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(54) Title: SEAMLESS MOBILITY OF LOCATION-BASED GAMING ACROSS VIRTUAL AND PHYSICAL WORLDS

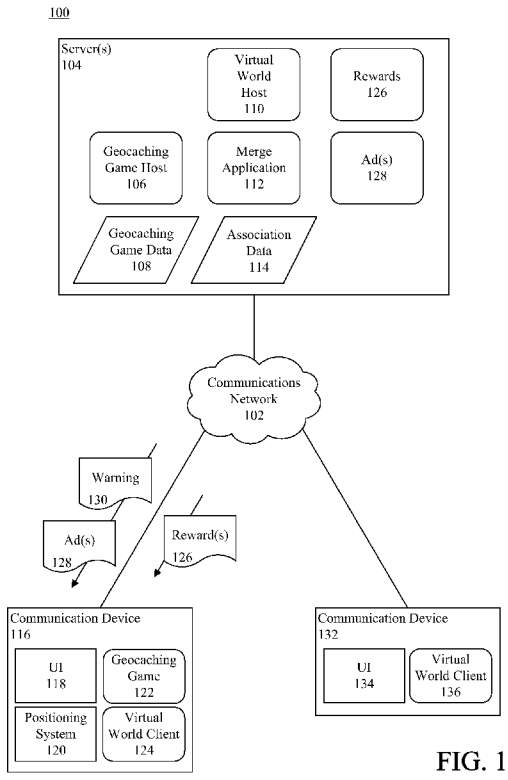


FIG. 1

(57) Abstract: A method (200, 300) of hosting a geocaching game. The method can include interfacing with a geocaching game host (106) to retrieve geocaching game data (108) associated with a physical world geocaching game (122). The method also can include managing association data (114) that forms a nexus between a virtual world and the geocaching game data, the association data enabling a virtual geocaching game that corresponds to the physical world geocaching game to be hosted in the virtual world. The present invention also relates to a geocaching gaming system (100) that includes at least one server (104) that interfaces with a geocaching game host to retrieve geocaching game data associated with a physical world geocaching game, and manages association data that forms a nexus between a virtual world and the geocaching game data.

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SEAMLESS MOBILITY OF LOCATION-BASED GAMING ACROSS VIRTUAL AND PHYSICAL WORLDS

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention generally relates to gaming systems and, more particularly, to location-based gaming using a communication device.

Background of the Invention

[0002] Geocaching is an outdoor treasure-hunting game in which the participants use a Global Positioning System (GPS) receiver or other navigational techniques to hide containers, oftentimes referred to as "caches," and to seek such containers. A typical cache may include a small waterproof container in which a treasure and a logbook have been placed. The treasure usually comprises a toy or trinket of little value. The logbook typically is provided for those who find the cache to record the date found, a brief description of their experience searching for the cache, and to provide a stamp or other symbol of personalization.

[0003] The popularity of geocaching has grown exponentially since Selective Availability, a feature that introduced intentional random errors in GPS coordinates, was removed from the GPS in May 2000. Over five hundred thousand geocaches now are registered on various websites devoted to the sport, and geocaches currently are placed in over 100 countries around the world and on all seven continents, including Antarctica.

SUMMARY OF THE INVENTION

[0004] The present invention relates to a method of hosting a geocaching game. The method can include interfacing with a geocaching game host to retrieve geocaching game data associated with a physical world geocaching game. The method also can include managing association data that forms a nexus between a virtual world and the geocaching game data, the association data enabling a virtual geocaching game that corresponds to the physical world geocaching game to be hosted in the virtual world.

[0005] The present invention also relates to a geocaching gaming system. The system can include at least one server that interfaces with a geocaching game host to retrieve geocaching game data associated with a physical world geocaching game, and manages association data that forms a nexus between a virtual world and the geocaching game data. The association data can enable a virtual geocaching game that corresponds to the physical world geocaching game to be hosted in the virtual world.

[0006] The present invention also relates to a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform the various steps and/or functions described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Preferred embodiments of the present invention will be described below in more detail, with reference to the accompanying drawings, in which:

[0008] FIG. 1 depicts a system that is useful for understanding the present invention;

[0009] FIG. 2 is a flowchart that is useful for understanding the present invention; and

[0010] FIG. 3 is a flowchart that is useful for understanding the present invention.

DETAILED DESCRIPTION

[0011] While the specification concludes with claims defining features of the invention that are regarded as novel, it is believed that the invention will be better understood from a consideration of the description in conjunction with the drawings. As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention, which can be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure. Further, the terms and phrases used herein are not intended to be limiting but rather to provide an understandable description of the invention.

[0012] Arrangements described herein relate to a method and a system for hosting a geocaching game which may be accessed both in physical world settings and in virtual world settings. For example, a user may play the

geocaching game to search for caches in the physical world, and also play the geocaching game to search for caches in one or more virtual worlds. Notably, the locations in the virtual worlds can be mapped to physical world locations. For example, if a physical cache is located at a particular location in the physical world, a virtual cache can be located at corresponding locations in the virtual worlds. Accordingly, the user can choose the manner in which to participate in the geocaching game at any given time. Moreover, if the user is distally located from a particular physical world cache location, the user still may select a desired virtual world in which to search for such cache.

[0013] FIG. 1 depicts a system 100 that is useful for understanding the present invention. The system 100 can include a communications network 102, which may comprise a wide area network (WAN), such as the Internet, the World Wide Web, an interconnect communications network (e.g. a cellular communications network), a dispatch communications network, a public switched telephone network (PSTN), and the like. The communications network also may comprise a local area network (LAN), a metropolitan area network (MAN), a WiFi network, a Mesh network, and/or any other networks or systems over which communication signals can be propagated. In that regard, the communications network 102 can include wired and/or wireless communication links.

[0014] The communications network 102 can be configured to communicate data via IEEE 802 wireless communications, for example, 802.11 and 802.16 (WiMAX), 3G, 4G, EUTRAN, UMB, WPA, WPA2, GSM, TDMA, CDMA, WCDMA, OFDM, direct wireless communication, or any other

communications format. Indeed, the communications network 102 can be implemented in accordance with any suitable communications standards, protocols, and/or architectures, or a suitable combination of such standards, protocols, and/or architectures.

[0015] The system 100 can include one or more servers 104, each of which can comprise one or more processors/controllers, data storage devices, user interfaces, communication adapters, and/or other suitable components. In an arrangement in which a plurality of servers 104 are implemented, such servers 104 can be co-located and networked in a single facility, or located in a variety of different facilities that are communicatively linked, for instance via the communications network 102.

[0016] A geocaching game host 106 can be instantiated on the server(s) 104. The geocaching game host 106 can manage (e.g. store, retrieve, update, delete, etc.) geocaching game data 108, and provide access to such data 108. The geocaching game host 106 can receive the geocaching game data 108 via a user interface, a web portal, electronic upload, e-mail, or in another fitting manner, and can store the geocaching game data 108 in one or more databases, data tables, data files, or other suitable data storage formats.

[0017] The geocaching game data 108 can comprise geocaching data associated with the physical world. For example, the geocaching game data 108 can identify particular geocaching games, instances of geocaching games, and associated caches that are located in the physical world, which may be referred to as physical world caches. As used herein, the "physical

world" is the world of material objects, for example those discernible by touch or physical sense.

[0018] The geocaching game data 108 also can include coordinates indicating where such caches are located, information about the environment at the cache locations, and identifiers that associate the caches with particular geocaching games. The coordinates can be, for instance, geographic coordinates such as global positioning system (GPS) coordinates. In another arrangement, the geocaching game data 108 can indicate the coordinates as local coordinates, addresses, map locations, or can indicate the coordinates in another desired manner. In yet another arrangement, the geocaching game data 108 can comprise directions, riddles or clues in lieu of, or in addition to, geographic coordinates. Further, the geocaching game data 108 can include other information related to geocaching games, for instance user names, user passcodes, current locations of users, past locations of users, events that occur in the geocaching games, etc.

[0019] One or more virtual world hosts 110 can be instantiated on the server(s) 104. As used herein, a “virtual world” is a computer-simulated environment intended for its users to inhabit and interact via avatars or other software agents acting on behalf of a user. An example of a virtual world is an environment presented in a massive multiplayer online game (MMOG), such as World of Warcraft ® or Second Life ®. As used herein, an “avatar” is a visual representation of a user, or a user’s character, in a virtual world. For example, an avatar can be a multi-dimensional picture or model. Virtual worlds and avatars are each well known to the skilled artisan.

[0020] The server(s) 104 also can host a merge application 112 that forms a nexus between the virtual world(s) and geocaching game data and events in the physical world. For instance, the merge application 112 can manage physical/virtual world association data 114 that forms such nexus. The association data 114 also can be stored in one or more databases, data tables, data files, or in any other suitable manner, and can map a virtual world to the physical world geocaching game data 108. By way of example, the merge application 112 can interface with the geocaching game host 106 to retrieve the geocaching game data 108. The merge application 112 then can generate corresponding association data 114 that associates the geocaching game data 108 with one or more of the virtual worlds. For instance, the merge application 112 can map user identities, coordinates and other information to the virtual worlds.

[0021] As an example, the association data 114 can map identities of users to the identifiers of avatars in the virtual worlds. In one arrangement, the identities of the users can be based on biometric parameters, unique identifiers, or the like. The virtual world identifiers can be based on account identifiers, login names, network identifiers, or other suitable information. It should be noted that a particular user may be mapped to a plurality of avatars, software agents and/or other virtual world entities, and that a particular avatar, software agent and/or other virtual world entity may be mapped to one or more users, for example to a user group.

[0022] The association data 114 also can map three-dimensional (3-D) coordinate locations in the physical world to 3-D coordinate locations in one or

more virtual worlds. Further, names of physical world entities (e.g. stores, parks, etc.) can be mapped to names of virtual world entities, and logical rules can be provided which map physical world context (e.g. location, time, recent actions, nearby entities, safety and security conditions, etc.) to the virtual worlds. The association data 114 also can map location-based services available in the physical world to virtual world services.

[0023] The association data 114 further can include logical rules that map events, activity states, presence information, connectivity information and/or social networking characteristics associated with a user to corresponding events, locations and/or other parameters within a virtual world. For example, the logical rules can map the user's physical world experiences to experiences in the virtual world that tend to mirror or diverge from the physical world experiences. The logical rules can be based on user preferences, gaming events, or any other suitable parameters.

[0024] Logical rules provided in the association data 114 also can identify opportune occasions to switch between worlds (e.g. via contests or prizes), identify specific points in a virtual game (e.g. in a time-space-context) at which users are allowed to switch between physical and virtual worlds, identify occasions when the user can play a geocaching game in both physical and virtual worlds simultaneously, or the like. For example, while a user plays a geocaching game in the physical world, in accordance with the association data 114, one or more associated avatars can reflect the user's game play in the virtual word(s).

[0025] The aforementioned examples of association data 114 are presented to aid understanding of the present arrangements, but are not intended to limit the scope of the present invention. In that regard, the association data 114 can be implemented in any other manner suitable for associating geocache gaming in the physical world with one or more virtual worlds. Moreover, the association data 114, and corresponding mappings provided therein, can be organized and prioritized in any suitable manner.

[0026] The merge application 112 can communicate applicable association data 114 to the virtual world host 110, which can process the association data 114 to host geocaching games in the virtual worlds (hereinafter referred to as "virtual geocaching games") that correspond to the physical world geocaching games. For instance, the virtual world host 110 can generate virtual caches that correspond to the physical world caches, update user profiles with pertinent geocaching game data 108, and reflect events that occur in the corresponding physical world geocaching games. In one arrangement, the merge application 112 can communicate with the virtual world host 110 to determine the appropriate format in which to communicate the data, and then communicate the data accordingly.

[0027] In addition, the merge application 112 can receive geocaching data from the virtual world host 110 that corresponds to virtual geocaching games being hosted by the virtual world host 110, and update corresponding association data 114. The merge application 112 also can communicate the association data 114 to the geocaching game host 106, which can update the geocaching game data 108 with events and game changes that occur in the

virtual world. At this point it should be noted that the merge application 112 need not be a stand-alone application, but also can be a component of another application, such as the geocaching game host 106 or the virtual world host 110.

[0028] The system 100 also can include one or more communication devices that may communicatively link to the server(s) 104 via the communications network 102. For example, the system can include a communication device 116. The communication device 116 can be a mobile communication device, such as a mobile radio, a mobile telephone, a mobile station (e.g. a mobile computer, a personal digital assistant, a portable gaming device, or the like), or any other mobile device that is suitably configured to communicate with the server(s) 104 from various locations in the physical world. As such, the communication device 116 can comprise one or more processors/controllers, data storage devices, transceivers, communication adapters, and/or other suitable components. In addition, the communication device 116 can include a user interface 118, which can comprise one or more keys, keypads, keyboards, softkeys, buttons, displays, touch screens, touch pads, joysticks, game pads, audio input/output devices, and so on.

[0029] In one arrangement, the communication device 116 can include a positioning system 120, such as a GPS receiver, that indicates the current location of the communication device 116. In another arrangement, the current location of the communication device 116 can be determined using a location beacon or triangulation implemented with the use of communication

towers. Still, the current location of the communication device 116 can be determined in any other suitable manner and the invention is not limited in this regard.

[0030] A geocaching game 122 can be instantiated on the communication device 116. Alternatively, the geocaching game 122 can be instantiated on one or more of the servers 104. In such an arrangement, a geocaching game client which enables a user to interact with the geocaching game 122 can be instantiated on the communication device 116. A virtual world client 124 also can be instantiated on the communication device 116. Via the virtual world client 124, a user can interact with one or more of the virtual worlds. For instance, the virtual world client 124 can present virtual world audio, video and/or textual information to the user via the user interface 118, can receive user commands via the user interface 118, and can communicate the user commands to a server 104 to control the user's game play in the virtual world.

[0031] During geocaching game play, the current location of the communication device 116 can be tracked with the positioning system 120, which may communicate position coordinates to the geocaching game 122. In addition, any number of physical world events can be initiated to generate gaming inputs for the geocaching game 122. For example, a user can establish a cache location in a geocaching game, report a cache find, switch between various geocaching game databases, switch between types of geocaching games, find other people playing a particular geocache game, report conditions at a particular geocache location, and so on.

[0032] The physical world events can be initiated in any suitable manner, for example by a user input entered into the user interface 118 (e.g. a tactile input, a spoken utterance, etc.). In one aspect of the inventive arrangements, one or more push-to-experience (PTX) buttons can be depressed to initiate physical world events. In such an arrangement, functions can be transcribed into a standard set of commands, for example as extensions to an existing GPS exchange format (GPX). As known to the skilled artisan, GPX is an extensible markup language (XML) schema designed for transferring GPS data between software applications.

[0033] The geocaching game 122 can communicate with the geocaching game host 106 to manage geocaching game data 108 to correspond to the geocaching game play in the physical world. For example, the geocaching game data 108 can be managed to reflect current and past locations of the communication device 116, geocaching game events, caches located, rewards received, and so on. Further, such data management can trigger the merge application 112 to manage the association data 114 accordingly. Notably, management of the geocaching game data 108 and the association data 114 can be implemented in real time. As used herein, the term “real time” means a level of processing responsiveness that a user senses as sufficiently immediate or that enables the processor to keep up with some external process.

[0034] A user playing a geocaching game in the physical world may be able to keep any tangible treasures that are found at cache locations. In addition to, or in lieu of, such treasures, a reward 126 may be communicated

from the server(s) 104 to the communication device 116 of a user who finds a cache. A reward 126 can comprise, for example, a virtual item. As used herein, a "virtual item" is an item that is incorporeal (e.g. incapable of being perceived by the sense of touch). Examples of virtual items include, but are not limited to, electronic data, electronic files and electronic information. For instance, a virtual item can include media content (e.g. text, audio and/or video data), a computer program, an electronic game, a pass key which may be used to access a tangible or intangible item of value, a coupon code which provides a discount for items available for purchase, or the like.

[0035] In one arrangement, the user can be provided options to immediately retrieve the reward 126, to save a reward 126 for retrieval at a later time, to select a reward from a plurality of available rewards 126, to leave an earned reward for a next person who successfully finds a given cache, etc. Access to the rewards 126 can be controlled by the geocaching game host 106, the geocaching game 122, or another suitable application.

[0036] The user can launch the virtual world client 124 to initiate virtual geocaching game play. During virtual geocaching game play, the user can initiate any number of events in the virtual world (hereinafter referred to as "virtual world events") which generate gaming inputs for the virtual world. As with physical world events, virtual world events can be initiated to establish a cache location in a geocache game, report a cache find, switch between various geocaching game databases, switch between types of geocache games, find other people playing a particular geocache game, report conditions at a virtual geocache location, and so on.

[0037] Geocaching game play in the virtual world can be associated with geocaching game play in the physical world. Such association can be based on a user identifier, a user password, a geocaching game identifier, a game session identifier, or the like. The geocaching game host 106 can interface with the merge application 112 to manage physical/virtual world association data 114 and/or corresponding geocaching game data 108 to correspond to geocaching game play in the virtual world. Such data management can be performed in real time. Thus, the current status of a particular geocaching game or geocaching game session can be maintained and shared between the physical world and the virtual world, and a high level of data reliability and accuracy can be maintained.

[0038] Further, via the merge application 112, geocaching game data 108 associated with a user can be available for use in the user's geocaching game sessions both in the physical world and in the virtual world, thereby providing a seamless transition between physical world gaming and virtual world gaming. Such data can include, but is not limited to, user preferences, user logs, lists of caches found, lists of rewards earned, present user location, past user locations, user statistics, and the like. Moreover, the geocaching game data 108 can be shared with other users active in the same geocaching game, regardless of whether the users are participating in the geocaching game in the physical world or in the virtual world. For instance, if a first user is participating in a particular geocaching game in the physical world, and a second user is participating in the same geocaching game in the virtual world, such users can monitor each other's movements, cache finds, rewards, etc.

[0039] Notably, caches presented to a user in the virtual world can be mapped to correspond to caches available in the physical world. Thus, if the user is not able to, or decides not to, physically search for a cache in the physical world, the user can search for the cache in the virtual world. Indeed, the user can search for caches in the physical world during one geocaching game session and search for caches in the virtual world during another game session.

[0040] To accentuate the sense of realism in the virtual world, environment data (e.g. satellite image data, geo-spatial image data, weather data, etc.) can be generated for physical world cache locations, and such data can be incorporated into the virtual world to simulate the environment at the cache locations. Moreover, a user's avatar within the virtual world can carry, or otherwise be associated with, a virtual GPS receiver, a virtual map, etc. Accordingly, a user's participation in a geocaching game in the virtual world may have many similarities with geocaching game participation in the physical world, though this need not be required. For example, game play in the virtual world may only loosely resemble game play in the physical world, or there may be no resemblance at all.

[0041] As with physical world geocaching game play, a user playing a geocaching game in the virtual world also may receive a reward 126 for finding a cache. As noted, such reward 126 also can comprise, for example, a virtual item. In one aspect of the inventive arrangements, the virtual item can be a virtual weapon for use in the virtual world, a virtual object that provides the player with special powers or abilities within the virtual world,

virtual currency that may be used within the virtual world, or the like. Notice of the rewards 126 can be communicated to the communication device 116 for presentation to the user. Such communication can be initiated by the geocaching game host 106, the virtual world host 110, the virtual world client 124 or another suitable application. Again, the user can be provided reward handling options, as previously described.

[0042] Further, the geocaching game host 106, the geocaching game 122, the virtual world host 110, the virtual world client 124 or another application can trigger one or more advertisements 128 to be communicated to the communication device 116 for presentation to the user in response to an event detected in the physical world or the virtual world during geocaching game play. By way of example, if a cache is found at an automobile dealership, either in the physical world or the virtual world, an automobile advertisement can be presented to the user. The advertisements 128 also can be combined with rewards 126. For instance, an advertisement 128 can provide a coupon code which may be used to purchase an item at a discounted price.

[0043] Further, the geocaching game host 106 can monitor the present location of the communication device 116, as well as weather and other information that indicate present conditions at the communication device's location. For instance, the geocaching game host 106 can include an information client that monitors weather and/or other environment information via the communications network 102. If a potential dangerous condition, such as severe weather or other adverse conditions, is expected to impact the

user's location, the geocaching game host 106 can communicate a warning 130 to the communication device 116 for presentation to the user. Optionally, the geocaching game host 106 also can automatically notify an emergency response system.

[0044] Participants in a geocache game also can report potentially hazardous conditions that have been encountered. The geocaching game host 106 then can communicate a corresponding notification to the merge application 112, which can process the notification to identify other participants whose game context indicates that the potentially hazardous condition may apply to them. These physical and/or virtual world players then may be notified of the condition, for example via the geocaching game host 106 or the virtual world host 110.

[0045] The system 100 also can include a communication device 132 which lacks a positioning system and/or geocaching game, but which can be used to participate in the geocaching game via the virtual world host 110. Such communication device 132 can be, for instance, a computer, a gaming console, a set-top box, a network appliance, or the like, and can comprise one or more processors/controllers, data storage devices, communication adapters, and/or other suitable components. The communication device 132 also can include a user interface 134 and virtual world client 136, which have been described. Accordingly, a user of the communication device 132 can interact with a user of the communication device 116 in the virtual world.

[0046] FIG. 2 is a flowchart presenting a method 200 of starting a new geocaching game, which is useful for understanding the present invention.

The method 200 can begin in a state in which the communication device has established a communication link with the server(s), and the communication device is configured for geocaching game play. At step 202, a user input can be received to start a new physical world geocaching game. In an arrangement in which a plurality of different geocaching games are available, a user input also can be received to make a game selection. Such user inputs can be entered into the communication device and received by the geocaching game and/or the geocaching game host. At step 204, a selection can be received to select a virtual world in which to enable a corresponding virtual geocaching game. Such selection can be input into the communication device and received by the merge application, the geocaching game host and/or the virtual world host.

[0047] The virtual world can be associated with the physical world geocaching game. For instance, at step 206 the merge application can interface with the geocaching game host to retrieve geocaching game data associated with the physical world geocaching game. At step 208, the merge application can also can interface with the virtual world host to manage association data that forms a nexus between the virtual world and the physical world geocaching game data. The association data can enable a virtual geocaching game that corresponds to the physical world geocaching game to be hosted in the virtual world. At step 210, the association data can be communicated to the virtual world host, or otherwise be made available to the virtual world host.

[0048] At step 212, caches in the virtual world can be mapped to corresponding cache locations in the physical world. For example, coordinates of the cache locations in the physical world can be communicated from the communication device and/or the geocaching game host to the merge application, and such data can be included in the association data that associates the physical world geocaching game with the virtual world.

[0049] At step 214, association data that simulates an environment at a cache location in the physical world can be managed. For example, data about the environment of physical world cache locations can be communicated from the communication device and/or the geocaching game host to the merge application and included in the association data. In one arrangement, information about variables that are applicable to the virtual world and available virtual world locations can be communicated to the communication device and/or the geocaching game host, and such information can be processed to select appropriate variables for the environment data. As noted, the merge application can manage the association data.

[0050] Referring to decision box 216, if it is desired to associate another virtual world with the physical world geocaching game, steps 204-214 can be repeated. Proceeding to step 218, rewards can be associated with cache locations in the geocaching game. For example, via a communication device, a user can interface with the geocaching game/geocaching game host to define a cache location and select a reward to associate with the cache location from a list of available rewards. Alternatively, the user can upload a

reward to the geocaching game host and associate the uploaded reward with the cache location. At step 220, advertisements also can be associated with the cache locations. The advertisements also can be selected from a list or uploaded to the geocaching game host. The rewards and advertisements can be made available to other users playing the geocaching game, regardless of whether the other users are playing the geocaching game in the physical world or in the virtual world.

[0051] At step 222, players can be associated with the geocaching game. In one arrangement, the players can be selected by a user, for example from a list of available players, and such selections can be communicated to the geocaching game host. In another arrangement, the geocaching game host can add the geocaching game to a list of available geocaching games, and users can select the geocaching game from the list when they desire to participate in that particular geocaching game.

[0052] The geocaching game host can store data generated in steps 212-216 as geocaching game data. Moreover, the merge application can store corresponding data as association data so as to make the data available in the selected virtual worlds.

[0053] FIG. 3 is a flowchart presenting a method 300 of geocaching game play, which is useful for understanding the present invention. The method 300 can begin in a state in which a geocaching game has been started. At step 302, geocaching game play can be monitored both in the physical world and in one or more virtual worlds. Such monitoring can be performed by the geocaching game or the geocaching game host and can include, for example,

monitoring data that indicates the current location of a communication device participating in the geocaching game. At step 304, the association data can be managed in real time to correspond to geocaching game play both in the physical world and in the virtual world(s). For example, the geocaching game data can be managed to reflect a current location of the communication device during game play. In that regard, the merge application can exchange corresponding data with the geocaching game host and/or the virtual world host in real time.

[0054] Referring to decision box 306, if a cache is found in the physical world or the virtual world, at step 308 a notice of reward can be communicated to the communication device with which the cache was found. For example, if a physical world cache was found, the geocaching game host can communicate the reward notice to the communication device which indicated finding the cache, and such communication device can present the notice to its user in a suitable manner. If a virtual world cache was found, the geocaching game host can send the reward notice to the virtual game host, and the virtual game host can communicate the reward notice to the communication device on which the finder of the cache was gaming in the virtual world.

[0055] Referring to decision box 310, if an advertising opportunity is identified either during physical world game play or virtual game play, at step 312 an advertisement can be communicated to the corresponding communication device. Such opportunity can be, for example, a user finding a cache at a particular location in the physical world or the virtual world. Such

advertisement can be communicated in the same manner described for communicating a notice of reward.

[0056] At step 314, conditions at the present location of the communication device can be monitored, for example as previously described. Proceeding to decision box 316, if a potentially dangerous condition is detected at the location, at step 318 a warning can be communicated to the communication device. As noted, such warning can be communicated by the geocaching game host.

[0057] The flowchart and block diagrams in the figures illustrate the architecture, functionality, and operation of possible implementations of systems, methods and computer program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some alternative implementations, the functions noted in the block may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved.

[0058] The present invention can be realized in hardware, software, or a combination of hardware and software. The present invention can be realized in a centralized fashion in one processing system or in a distributed fashion where different elements are spread across several interconnected

processing systems. Any kind of processing system or other apparatus adapted for carrying out the methods described herein is suited. A typical combination of hardware and software can be a processing system with an application that, when being loaded and executed, controls the processing system such that it carries out the methods described herein. The present invention also can be embedded in a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform methods and processes described herein. The present invention also can be embedded in an application product which comprises all the features enabling the implementation of the methods described herein and, which when loaded in a processing system, is able to carry out these methods.

[0059] The terms "computer program," "software," "application," variants and/or combinations thereof, in the present context, mean any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both of the following: a) conversion to another language, code or notation; b) reproduction in a different material form. For example, an application can include, but is not limited to, a script, a subroutine, a function, a procedure, an object method, an object implementation, an executable application, an applet, a servlet, a MIDlet, a source code, an object code, a shared library/dynamic load library and/or other sequence of instructions designed for execution on a processing system.

[0060] The terms “a” and “an,” as used herein, are defined as one or more than one. The term “plurality,” as used herein, is defined as two or more than two. The term “another,” as used herein, is defined as at least a second or more. The terms “including” and/or “having,” as used herein, are defined as comprising (i.e. open language).

[0061] This invention can be embodied in other forms without departing from the spirit or essential attributes thereof. Accordingly, reference should be made to the following claims, rather than to the foregoing specification, as indicating the scope of the invention.

[0062] What is claimed is:

CLAIMS

1. A method of hosting a geocaching game, comprising:

interfacing with a geocaching game host to retrieve geocaching game data associated with a physical world geocaching game; and

managing association data that forms a nexus between a virtual world and the geocaching game data, the association data enabling a virtual geocaching game that corresponds to the physical world geocaching game to be hosted in the virtual world.

2. The method of claim 1, further comprising:

communicating the association data to a virtual world host.

3. The method of claim 1, further comprising:

mapping caches in the virtual world to correspond to caches in the physical world.

4. The method of claim 3, further comprising:

managing association data that simulates an environment at a cache location in the physical world.

5. The method of claim 1, further comprising:

managing the geocaching game data to correspond to geocaching game play in the physical world; and

managing the geocaching game data to correspond to geocaching game play in the virtual world.

6. The method of claim 5, wherein managing the geocaching game data to correspond to geocaching game play in the physical world comprises:

managing the geocaching game data to reflect a current location of a communication device during the geocaching game play.

7. The method of claim 6, further comprising:

monitoring a present location of a communication device; and

responsive to detecting a potentially dangerous condition that is expected to impact the present location, communicating a warning to the communication device.

8. The method of claim 5, further comprising:

responsive to a cache being found either in the physical world or in the virtual world, communicating a notice of reward to the communication device.

9. The method of claim 5, further comprising:

responsive to an event in the physical world geocaching game or the virtual geocaching game, communicating an advertisement to the communication device.

10. A geocaching gaming system, comprising:

at least one server that interfaces with a geocaching game host to retrieve geocaching game data associated with a physical world geocaching game, and manages association data that forms a nexus between a virtual world and the geocaching game data, the association data enabling a virtual geocaching game that corresponds to the physical world geocaching game to be hosted in the virtual world.

11. The geocaching gaming system of claim 10, wherein the server communicates the association data to a virtual world host.

12. The geocaching gaming system of claim 10, wherein the association data maps caches in the virtual world to correspond to caches in the physical world.

13. The geocaching gaming system of claim 12, wherein the association data simulates an environment at a cache location in the physical world.

14. The geocaching gaming system of claim 10, wherein the server manages the geocaching game data to correspond to geocaching game play in the physical world, and manages the geocaching game data to correspond to geocaching game play in the virtual world.

15. The geocaching gaming system of claim 14, wherein the server manages the geocaching game data to reflect a current location of a communication device during the geocaching game play.

16. The geocaching gaming system of claim 15, wherein the server monitors a present location of a communication device and, responsive to detecting a potentially dangerous condition that is expected to impact the present location, communicates a warning to the communication device.

17. The geocaching gaming system of claim 14, wherein the server communicates a notice of reward to the communication device in response to a cache being found either in the physical world or in the virtual world.

18. The geocaching gaming system of claim 14, wherein the server communicates an advertisement to a communication device during geocaching game play in response to a detected event in the physical world geocaching game or the virtual geocaching game.

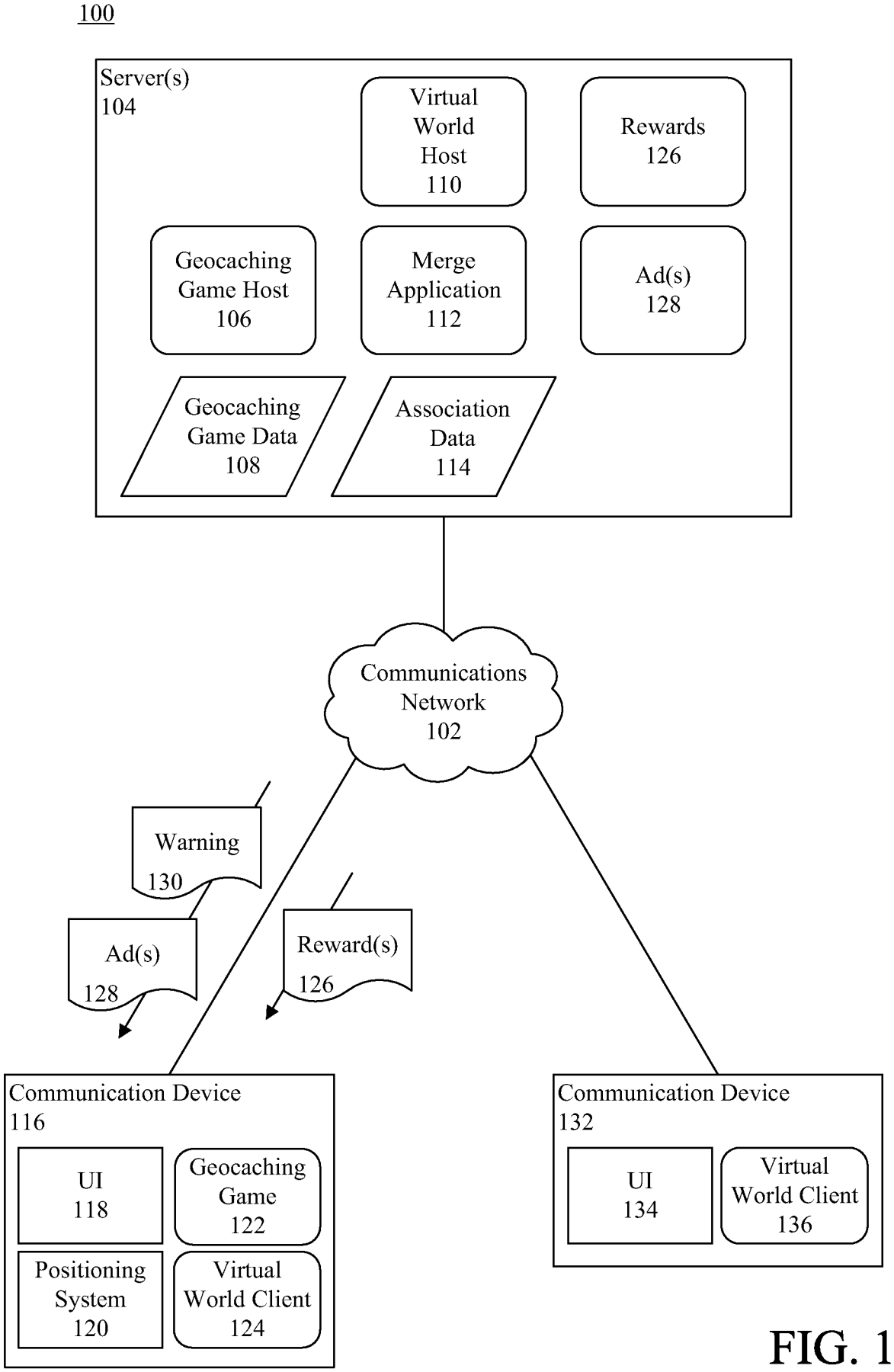

100
Server(s)
104
Virtual
World
Host
110
Rewards
126
Geocaching
Game Host
106
Merge
Application
112
Ad(s)
128
Geocaching
Game Data
108
Association
Data
114
Communications
Network
102
Warning
130
Ad(s)
128
Reward(s)
126
Communication Device
116
UI
118
Geocaching
Game
122
Positioning
System
120
Virtual
World Client
124
Communication Device
132
UI
134
Virtual
World Client
136

FIG. 1

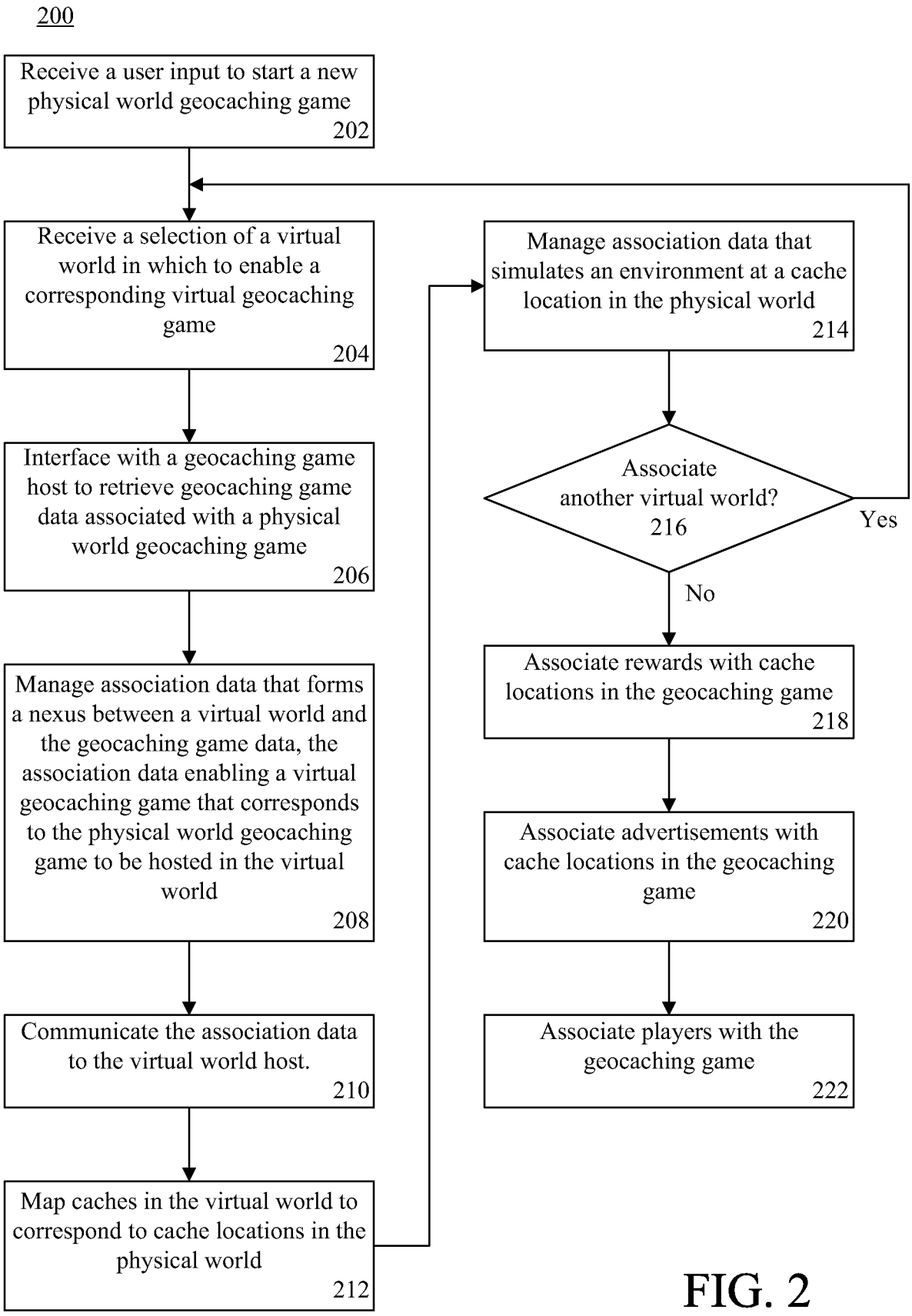

200
Receive a user input to start a new physical world geocaching game
202
Receive a selection of a virtual world in which to enable a corresponding virtual geocaching game
204
Interface with a geocaching game host to retrieve geocaching game data associated with a physical world geocaching game
206
Manage association data that forms a nexus between a virtual world and the geocaching game data, the association data enabling a virtual geocaching game that corresponds to the physical world geocaching game to be hosted in the virtual world
208
Communicate the association data to the virtual world host.
210
Map caches in the virtual world to correspond to cache locations in the physical world
212
Manage association data that simulates an environment at a cache location in the physical world
214
Associate another virtual world?
216
Yes
No
Associate rewards with cache locations in the geocaching game
218
Associate advertisements with cache locations in the geocaching game
220
Associate players with the geocaching game
222

FIG. 2

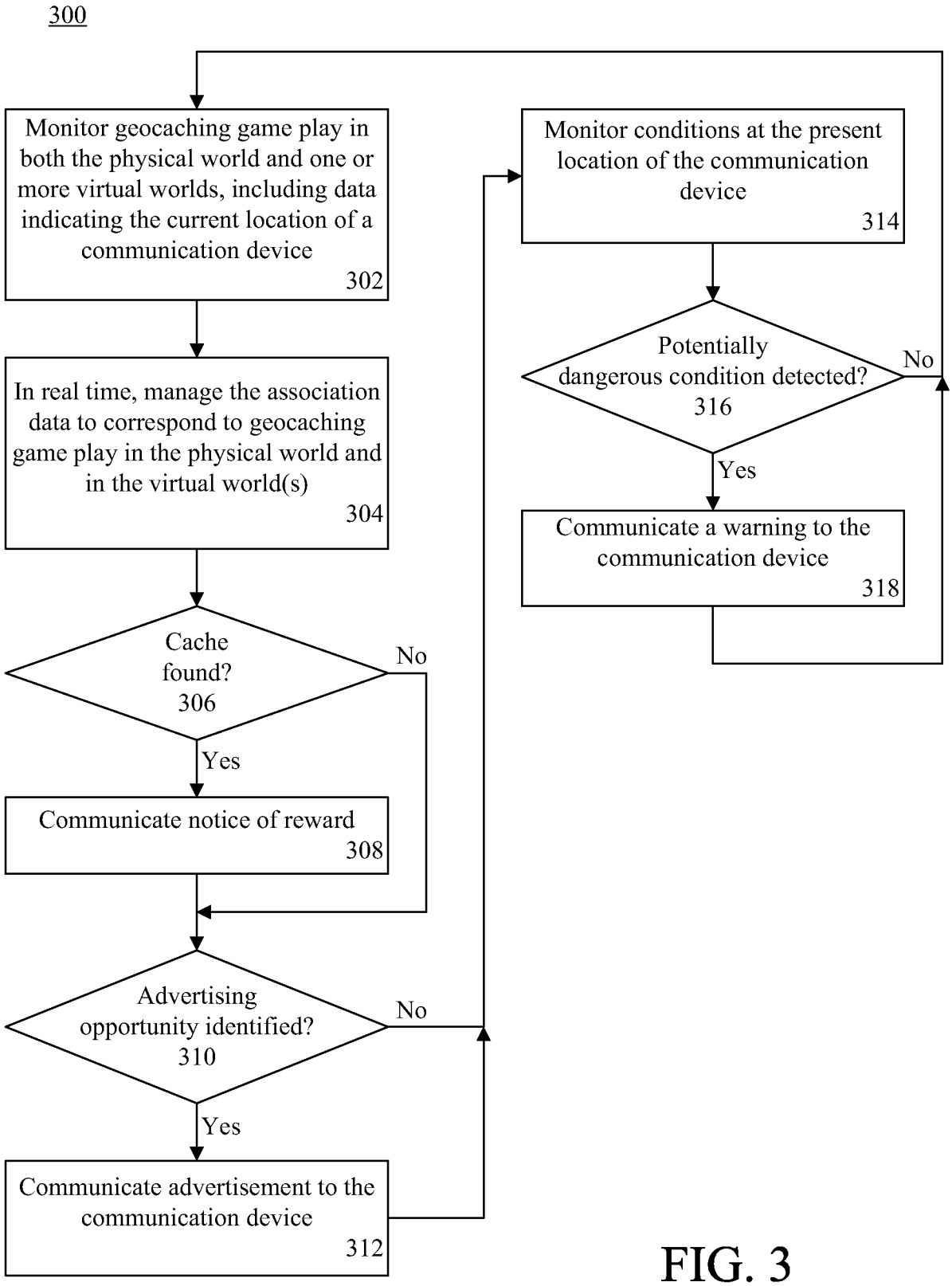

300
Monitor geocaching game play in both the physical world and one or more virtual worlds, including data indicating the current location of a communication device
302
In real time, manage the association data to correspond to geocaching game play in the physical world and in the virtual world(s)
304
Cache found?
306
No
Yes
Communicate notice of reward
308
Advertising opportunity identified?
310
No
Yes
Communicate advertisement to the communication device
312
Monitor conditions at the present location of the communication device
314
Potentially dangerous condition detected?
316
No
Yes
Communicate a warning to the communication device
318

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/035833

A. CLASSIFICATION OF SUBJECT MATTER

G06Q 50/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC G06Q 50/00; A63F 13/12; G06F 9/44; A63F 13/12l A63F 13/00

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

Korean utility models and applictions for utility models since 1975.
Japanese utility models and application for utility models since 1975.

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

eKOMPASS(KIPO internal) & keyword: GAME, GEOGRAPHIC, GEOCACHING, VIRTUAL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2006/024866 A1 (THE SECRETARY OF STATE ACTING THROUGH ORDNANCE SURVEY) 9 March 2006 See abstract; figure 5; claim 1, 15	1-18
Y	WO 2007/010366 A1 (NOKIA CORPORATION) 25 January 2007 See abstract; figure 1; claim 1	1-18
A	EP 1574239 A1 (Navteq North America, LLC) 14 September 2005 See abstract; figure 4; claim 1	1-18
A	US 2002/0111201 A1 (LANG, B. W.) 15 August 2002 See abstract; claim 1	1-18

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 JULY 2009 (28.07.2009)	**28 JULY 2009 (28.07.2009)**

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/035833

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006-024866 A1	09.03.2006	GB 2417694 A	08.03.2006
WO 2007-010336 A1	25.01.2007	EP 1904199 A1 US 2007-0021166 A1	02.04.2008 25.01.2007
EP 1574239 A1	14.09.2005	US 2005-0203922 A1	15.09.2005
US 2002-111201 A1	15.08.2002	None	