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(54) **SYSTEM AND METHOD FOR SIMULTANEOUS ARTICLE RETRIEVAL AND TRANSACTION VALIDATION**

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USPC 700/237

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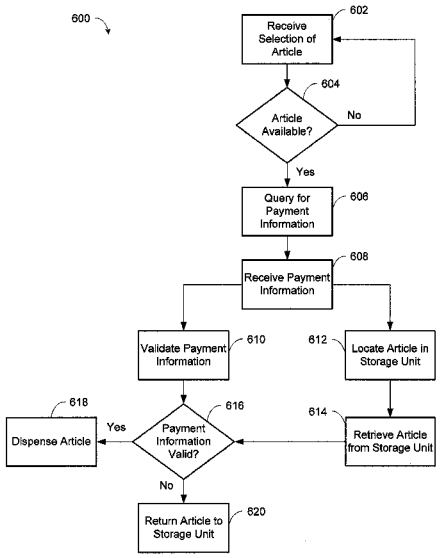
(57) **ABSTRACT**

A system and method for dispensing an article from an article dispensing machine by reducing the amount of time for completing a transaction involving the article is provided. A request related to a selected article and payment information for a balance related to the selected article may be received at the article dispensing machine through a user interface. The payment information may be validated, and simultaneously and in parallel, the selected article may be retrieved from a storage unit in the article dispensing machine. The selected article may be dispensed from the article dispensing machine if the payment information is valid. If the payment information is not valid, the selected article may be returned to the storage unit. Quicker dispensing of articles during consumer transactions with the article dispensing machine may result. The articles may include media articles, such as DVDs, Blu-Ray discs, and video game discs.

34 Claims, 7 Drawing Sheets



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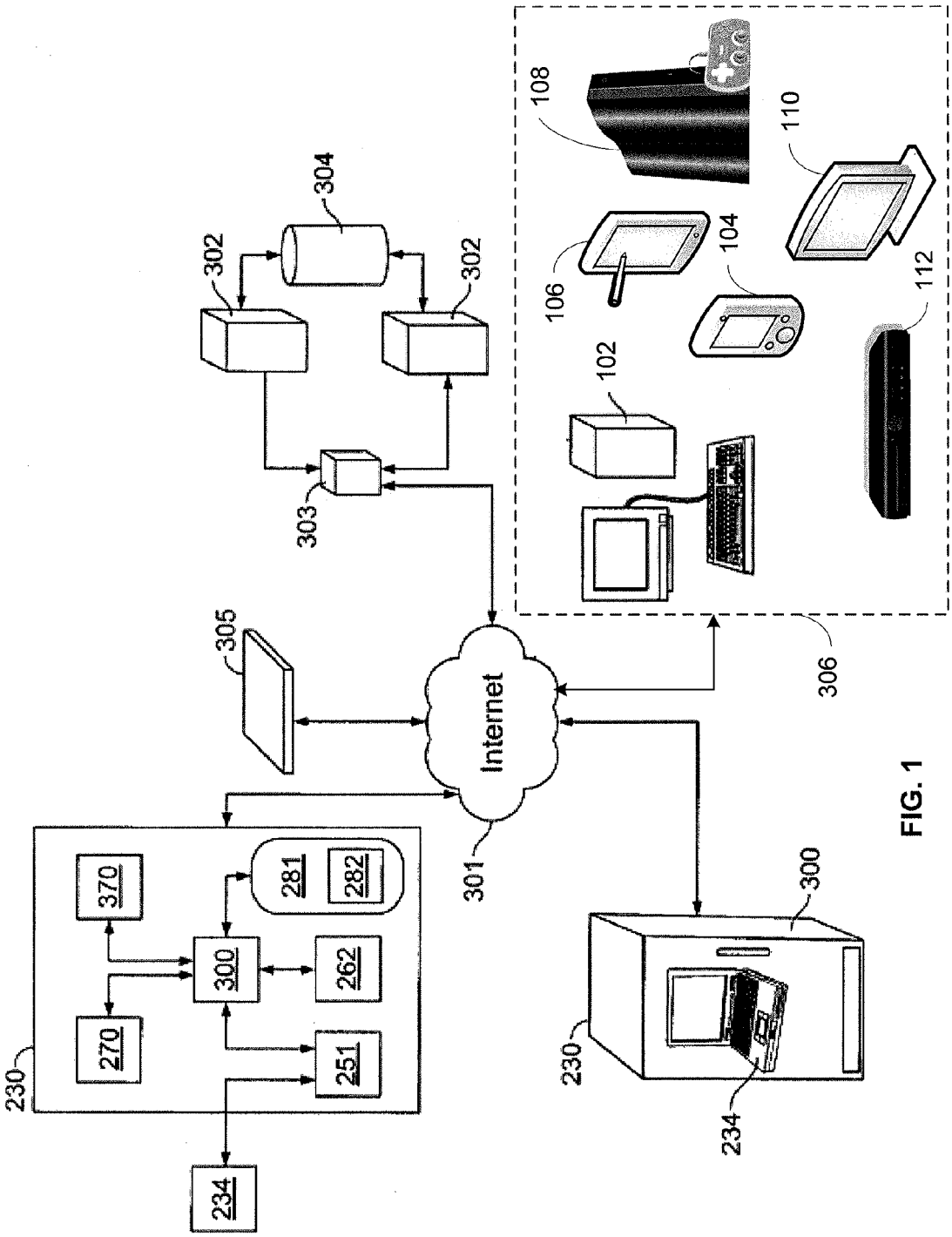
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110
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304
302
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281
282
300
262
270
251
230
234
300
230
234

FIG. 1

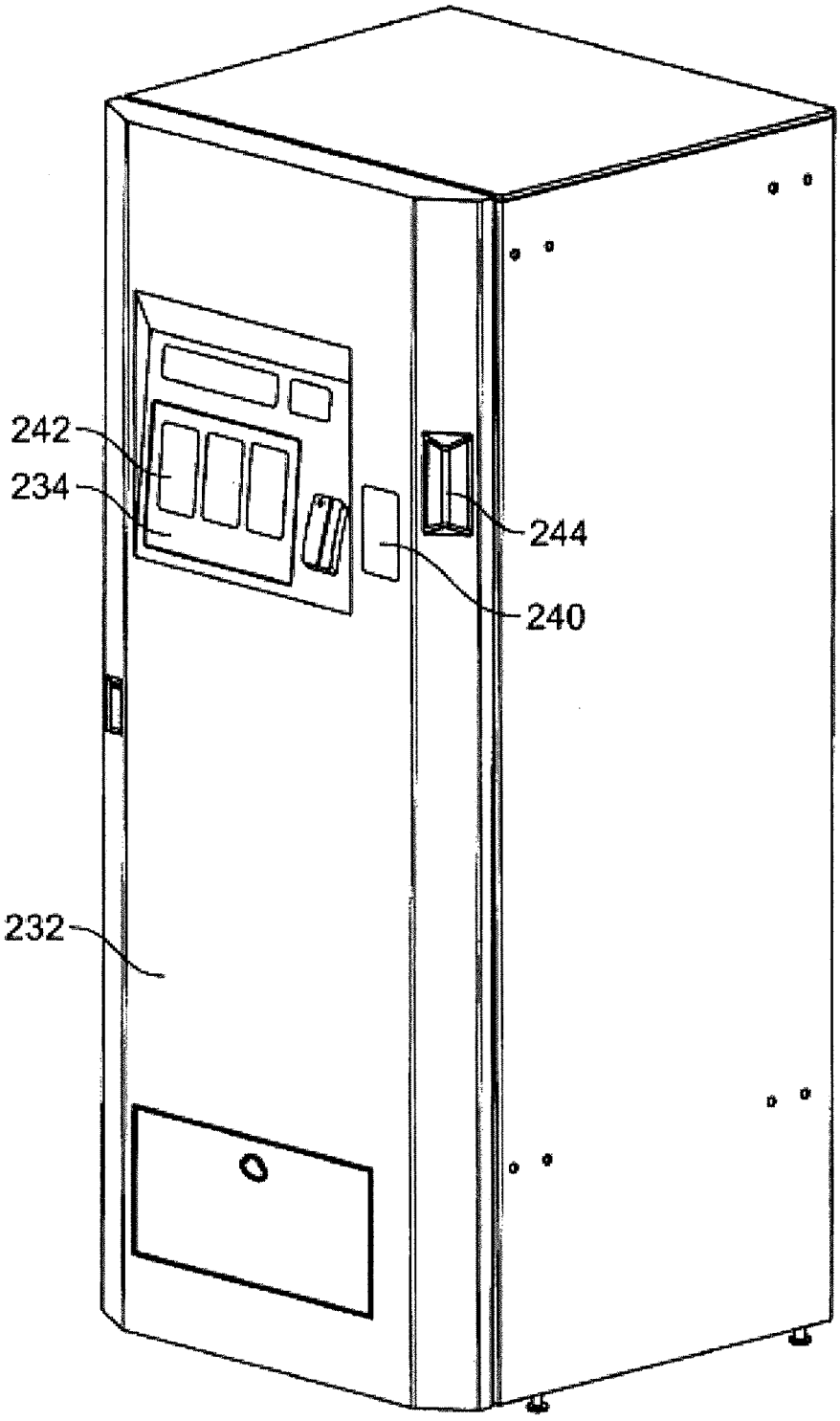


FIG. 2

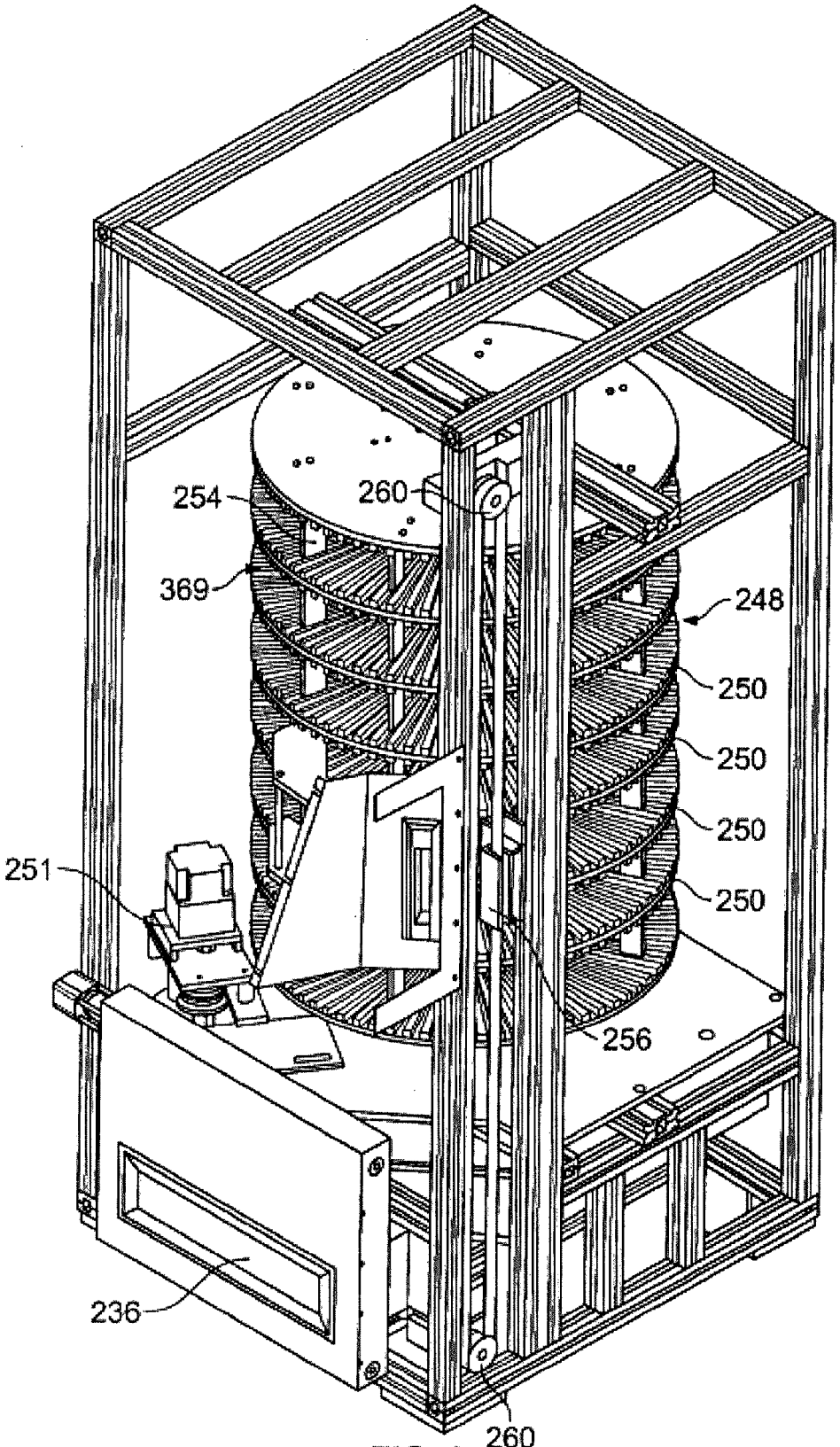


FIG. 3

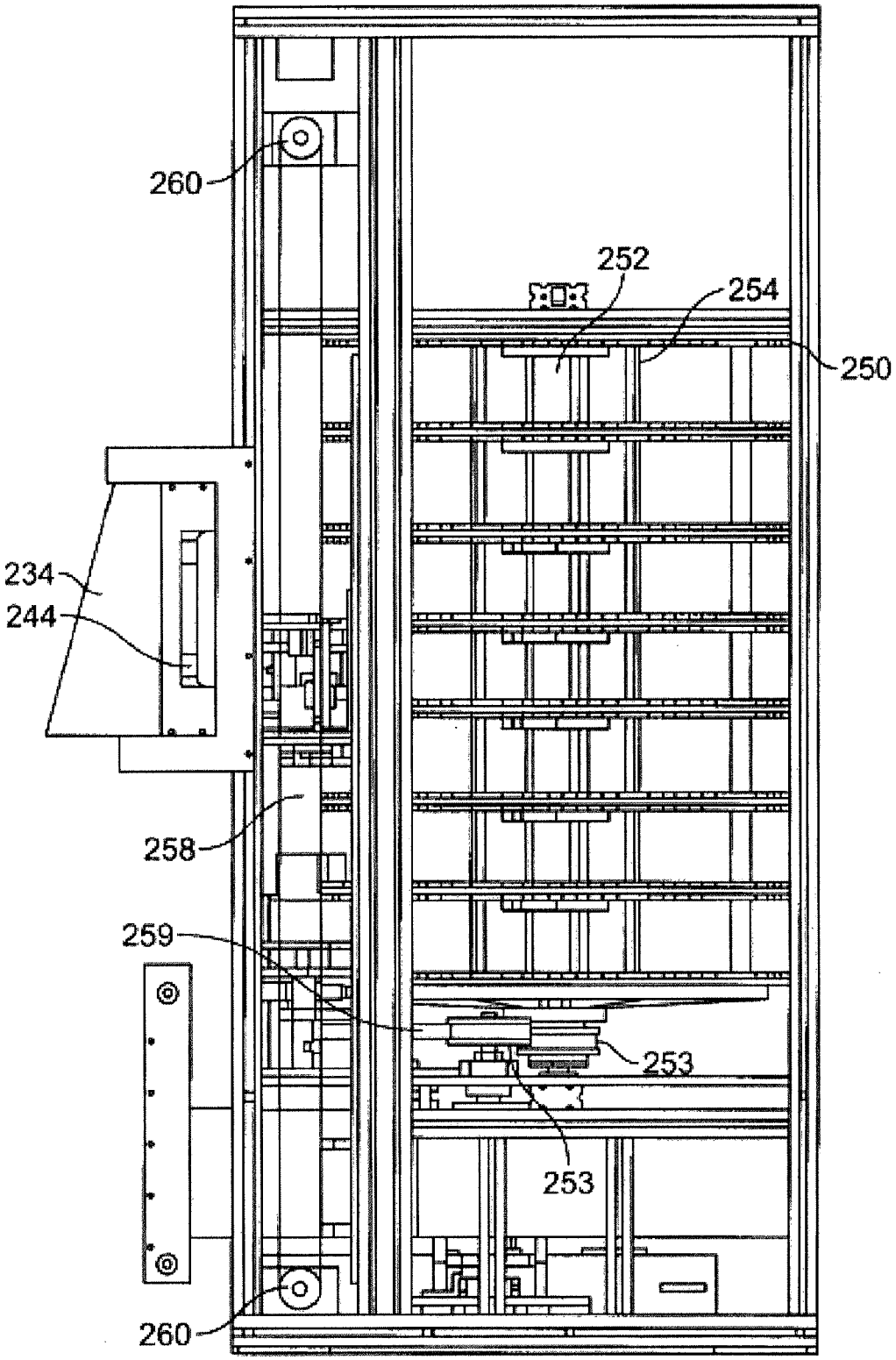


FIG. 4

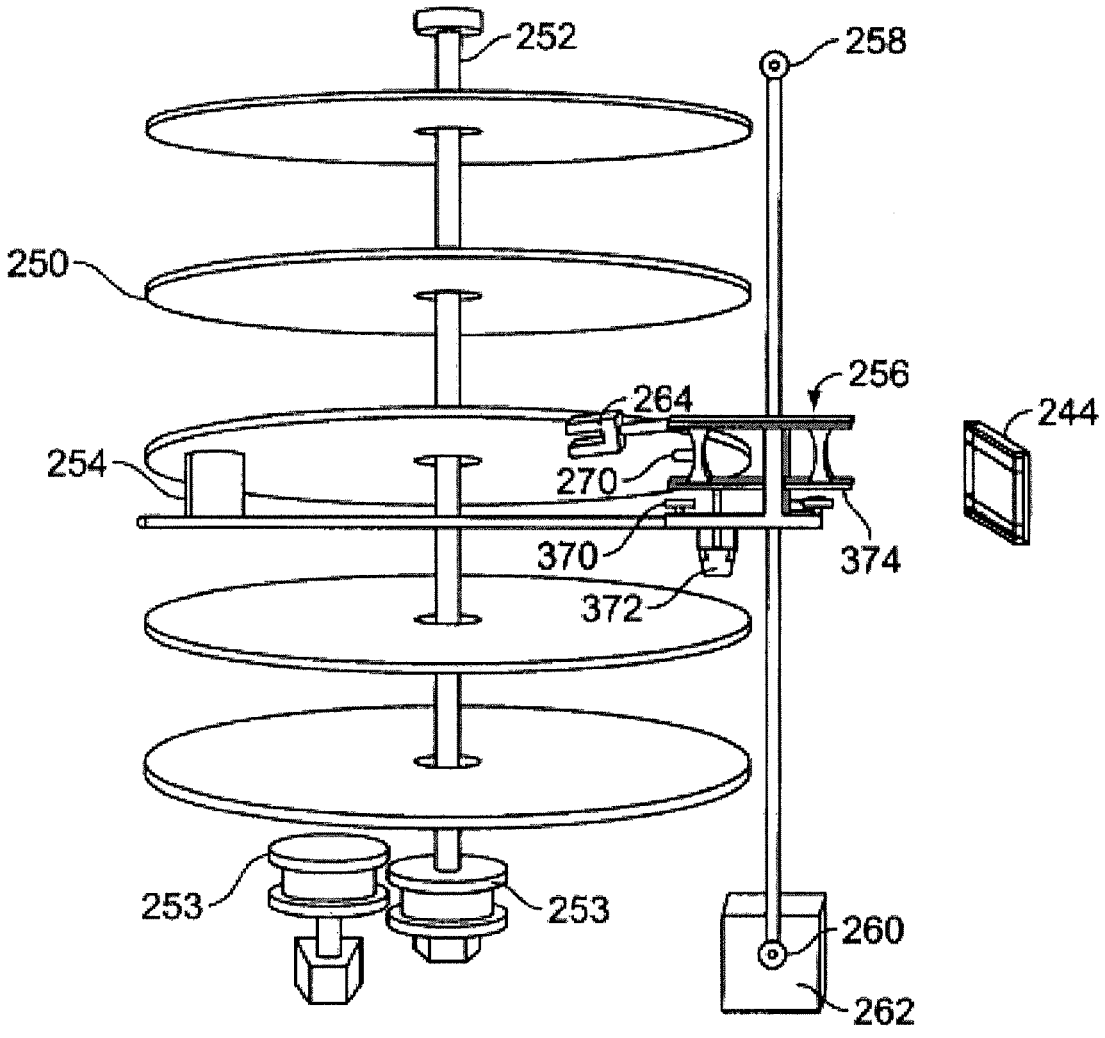
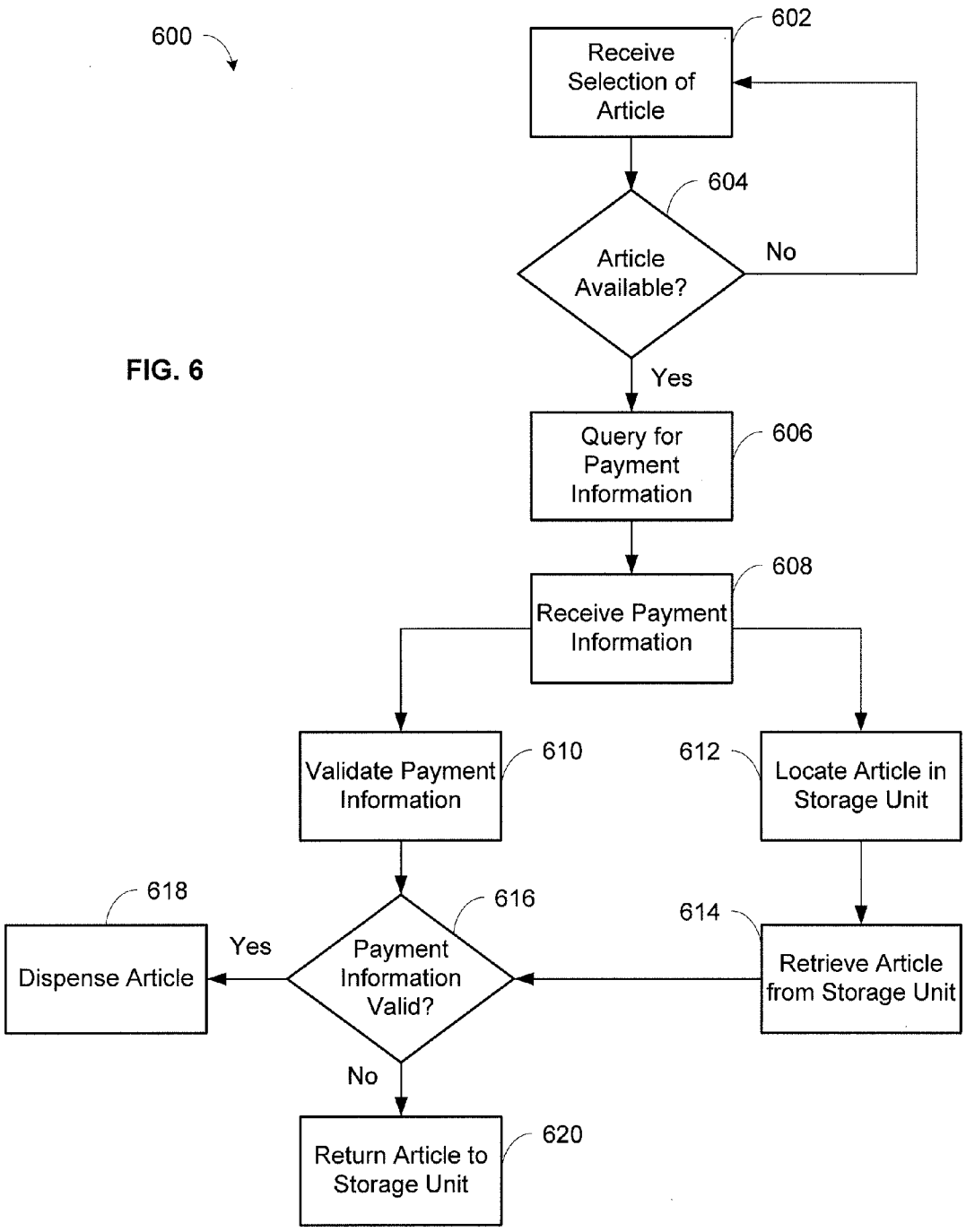


FIG. 5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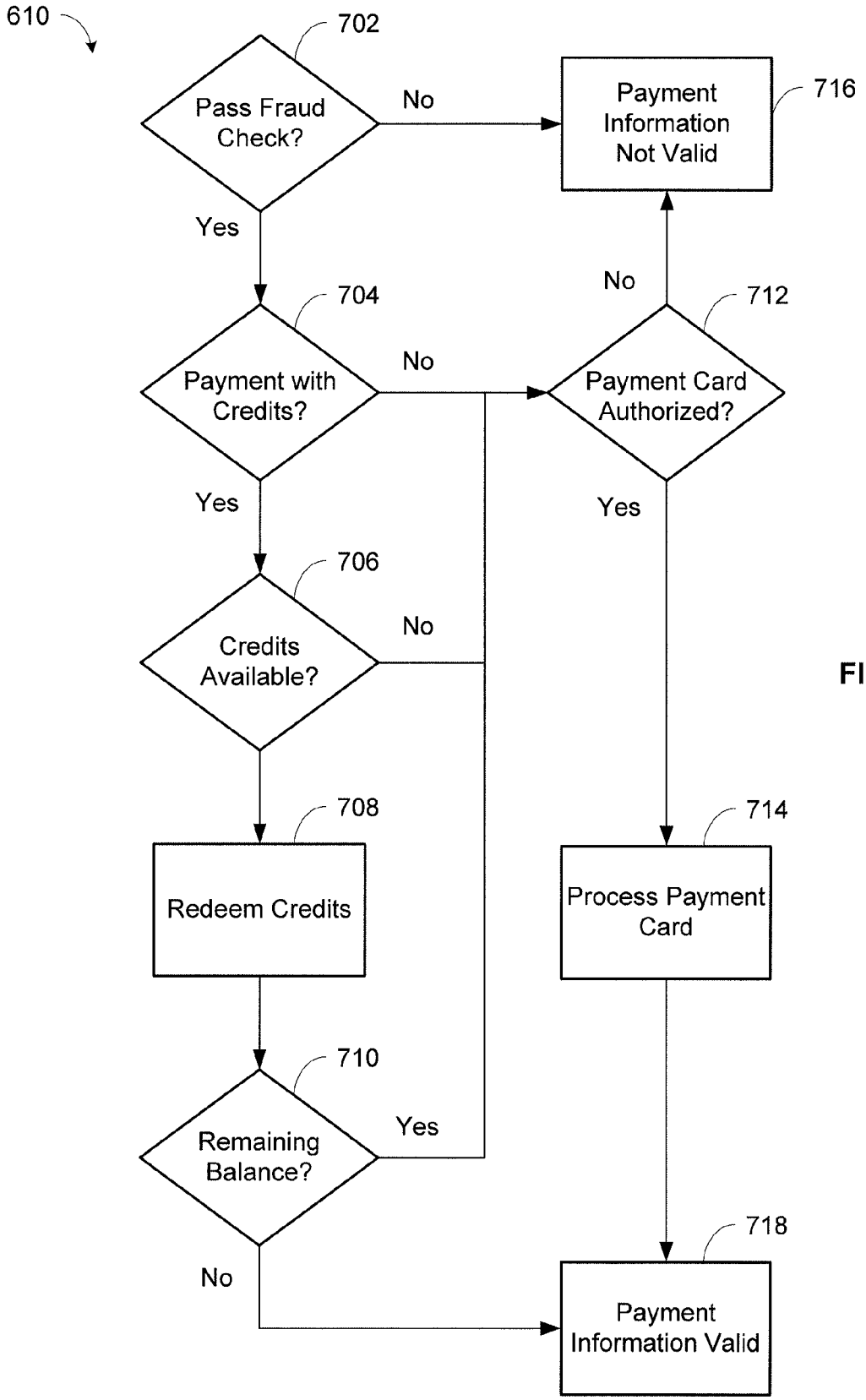
604
Article Available?
No
Yes
606
Query for Payment Information
608
Receive Payment Information
610
Validate Payment Information
612
Locate Article in Storage Unit
616
Payment Information Valid?
618
Dispense Article
Yes
614
Retrieve Article from Storage Unit
No
620
Return Article to Storage Unit

FIG. 6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Yes
704
Payment with Credits?
No
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Payment Card Authorized?
No
Yes
Yes
706
Credits Available?
No
708
Redeem Credits
714
Process Payment Card
710
Remaining Balance?
Yes
718
No
Payment Information Valid

FIG. 7

SYSTEM AND METHOD FOR SIMULTANEOUS ARTICLE RETRIEVAL AND TRANSACTION VALIDATION

TECHNICAL FIELD

This invention relates to a system and method for simultaneous article retrieval and transaction validation in an article dispensing machine. More particularly, the invention provides a system and method for retrieving a selected article from a storage unit of an article dispensing machine in parallel with determining whether payment information for a balance related to the selected article is valid.

BACKGROUND AND SUMMARY OF THE INVENTION

While the invention is often described herein with reference to a digital video disc, Blu-Ray disc, and video game distribution system, an application to which the invention is advantageously suited, it will be readily apparent that the invention is not limited to that application and can be employed in article dispensing systems used to distribute a wide variety of dispensable articles.

The digital video disc (DVD) player has been one of the most successful consumer electronics product launches in history. The market for DVD movie video, Blu-Ray movie video, and video game rentals is enormous and growing. Millions of households have acquired DVDs since they were introduced in 1997. In the first quarter of 2003 alone, it was estimated that well over three million DVD players were shipped to U.S. retailers.

In 2003, brick-and-mortar stores dominated the movie video and video game rental landscape in the U.S. Statistics showed that two brick-and-mortar companies controlled nearly sixty-five percent of the home video rental business. One element repeatedly cited for success of certain brick-and mortar store video rental franchises was perceived high availability of new video releases. Consumers want entertainment on demand, and through stocking multiple units of each new release, successful brick-and-mortar companies meet this consumer demand.

The foregoing indicates that there is a significant market potential for aligning regular routines of consumers (e.g., shopping, getting coffee or gas or going to a convenience store) with their DVD, Blu-Ray, and video game rental activities.

One improved article dispensing machine is disclosed in commonly owned U.S. Pat. No. 7,234,609, which is herein incorporated by reference in its entirety. The invention of the U.S. Pat. No. 7,234,609 and the invention can function as an article dispensing machine-based distribution system that will typically have multiple units of each new release per article dispensing machine. The dispensing machines of the U.S. Pat. No. 7,234,609 and the invention can stock up to two thousand DVDs, Blu-Ray, video games, or other discs (movies, games or other entertainment content), making the system competitive with existing brick-and-mortar video rental superstores.

The dispensing machine and system of the U.S. Pat. No. 7,234,609 and the invention distinguishes itself from such stores by offering major benefits not conventionally offered by such stores, including additional cross-marketing programs (e.g., promotional rentals for a certain amount of dollars spent at the retail location) and convenience (e.g., open always).

The dispensing machine of the U.S. Pat. No. 7,234,609 and the invention yields a competitive advantage in the DVD, Blu-Ray disc, and video game rental marketplace by offering consumers cross-marketing/promotional programs, convenience of selection (e.g., computer-based searches for movies and recommendations based on consumer profiles), and potentially extended hours (e.g., 24 hours a day, 7 days a week). The invention employs a more cost-effective, convenient platform than brick-and-mortar stores. In addition, with the invention, dispensing machines can be situated in retail locations having high foot traffic, such as at a popular grocery store, restaurant, drug store, and/or other popular retail location.

The dispensing machine of the U.S. Pat. No. 7,234,609 and the invention can be operated at a substantial savings over the costs associated with traditional brick-and-mortar video rental stores. For example, the invention does not require hourly employees to continuously man the dispensing machines or restock them with inventories.

Unlike brick-and-mortar stores, the dispensing machine of the U.S. Pat. No. 7,234,609 and the invention does not require an on-site store manager because all operational decisions can be made at a centralized location by a management team officed remote from the retail locations. Unlike brick-and-mortar stores, the dispensing machine of the U.S. Pat. No. 7,234,609 and the invention does not require significant physical space. Unlike brick-and-mortar stores, the dispensing machine of the U.S. Pat. No. 7,234,609 and the invention has low operating costs because heating or air conditioning is not necessarily required for the dispensing machines and they consume a relatively low level of electrical energy. In addition, the dispensing machine of the U.S. Pat. No. 7,234,609 has low maintenance costs and downtime.

The dispensing machine of the U.S. Pat. No. 7,234,609 and the invention addresses the shortcomings of traditional brick-and-mortar stores in a convenient and cost-effective delivery vehicle having the added bonus of serving as an effective promotional platform that drives incremental sales to retail locations. In addition, the dispensing machine of the U.S. Pat. No. 7,234,609 and the invention overcomes these disadvantages by at least offering more new releases and older selections for any given time period, and lower cost per viewing with significantly more convenience than Internet-based and pay-per-view services.

The dispensing machine of the U.S. Pat. No. 7,234,609 and the invention is a fully automated, integrated DVD, Blu-Ray, and video game rental and/or purchase systems. It may incorporate robust, secure, scalable software that provides a fully personalized user experience and real-time feedback to retail locations and advertisers, scalable hardware that leverages existing technologies such as touch screen, focused audio speakers and video monitors, technology utilizing the Internet through a system website or mobile/consumer electronics device application. These technologies and others fill long-felt needs in the art and give advantages over conventional video distribution options. The dispensing machine of the U.S. Pat. No. 7,234,609 and the invention functions as much as a promotional platform as it does a rental kiosk.

By utilizing the dispensing machines and the fully-interactive, real-time, linked Internet website or mobile/consumer electronics device applications, consumers can rent one or more DVDs, Blu-Ray discs, video games, or other entertainment content directly from dispensing machines as well as indirectly by making a rental reservation through the website or application for later pickup at a conveniently

located machine. These dispensing machines may be networked with each other, with the inventory control and/or supply office and with the system website or application by phone-line, DSL, wireless network, or other Internet connection at each retail location. Through this linked network, the rental experience for each consumer can be customized based on a profile for each consumer, such as via personalized home pages and rental screens.

The invention allows for dispensing a selected article of a plurality of articles from an article dispensing machine by reducing the amount of time for completing a transaction involving the selected article. A request related to the selected article and payment information for a balance related to the selected article may be received. The request may include at least a rental transaction request or a purchase transaction request. It may be determined whether the payment information is valid, such as whether a payment card is authorized or whether credits are available for redemption. The selected article may be retrieved from a storage unit in the article dispensing machine simultaneously with determining whether the payment information is valid. If the payment information is valid, the selected article may be dispensed from the article dispensing machine and quicker dispensing of the selected article. However, if the payment information is not valid, the selected article may be returned to the storage unit.

The invention has the advantage of quicker dispensing of articles from the article dispensing machine to a consumer because the validation of payment information is executed in parallel with the retrieval of the selected article from the storage unit. Consumer interaction with the article dispensing machine may be improved and more pleasing due to the reduced transaction time. Moreover, the revenue for an article dispensing machine may increase because more transactions are possible due to reduced individual transaction times. Other features and advantages are provided by the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an illustration of a system for communicating and processing information in a network of article dispensing machines and dispensing apparatus.

FIG. **2** is a perspective view of an article dispensing machine constructed in accordance with the principles of the invention.

FIG. **3** is a partially open perspective view of the article dispensing machine of FIG. **2**.

FIG. **4** is a partially open side elevational view of the article dispensing machine of FIG. **2**.

FIG. **5** is a partially open side elevational view of the view of the article dispensing machine of FIG. **2** with certain components removed for clarity.

FIG. **6** is a flowchart illustrating operations for simultaneous article retrieval and transaction validation in an article dispensing machine.

FIG. **7** is a flowchart illustrating operations for validating payment information.

DETAILED DESCRIPTION OF THE INVENTION

While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiments illustrated.

FIGS. **1-5** illustrate an article dispensing machine designated **230**. Article dispensing machine **230** is one of a plurality of article dispensing machines included within an article distribution system having a plurality of such machines situated at a plurality of retail locations. The article dispensing machines of a particular article distribution system may form a network. As such, those machines may be in electrical communication with each other and with a central server or central controller.

As shown in FIG. **1**, each article dispensing machine **230** includes a dispensing machine processor **300**, also referred to herein as a vending controller, which is connected to a first sensor **270** and a second sensor **370**, a first motor **251** and a second motor **262** and a user interface control system **234**, collectively referred to as "the peripheral devices." The processor is capable of executing various programs to provide input to and/or receive outputs from the peripheral devices. Suitable processors for such use are known to those of skill in the art. In addition, the processor is operably connected to at least one memory storage device **281**, such as a hard-drive or flash-drive or other suitable memory storage device.

Article dispensing machine memory storage device **281** can include any one or a combination of volatile memory elements (e.g., random access memory (RAM, such as DRAM, SRAM, SDRAM, etc.)) and nonvolatile memory elements (e.g., ROM, hard drive, tape, CDROM, etc.). Moreover, article dispensing machine memory storage device **281** may incorporate electronic, magnetic, optical, and/or other types of storage media. Article dispensing machine memory storage device **281** can have a distributed architecture where various components are situated remote from one another, but are still accessed by processor. Article dispensing machine memory storage device includes an article dispensing machine database **282**.

The article dispensing machines **230** may comprise a network of machines in communication with one another. As shown in FIG. **1**, the article dispensing machines **230** are networked with one another via a central server or central controller **302** in a hub-and-spoke system. However, optionally, the article dispensing machines may be connected and communicate directly with one another, and/or subsets of article dispensing machines may communicate with one another directly as well as with the central server **302**.

Generally, in terms of hardware architecture, the central server **302** includes a central processor and/or controller, central memory, and one or more input and/or output (I/O) devices (or peripherals) that are communicatively coupled via a local interface. The architecture of the central server **302** is set forth in greater detail in U.S. Pat. No. 7,234,609, the contents of which are incorporated herein by reference. Numerous variations of the architecture of the central server **302** would be understood by one of skill in the art and are encompassed within the scope of the invention.

The processor/controller is a hardware device for executing software, particularly software stored in memory. The processor can be any custom made or commercially available processor, a central processing unit (CPU), an auxiliary processor among several processors associated with the server **302**, a semiconductor based microprocessor (in the form of a microchip or chip set), a macroprocessor, or generally any device for executing software instructions. Examples of suitable commercially available microprocessors are as follows: a PA-RISC series microprocessor from Hewlett-Packard Company, an 80×86 or Pentium series

microprocessor from Intel Corporation, a PowerPC microprocessor from IBM, a Sparc microprocessor from Sun Microsystems, Inc., or a 68xxx series microprocessor from Motorola Corporation. The processor may also represent a distributed processing architecture such as, but not limited to, SQL, Smalltalk, APL, KLisp, Snobol, Developer 200, MUMPS/Magic.

The software in memory may include one or more separate programs. The separate programs comprise ordered listings of executable instructions for implementing logical functions. The software in memory includes a suitable operating system (O/S). A non-exhaustive list of examples of suitable commercially available operating systems is as follows: (a) a Windows operating system available from Microsoft Corporation; (b) a Netware operating system available from Novell, Inc.; (c) a Macintosh operating system available from Apple Inc.; (d) a UNIX operating system, which is available for purchase from many vendors, such as the Hewlett-Packard Company, Sun Microsystems, Inc., and AT&T Corporation; (e) a LINUX operating system, which is freeware that is readily available on the Internet; (f) a run time Vxworks operating system from WindRiver Systems, Inc.; or (g) an appliance-based operating system, such as that implemented in handheld computers, smartphones, or personal digital assistants (PDAs) (e.g., PalmOS available from Palm Computing, Inc., Windows CE or Windows Phone available from Microsoft Corporation, iOS available from Apple Inc, Android available from Google Inc., BlackBerry OS available from Research in Motion Limited, Symbian available from Nokia Corp.). The operating system essentially controls the execution of other computer programs and provides scheduling, input-output control, file and data management, memory management, and communication control and related services.

Steps and/or elements, and/or portions thereof of the invention may be implemented using a source program, executable program (object code), script, or any other entity comprising a set of instructions to be performed. When a source program, the program needs to be translated via a compiler, assembler, interpreter, or the like, which may or may not be included within the memory, so as to operate properly in connection with the operating system (O/S). Furthermore, the software embodying the invention can be written as (a) an object oriented programming language, which has classes of data and methods, or (b) a procedural programming language, which has routines, subroutines, and/or functions, for example but not limited to, C, C++, Pascal, Basic, Fortran, Cobol, Perl, Java, Ada, and Lua.

When article dispensing machine **230** is in operation, the article dispensing machine processor is configured to execute software stored within article dispensing machine memory, to communicate data to and from the dispensing machine memory, and to generally control operations of article dispensing machine pursuant to the software. The software aspects of the invention and the O/S, in whole or in part, but typically the latter, are read by processor, perhaps buffered within the processor, and then executed.

When the invention or aspects thereof are implemented in software, it should be noted that the software can be stored on any computer readable medium for use by or in connection with any computer related system or method. In the context of this document, a computer readable medium is an electronic, magnetic, optical, or other physical device or means that can contain or store a computer program for use by or in connection with a computer related system or method. The invention can be embodied in any computer-readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch the instructions from the instruction execution system, apparatus, or device and execute the instructions. In the context of this document, a "computer-readable medium" can be any means that can store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer readable medium can be for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a non-exhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a portable computer diskette (magnetic), a random access memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM, EEPROM, or Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via, for instance, optical scanning of the paper or other medium, then compiled, interpreted or otherwise processed in a suitable manner if necessary, and then stored in a computer memory.

For communication with the central server **302**, article dispensing machine **230** is equipped with network communication equipment and circuitry. In one embodiment, the network communication equipment includes a network card such as an Ethernet card. In one network environment, each of the plurality of article dispensing machines **230** on the network is configured to use the TCP/IP protocol to communicate via the network **301**. It will be understood, however, that a variety of network protocols could also be employed, such as IPX/SPX, Netware, PPP and others. It will also be understood that while one embodiment of the invention is for article dispensing machine **230** to have a "broadband" connection to the network **301**, the principles of the invention are also practicable with a dialup connection using a standard modem. Wireless network connections are also contemplated, such as wireless Ethernet, satellite, infrared, radio frequency, Bluetooth, near field communication, and cellular networks.

The central controller **302** communicates with the article dispensing machine controllers **300** via the network **301**. The central controller **302** may be located at a central station or office that is remote from the plurality of article dispensing machines **230**. The central controller **302** can operate as the server for communicating over the network **301** between the plurality of article dispensing machines **230**. The central controller **302** receives communications and information from the article dispensing machines **230**, and also transmits communications and information to the machines **230**. For example, when a rental transaction is performed at the article dispensing machine **230**, transaction data such as the rented title is then transmitted from the machine **230** to the central controller **302** via the network **301**. It will be understood that central servers in general, such as the central controller **302**, are often distributed. A plurality of central servers/controllers **302** may optionally be arranged in "load balanced" architecture to improve the speed and efficiency of the network. To accomplish the implementation of multiple controllers **302**, the controllers **302** may be in communication with a router/distributor **303**.

The central controller **302** is also in communication with a central database **304**. The central database **304** stores information regarding the transaction network. For example, the central database **304** stores data regarding the vending inventory at each of the plurality of article dispensing machines **230**. The central database **304** also stores sales information regarding the sales quantities of the vending merchandise stored in the machines **230**. For example, the central database **304** stores information regarding the sales totals for each title and for each machine **230** vending location. Central database **304** also stores user information and rental transaction information, such as user IDs, the date on which discs are due to be returned, the date on which discs were rented from the machines **230** and a list of valid coupon codes and restrictions associated with those codes. In certain embodiments, central database **304** also may be configured to store user PINs. Some of this information may also be stored in article dispensing machine database **282**.

Central database **304** may be a relational database, although other types of database architectures may be used without departing from the principles of the invention. For example, the database **304** may be a SQL database, an Access database or an Oracle database, and in any such embodiment have the functionality stored herein. Central database **304** may also be capable of being shared, as illustrated, between a plurality of central controllers **302** and its information may also be capable of being transmitted via network **301**. It will be understood that a variety of methods exist for serving the information stored in central database **304**. In one embodiment, .net and Microsoft Reporting Services are employed, however, other technologies such as ODBC, MySQL, CFML and the like may be used.

The central controller **302** and central database **304** are also accessible by an electronic device **306**, which may include a personal computer **102**, mobile device **104** (e.g., smartphone, personal digital assistant, etc.), tablet computer **106**, video game console **108**, television **110**, and Blu-Ray player **112**. The electronic device **306** may be in direct or indirect communication with the central controller **302** and/or the central database **304** through a wired and/or wireless network connection, such as Ethernet, Wi-Fi, cellular (3G, 4G, etc.), or other type of connection. As a personal computer **102**, the electronic device **306** will be understood as comprising hardware and software consistent with marketable personal and laptop computers, such as a display monitor, a keyboard, and a microprocessor. The electronic device **306** may also comprise Internet browser software such as Firefox, Internet Explorer, Chrome, or Safari. Using the browser software, a user of the electronic device **306** can access a web interface through the central controller **302**. An application may also execute on the electronic device **306** that accesses the central controller **302**. To that end, central controller **302** may comprise web server software such as IIS or Apache. It will be understood that a variety of web server software and web browser software exists to implement the principles of the invention without departing therefrom. Through the web browser software or application, the electronic device **306** communicates with the central controller **302** and allows the user to login to a central command functionality of the central controller **302** and to view and modify data stored in the central database **304**. The browser interface or application also allows the user to perform certain system functions, which will affect the inventory and behavior of the article dispensing machines **230**. The electronic device **306** may communicate with the central controller **302** and the central database **304** using rules and specifications of an application programming interface (API).

In one embodiment, a financial server **305** is also in communication with the network **301**. It will be understood that a variety of financial services exist for processing financial information via the Internet and other networks **301**. Those services allow for the processing of credit card and debit card information, so that users of the services do not have to interface directly with credit and debit card companies. In FIG. **1**, the financial server **305** is illustrated as a single server, although the financial server **305** may comprise an entire sub-network of financial servers **305** responsible for processing financial information.

As shown in FIG. **2**, article dispensing machine **230** includes a machine housing **232** with front, rear, top, bottom and side panels. The machine housing **232** may be a combination molded fiberglass and sheet metal cabinet. However, those skilled in the art will appreciate that the housing can be constructed from a variety of other suitable materials and with a variety of other suitable manufacturing techniques.

As shown most clearly in FIG. **2**, a user interface portion **234** of housing **232** includes a card reader **240**, a keypad and/or touch screen **242** and an article transfer opening **244**. The card reader **240** may be designed in known fashion to read magnetically encoded membership and/or credit/debit cards for authorizing the distribution of articles of inventory through the article transfer opening **244**. The card reader **240** may also include the ability to communicate with a smart chip, a near field communication tag, and/or a contactless chip of a membership, credit, or debit card. Keypad and/or touch screen **242** permits consumers and/or inventory stocking personnel to communicate with the dispensing machine **230** and/or a central office linked in electrical communication with the dispensing machine. Keypad and/or touch screen **242** also permits consumers and/or inventory stocking personnel to enter appropriate commands directed to carrying out specific machine tasks. It will be appreciated that the optional touch screen includes a monitor made with known technologies making it capable of being utilized as a user interface for entry of commands designed to carry out machine tasks. The touch screen **242** may also be capable of displaying a QR (Quick Response) code to a customer. The customer may read the QR code with a camera on a mobile device or with a dedicated QR code reader. The QR code can represent a universal resource locator (URL) to access a digital media selection or can represent a reference number for use by the customer when contacting customer service, for example.

Furthermore, it will be appreciated that additional user interface portions having additional or even identical user interface components could be incorporated within article dispensing machine **230**. For example, these components could be incorporated on other panels of the housing **232** of machine **230** so that the machine can be used simultaneously by multiple consumers, translating into more efficient distribution of articles in high traffic areas. Dispensing machine **230** also may include speaker units. Known audio technology may be incorporated within dispensing machine **230** to broadcast focused audio directed to relatively small (e.g., three square feet) locations in front of the machines from speaker units and/or in other designated locations at a retail site.

Referring now to FIG. **3** which shows the components positioned in the interior of dispensing machine **230**, the article dispensing machine includes a non-removable stor-

age unit **248** which may be a carousel-style, cylindrical storage facility having a plurality of compartmentalized rows defined by circular-shaped storage racks **250** sharing a common central axis. Each of the rows has a plurality of receiving slots or compartments **369**. Each storage rack **250** includes radially extending, angularly separated compartment panels defining article storage compartments **369** which are designed to receive and retain flat-type pack articles, such as DVD, Blu-Ray disc, and video game disc cases, as desired. The compartment panels may be axially aligned to retain the opposing sides of DVD, Blu-Ray disc, and video game disc cases at the top and bottom ends thereof. In that regard, the DVD, Blu-Ray disc, and video game disc cases may be retained between successive vertical pairs of storage racks **250**. The storage racks **250** are vertically spaced by axially extending support members **254**.

A first motor **251**, hereinafter referred to as the rotational motor, rotates the storage unit **248** about a vertical axis formed by the driven shaft **252**. As shown in FIG. **4**, rotational motor **251** drives a belt **259**, which in turn rotates wheels **253** and shaft **252** to which the storage racks **250** are attached.

As shown in FIGS. **3** and **5**, a selector arm **256** is adjacent the storage unit **248**. The selector arm **256** is connected to a conveying belt **258** carried by rollers **260**, which may be positioned proximate to the top and the bottom of the article dispensing machine housing. At least one of the rollers **260** may be driven by a second motor **262**, hereinafter referred to as the selector arm motor, to provide for vertical movement of selector arm **256** along a vertical axis generally parallel to the vertical axis of the storage device. Alternatively, the selector arm motor **262** may be positioned on the selector arm **256**. In one embodiment, the motors **251**, **262** are stepper motors that are capable of accurately controlling the movement and position of the compartmentalized storage unit **248** and the selector arm **256**, respectively.

Referring now to FIG. **5**, the vending apparatus **230** is equipped with a first sensor **270** for sensing objects stored in the inventory of the apparatus. The first sensor may be mounted on the selector arm **256**. A variety of forms of sensors are practicable with the invention for use as the first sensor without departing from the principles thereof, including proximity sensors, proximity sensors, an optical laser scanner, a magnetic scanner, an optical bar code reader, an ultraviolet optical scanner, a radio frequency sensor and an infrared optical scanner. The vending apparatus **230** is further equipped with a second sensor **370** capable of reading information attached to the objects stored in the inventory of the apparatus. The second sensor **370** may be, as illustrated, mounted on the selector arm **256**. A variety of forms of sensors are practicable with the invention for use as the second sensor without departing from the principles thereof, including an optical laser scanner, a magnetic scanner, an optical bar code reader, an ultraviolet optical scanner, a radio frequency sensor and an infrared optical scanner.

The selector arm **256** comprises a picker device **264** which is capable of removing a DVD, Blu-Ray disc, or video game disc from the compartments **369**. The selector arm **256** may further comprise a conveyor belt **374**, which contacts one of the media products in one of the compartments **369** and conveys the product to the article transfer opening **244** whereby it is delivered to a user on the exterior of the article dispensing machine **230**. The conveyor **374** is driven by a conveyor motor **372**.

A system and method for calibrating the selector arm controller is disclosed in commonly owned U.S. Patent Application, Publication No. 2006/0254832, which is herein incorporated by reference in its entirety.

Generally, during the normal operation of the article dispensing machine, each article of inventory dispensed from a dispensing machine may be scanned by the second sensor **370** and an electronic record is created indicating the consumer who rented and/or purchased the media. In addition, articles of inventory returned to a dispensing machine by a customer and inserted into the article transfer opening **244** thereof may be scanned by the second sensor **370** and identified by the dispensing machine (for example with a bar code reader or scanner in electronic communication with the dispensing machine controller, positioned proximate the media dispending/return opening) along with an identification of its later stored position on the storage device.

These electronic records can be shared among dispensing machines within a network thereof, and can also be shared with a centralized office via the Internet or any other electronic data communication link. These electronic records can be used to ensure that the inventory process is carried out efficiently and accurately.

The physical media article in an article dispensing machine **230** may include at least a DVD, Blu-Ray disc, video game disc, or other media article. Each of the article dispensing machines **230** may operate without requiring continuous connectivity and communication with the central controller **302**. In one embodiment, the central controller **302** only transmits data in response to communication from an article dispensing machine **230**. For example, an article dispensing machine **230** may attempt to communicate with the central controller **302** following completion of one or more rental transactions or one or more media article return transactions. In another embodiment, the article dispensing machine **230** continues normal operations and transactions even if communication is interrupted or cannot be established with the central controller **302**. Communication with the central controller **302** may be interrupted if the load at the central controller **302** is above a certain threshold. For example, the central controller **302** may direct the article dispensing machine **230** to only transmit certain types of messages and/or transactions, e.g., financial authorizations, until the load has decreased. In these cases, transaction data can be stored locally in the article dispensing machine **230**, such as in the article dispensing machine memory storage device **281**, until a predetermined time interval elapses, when a predetermined number of transactions is reached, until communication with the central controller **302** can be reestablished, or the load at the central controller **302** has decreased. Once communication is established with the central controller **302**, financial and inventory information can be uploaded and the appropriate servers and databases can be updated.

In one embodiment, the article dispensing machine **230** can display only media articles which are physically located at the article dispensing machine **230**. In this way, a customer may browse on the user interface **234** only the media articles which are in-stock and available to rent at that article dispensing machine **230**. Typically, the article dispensing machine **230** possesses media information for the media articles that are currently located in the article dispensing machine **230**. The media information for a media article includes title, actor, director, studio, publisher, plot synopsis, format, description, parental rating, individualized ratings and reviews, popularity, article type, running time, genre, cover artwork, or other information. The article dispensing machine **230** can also store in memory the media information for recently-rented media articles that are no longer

physically stored in the article dispensing machine **230**. The article dispensing machine **230** can communicate with the central controller **302** when media information about a particular media article is needed. For example, when a particular media article is returned to an article dispensing machine **230** that does not have the corresponding media information for that particular media article, the article dispensing machine **230** can query the central controller **302** and central database **304** for the media information. Once the media information is obtained, the article dispensing machine **230** may display that particular media article on the user interface **234** as in-stock and available to rent.

In another embodiment, the article dispensing machine **230** can display media articles that are both physically located and not physically located at the article dispensing machine **230**. In this embodiment, media articles which are both available and unavailable to rent can be displayed. A media article may be unavailable to rent if it is not in-stock or is in-stock but has been reserved for rental. In one example, the entire catalog of media articles stored in an inventory database can be displayed on the article dispensing machine **230**. In another example, a subset of the entire catalog of media articles can be displayed on the article dispensing machine **230**. The subset of media articles that can be displayed on the article dispensing machine **230** may be determined, for example, based on geographic location, retailer agreements, contractual obligations, customer rental habits, and other criteria. The media articles that can be displayed on the article dispensing machine **230** may include recently-rented media articles that are no longer physically stored in the article dispensing machine **230** or media articles that have never been physically in the article dispensing machine **230**. For example, media articles that have never been physically in the article dispensing machine **230** may be displayed because those media articles may be available at a nearby article dispensing machine. In this case, those media articles may be displayed to the customer so that the customer has an option to obtain those media articles from the nearby article dispensing machine **230**. In this embodiment, if a customer attempts to rent a media article that is out-of-stock, reserved for another customer, or otherwise cannot be vended at the particular article dispensing machine **230**, then that media article can be deemed an unavailable media article.

An embodiment of a process **600** for simultaneously retrieving a selected article, such as a media article, and validating a payment transaction for a balance related to the selected article is shown in FIG. **6**. The process **600** can result in the quicker dispensing of the selected media article from an article dispensing machine **230** during a transaction. A media article may include a DVD, Blu-Ray disc, video game disc, or other media article. A consumer may rent and/or purchase a media article from the article dispensing machine **230**. The consumer may provide payment information to satisfy a balance owed for the transaction. While the payment information is being validated, the selected media article may be retrieved from a storage unit **248** in the article dispensing machine **230** and positioned at an article transfer opening **244**. The selected media article may be dispensed from the article dispensing machine **230** through the article transfer opening **244** after the payment information is determined to be valid. If the payment information is determined to be not valid, then the selected media article may be returned to the storage unit **248**. By pre-positioning the selected the media article at the article transfer opening **244** while the payment information is being validated, the total time for a given transaction may be reduced and accordingly, a greater total number of transactions for the article dispensing machine may result because each total transaction time is reduced.

At step **602**, a selected media article may be received at an article dispensing machine **230** as part of a request from a consumer. The consumer may initiate a transaction by interacting with the user interface **234** of the article dispensing machine **230**. The consumer may browse or search for media articles through the user interface **234** that the consumer desires to rent or purchase from the article dispensing machine **230**. One or more media articles may be selected by the consumer through the user interface **234** as part of the request, such as a rental transaction request or purchase transaction request. One or more identifiers, such as a title, catalog number, or serial number, may be associated with the selected media article. The identifier(s) may be received at step **602** at the processor **300** as part of the request.

It may be determined at step **604** whether the selected media article is available and physically located in the article dispensing machine **230**. The processor **300** may access the article dispensing machine database **282** and/or the central database **304**, for example, to determine whether the selected media article is available to be dispensed from the article dispensing machine **230**. If the selected media article is not available in the article dispensing machine **230**, then the process **600** may return to step **602** to receive another selection of a media article. The consumer may also be notified through the user interface **234** that the selected media article is not available in the article dispensing machine **230**. However, if the selected media article is available in the article dispensing machine **230**, then the process **600** may continue to step **606**. At step **606**, the processor **300** may query for payment information through the user interface **234**. The query may be visual and/or audible to ask the consumer to provide payment information to satisfy a balance that may be owed for the transaction. For example, the balance may be for an initial amount that is owed for a first rental night of the selected media article. The query may include instructions to a consumer to swipe a payment card or enter information about the payment card and/or credits.

At step **608**, the payment information may be received at the processor **300**. The payment information may be received from the consumer through the user interface **234**. A payment card and/or credits may be provided as the payment information to satisfy the balance owed for the transaction. A payment card may include a credit card or a debit card. The payment information may include the number of the payment card, the expiration date of the payment card, the card security code (also known as a card verification value (CVV2) or card verification code (CVC2)), and/or other information of the payment card. The payment information may be acquired via the card reader **240** or manually entered through the user interface **234** in response to the query of step **606**.

One or more credits may be redeemed for the balance owed for the transaction. Credits may be associated with a particular consumer and electronically tracked in a database, such as the central database **304**. Credits may be obtained through a one-time subscription, a periodic subscription, or be issued, for example. In one embodiment, the consumer may provide a unique customer identifier to access their credits. A unique customer identifier may include a payment card number, for example. Exemplary systems and methods for the acquisition, usage, and redemption of credits are disclosed in commonly owned U.S. Provisional Patent Application No. 61/538,898, filed Sep. 25, 2011 (System

and Method for Redemption of Credits in a Variable Value Transaction); U.S. Provisional Patent Application No. 61/538,900, filed Sep. 25, 2011 (System and Method for Predictive Accrual of Credits in a Variable Value Transaction); U.S. Provisional Patent Application No. 61/538,901, filed Sep. 25, 2011 (System and Method for Optimized Redemption of Credits in a Variable Value Transaction); U.S. Provisional Patent Application No. 61/538,902, filed Sep. 25, 2011 (System and Method for Management of Credit Subscriptions); and U.S. Provisional Patent Application No. 61/538,903, filed Sep. 25, 2011 (System and Method for Currency Conversion Related to Credits Redeemable in a Variable Value Transaction), each of which are herein incorporated by reference in their entirety.

The payment information may be validated at step **610** following the receipt of the payment information at step **608**. In the case of a payment card, the processor **300** may communicate with the financial server **305** at step **610** to authorize the payment capability of the payment card as well as to process the payment card for the balance owed for the transaction. The payment card number may be hashed with a hash function prior to communication of the payment card number to the financial server **305**. The hash function may be implemented on the article dispensing machines **230** and may be, for example, a SHA-256 hashing algorithm. If the payment information includes credits, one or more credits may be redeemed for the balance owed at step **610**. The validation of the payment information at step **610** is described in further detail below with regards to FIG. **7**.

The process **600** may also continue to step **612** following the receipt of the payment information at step **608**. In particular, steps **612** and **614** related to the physical retrieval of the selected media article from the storage unit **248** may be performed simultaneously and in parallel with the validation of payment information at step **610**. In this way, the total transaction time may be reduced and the selected media article may be dispensed to the consumer more quickly, if the payment information is determined to be valid. In contrast, the total transaction time may be longer if the selected media article is not retrieved from the storage unit **248** until after the payment information is validated. It should be noted that although step **610** for validation of the payment information and steps **612** and **614** for retrieval of the selected media article may be performed simultaneously, the steps may but do not necessarily begin or end at the same time. At step **612**, the selected media article may be located in the storage unit **248** of the article dispensing machine **230**. The physical location of the selected media article may be stored in the article dispensing machine database **282**, for example, and may include a specific compartment, rack, slot, and/or other location identifier in the storage unit **248** where the selected media article is physically located.

At step **614**, the selected media article may be retrieved from the physical location in the storage unit **248**, as identified at step **612**. A picker device **264** may be directed to the compartment, rack, or slot of the storage unit **248** where the selected media article is located. The identity of the selected media article may be verified, such as by the sensor **370**, as each article may have a unique identifier, such as a barcode, serial number, radio frequency identification (RFID) tag, or other identifier, that identifies the article and/or characteristics of the article, such as a title, type, and other information. The picker device **264** may retrieve the selected media article from the compartment, rack, or slot of the storage unit **248**. The picker device **264** may subsequently be directed to move the selected media article to a location near the article transfer opening **244**. Therefore, the selected media article may be pre-positioned to be immediately dispensed from the article dispensing machine **230**, pending validation of the payment information at step **610**.

Following step **610** for performing validation of the payment information and step **614** for retrieving the selected media article from the storage unit **248**, the process **600** continues to step **616**. At step **616**, it is determined whether the payment information is valid. If the payment information is valid at step **616**, then at step **618**, the selected media article may be dispensed from the article dispensing machine **230** through the article transfer opening **244**. However, if the payment information is not valid at step **616**, then at step **620**, the selected media article may be returned to the storage unit **248**. In particular, the picker device **264** may be directed to move the selected media article from the location near the article transfer opening **244** back to a compartment, rack, or slot of the storage unit **248**. The specific compartment, rack, or slot that the selected media article is returned to at step **620** may be the same or different compartment, rack, or slot that the selected media article was retrieved from at step **614**. If the selected media article is returned to a different compartment, rack, or slot, then the new physical location of the selected media article in the storage unit **248** may be recorded in the article dispensing machine database **282**.

In some embodiments, the different compartment, rack, or slot that the selected media article is returned to may be a location that is closer to the article transfer opening **244** for quicker future dispensing. For example, this may be the case if the selected media article is a new release that is more likely be rented or purchased by a future consumer. In other embodiments, the different compartment, rack, or slot that the selected media article is returned to may be a location that is farther from the article transfer opening **244**. For example, this may be the case if the selected media article is an older release that is less likely to be rented or purchased by a future consumer.

In some embodiments, a task may be scheduled and executed by the processor **300** at steps **612** and **614** to retrieve the selected media article from the storage unit **248**. The task may be executed simultaneously with step **610** for validating the payment information. If the payment information is valid at step **616**, then the processor **300** may issue a command to the task to direct the picker device **264** to dispense the selected media article at step **618**. If the payment information is not valid at step **616**, then the processor **300** may issue a different command to the task to direct the picker device **264** to return the selected media article to the storage unit **248** at step **620**.

An embodiment of a process **610** for validating payment information is shown in FIG. **7**. The process **610** corresponds to step **610** of the process **600** shown in FIG. **6**, described above. The payment information provided by the consumer may include a payment card and/or credits, and once validated, may be used to satisfy a balance owed for the transaction involving the selected media article. As described above, the process **610** may be performed simultaneously and in parallel with steps **612** and **614** to retrieve the selected media article from the storage unit **248**. At step **702**, it may be determined whether the consumer passes a fraud check. The fraud check may include whether the consumer is eligible for the transaction, based on unpaid debts, a history of declined payment cards, appearance on a customer blacklist, and other risk factors. If the fraud check is not passed, then the payment information may be deemed as not valid at step **716**. In this case, the consumer may not be allowed to rent and/or purchase the selected media article.

In one embodiment, a fraud check may be performed for the consumer if a unique customer identifier has been obtained and/or an account exists for the consumer. If no unique customer identifier has been obtained and/or no account exists for the consumer, step **702** may be optional.

If the fraud check is passed at step **702**, then the process **610** continues to step **704**. At step **704**, it is determined whether the payment information includes credits. A consumer may redeem one or more credits for the balance owed for the transaction. If the payment information does not include credits at step **704**, then the process **610** continues to step **712** to authorize the payment capability of the payment card to satisfy the balance owed. The processor **300** of the article dispensing machine **230** may communicate with the financial server **305**, for example, to authorize whether the payment card has the capability to pay the balance owed for the transaction. If the payment capability is not authorized at step **712**, then the payment information is deemed as not valid at step **716** and the consumer may not be allowed to rent or purchase the selected media article. However, if the payment capability is authorized at step **712**, then the payment card may be processed at step **714** to pay for the balance owed. In one embodiment, processing of the payment card may include charging or billing an account at the affiliate or external vendor. In another embodiment, processing of the payment card may include using alternative methods of payment, such as PayPal, American Express Serve, Facebook Credits, frequent flyer mile redemption, and the like. Following processing of the payment card at step **714**, the payment information may be deemed as valid at step **718**.

Returning to step **704**, if the payment information includes credits, then the process **610** continues to step **706**. At step **706**, it may be determined whether one or more credits are available and applicable to be redeemed to satisfy the balance owed for the transaction involving the selected media article. The processor may communicate with the financial server **305** or another system that tracks the number of credits for the consumer to determine whether credits are available. In one embodiment, credits may be used to satisfy all or a portion of the balance owed for the transaction. If no credits are available for the consumer to redeem at step **706**, then the process **610** may continue to step **712** to authorize the payment capability of the payment card to satisfy the balance owed, as described above. For example, a consumer may desire to redeem credits for the transaction and therefore specifies credits as part of the payment information because the consumer believes that they have credits available. However, if the consumer has exhausted their credits or does not have sufficient credits, then it may be determined at step **706** that credits are not available. As another example, the consumer may have credits that are not applicable to the selected media article because the credits may only be redeemable for certain types of media articles. In this case, it may also be determined at step **706** that credits are not available.

If credits are available for the consumer to redeem at step **706**, then at step **708**, one or more credits may be redeemed to satisfy all or a portion of the balance owed for the transaction. Continuing to step **710**, it may be determined whether there is a remaining portion of the balance owed for the transaction. There may be a remaining portion of the balance owed if the redeemed credits did not satisfy the entire balance owed, for example. If there is a remaining portion of the balance owed at step **710**, then the process **610** continues to step **712** to authorize the payment capability of the payment card to satisfy the remaining portion of the balance owed, as described above. However, if there is not a remaining portion of the balance owed at step **710**, i.e., the balance owed has been fully satisfied by redeeming credits, then at step **718**, the payment information may be deemed as valid.

Any process descriptions or blocks in figures should be understood as representing modules, segments, or portions of code which include one or more executable instructions for implementing specific logical functions or steps in the process, and alternate implementations are included within the scope of the embodiments of the invention in which functions may be executed out of order from that shown or discussed, including substantially concurrently or in reverse order, depending on the functionality involved, as would be understood by those having ordinary skill in the art.

It should be emphasized that the above-described embodiments of the invention, particularly, any "preferred" embodiments, are possible examples of implementations, merely set forth for a clear understanding of the principles of the invention. Many variations and modifications may be made to the above-described embodiment(s) of the invention without substantially departing from the spirit and principles of the invention. All such modifications are intended to be included herein within the scope of this disclosure and the invention and protected by the following claims.

The invention claimed is:

1. A method of dispensing a selected article of a plurality of articles from an article dispensing machine, the article dispensing machine comprising a user interface, a processor, a selector device driven by a motor, and a storage unit for holding the plurality of articles, the method comprising:

receiving a request related to the selected article through the user interface at the processor;

receiving payment information for a balance related to the request through the user interface at the processor;

determining whether the payment information is valid, using the processor;

retrieving the selected article from the storage unit via the selector device driven by the motor simultaneously with the step of determining whether the payment information is valid;

dispensing the selected article from the article dispensing machine, if the payment information is valid; and

returning the selected article to the storage unit, if the payment information is not valid.

2. The method of claim **1**, wherein the request related to the selected article comprises at least one of a rental transaction request or a purchase transaction request.

3. The method of claim **1**, wherein the payment information comprises one or more of a payment card or a credit.

4. The method of claim **3**, wherein determining whether the payment information is valid comprises:

authorizing a payment capability of the payment card for the balance, using the processor;

processing the payment card for the balance, using the processor, if the payment card is authorized; and

transmitting from the processor that the payment information is not valid, if the payment card is not authorized.

5. The method of claim **3**, wherein determining whether the payment information is valid comprises:

determining whether the credit is available, using the processor; and

redeeming the credit for the balance, if the credit is available, using the processor.

6. The method of claim **3**, wherein determining whether the payment information is valid comprises:

redeeming the credit for an initial portion of the balance, using the processor;

authorizing a payment capability of the payment card, using the processor;

processing the payment card for a remaining portion of the balance, using the processor, if the payment card is authorized, wherein the remaining portion is equal to the initial portion subtracted from the balance; and

transmitting from the processor that the payment information is not valid, if the payment card is not authorized.

7. The method of claim **1**, wherein determining whether the payment information is valid comprises:

determining whether a customer passes a fraud check, wherein the fraud check comprises whether the customer is eligible to receive the selected article; and

transmitting from the processor that the payment information is not valid, if the customer does not pass the fraud check.

8. The method of claim **1**, wherein retrieving the selected article from the storage unit comprises:

determining a location of the selected article in the storage unit; and

moving the selected article from the location in the storage unit to an article transfer opening at least partially via the selector device driven by the motor.

9. The method of claim **8**, wherein the selector device is a selector arm and includes a U-shaped picker device.

10. The method of claim **1**, wherein dispensing the selected article from the article dispensing machine comprises dispensing the selected article through an article transfer opening, if the payment information is valid.

11. The method of claim **1**, further comprising:

determining whether the selected article is physically located in the article dispensing machine, using the processor; and

querying for the payment information through the user interface, using the processor, only if the selected article is physically located in the article dispensing machine.

12. The method of claim **1**, wherein the selected article comprises a disc.

13. The method of claim **1**, including querying for payment information prior to the step of receiving payment information for a balance related to the request.

14. The method of claim **13**, wherein the step of retrieving the selected article from the storage unit via the selector device driven by the motor occurs after the step of querying for payment information.

15. The method of claim **1**, including locating the selected article in the storage unit simultaneous with the step of determining whether the payment information is valid.

16. The method of claim **15**, wherein the step of receiving payment information for a balance related to the request precedes the step of locating the selected article in the storage unit.

17. The method of claim **1**, wherein the method includes pre-positioning the selected article at an article transfer opening of the article dispensing machine simultaneous with the step of determining whether the payment information is valid.

18. The method of claim **17**, wherein the step of dispensing the selected article from the article dispensing machine, if the payment information is valid, comprises dispensing the selected article through the article transfer opening.

19. The method of claim **17**, further comprising keeping the pre-positioned article at the article transfer opening at least until the validity of the payment information is determined.

20. The method of claim **1**, wherein the step of retrieving the selected article from the storage unit via the selector device driven by the motor includes retrieving the selected article from a first location in the storage unit,

wherein the step of returning the selected article to the storage unit, if the payment information is not valid, includes returning the selected article to a second location in the storage unit, and

wherein the second location is different than the first location.

21. The method of claim **1**, wherein the step of receiving payment information for a balance related to the request precedes the step of retrieving the selected article from the storage unit via the selector device.

22. The method of claim **1**, wherein the step of returning the selected article to the storage unit, if the payment information is not valid includes returning the selected article to the storage unit based on the determination of whether the payment information is valid.

23. A non-transitory computer readable medium for dispensing a selected article of a plurality of articles from an article dispensing machine, the article dispensing machine comprising a user interface, a processor, a selector device driven by a motor, and a storage unit for holding the plurality of articles, the computer readable medium comprising:

a first code segment for receiving a request related to the selected article through the user interface at the processor;

a second code segment for receiving payment information for a balance related to the request through the user interface at the processor;

a third code segment for determining whether the payment information is valid, using the processor;

a fourth code segment for retrieving the selected article from the storage unit via the selector device driven by the motor simultaneously with the step of determining whether the payment information is valid;

a fifth code segment for dispensing the selected article from the article dispensing machine, if the payment information is valid; and

a sixth code segment for returning the selected article to the storage unit, if the payment information is not valid.

24. The non-transitory computer readable medium of claim **23**, wherein the payment information comprises one or more of a payment card or a credit.

25. The non-transitory computer readable medium of claim **24**, wherein the third code segment for determining whether the payment information is valid comprises:

a seventh code segment for authorizing a payment capability of the payment card for the balance, using the processor;

an eighth code segment for processing the payment card for the balance, using the processor, if the payment card is authorized; and

a ninth code segment for transmitting from the processor that the payment information is not valid, if the payment card is not authorized.

26. The non-transitory computer readable medium of claim **24**, wherein the third code segment for determining whether the payment information is valid comprises:

a tenth code segment for determining whether the credit is available, using the processor; and

an eleventh code segment for redeeming the credit for the balance, if the credit is available, using the processor.

27. The non-transitory computer readable medium of claim **24**, wherein the third code segment for determining whether the payment information is valid comprises:

a twelfth code segment for redeeming the credit for an initial portion of the balance, using the processor;

a thirteenth code segment for authorizing a payment capability of the payment card, using the processor;

a fourteenth code segment for processing the payment card for a remaining portion of the balance, using the processor, if the payment card is authorized, wherein the remaining portion is equal to the initial portion subtracted from the balance; and

a fifteenth code segment for transmitting from the processor that the payment information is not valid, if the payment card is not authorized.

28. The non-transitory computer readable medium of claim **23**, wherein the third code segment for determining whether the payment information is valid comprises:

a sixteenth code segment for determining whether a customer passes a fraud check, wherein the fraud check comprises whether the customer is eligible to receive the selected article; and

a seventeenth code segment for transmitting from the processor that the payment information is not valid, if the customer does not pass the fraud check.

29. The non-transitory computer readable medium of claim **23**, wherein the fourth code segment for retrieving the selected article from the storage unit comprises:

an eighteenth code segment for determining a location of the selected article in the storage unit; and

a nineteenth code segment for moving the selected article from the location in the storage unit to an article transfer opening at least partially via the selector device driven by the motor.

30. The non-transitory computer readable medium of claim **23**, wherein the fifth code segment for dispensing the selected article from the article dispensing machine comprises a twentieth code segment for dispensing the selected article through an article transfer opening, if the payment information is valid.

31. The non-transitory computer readable medium of claim **23**, further comprising:

a twenty-first code segment for determining whether the selected article is physically located in the article dispensing machine, using the processor; and

a twenty-second code segment for querying for the payment information through the user interface, using the processor, only if the selected article is physically located in the article dispensing machine.

32. A method of dispensing a selected article from an article dispensing machine, the article dispensing machine comprising a processor, a selector device driven by a motor, and a storage unit, the method comprising:

receiving a request related to the selected article at the processor;

receiving payment information for a balance related to the request;

determining whether the payment information is valid;

simultaneously (a) retrieving the selected article from the storage unit via the selector device driven by the motor while (b) performing the determination of whether the payment information is valid; and

dispensing the selected article from the article dispensing machine, if the payment information is valid.

33. The method of claim **32**, wherein the step of receiving payment information for a balance related to the request precedes the step of retrieving the selected article from the storage unit via the selector device.

34. The method of claim **32**, including returning the selected article to the storage unit based on a determination that the payment information is not valid.

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