **144**, database **146**, and a network interface component **148**. Transaction processing application **142** and other applications **144** may correspond to processes, procedures, and/or applications executable by a hardware processor, for example, a software program. In other embodiments, payment provider server **140** may include additional or different software as required.

Payment provider server **140** may include one or more transaction processing application **142**, which may be configured interact with purchase application **112** of user device **110** over network **160** to facilitate payment of products **124** of vending machine **120**. In various embodiments, transaction processing application **142** includes feature to receive and/or identify payment requests, for example a payment request including a product, product price, machine identifier, and funding source information, and effectuate a purchase of the designated item. Transaction processing application **142** in configured to receive a payment request and respond with an approval for transmission to a vender, such as vendor server **150**, to receive a payment authorization to dispense one or more of products **124**. However, in other embodiments, payment provider server **140** may include data and/or processes corresponding to vending machine **120**, for example, a displayable list or menu of products **124**.

In various embodiments, payment provider server **140** includes other applications **144** as may be desired in particular embodiments to provide desired features to payment provider server **140**. For example, other applications **144** may include security applications for implementing client-side security features, programmatic client applications for interfacing with appropriate application programming interfaces (APIs) over network **160**, or other types of applications. Other applications **144** may contain software programs, such as a graphical user interface (GUI), executable by a processor that is configured to provide an interface to a user.

Payment provider server **140** database **146**. Payment provider server **140** may maintain a plurality of user accounts in database **146**, each of which may include account information associated with individual users, such as user **102**. For example, database **146** may include private financial information of users of devices such as account numbers, passwords, device identifiers, user names, phone numbers, credit card information, bank information, or other financial information which may be used to facilitate online transactions by user **102**. Database **146** may also include information associated with the transaction history processing described herein. Advantageously, database **146** may be configured to interact with transaction processing application **142** on behalf of user **102** during a transaction with purchase application **112** to handle payments using account information corresponding to user **102**.

Database **146** may further include data corresponding to vending machine **120** and/or products **124**. For example, database **146** may include menus and/or lists of products for sale at vending machine **120**, including inventory levels if desired. Additionally, database **146** may include further information, such as nutritional data corresponding to products **124**. In some embodiments, database **146** may include cross-promotional products and/or preferences for use in upselling products, for example, displaying a message to user **102** after purchasing a drink such as, "Would you like chips with your drink."

In various embodiments, payment provider server **140** includes at least one network interface component (NIC) **148** adapted to communicate with network **160** including user device **110** and/or vendor server **150**. In various embodiments, network interface component **148** may comprise a DSL (e.g., Digital Subscriber Line) modem, a PSTN (Public Switched Telephone Network) modem, an Ethernet device, a broadband device, a satellite device and/or various other types of wired and/or wireless network communication devices including microwave, radio frequency (RF), and infrared (IR) communication devices.

Vendor server **150** may be maintained, for example, by a consumer product provider, which may provide a NICM, such as vending machine **120**, for use by user **102**. In this regard, vendor server **150** includes one or more processing application which may be configured to interact with user device **110** and/or payment provider server **140** over network **160** to facilitate payments and dispensing of products between user device **110** and vending machine **120**. In one example, vendor server **150** may be provided by a consumer product provider, such as COCACOLA®, or an online marketplace provider, such as Ebay®, Inc. of San Jose, Calif., USA.

Vendor server **150** of FIG. **1** includes an authorization application **152**, inventory data **154**, and a network interface component **156**. Authorization application **152** may correspond to processes, procedures, and/or applications executable by a hardware processor, for example, a software program. In other embodiments, vendor server **150** may include additional or different software as required.

Vendor server **150** may include one or more authorization application **152**, which may be configured interact with purchase application **112** of user device **110** and/or transaction processing application **142** over network **160** to facilitate dispensing of products **124** of vending machine **120**. In various embodiments, authorization application **152** includes feature to receive approvals of purchase requests, for example an approval designating a purchase request including a product, product price, machine identifier, and funding source information, and effectuate dispensing of the designated item. In such embodiments, vendor server **150** may include data and/or processes corresponding to vending machine **120**, for example, an encrypted message corresponding to dispensing of a purchased item from products **124** or other desired information. Authorization application may receive the approval of the purchase request directly from payment provider server **140** or may receive the approval from user device **110** after payment provider server **140** has approved the purchase request.

Inventory data **154** may correspond generally to data of purchased and purchasable products at vending machine **120**. Inventory data **154** may be received from vending machine **120**, for example using an Internet connection of user device **110** after a short range communication link is established between user device **110** and vending machine **120**. Inventory data **154** may include current stocks of products **124**, sold out products of products **124**, purchase demands and/or rates of products **124**, or other desired data. Inventory data **126** may be utilized with payment provider server **140** to adjust viewable inventory levels of products **124** for display to user **102**. Inventory data **154** may also be utilized to with an owner of vendor server **150**, such as a vendor, to provide helpful analytics, track inventory levels of products **124**, or other desired function.

In various embodiments, vendor server **150** includes at least one network interface component (NIC) **156** adapted to communicate with network **160** including user device **110** and/or payment provider server **140**. In various embodiments, network interface component **156** may comprise a DSL (e.g., Digital Subscriber Line) modem, a PSTN (Public Switched Telephone Network) modem, an Ethernet device, a broadband device, a satellite device and/or various other types of wired and/or wireless network communication devices including microwave, radio frequency (RF), and infrared (IR) communication devices.

Network **160** may be implemented as a single network or a combination of multiple networks. For example, in various embodiments, network **160** may include the Internet or one or more intranets, landline networks, wireless networks, and/or other appropriate types of networks. Thus, network **160** may correspond to small scale communication networks, such as a private or local area network, or a larger scale network, such as a wide area network or the Internet, accessible by the various components of system environment **100**.

Referring now to FIG. **2**, FIG. **2** is a flowchart illustrating a method for use by a payment service server for an electronic payment to a non-Internet connected device according to one embodiment. At step **202**, a server, such as payment provider server **140**, transmits information about items for sale at a non-Internet connected machine to a user device. The information may be transmitted in response to a request by user device **110** to view information related to a plurality of NICM of a specific NICM. For example, user **102** may access electronic payment module **130** of vending

machine **120** using user device **110** and receive a machine identifier from identifiers **136**. The machine identifier may be transmitted to payment provider server **140** to receive information corresponding to vending machine **120**. In other embodiments, payment provider server **140** may receive a location of user device **110** and transmit information corresponding to a plurality of NICM near user device **110**.

In various embodiments, payment provider server **140** may include information in database **146** for transmission to user device **110** to display to user **102**. The information may correspond to lists of products **124**, such as a menu. The information may further include available inventory, nutritional information, or other desirable data.

Additional data may be transmitted to user device **110** during transmission of information corresponding to items for sale at the non-Internet connected machine In various embodiments, a user may not know a location of a NICM configured to accept electronic payments. However, the user may utilize a user device to access payment provider server **140** and receive locations of available NICMs with lists of available products at each machine. The user can further receive directions, map coordinates, and/or a GPS location of desired NICM.

At step **204**, the server receives a purchase request from the user device for an item for sale at the non-Internet connected machine. Payment provider server **140** may receive a purchase request from user device **110** after user **102** selects a product for purchase of products **124**. The purchase request may designate a product and further include funding information such as a funding source or a user account including a funding source. Payment provider server **140** may execute transaction processing application **142** approve the purchase request after review. Transaction processing application **142** may verify the funding source and/or user account. Transaction processing application **142** may determine if there are any limitations and/or restrictions on a user account included in database **146** and if the restrictions are met.

If transaction processing application **142** approves the purchase request, an approval is communicated to the user device for use with the non-Internet connected machine at step **206**. The approval may include identifying information such as a product name, product price, product code, a machine identifier, and/or a transaction number. Additionally, the approval may include a payment authorization, receipt, or other payment verification. In certain embodiments, payment provider server **140** may communicate the payment authorization included in the approval to user device **110** for transmission to vending machine **120**. However, in other embodiments, vendor server **150** may first receive the approval and authorize the payment verification included in the approval by transmitting a payment authorization to user device **110**. The payment authorization may include an encrypted message, the machine identifier, and/or product code for dispensing the purchased item. After vending machine **120** receives a payment authorization, vending machine **120** may dispense the purchased item of products **124**. In embodiments where the payment authorization includes an encrypted message, vending machine **120** may include an encryption key, such as a public key of an asymmetric key pair, to decrypt the encrypted message.

In certain embodiments, user device **110** may remotely purchase an item from products **124** without a short range communication link established concurrently with vending machine **120**. Thus, user device **110** may store the approval and redeem the approval when user device **110** is in communication range of vending machine **110**.

FIG. **3** is a flowchart illustrating a method for use by a user device for an electronic payment to a non-Internet connected device according to one embodiment. FIG. **3** presents a method according to another embodiment for an electronic payment. At step **302**, a user device, such as user device **110**, receives information about items for sale from a non-Internet connected machine. In embodiments of FIG. **3**, communication module **118** of user device **110** connects to communication module **134** of electronic payment module **130**. As previously discussed, user device **110** and electronic payment module may utilize a short range wireless communication connection, such as near field communication, radio communication, infrared communication, and Bluetooth communication. User device **110** may transmit a device identifier and receive a listing of items for sale, as well as information corresponding to vending machine **120**, such as a machine identifier.

Once the user device has received information about items for sale at the non-Internet connected machine, the user device receives a purchase request for an item for sale at step **304**. The purchase request may designate a product name, product price, product code, a machine identifier, and/or a transaction number. The purchase request may be received after a user utilizes user device **110** and/or vending machine **120** to select at least one product of products **124** for purchase. For example, user **102** may utilize user device **110** to view and select a product while user device **110** is in communication with electronic payment module **130**. In another embodiment, user **102** may also utilize product dispensing module **122** to select a product to purchase and electronic payment module may transmit the product information, such as a product name, product price, product code, a machine identifier, and/or a transaction number to user device **110**. Once user device **110** has identified a product, a machine identifier, and/or a transaction number, user device **110** may request funding source information. The funding source information may include a funding card and/or a user account. Thus, the payment request may include a product name, product price, product code, a machine identifier, a transaction number, a funding source, and/or a user account.

At step **306**, the user device transmits the purchase request to a server for approval. The purchase request may be transmitted to payment provider server **140** for approval as discussed herein. Transaction processing application **142** of payment provider server **140** may processes a funding source according to payment details included in the payment request, such as a product price and/or transaction number. Transaction processing application **142** may utilize a user account provided with the purchase request to acquire a funding source, or the funding source may be provided in the purchase request. As previously discussed, transaction processing application **142** may determine if there are any restrictions and/or limitations corresponding to the user account and may take appropriate actions as desired.

Once transaction processing application **142** has processed the purchase request, an approval is received by the user device of the purchase request at step **308**. User device **110** may receive the approval and use a payment authorization included in the approval with electronic payment module **130** to dispense a purchased item of products **124** from vending machine **120**.

In various embodiments, user device **110** may transmit the approval to vendor server **150** for authorization. User device may transmit an approval containing, for example, a machine identifier, product code or other identifying information, and transaction approval information. Vendor server **150** may utilize authorization application **152** to authorize

the approval and transmit an authorization message to user device **110**. The authorization message may include a dispense message including a machine identification and/or a product identification code. The authorization message may be encrypted, for example, by a private key of vendor server **150**. Electronic payment module may then decrypt the authorization message received from user device **110** using a public key and dispense the product.

FIG. **4** is an exemplary system environment flowchart for an electronic payment to a non-Internet connected device according to one embodiment. FIG. **4** shows a user device **410** implementing an electronic payment to a vending machine **420**. User device **410** may utilize a network **460** to communicate with a payment provider server **440** and a vendor server **450** in order to effectuate the electronic payment.

Initially, the user or consumer of user device **410** may download a mobile app from payment provider server **440**, such as PayPal, Inc. of San Jose, Calif., to enable the user to make payments to a NICM. Once downloaded, the user may be asked to sign in through a payment provider credential, such as with a user identifier (e.g., email, name, phone number) and a password or PIN. The user can configure desired settings for the app, such as turning on a "remember me" feature. If such a feature is enabled, the user may set transaction limits for protection. For example, the user may set a maximum transaction amount per transaction, per day, or other type of time limit or restriction. If a requested transaction is above a set limit, the user may be asked to enter a password/PIN to continue. If under the limit, the transaction may be allowed to proceed without any further user-supplied authentication. The user may also set an option to automatically connect or pair with "accepted" machines, e.g., machines that are registered or approved by the payment provider.

A user of user device **410** may approach vending machine **420** and receive a menu of items for purchase at vending machine **420**. User device **410** may receive the menu from vending machine **420**, for example, by initiating a short range communication with vending machine **420**, such as near field communication, radio communication, infrared communication, and Bluetooth communication, and transmitting a device identifier to vending machine **420**. Thus, vending machine **420** may transmit a purchase request including product name, product price, product code, a machine identifier, and/or a transaction number to user device **410**. However, in other embodiments, user device **410** may access a menu form payment provider server **440** and/or vendor server **450** over network **460**. In such embodiments, the user may receive the menu after receiving a machine identifier from vending machine **420**, or may access a list and a specific nearby non-Internet connected machine from payment provider server **440** and/or vendor server **450**, or example, when requesting a remote electronic payment.

Once the user has selected an item and initiated a purchase request, user device **410** may communicate the purchase request to payment service provider **440**. In various embodiments, user device **410** may transmit as a product name, product price, product code, a machine identifier, and/or a transaction number with funding source information, such as a user account and/or funding card or account information to payment provider server **440**.

In response, payment provider server **440** may validate the funding source, such as by checking for adequate funds and charging the account/funding card. Payment provider server **440** may further check for any limitation and/or restrictions associated with the user account, and determine if those limitations and/or restrictions are met. User device **410** may receive an approval include as a product name, product price, product code, a machine identifier, a transaction number with payment authorization. However, in other embodiments, user device **410** may receive only a payment approval having a receipt redeemable with payment provider server **440** for the amount requested by user device **410**.

Once user device **410** has received an approval with a payment authorization, user device **410** may, in some embodiments, transmit the payment authorization to vending machine **420** to dispense and receive the product. In other embodiments, user device **410** may be required to first transmit the approval to vendor server **450**. Vendor server **450** may then authorize the approval and return a payment authorization message to user device **410** including a dispense process for vending machine **420**. The message may be encrypted, such as using a private key of an asymmetric key pair possessed by vendor server **450**.

User device **410** may then transmit the payment authorization to vending machine **420** in such embodiments. Vending machine **420** may decrypt the message using a corresponding public key and dispense the products to the user. Thus, the user is enabled to make an electronic payment to a NICM.

FIG. **5** is a block diagram of a computer system **500** suitable for implementing one or more embodiments of the present disclosure. In various implementations, the user device may comprise a personal computing device (e.g., a personal computer, laptop, smart phone, tablet, PDA, Bluetooth device, key FOB, badge, etc.) capable of communicating with the network. The merchant and/or payment provider may utilize a network computing device (e.g., a network server) capable of communicating with the network. It should be appreciated that each of the devices utilized by users, merchants, and payment providers may be implemented as computer system **500** in a manner as follows.

Computer system **500** includes a bus **502** or other communication mechanism for communicating information data, signals, and information between various components of computer system **500**. Components include an input/output (I/O) component **504** that processes a user action, such as selecting keys from a keypad/keyboard, selecting one or more buttons or links, etc., and sends a corresponding signal to bus **502**. I/O component **404** may also include an output component, such as a display **511** and a cursor control **513** (such as a keyboard, keypad, mouse, etc.). An optional audio input/output component **505** may also be included to allow a user to use voice for inputting information by converting audio signals. Audio I/O component **505** may allow the user to hear audio. A transceiver or network interface **506** transmits and receives signals between computer system **500** and other devices, such as another user device, a merchant server, or a payment provider server via network **560**. In one embodiment, the transmission is wireless, although other transmission mediums and methods may also be suitable. A processor **512**, which can be a microcontroller, digital signal processor (DSP), or other processing component, processes these various signals, such as for display on computer system **500** or transmission to other devices via a communication link **418**. Processor **512** may also control transmission of information, such as cookies or IP addresses, to other devices.

Components of computer system **500** also include a system memory component **514** (e.g., RAM), a static storage component **516** (e.g., ROM), and/or a disk drive **517** to store

information, such as account information, transaction numbers, machine IDs, and other information described above. Computer system **500** performs specific operations by processor **512** and other components by executing one or more sequences of instructions contained in system memory component **514**. Instructions may be performed by one or more processors **512**. Logic may be encoded in a computer readable medium, which may refer to any medium that participates in providing instructions to processor **512** for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. In various implementations, non-volatile media includes optical or magnetic disks, volatile media includes dynamic memory, such as system memory component **514**, and transmission media includes coaxial cables, copper wire, and fiber optics, including wires that comprise bus **502**. In one embodiment, the logic is encoded in non-transitory computer readable medium. In one example, transmission media may take the form of acoustic or light waves, such as those generated during radio wave, optical, and infrared data communications.

Some common forms of computer readable media includes, for example, floppy disk, flexible disk, hard disk, magnetic tape, any other magnetic medium, CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, RAM, PROM, EPROM, FLASH-EPROM, any other memory chip or cartridge, or any other medium from which a computer is adapted to read.

In various embodiments of the present disclosure, execution of instruction sequences to practice the present disclosure may be performed by computer system **500**. In various other embodiments of the present disclosure, a plurality of computer systems **500** coupled by communication link **518** to the network (e.g., such as a LAN, WLAN, PTSN, and/or various other wired or wireless networks, including telecommunications, mobile, and cellular phone networks) may perform instruction sequences to practice the present disclosure in coordination with one another.

Where applicable, various embodiments provided by the present disclosure may be implemented using hardware, software, or combinations of hardware and software. Also, where applicable, the various hardware components and/or software components set forth herein may be combined into composite components comprising software, hardware, and/or both without departing from the spirit of the present disclosure. Where applicable, the various hardware components and/or software components set forth herein may be separated into sub-components comprising software, hardware, or both without departing from the scope of the present disclosure. In addition, where applicable, it is contemplated that software components may be implemented as hardware components and vice-versa.

Software, in accordance with the present disclosure, such as program code and/or data, may be stored on one or more machine readable mediums, including non-transitory machine readable medium. It is also contemplated that software identified herein may be implemented using one or more general purpose or specific purpose computers and/or computer systems, networked and/or otherwise. Where applicable, the ordering of various steps described herein may be changed, combined into composite steps, and/or separated into sub-steps to provide features described herein.

Embodiments described herein are exemplary only. One skilled in the art may recognize various alternative embodiments from those specifically disclosed. Those alternative embodiments are also intended to be within the scope of this disclosure. As such, the embodiments are limited only by the following claims.

What is claimed is:

1. A system comprising:

a non-transitory memory; and

one or more hardware processors coupled to the non-transitory memory and configured to read instructions from the non-transitory memory to cause the system to perform operations comprising:

receiving, by a payment provider, a request to view information associated with at least one of a plurality of non-Internet connected machines associated with a location of a user device for a user, wherein the request comprises the location of the user device;

determining, based at least in part on the location, identification of the plurality of non-Internet connected machines within a distance to the user device;

communicating the identification of the plurality of non-Internet connected machines to the user device;

receiving, from the user device, a selection of a first non-Internet connected machine from the plurality of non-Internet connected machines, wherein the selection comprises identification information of the first non-Internet connected machine;

in response to approving a request to purchase at least one item from the first non-Internet connected machine, generating an executable code for dispensing the at least one item from the first non-Internet connected machine, wherein the executable code is encrypted using a key associated with the first non-Internet connected machine;

transmitting the executable code to the user device;

in response to determining that the user device is connected to the first non-Internet through a local wireless connection, causing the first non-Internet connected machine to activate and dispense the at least one item the executable code, wherein the executable code is communicated to the first non-Internet connected machine via the local wireless connection between the user device and the first non-Internet connected machine;

determining a change in inventory data for the first non-Internet connected machine based on the causing the at least one item to be dispensed via the local wireless connection; and

adjusting, in a graphical user interface displayed by a vendor device associated with the first non-Internet connected machine, the inventory data based on the change.

2. The system of claim **1**, wherein the local wireless connection includes one of near field communication, radio communication, infrared communication, or Bluetooth communication.

3. The system of claim **1**, wherein the operations further comprise:

transmitting the change in the inventory data corresponding to the first non-Internet connected machine to a server of an operator of the first non-Internet connected machine.

4. The system of claim **1**, wherein the executable code includes at least one of a unique identifier for the non-Internet connected machine or a transaction number corresponding to the request.

5. The system of claim **1**, wherein the operations further comprise:

determining whether there is a limitation or a restriction associated with an account corresponding to the user device; and

if there is a limitation or a restriction, determining whether the limitation or the restriction is satisfied for the request.

6. The system of claim **5**, wherein the operations further comprise:

requesting an authenticating credential from the user of the user device if the limitation or the restriction is not satisfied.

7. A non-transitory machine-readable medium having stored thereon machine-readable instructions executable to cause a machine to perform operations comprising:

receiving, by a payment provider, a request to view information associated with at least one of a plurality of non-Internet connected machines associated with a location of a user device for a user, wherein the request comprises the location of the user device;

determining, based at least in part on the location, identification of the plurality of non-Internet connected machines within a distance to the user device;

communicating the identification of the plurality of non-Internet connected machines to the user device;

receiving, from the user device, a selection of a first non-Internet connected machine from the plurality of non-Internet connected machines, wherein the selection comprises identification information of the first non-Internet connected machine;

in response to approving a request to purchase at least one item from the first non-Internet connected machine, generating an executable code for dispensing the at least one item from the first non-Internet connected machine, wherein the executable code is encrypted using a key associated with the first non-Internet connected machine;

transmitting the executable code to the user device;

in response to determining that the user device is connected to the first non-Internet through a local wireless connection, causing the first non-Internet connected machine to activate and dispense the at least one item using the executable code, wherein the executable code is communicated to the first non-Internet connected machine via the local wireless connection between the user device and the first non-Internet connected machine;

determining a change in inventory data for the first non-Internet connected machine based on the causing the at least one item to be dispensed via the local wireless connection; and

adjusting, in a graphical user interface displayed by a vendor device associated with the first non-Internet connected machine, the inventory data based on the change.

8. The non-transitory machine-readable medium of claim **7**, wherein the operations further comprise:

transmitting the change in the inventory data corresponding to the first non-Internet connected machine to a server device of an operator of the first non-Internet connected machine.

9. The non-transitory machine-readable medium of claim **7**, wherein the executable code comprises a unique identifier for the first non-Internet connected machine and a transaction number corresponding to the request.

10. The non-transitory machine-readable medium of claim **7**, wherein the operations further comprise:

determining whether there is a limitation or a restriction associated with an account corresponding to the user device; and

if there is a limitation or a restriction, determining whether the limitation or the restriction is satisfied for the request.

11. The non-transitory machine-readable medium of claim **10**, wherein the operations further comprise:

requesting an authenticating credential from the user of the user device if the limitation or the restriction is not satisfied.

12. A method comprising:

receiving, by a payment provider, a request to view information associated with at least one of a plurality of non-Internet connected machines associated with a location of a user device for a user, wherein the request comprises the location of the user device;

determining, based at least in part on the location, identification of the plurality of non-Internet connected machines within a distance to the user device;

communicating the identification of the plurality of non-Internet connected machines to the user device;

receiving, from the user device, a selection of a first non-Internet connected machine from the plurality of non-Internet connected machines, wherein the selection comprises identification information of the first non-Internet connected machine;

in response to approving a request to purchase at least one item from the first non-Internet connected machine, generating an executable code for dispensing the at least one item from the first non-Internet connected machine, wherein the executable code is encrypted using a key associated with the first non-Internet connected machine;

transmitting the executable code to the user device;

in response to determining that the user device is connected to the first non-Internet through a local wireless connection, causing the first non-Internet connected machine to activate and dispense the at least one item using the executable code, wherein the executable code is communicated to the first non-Internet connected machine via the local wireless connection between the user device and the first non-Internet connected machine;

determining a change in inventory data for the first non-Internet connected machine based on the causing the at least one item to be dispensed via the local wireless connection; and

adjusting, in a graphical user interface displayed by a vendor device associated with the first non-Internet connected machine, the inventory data based on the change.

13. The method of claim **12**, further comprising:

transmitting the change in the inventory data corresponding to the first non-Internet connected machine to a server device of an operator of the first non-Internet connected machine.

14. The method of claim **12**, wherein the executable code comprises a unique identifier for the first non-Internet connected machine and a transaction number corresponding to the request.

15. The method of claim **12** further comprising:

determining whether there is a limitation or a restriction associated with an account corresponding to the user device; and

if there is a limitation or a restriction, determining whether the limitation or the restriction is satisfied for the request.

16. The system of claim **1**, wherein the operations further comprise:

in response to the selection, accessing the inventory data comprising a stock of items at the first non-Internet connected machine and sold out items at the first non-Internet connected machine; and

communicating the inventory data to the user device.

17. The non-transitory machine-readable medium of claim **7**, wherein the operations further comprise:

in response to the selection, accessing the inventory data comprising a stock of items at the first non-Internet connected machine and sold out items at the first non-Internet connected machine; and

communicating the inventory data to the user device.

18. The method of claim **12**, wherein the method further comprises:

in response to the selection, accessing the inventory data comprising a stock of items at the first non-Internet connected machine and sold out items at the first non-Internet connected machine; and

communicating the inventory data to the user device.

* * * * *