



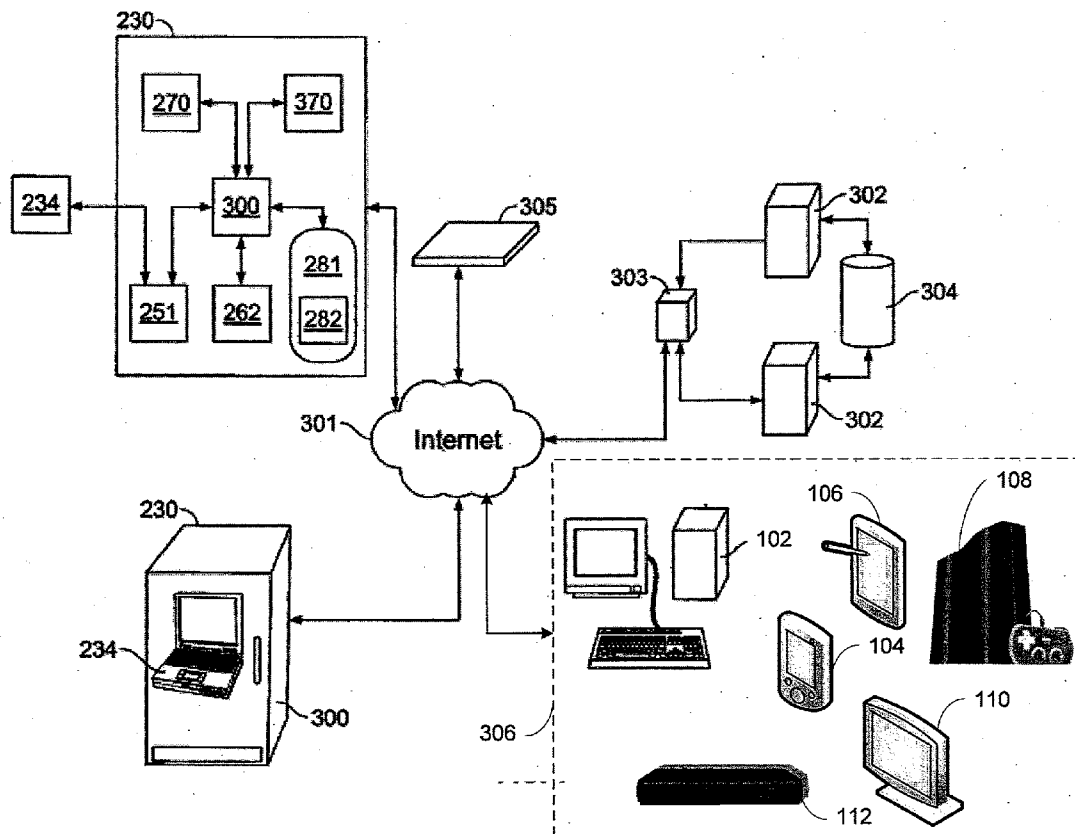
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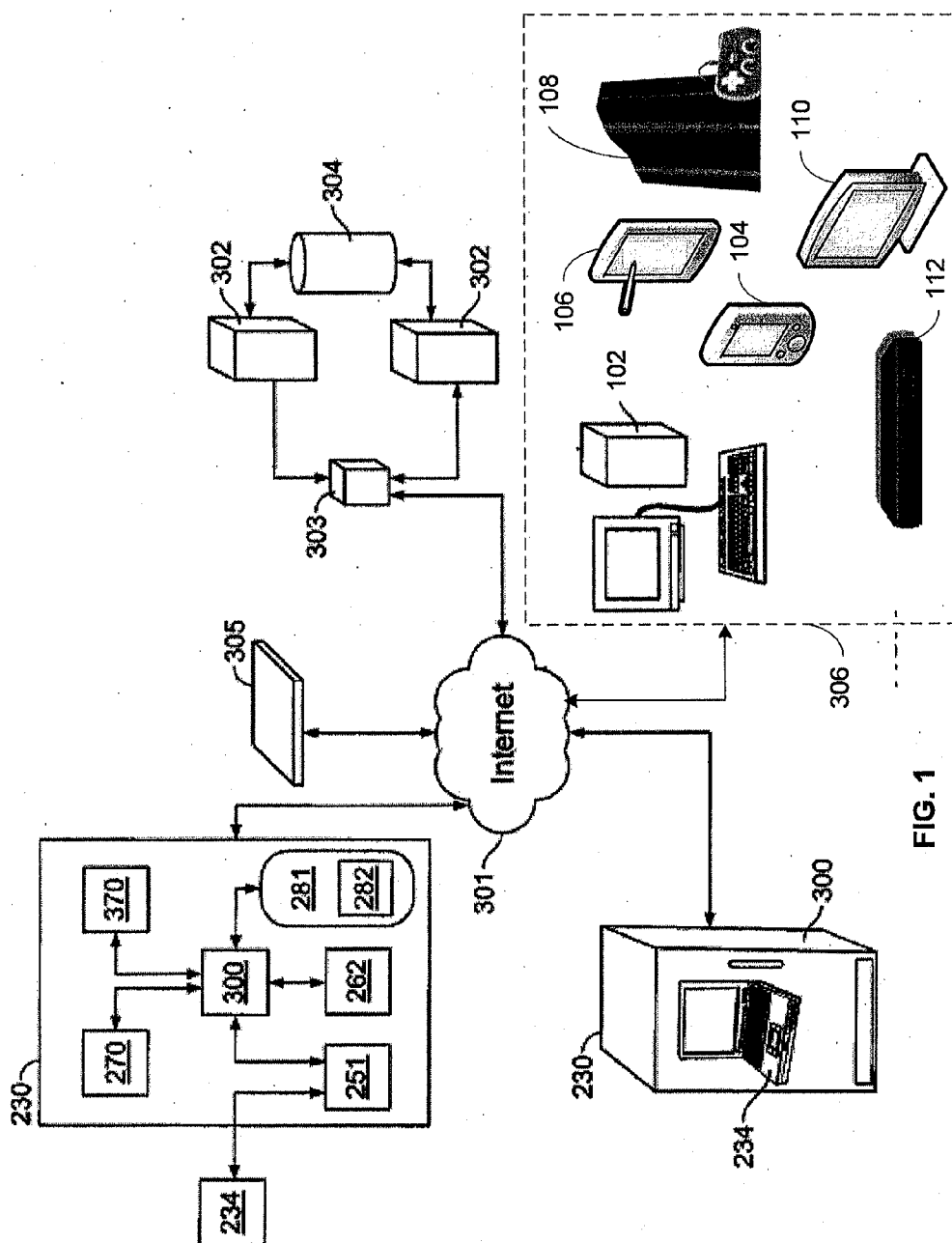
(19) **United States**(12) **Patent Application Publication**
Maskatia et al.(10) **Pub. No.: US 2013/0073468 A1**(43) **Pub. Date: Mar. 21, 2013**(54) **SYSTEM AND METHOD OF ASSOCIATING
AN ARTICLE DISPENSING MACHINE
ACCOUNT WITH A CONTENT PROVIDER
ACCOUNT****Publication Classification**(51) **Int. Cl.**
G06Q 20/38

(2012.01)

(52) **U.S. Cl.**USPC **705/75; 705/35**(75) **Inventors:** **Imran Maskatia**, Milpitas, CA (US);
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Oakbrook Terrace, IL (US)(21) **Appl. No.: 13/517,566**(22) **Filed: Jun. 13, 2012****Related U.S. Application Data**(60) **Provisional application No. 61/497,014, filed on Jun.
14, 2011.**(57) **ABSTRACT**

A method of associating a first customer account for an article dispensing machine with a second customer account at a content provider. The article dispensing machine has a user interface. The method receives a unique customer identifier through the user interface, accesses the first customer account based on the unique customer identifier, and associates the second customer account at the content provider with the first customer account. The second customer account can include a customer subscription with access permission for a digital media selection at the content provider. In addition, the unique customer identifier can include at least one of a credit card number or a debit card number, and the method can apply a hash function to at least one of the credit card number or the debit card number to produce at least one of a hashed credit card number or a hashed debit card number.





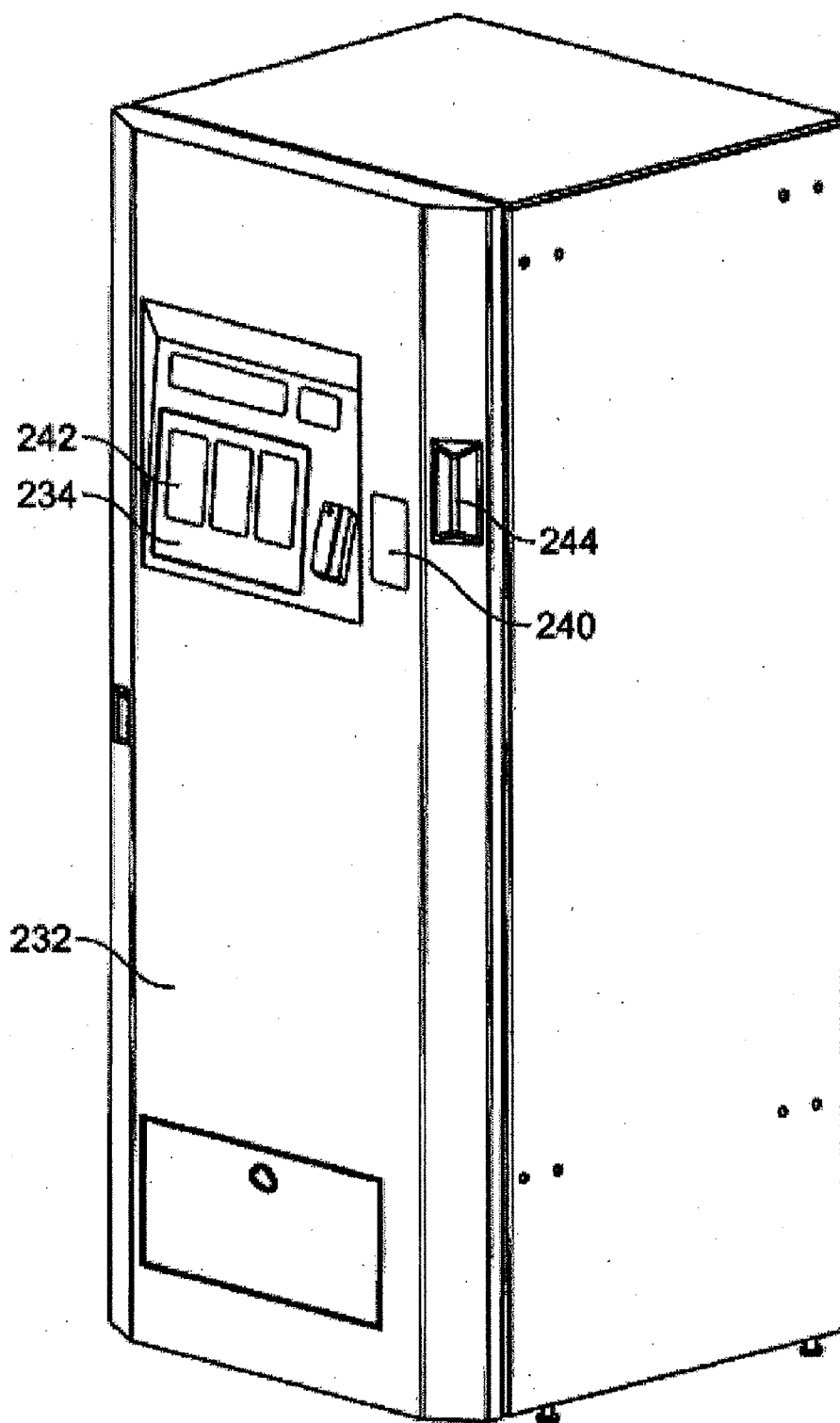


FIG. 2

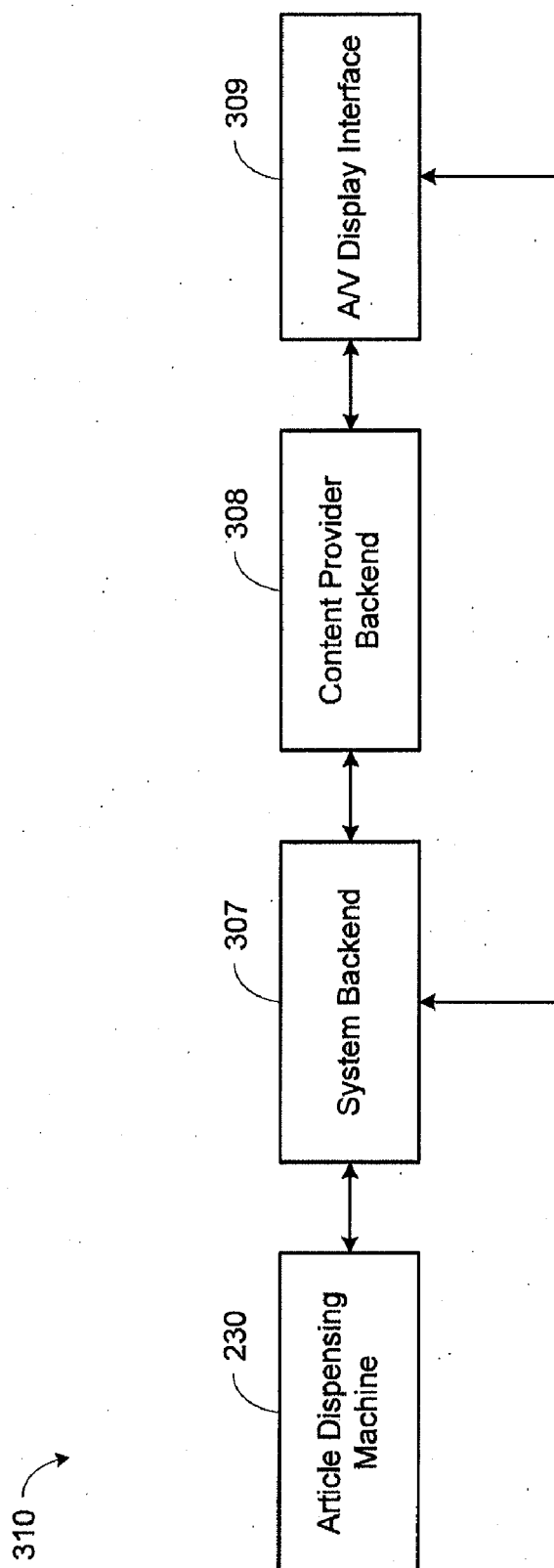


FIG. 3

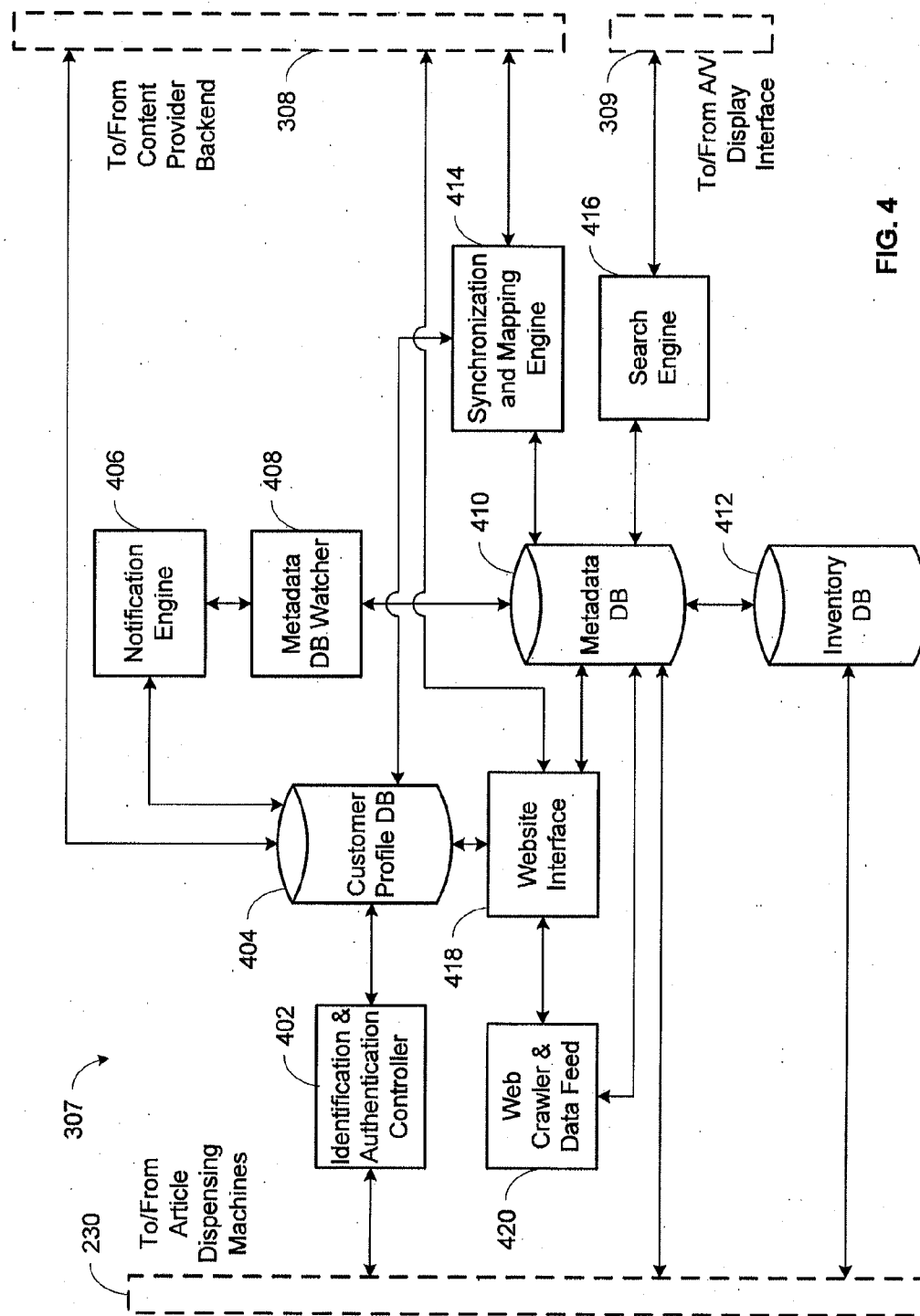


FIG. 4

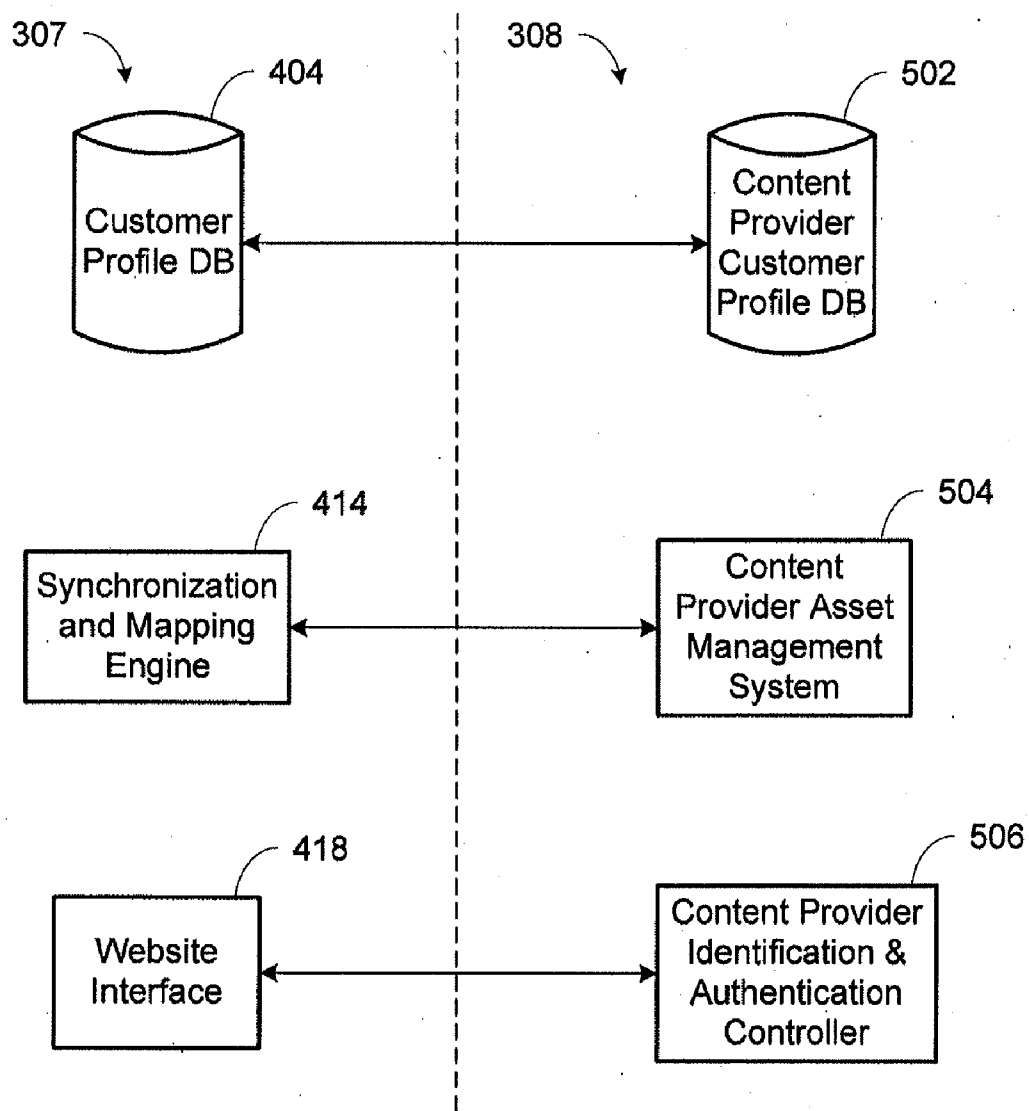


FIG. 5

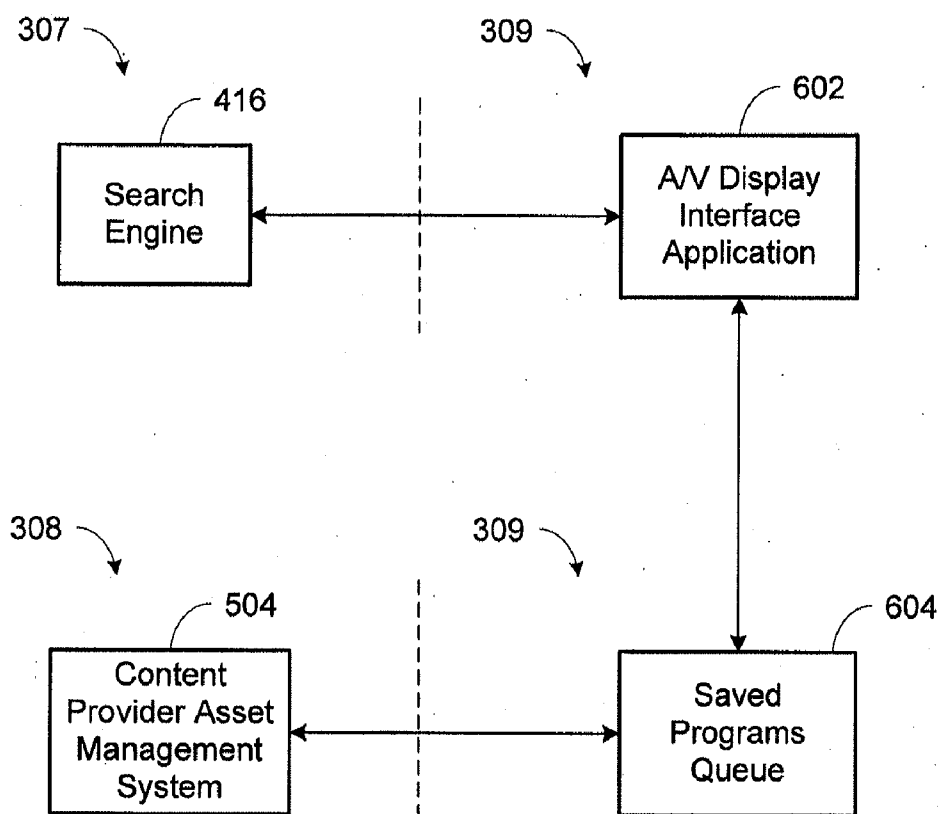
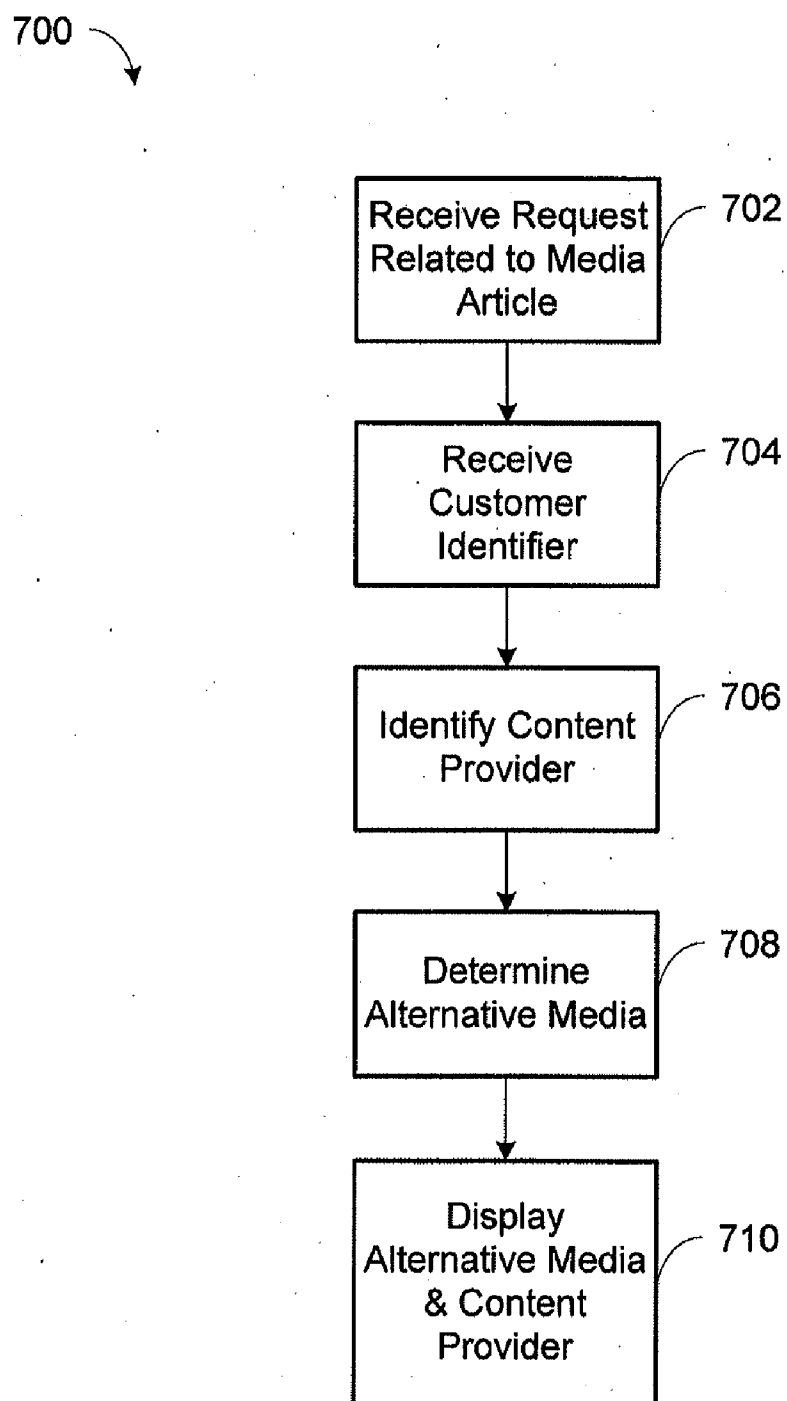


FIG. 6

**FIG. 7**

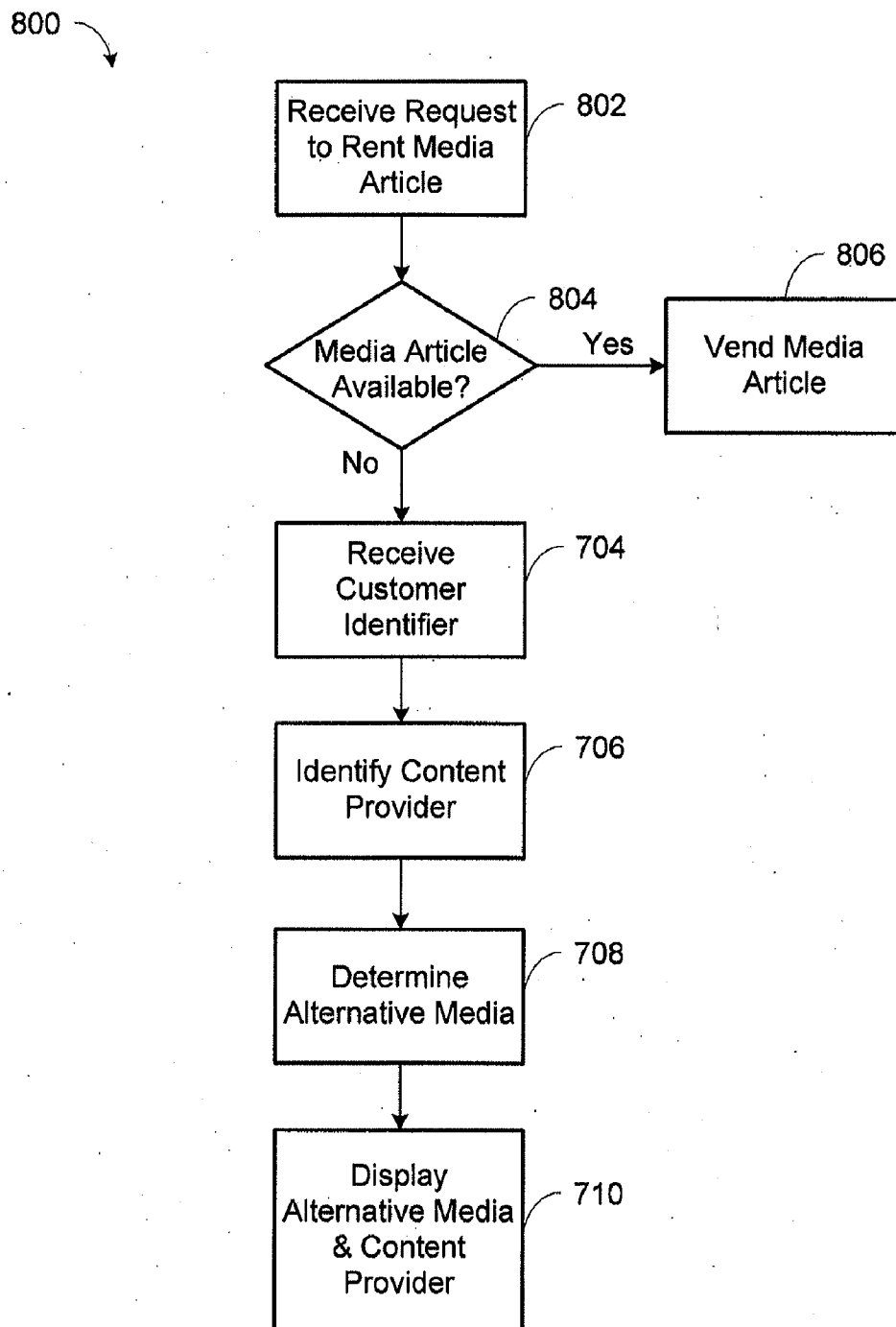


FIG. 8

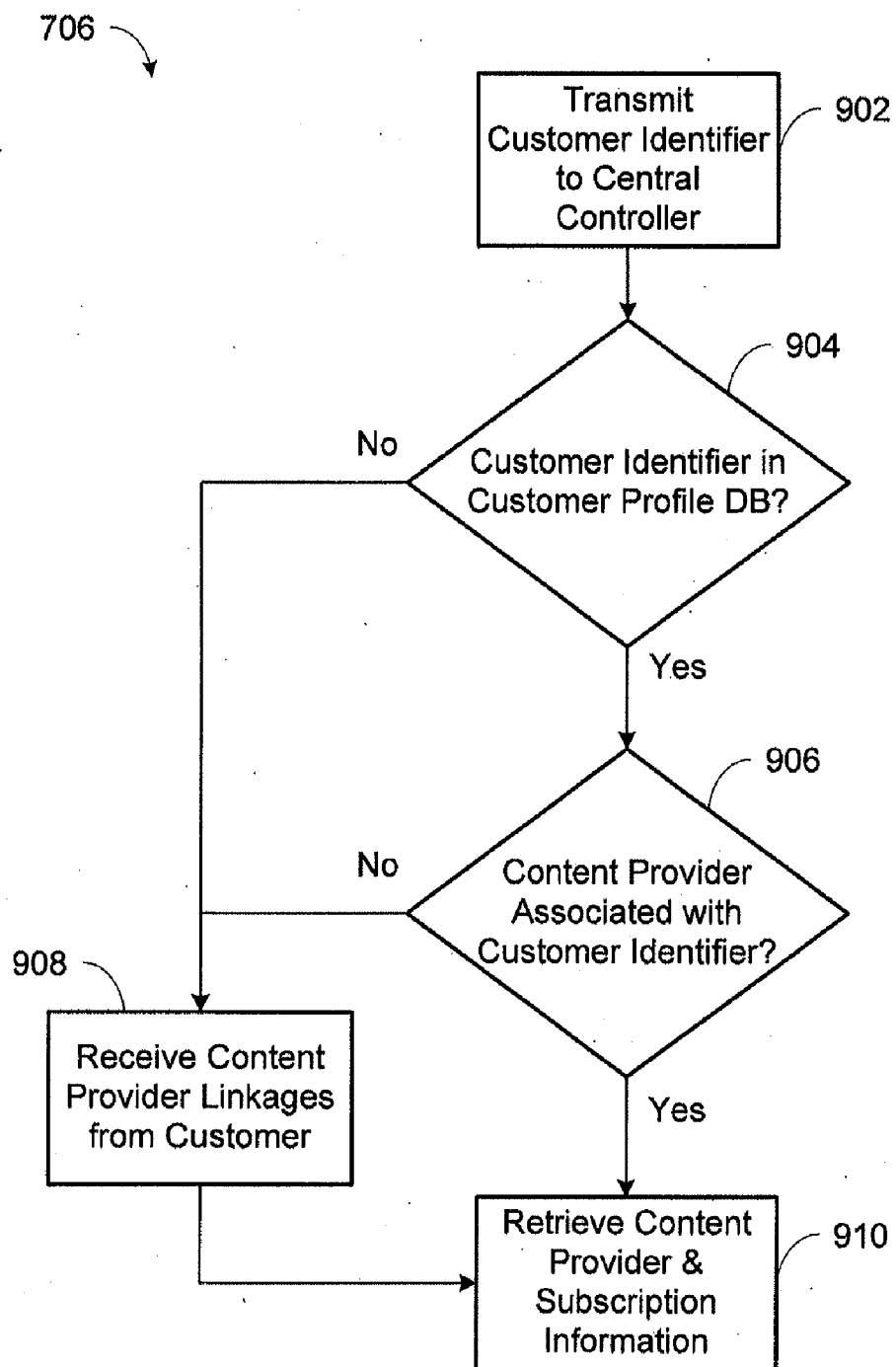


FIG. 9

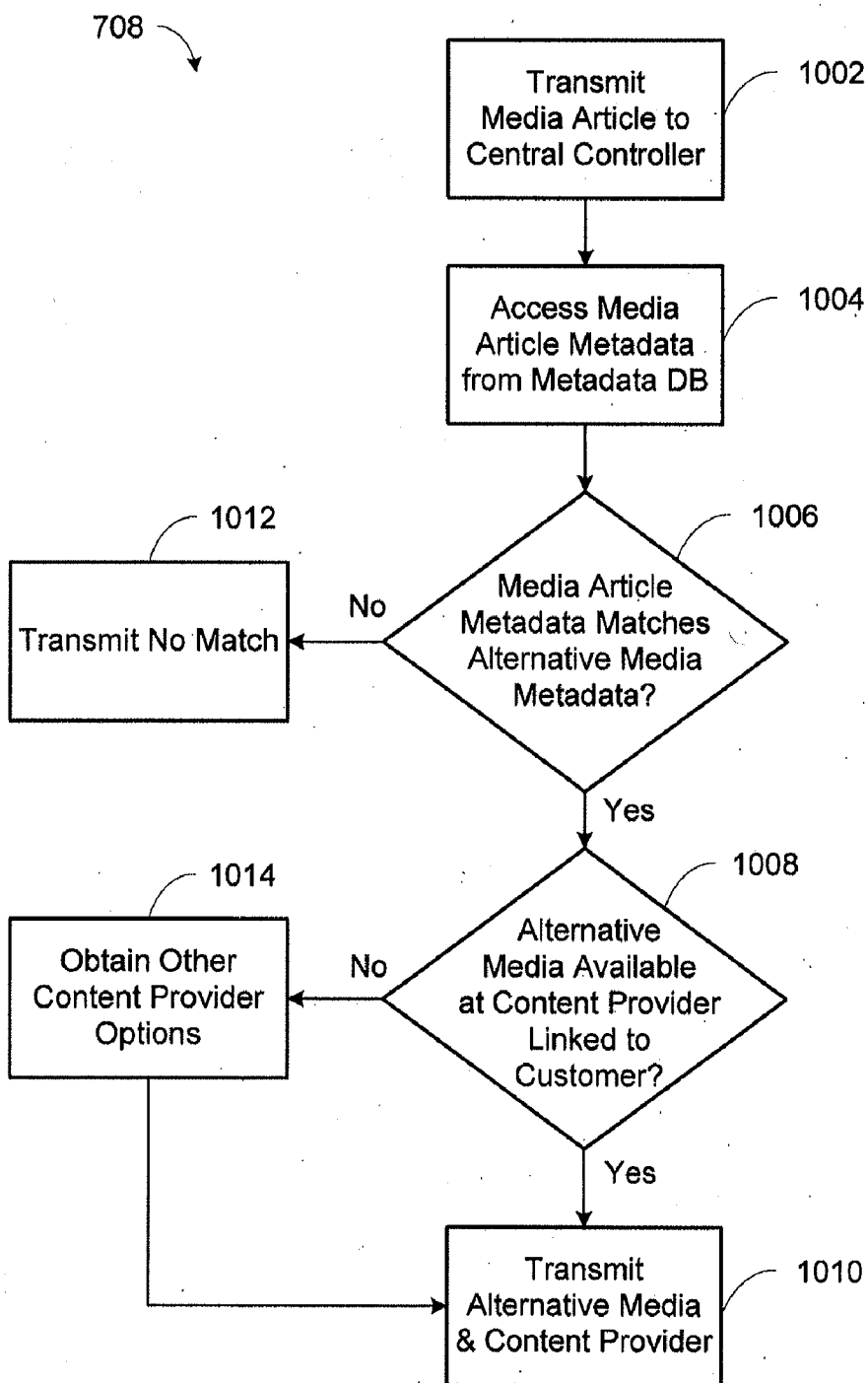


FIG. 10

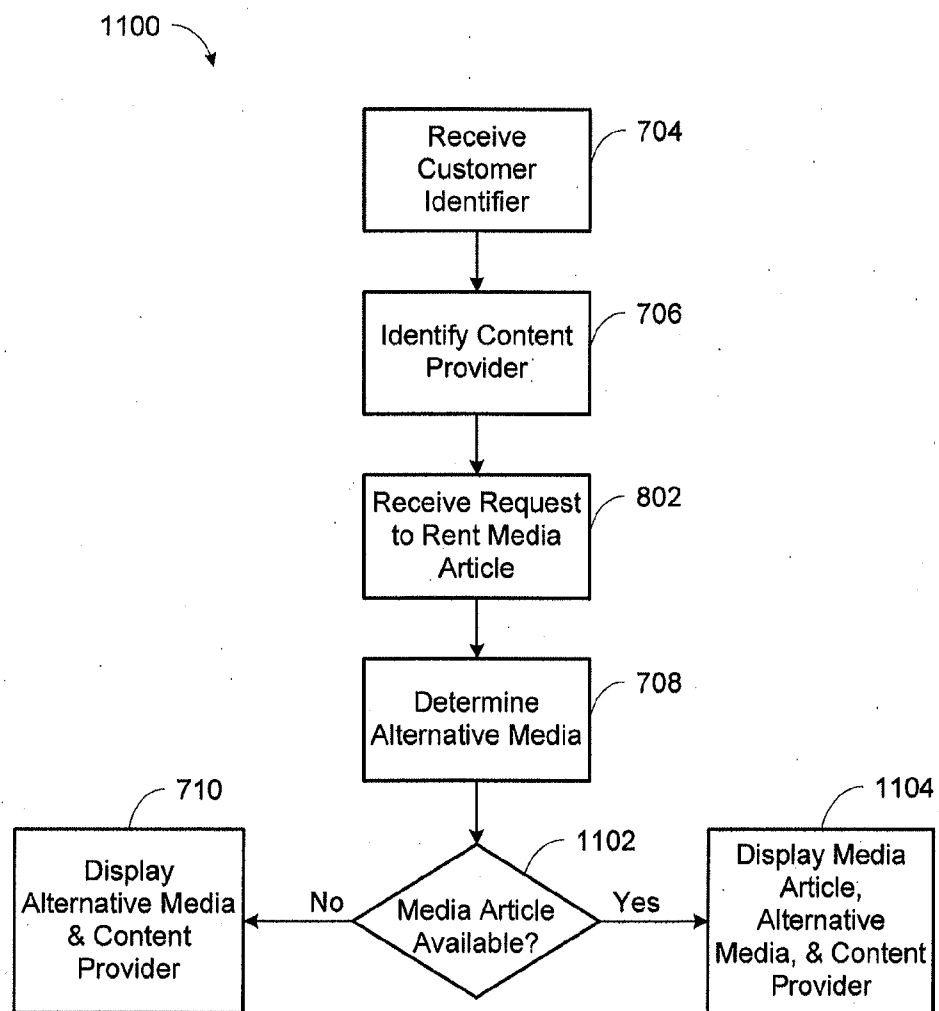


FIG. 11

SYSTEM AND METHOD OF ASSOCIATING AN ARTICLE DISPENSING MACHINE ACCOUNT WITH A CONTENT PROVIDER ACCOUNT

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to U.S. patent application Ser. No. 61/497,014, filed on Jun. 14, 2011, entitled "SYSTEM AND METHOD OF ASSOCIATING AN ARTICLE DISPENSING MACHINE ACCOUNT WITH A CONTENT PROVIDER ACCOUNT", and is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] This invention relates to a system and method for associating a first customer account for an article dispensing machine with a second customer account at a content provider.

BACKGROUND AND SUMMARY OF THE INVENTION

[0003] While the present 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 present invention is advantageously suited, it will be readily apparent that the present invention is not limited to that application and can be employed in article dispensing systems used to distribute a wide variety of dispensable articles.

[0004] 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.

[0005] 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.

[0006] 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.

[0007] 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 present 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 present invention can stock up to two thousand DVDs, Blu-Ray, video games, or other discs (movies, games or other enter-

tainment content), making the system competitive with existing brick-and-mortar video rental superstores.

[0008] The dispensing machine and system of the U.S. Pat. No. 7,234,609 and the present 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).

[0009] The dispensing machine of the U.S. Pat. No. 7,234,609 and the present 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. The present invention employs a more cost-effective, convenient platform than brick-and-mortar stores. In addition, with the present 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.

[0010] The dispensing machine of the U.S. Pat. No. 7,234,609 and the present invention can be operated at a substantial savings over the costs associated with traditional brick-and-mortar video rental stores. For example, the present invention does not require hourly employees manning the dispensing machines or restocking them with inventories, due to the ability of the article transport storage units to be delivered to/picked up from retail locations by third-party delivery services, such as traditional or contracted courier services.

[0011] Unlike brick-and-mortar stores, the dispensing machine of the U.S. Pat. No. 7,234,609 and the present 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 present 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 present invention has low operating costs because no heating or air conditioning is 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.

[0012] The dispensing machine of the U.S. Pat. No. 7,234,609 and the present 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 present 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.

[0013] The dispensing machine of the U.S. Pat. No. 7,234,609 and the present invention is a fully automated, integrated DVD, Blu-Ray, and video game rental and/or purchase systems. It preferably incorporates 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, technol-

ogy utilizing the Internet through a system website or mobile/consumer electronics device application, and an article transport storage unit that facilitates the exchange of new discs for old discs in each machine with virtually no need for human intervention. 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 present invention functions as much as a promotional platform as it does a rental kiosk.

[0014] By utilizing the dispensing machines and the fully-interactive, real-time, linked Internet website or mobile/consumer electronics device application, 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 are preferably 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.

[0015] With article dispensing machines, there exists the potential for a customer to attempt to rent a particular movie, television show, or video game disc and find that it is out-of-stock or otherwise unavailable. Conventional article dispensing machines may direct the customer to a nearby article dispensing machine that has the particular disc in stock. While this option may be useful to some customers, it may be inconvenient for other customers to travel to another location. Still other customers may abandon their attempt to rent the particular title from the article dispensing machine and instead patronize another media rental company, a video on demand provider, a downloadable video game provider, an online video or video game streaming provider, or other content provider. In this case, the revenue associated with the rental transaction is lost and the customer may be dissatisfied with their experience with the article dispensing machine. In other situations, a customer at a conventional article dispensing machine desires to rent an in-stock DVD, Blu-ray disc, or video game disc but is not informed of other options available through the machine, including renting related titles or obtaining access to a corresponding digital media selection. This could result in a missed opportunity to build or further a customer relationship, and/or to create a rental or purchase transaction.

[0016] The present invention permits a customer to substitute digital alternative media for a physical media article at an article dispensing machine, if the media article is available and in-stock or if the media article is unavailable because it is out-of-stock or reserved to another customer. By offering substitute alternative media, the present invention assists in retention of customers and revenue. Moreover, the content provider receives marketing exposure on the article dispensing machine, which may enhance the value of the content provider's subscription packages. The present invention overcomes disadvantages of conventional article dispensing machines by showing alternative media that correspond to the media article at the article dispensing machine. In one aspect of the present invention, an associated content provider is identified using a unique customer identifier that also applies to the article dispensing machine. In another aspect of the

present invention, a customer subscription for the associated content provider is accessed so that the alternative media is determined if the customer subscription allows access to the alternative media. In another aspect of the present invention, determining the alternative media corresponding to the media article is based on matching of the metadata of the media article and the alternative media. In yet another aspect of the present invention, the associated content provider is identified by a user through providing a linkage of the associated content provider to a customer account through a user interface or on a website interface.

[0017] In a further aspect of the present invention, the system and method of can associate a first customer account for an article dispensing machine with a second customer account at a content provider. The system and method receives a unique customer identifier through the user interface, accesses the first customer account based on the unique customer identifier, and associates the second customer account at the content provider with the first customer account. The second customer account can include a customer subscription with access permission for a digital media selection at the content provider. In addition, the unique customer identifier can include at least one of a credit card number or a debit card number, and the method can apply a hash function to at least one of the credit card number or the debit card number to produce at least one of a hashed credit card number or a hashed debit card number. Other features and advantages are provided by the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. 1 is an illustration of a system for communicating and processing information in a network of article dispensing machines and dispensing apparatus.

[0019] FIG. 2 is a perspective view of an article dispensing machine constructed in accordance with the principles of the present invention.

[0020] FIG. 3 is a high-level block diagram illustrating a networked media content system and connections including an article dispensing machine, a system backend, a content provider backend, and an A/V display interface.

[0021] FIG. 4 is a block diagram illustrating the system backend.

[0022] FIG. 5 is a block diagram illustrating connections between the system backend and the content provider backend.

[0023] FIG. 6 is a block diagram illustrating connections between the system backend, the content provider backend, and the A/V display interface.

[0024] FIG. 7 is a flowchart illustrating an order of operations performed by an article dispensing machine for substituting alternative media for a media article.

[0025] FIG. 8 is a flowchart illustrating an order of operations performed by an article dispensing machine for substituting alternative media for a media article in an alternative embodiment.

[0026] FIG. 9 is a flowchart illustrating an order of operations performed by an article dispensing machine for linking a content provider with a customer identifier in the substitution operations of FIGS. 7, 8, and 11.

[0027] FIG. 10 is a flowchart illustrating an order of operations performed by an article dispensing machine for mapping alternative media to a media article in the substitution operations of FIGS. 7, 8, and 11.

[0028] FIG. 11 is a flowchart illustrating an order of operations performed by an article dispensing machine for substituting alternative media for a media article in a further alternative embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[0029] While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail preferred 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.

[0030] FIGS. 1-2 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 preferably form a network. As such, those machines are preferably in electrical communication with each other and with a central server or central controller.

[0031] 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.

[0032] 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.

[0033] The article dispensing machines 230 preferably comprise a network of machines in communication with one another. As shown in FIG. 1, in the preferred configuration, 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.

[0034] Generally, in terms of hardware architecture, the central server 302 and the content provider backend 308 shown in FIG. 3 include 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 and the content provider backend 308 would be understood by one of skill in the art and are encompassed within the scope of the present invention.

[0035] 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 80x86 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.

[0036] 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.

[0037] Steps and/or elements, and/or portions thereof of the present 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 present 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.

[0038] 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 present 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.

[0039] When the present 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 present 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.

[0040] For communication with the central server 302, article dispensing machine 230 is equipped with network communication equipment and circuitry. In a preferred embodiment, the network communication equipment includes a network card such as an Ethernet card. In a preferred 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 a preferred embodiment of the present invention is for article dispensing machine 230 to have a "broadband" connection to the network 301, the principles of the present 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.

[0041] The central controller 302 communicates with the article dispensing machine controllers 300 via the network 301. The central controller 302 is preferably 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.

[0042] 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 is also preferably stored in article dispensing machine database 282.

[0043] Central database 304 and databases in the content provider backend 308, such as the content provider customer profile database 502 and other databases, are preferably relational databases, although other types of database architectures may be used without departing from the principles of the present invention. For example, the databases 304 and 502 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 is also preferably capable of being shared, as illustrated, between a plurality of central controllers 302 and its information is also preferably 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 and database 502. In one embodiment, .net and Microsoft Reporting Services are employed, however, other technologies such as ODBC, MySQL, CFML and the like may be used.

[0044] The central controller 302, central database 304, and components of the content provider backend 308 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, central database

304, and/or the content provider backend **308** 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** preferably comprises 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 present 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**.

[0045] In a preferred 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.

[0046] 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** is preferably 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.

[0047] 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** is preferably 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**. 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, for example.

[0048] 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 preferably includes 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.

[0049] FIG. 3 illustrates a networked media content system **310** including an article dispensing machine **230**, a system backend **307**, a content provider backend **308**, and an audio/visual (A/V) display interface **309**. The networked media content system **310** provides for a variety of processes involving management, manipulation, searching, presentation, and notification related to digital content and vendible physical media articles, including processes related to the present invention for substitution of a physical media article with digital alternative media. The networked media content system **310** allows for direct and indirect communication between the components in the networked media content system **310** via one or more networks. The components in the networked media content system **310** may be operated by one or more entities. In one embodiment, the article dispensing machine(s) **230** and the system backend **307** are operated by a first entity, such as the operator of the article dispensing machines, while the content provider backend **308** and the A/V display interface **309** are operated by a second entity, such as a content provider. In another embodiment, all of the components shown in the networked media content system **310** of FIG. 3 are operated by the same entity. The physical media article may include at least a DVD, Blu-Ray disc, video game disc, or other media article, including those that are out-of-stock or otherwise unavailable for rental. The digital alternative media may include streaming video content, video-on-demand content, downloadable video content, streaming video games, downloadable video games, or other digital media. Although FIG. 3 shows a single content provider backend **308** and a single A/V display interface **309**, it is contemplated that more than one content provider backend and/or A/V display interfaces may be in communication with the system backend **307**.

[0050] The system backend **307** includes components that primarily communicate information, such as transaction and inventory data, to and from the article dispensing machines **230**. Components in the system backend **307** also communicate information to and from the content provider backend **308** and the A/V display interface **309**. The system backend **307** is detailed below with reference to FIG. 4. The content provider backend **308** includes components that primarily communicate information to and from the A/V display interface **309**. Components in the content provider backend **308** also communicate information to and from the system backend **307**, as detailed further below. Data communicated between the article dispensing machines **230**, the system

backend 307, the content provider backend 308, and/or the A/V display interface 309 may utilize the XML (Extensible Markup Language) format.

[0051] The A/V display interface 309 can be a set-top box, a module of an internet-ready television, a Blu-Ray player with internet connectability, a software application executing on a mobile device, cable television converter box, satellite television set-top box, IPTV (Internet Protocol television) set-top box (including AT&T U-Verse), digital video recorder, tablet computer, video game console (including Microsoft Xbox family, Sony PlayStation family, Nintendo Wii, and similar devices), handheld gaming device (including Sony PlayStation Portable, Nintendo DS, and similar devices), laptop computer, desktop computer, streaming media box (including Apple TV, Google TV, Roku, Boxee, and similar devices), or any other device capable of receiving and displaying streaming, on-demand, and/or downloadable electronic media from a content provider. Moreover, applications may be installed and executed on the A/V display interface 309 that communicate with the system backend 307 and/or the content provider backend 308 to provide media content and other information to a user of the A/V display interface 309.

[0052] The article dispensing machines 230 can communicate with the system backend 307, including the central server and controller 302, via network communication equipment and circuitry, as detailed above. Furthermore, the system backend 307 can communicate with the content provider backend 308 and the A/V display interface 309 via the same or different network communication equipment and circuitry. In particular, the system backend 307 can directly communicate with the content provider backend 308 and the A/V display interface 309, or in one embodiment, the system backend 307 can communicate with the A/V display interface 309 through the content provider backend 308. It will also be understood that while a preferred embodiment of the present invention is for the components of the system 310 to have a "broadband" connection with one another, the principles of the present 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.

[0053] 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. 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, or until communication with the central controller 302 can be reestablished. 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.

[0054] 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 possess 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, metadata database 410, and/or inventory database 412 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. A physical media article may be substituted with a digital alternative media selection, as described further below.

[0055] 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 the inventory database 412 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. Although a physical unavailable media article cannot be rented from the particular article dispensing machine 230, a

digital alternative media selection may be available and substituted for the unavailable media article, as described further below.

[0056] FIG. 4 is a block diagram illustrating the system backend 307 and connections to and from the system backend 307 to the article dispensing machines 230, the content provider backend 308, and the A/V display interface 309. The system backend 307 includes components that provide and receive data to and from the article dispensing machines 230 during DVD, Blu-Ray disc, and video game rental transactions and other transactions. Components in the system backend 307 are utilized in relation to the present invention for substitution of a physical media article with digital alternative media, as described below. It will be understood that components 402, 404, 406, 408, 414, 416, 418, and 420 in the system backend 307 may be implemented, for example, by the central controller 302 using instructions stored in a memory connected to the central controller 302. It will be further understood that the databases 404, 410, and 412 may be implemented as part of the central database 304 or as separate databases.

[0057] The identification and authentication controller 402 can receive a unique customer identifier that a customer provides to the article dispensing machines 230 during a rental transaction. The unique customer identifier can be a credit or debit card number, a hashed version of a credit or debit card number, or other unique identifier used for payment and/or identification purposes. In the case of hashing of the credit or debit card number, the hash function applied to the credit or debit card number is preferably implemented on the article dispensing machines 230 and may be, for example, a SHA-256 hashing algorithm. The identification and authentication controller 402 can validate the payment capability of a credit or debit card by communicating with the financial server 305.

[0058] In one embodiment, the content provider customer account in the content provider customer profile database 502 may include a shadow account that is created for the purposes of being associated with the existing customer profile and account in the customer profile database 404. The identification and authentication controller 402 may associate the existing customer profile with the shadow account. Entitlement and subscription information corresponding to the customer may be stored in the shadow account and retrieved from the shadow account, as described below. The entitlement and subscription information may have been obtained from the existing customer profile, another account, or be based on predetermined configurations of subscription packages. The customer may not have direct access to the shadow account.

[0059] A customer may be authenticated to multiple customer profiles and accounts by the identification and authentication controller 402. The unique customer identifier provided by the customer can authenticate the customer to an existing customer profile and account for the article dispensing machines 230. The existing customer profile and account can be stored and looked up using the unique customer identifier in the customer profile database 404 that is connected to the identification and authentication controller 402. The unique customer identifier can also link the existing customer account to a content provider customer account via a connection from the customer profile database 404 to the content provider customer profile database 502 in the content provider backend 308, as shown in FIG. 5. Zero, one, or more content provider customer accounts may be linked in the customer profile database 404 to the existing customer

account for the article dispensing machines 230. A content provider may include, but is not limited to, a cable television operator, a satellite television service provider, an IPTV (Internet Protocol television) provider, an online gaming and digital media delivery service (Xbox Live, PlayStation Network, OnLive, etc.), a website (YouTube, Hulu, etc.), a movie studio, a television network, a game publisher, or a retailer (Best Buy, Walmart, etc.). Media selections available from a content provider may include videos on demand, streaming videos, downloadable videos, streaming video games, or downloadable video games. The media selections may be available through the A/V display interface 309 that is in communication with the content provider backend 308.

[0060] The customer profile database 404 can contain information related to customers of the article dispensing machines 230, including name, mailing and billing addresses, email addresses, phone and mobile numbers, username, password, payment methods, rental history, purchase history, preferred article dispensing machines, movie and video game genre preferences, customizations, subscriptions, parental controls, linked content provider accounts, content provider subscriptions and entitlements, and other data. A rental transaction can be personalized using information from the customer profile database 404 at the article dispensing machines 230 and a website interface 418. For example, only certain genres and titles of DVDs, Blu-Ray discs, or video games could be shown if a customer sets particular preferences that are then stored in the customer profile database 404. Some of the information stored in the customer profile database 404 may also be stored in the article dispensing machine database 282.

[0061] The website interface 418 can be interactive and accessible to a customer using web browser software at an electronic device 306. The website interface 418 may also include a mobile application or consumer electronics device application. Rentable media articles may be searched, browsed, and reserved on the website interface 418 for receipt at the article dispensing machines 230. The location of and the inventory at article dispensing machines 230 can be viewed at the website interface 418. Digital media selections from content providers, such as streaming, downloadable, and on-demand media, may also be searched, browsed, and accessed on the website interface 418. A customer can access their customer profile on the website interface 418 for purposes of verifying and updating their personal information in the customer profile database 404. For example, a customer can link an account they have with a content provider on the website interface 418 by specifying their username, password, account number, and/or other identifying information for the content provider account. The system backend 307 can utilize SAML (Security Assertion Markup Language), OAuth (Open Authentication), or other protocols to authenticate the identity of the customer at the content provider via a connection from the website interface 418 to the content provider identification and authentication controller 506 in the content provider backend 308, as shown in FIG. 5. If the identifying information matches the content provider account, the linkage to the content provider account can be stored in the customer profile database 404.

[0062] An inventory database 412 may contain a catalog of physical media articles that may be rented at the article dispensing machines 230 and reserved at the website interface 418 for later receipt at the article dispensing machines 230. A catalog of digital media selections available at the content

provider can be contained in the metadata database **410**. Metadata for each of the media articles and media selections are stored in the metadata database **410**, including title, release date, running time, chapter information, technical details (resolution, audio options, languages, etc.), format, peripheral device requirements, number of players, online capability, actors, voice actors, director, studio, publisher, developer, platform, availability of downloadable content, episode information, genre, critic ratings, individualized ratings (reviews, recommendations, likes, etc.), parental ratings (MPAA, ESRB, TV Parental Guidelines, etc.), description, related content, media artwork, media stills, and other information.

[**0063**] Physical media articles that may be rented at the article dispensing machines **230** and digital media selections available at the content provider may be synchronized and mapped to one another by matching their respective metadata. As seen in FIG. **5**, a synchronization and mapping engine **414** connected to the customer profile database **404**, the metadata database **410**, and the content provider asset management system **504** in the content provider backend **308** may compare the metadata for the media articles and media selections to determine matches. Metadata in the content provider asset management system **504** for media selections can be compared to metadata in the metadata database **410** to perform the matching. For example, a combination of a title, release date, running time, and/or actor information can be used to map a media article to a corresponding media selection. In one embodiment, proprietary identification codes unique to a media article and a media selection can be used to map the media article to the corresponding media selection. The proprietary identification codes for the media article and the media selection can be stored in the metadata database **410** and the content provider asset management system **504**, respectively. Such proprietary identification codes can be assigned to media articles and media selections by third party providers such as Rovi, Baseline, and AMG.

[**0064**] A media selection at a content provider can be placed in the saved programs queue **604** on the A/V display interface **309**, as shown in FIG. **6**, by providing the appropriate instructions to the content provider asset management system **504** in the content provider backend **308**. Queuing a media selection may occur, for example, when a customer decides to purchase the digital media selection from the content provider in place of a physical media article at an article dispensing machine **230**, as detailed further below.

[**0065**] An inventory database **412** can be connected to the article dispensing machine **230** and the metadata database **410** to provide information regarding the availability of media articles in the article dispensing machines **230**. In conjunction with a search engine **416**, the inventory database **412** and the metadata database **410** can provide inventory results for media articles and media selections to an A/V display interface application **602** on an A/V display interface **309**, as shown in FIG. **6**. Such results may include the availability of physical media articles at the article dispensing machines **230** as well as digital media selections available at a content provider. The results may also be provided to the website interface **418** or other websites operated by a content provider, for example. The synchronization and mapping engine **414** can store the information from the content provider asset management system **504** regarding media selections at the content provider in the metadata database **410**. The inventory database **412** can also supply the availability of media articles

in the article dispensing machines **230** to the website interface **418** or to other portals, such as an application on a mobile device, when queried.

[**0066**] A metadata database watcher **408** can monitor the metadata database **410** for changes in metadata, media articles, and/or media selections. The metadata database watcher **408** can use customer watchlist subscriptions from a customer profile in the customer profile database **404** to determine what changes to monitor. The changes to the metadata can include inventory availability, content provider availability, release schedules, and other information related to a particular title. The customer watchlist subscriptions can be used by the metadata database watcher **408** to monitor these changes in combination with information regarding particular actors, directors, and other information. When a change corresponding to a customer watchlist subscription is found by the metadata database watcher **408**, a notification engine **406** can transmit notifications and details of the change to the customer. The notifications may be sent via email, SMS, mobile application alerts, set-top box notification, or other electronic channels.

[**0067**] A customer may also subscribe to be notified about new information regarding their favorite actors, directors, titles, studios, and other parameters. Such information may include information related to live performances, television appearances, news and magazine articles, blogs, and other content. A web crawler and data feed **420** can obtain this information by searching pertinent websites and use of a public API to feed the metadata database **410**. The customer can subscribe to this information about their favorites at the website interface **418**, for example. The metadata database watcher **408** monitoring the metadata database **410** can detect when there is a new piece of information about a favorite and transmit the desired notifications using the notification engine **406**.

[**0068**] A preferred embodiment of a process **700** for substituting a physical media article with a digital alternative media selection is shown in FIG. **7**. The process **700** can result in display of the alternative media selection and an associated content provider on the article dispensing machine **230** when a media article is unavailable, such as when the media article is out-of-stock or already reserved during a rental transaction, or when a media article is available. At step **702**, the article dispensing machine **230** can receive a request related to the media article through the user interface **234**. The request may include a rental request, such as when a customer desires to rent an available or unavailable media article during a rental transaction; an information request, such as when a customer is browsing available media articles and wishes to display information about alternative media corresponding or related to a particular media article; or a browsing request, such as when a customer is browsing or searching for media articles and information about alternative media can be presented on the user interface **234** based on the customer's preferences.

[**0069**] For a rental request, the customer may request to rent a media article that is available to rent and in-stock in the article dispensing machine **230**, or a media article that is unavailable because the media article is out-of-stock, reserved to another customer, or otherwise unavailable to rent from the article dispensing machine **230**. In the case of an information request, the customer may be browsing media articles prior to deciding whether to rent. For a particular media article, the customer can optionally select to obtain information about alternative media corresponding to the

media article. For a browsing request, the customer may also be browsing or searching for media articles prior to deciding whether to rent. Information about alternative media corresponding to or related to the media article being viewed can be displayed, based on a customer's preferences that are stored in the customer profile database 404. The preferences may include a particular genre, actor, director, studio, or other criteria.

[0070] At step 704, the article dispensing machine 230 can receive a unique customer identifier through the user interface 234, such as via the card reader 240 or the keypad and/or touch screen 242. The unique customer identifier is preferably a credit or debit card number obtained via a swipe of a credit or debit card in the card reader 240. The credit or debit card number may also be obtained using a Radio Frequency Identification (RFID) reader configured to read RFID-enabled credit cards. The credit or debit card number can be processed through a hash function on the article dispensing machine 230, and then the hashed credit or debit card number can be transmitted to the identification and authentication controller 402 in the system backend 307. The hashed credit or debit card number can be used to look up a customer profile in the customer profile database 404. The unique customer identifier may also include a customer-provided identification of the associated content provider. The customer could also provide what content providers they are associated with on the article dispensing machine 230, and optionally provide the specific subscription package they subscribe to, instead of a credit or debit card number or account number.

[0071] The associated content providers can be identified at step 706. Using the unique customer identifier provided at step 704, the associated content providers may be identified by accessing the customer profile database 404. A customer profile in the customer profile database 404 can contain linkages to customer accounts and subscriptions at content providers that the customer is associated with. The customer can provide what content providers they are associated with prior to commencing the rental transaction, such as on the website interface 418, and this information can be stored in the customer profile 404. If a customer does not have any existing linkages in the customer profile database 404 at step 706, the customer may identify the associated content providers, if any, via the user interface 234 on the article dispensing machine 230. The customer can provide account information, for example, or other unique information to identify a particular customer account at a content provider. In one embodiment, the operator of the associated content provider may be the same as the operator of the article dispensing machine 230. Details of step 706 are further described below with regards to FIG. 9.

[0072] At step 708, the central controller 302 can determine a digital alternative media selection to substitute for the physical media article. Mappings between the media article and a corresponding alternative media selection, based on their respective metadata, can be stored in the metadata database 410. The determination of the alternative media selection may be performed by the synchronization and mapping engine 414 in real time based on metadata in the metadata database 410, inventory information in the inventory database 412, and entitlement and subscription information in the customer profile database 404. Details of step 708 are further described below with regards to FIG. 10. The alternative media selection will be displayed at step 710 along with the content provider associated with the alternative media selec-

tion. In addition, the media article and related information may also be displayed at step 710 in the case of a rental request when the media article is available and in-stock, an information request, or a browsing request at step 702. For example, if the request at step 702 is a rental request, the customer may choose to rent the media article from the article dispensing machine 230 or access the alternative media selection. As another example, if the request at step 702 is an information request or a browsing request, the customer can view the available alternative media options along with the media article(s) available at the article dispensing machine 230.

[0073] Other information may be presented to the customer on the user interface 234 at step 710, such as payment options, subscription information, and other information related to the alternative media selection. In one embodiment, an email, SMS, or other communication may be sent to the customer with a uniform resource locator (URL) link to view the alternative media selection. In another embodiment, a QR code representing a URL link to view the alternative media selection may be displayed to the customer on the user interface 234. In another embodiment, an email, SMS, or other communication may be sent to the customer with details on how to view the alternative media selection, such as instructions about how to access a video-on-demand title on an A/V display interface 309. In another embodiment, the alternative media selection can be queued on the saved programs queue 604 on the A/V display interface 309 so that an application on the A/V display interface 309 can notify the customer of the availability of the alternative media selection when the application is executed. In further embodiments, the article dispensing machine 230 may communicate a URL link and/or instructions on how to view the alternative media selection to an electronic device 306 using near field communication, Bluetooth, USB, or another protocol. In another embodiment, the alternative media selection can be downloaded onto a USB flash drive connected to the article dispensing machine 230.

[0074] An alternative embodiment of a process 800 for substituting a physical media article with a digital alternative media selection is shown in FIG. 8. In this embodiment, a request to rent a media article is received at step 802. The media article may be unavailable because the media article is out-of-stock, reserved to another customer, or otherwise unavailable to rent from the article dispensing machine 230, or the media article may be available to rent and in-stock in the article dispensing machine 230. For example, the customer may search and/or browse through DVD, Blu-Ray, and video game titles on the user interface 234 of the article dispensing machine 230 and attempt to rent a certain media article. At step 804, it is determined whether the desired media article is available to rent at the article dispensing machine 230 by accessing the inventory database 412. If the desired media article is available, i.e., in-stock, then the media article is vended to the customer at step 806. However, if the desired media article is not available, then the process 800 continues to step 704. As described above with reference to the process 700 shown in FIG. 7, at step 704, a customer identifier can be received, followed by identifying the associated content provider at step 706. At step 708, alternative media corresponding to the unavailable media article is determined, followed by display of the alternative media and the associated content provider at step 712. When a corresponding alternative media selection is found at step 708, the cus-

tomer can be notified via the user interface 234 that the desired media article is not available for rental but that an alternative media selection is available at step 712.

[0075] In an alternative embodiment, a process 1100 shown in FIG. 11 can result in display of the alternative media selection and an associated content provider on the article dispensing machine 230 when a media article is unavailable, or can result in display of the media article, the alternative media selection, and the associated content provider on the article dispensing machine 230 when the media article is available. As in the process 700 described in FIG. 7 above, a unique customer identifier can be received by the article dispensing machine 230 at step 704, followed by identification of the associated content providers at step 706. At step 802 following step 706 in the process 1100, a request can be received by the article dispensing machine 230 and the central controller 302 to rent a desired media article. At step 708 in the process 1100 following step 802, the central controller 302 can determine an alternative media selection that corresponds to the desired media article, based on their respective metadata. Next, at step 1102 following step 708 in the process 1100, it is determined whether the desired media article is available to rent at the article dispensing machine 230 by accessing the inventory database 412. If the desired media article is not available at step 1102, then the alternative media selection and associated content provider are displayed on the user interface 234 at step 710. However, if the desired media article is determined to be available at step 1102, then the desired media article, the alternative media selection, and the associated content provider for the alternative media selection are displayed on the user interface 234 at step 1104.

[0076] In one embodiment, the content provider customer account in the content provider customer profile database 502 may include a shadow account that is created for the purposes of being associated with an existing customer profile and account in the customer profile database 404. The identification and authentication controller 402 may associate the existing customer profile with the shadow account. Entitlement and subscription information corresponding to the customer may be stored in the shadow account and retrieved from the shadow account, as described below. The entitlement and subscription information may have been obtained from the existing customer profile, another account, or be based on predetermined configurations of subscription packages.

[0077] A preferred embodiment of step 706 in the processes 700, 800, and 1100 above for identifying a content provider with a unique customer identifier is shown in FIG. 9. At step 902, the unique customer identifier received at step 704 is transmitted to the central controller 302. The central controller 302 can match the unique customer identifier to a particular customer profile in the customer profile database 404. If the unique customer identifier is present in the customer profile database 404 at step 904, then the process continues to step 906. At step 906, the central controller 302 can determine whether there is an associated content provider linked to the customer profile found in step 904. The customer profile in the customer profile database 404 may contain a linkage to an associated content provider. If there is not a content provider associated to the customer profile at step 906 or if no unique customer identifier is found in the customer profile database 404 at step 904, the customer may provide the linkages of content providers at step 908 via the user interface 234. The customer profile in the customer profile database 404 can include information obtained from the con-

tent provider customer profile database 502 in the content provider backend 308, such as an account number, email address, subscription information, and other information related to the customer's content provider customer profile.

[0078] If there is a content provider associated with the customer identifier at step 906, the process continues to step 910 where subscription information at the content provider for the customer is retrieved from the customer profile database 404. The customer profile database 404 may contain subscription and entitlement information that was previously received from the content provider customer profile database 502 in the content provider backend 308. Subscription information at the content provider can include the customer's subscribed service package, premium channel content the customer entitled to access, zip code and address for possible geographical content restrictions, parental authorization and controls for age authentication, and other subscriber information. The subscription information may be used by the central controller 302 at step 708 when determining the availability of alternative media selections for the customer at particular content providers. Step 910 is also performed following step 908 when a customer has entered a linkage to a content provider.

[0079] A preferred embodiment of step 708 in the processes 700, 800, and 1100 above for determining the digital alternative media selection in place of the physical media article is shown in FIG. 10. At step 1002, the desired media article the customer wishes to rent is transmitted to the central controller 302. The synchronization and mapping engine 414 can access metadata for the desired media article at step 1004 from the metadata database 410. As discussed above, metadata for each of the media article and the alternative media selection may include title, release date, running time, chapter information, technical details, format, peripheral device requirements, number of players, online capability, actors, voice actors, director, studio, publisher, developer, platform, availability of downloadable content, episode information, genre, critic ratings, individualized ratings, parental ratings, description, related content, media artwork, media stills, and other information, proprietary identification code, and other information. At step 1006, the synchronization and mapping engine 414 can determine whether the metadata for the media article matches the metadata for an alternative media selection in the metadata database 410. For example, a combination of the title of a movie and the release year may allow a match of a movie DVD or Blu-Ray disc to a streaming movie, downloadable movie, or video-on-demand movie that may be available from a content provider. As another example, a combination of the title of a television series, the episode title, episode number, and release year may allow a match of a television show DVD or Blu-Ray disc to a media selection available from a content provider. As a further example, a combination of the title of a video game, release date, and publisher may allow a match of a video game to a streaming or downloadable game from a content provider. In the case of a movie or television show, if a match between the desired media article and the alternative media is not found with the title, episode, and/or release year information, the synchronization and mapping engine 414 could also utilize the running time of the movie or television show and the names or initials of the top-billed actors. It will be understood that metadata in any combination may be used to obtain a mapping of media articles to alternative media.

[0080] In some embodiments, the synchronization and mapping engine **414** can determine a match of a media article to a related alternative media selection at step **1006**, instead of or in addition to determining the alternative media selection that exactly matches the media article. The rental or purchase history of the customer from the customer database **404** may also be utilized in conjunction with the metadata of the media article, as described above, to determine a related alternative media selection. An exact alternative media selection may not be available to a customer due to the unavailability of the physical media article in digital format at any content provider, due to the entitlements in the customer's subscription package, or other reasons. If an exact alternative media selection match to the media article is not available, then a related alternative media selection may be determined at step **1006**. For example, if a customer attempts to rent the movie *Return of the Jedi* and it is unavailable as a physical media article at the article dispensing machine **230** and as a digital media selection at all content providers, then related alternative media selections may be determined, such as the movies *The Empire Strikes Back* and *Star Wars Episode I: The Phantom Menace*. The related alternative media selections may be determined based on metadata for the movie *Return of the Jedi* and/or the prior rental history of the customer that may include, for example, rentals of the movie *Star Wars* and the video game *Star Wars: Battlefront*.

[0081] If no match between a media article and an alternative media is found at step **1006**, the central controller **302** may transmit to the user interface **234** of the article dispensing machine **230** that there was no alternative media selection found that corresponds to the media article at step **1012**. However, if a match is found at step **1006**, the synchronization and mapping engine **414** determines at step **1008** whether the alternative media selection is available at a content provider that is linked to the customer. The content provider linkages may have been supplied previously at step **706** and in particular, steps **906**, **908**, and **910**. The synchronization and mapping engine **414** determines whether an alternative media selection is available at a linked content provider by accessing information about possible digital media selections in the metadata database **410**. In addition to determining whether the alternative media selection is available at a linked content provider, the synchronization and mapping engine **414** can also determine at step **1008** whether the customer is entitled to access the alternative media selection based on the subscription information in the customer profile database **404** that was previously obtained at step **910**.

[0082] A customer may be entitled to access an alternative media selection for free, such as when the alternative media selection is already available within the customer's subscription package, or when the alternative media selection is publicly available. In other cases, a customer may only have access to an alternative media selection by providing additional payment, such as when the customer's subscription package does not allow access to the alternative media selection or when the alternative media selection is only available at an a la carte content provider. For example, if the customer's subscription package allows access to Home Box Office (HBO) content and the alternative media selection is available through HBO, then the customer will have access to the alternative media selection without additional payment. As another example, if the customer's subscription package only allows access to Showtime content and the alternative media selection is only available through HBO, then the customer

will not have access to the alternative media selection. In this case, the customer may have the option to upgrade their subscription package to include HBO or utilize an a la carte content provider for an additional payment. As a further example, if the customer is a Comcast subscriber and the alternative media selection is available as a free video-on-demand selection on Comcast, then the customer will have access to the alternative media selection without additional payment. However, if the alternative media selection is only available through Hulu Plus, then the customer will not have access to the alternative media selection unless the customer provides additional payment.

[0083] Therefore, if the alternative media selection is available at a linked content provider at step **1008**, then at step **1010**, the alternative media selection and associated content provider is transmitted from the central controller **302** for display on the article dispensing machine **230**. If the alternative media selection is not available at a linked content provider at step **1008**, then the central controller **302** can obtain other content provider options, if any, at step **1014**. In one embodiment, step **1014** may be performed to obtain other content provider options even if the alternative media selection is available at a linked content provider at step **1008**. Other content provider options may include a la carte content providers such as Amazon Instant Video, iTunes Store, YouTube, VUDU, and other services that allow a user to individually purchase digital media without requiring a subscription. Further content provider options that may be obtained at step **1014** include retailers that grant rights to a digital media selection in conjunction with the purchase of a physical item (e.g., Best Buy, Walmart, etc.), movie studios, television networks, video game developers, and online gaming delivery services (Xbox Live, PlayStation Network, OnLive, etc.). For example, a video game may be available from an online gaming delivery service for download, such as from Xbox Live or the PlayStation Network, or for streaming, such as from OnLive. If other content providers are available for the alternative media selection at step **1014**, the alternative media selection and the associated other content provider(s) may be transmitted at step **1010** from the central controller **302** for display on the article dispensing machine **230**.

[0084] As described above, following step **708**, the alternative media selection, associated content provider, and payment options may be displayed to the customer at step **710**. The payment options may be dependent on the subscription information obtained at step **910** or the a la carte content providers obtained at step **1014**. The payment options can include whether the alternative media selection is free to the customer, is free to the customer because of their subscription service package with a content provider, or will cost a particular price or number of credits. In one embodiment, the price for the alternative media selection may be discounted to the customer compared to the retail price. In another embodiment, the customer may also redeem a promotion code to gain access to the alternative media selection. In a further embodiment, the payment option may include the opportunity to upgrade to a higher level service package which includes access to the alternative media selection. The customer may pay for the alternative media selection at the article dispensing machine **230** using a credit or debit card, redeeming credits or promotion codes, charging the price to their account at the content provider, or using other payment methods.

[0085] 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 present 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.

[0086] It should be emphasized that the above-described embodiments of the present 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 present invention and protected by the following claims.

1. A method of associating a first customer account for an article dispensing machine with a second customer account at a content provider, the article dispensing machine having a user interface, the method comprising the steps of:

receiving a unique customer identifier received through the user interface;

accessing the first customer account based on the unique customer identifier; and

associating the second customer account for the content provider with the first customer account.

2. The method of claim 1, wherein the second customer account comprises a customer subscription, the customer subscription comprising an access permission for a digital media selection at the content provider.

3. The method of claim 1, wherein the unique customer identifier comprises at least one of a credit card number or a debit card number.

4. The method of claim 3, further comprising applying a hash function to at least one of the credit card number or the debit card number to produce at least one of a hashed credit card number or a hashed debit card number.

5. The method of claim 4, wherein the hash function comprises a SHA-256 hashing algorithm.

6. The method of claim 4, further comprising transmitting at least one of the hashed credit card number or the hashed debit card number to a central processor.

7. The method of claim 1, wherein accessing the first customer account comprises accessing the first customer account in a customer profile database based on the unique customer identifier.

8. The method of claim 1, wherein associating the second customer account comprises authenticating to the second customer account based on the unique customer identifier.

9. The method of claim 8, wherein authenticating comprises utilizing at least one of a Security Assertion Markup Language protocol or an Open Authentication protocol.

10. A method of associating a first customer account for an article dispensing machine with a second customer account at

a content provider, the article dispensing machine having a user interface and being connected to a central processor via a network, the method comprising the steps of:

receiving a unique customer identifier at the central processor via the network that was received through the user interface;

accessing the first customer account in a customer profile database based on the unique customer identifier, the first customer account comprising a mapping of the first customer account to the second customer account, the customer profile database in communication with the central processor; and

transmitting at least one aspect of the mapping to the article dispensing machine.

11. The method of claim 10, wherein the second customer account comprises a customer subscription, the customer subscription comprising an access permission for a digital media selection at the content provider.

12. The method of claim 10, wherein the unique customer identifier comprises at least one of a credit card number or a debit card number.

13. The method of claim 12, further comprising applying a hash function to at least one of a credit card number or a debit card number to produce at least one of a hashed credit card number or a hashed debit card number.

14. The method of claim 13, wherein the hash function comprises a SHA-256 hashing algorithm.

15. The method of claim 13, wherein transmitting the unique customer identifier comprises transmitting at least one of the hashed credit card number or the hashed debit card number to the central processor.

16. The method of claim 10, further comprising authenticating to the second customer account based on the unique customer identifier.

17. The method of claim 16, wherein authenticating comprises utilizing at least one of a Security Assertion Markup Language protocol or an Open Authentication protocol.

18. A system for associating a first customer account for an article dispensing machine with a second customer account at a content provider, the article dispensing machine having a user interface, the system comprising:

a central processor in communication with a network;

a memory storing a customer profile database and storing computer program code for execution of the central processor, wherein program code is configured to:

receive a unique customer identifier at the central processor via the network that was received through the user interface;

access the first customer account in a customer profile database based on the unique customer identifier, the first customer account comprising a mapping of the first customer account to the second customer account, the customer profile database in communication with the central processor; and

transmit at least one aspect of the mapping to the article dispensing machine.

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