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(54) **EXCHANGING ASSETS BETWEEN ON-LINE VIRTUAL WORLDS**

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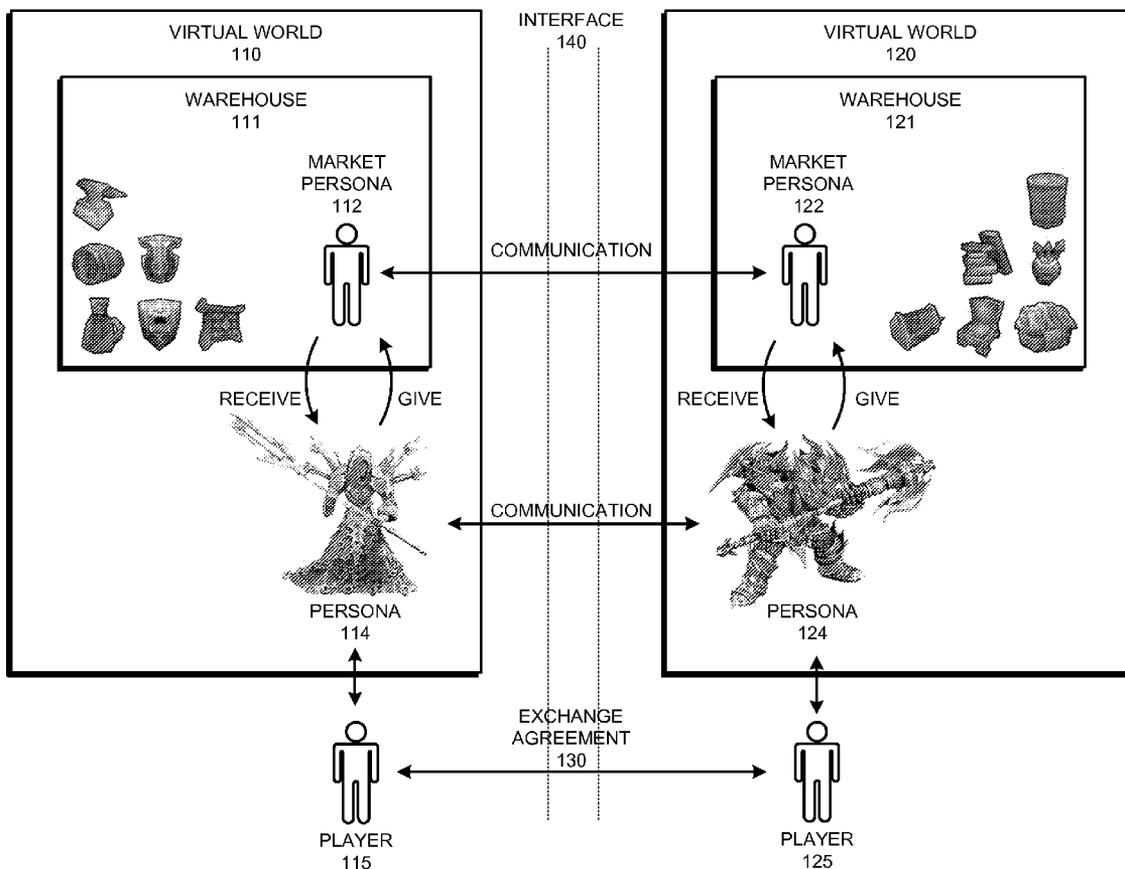
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(57) **ABSTRACT**

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Some embodiments of the present invention provide a system that facilitates exchanging assets between online virtual worlds. During operation, the system receives a first asset from a representative of a first player who controls the first asset in a first virtual world, and receives a second asset from a representative of a second player who controls the second asset in the second virtual world. Next, the system provides the first asset to a representative of the second player in the first virtual world, and provides the second asset to a representative of the first player in the second virtual world.

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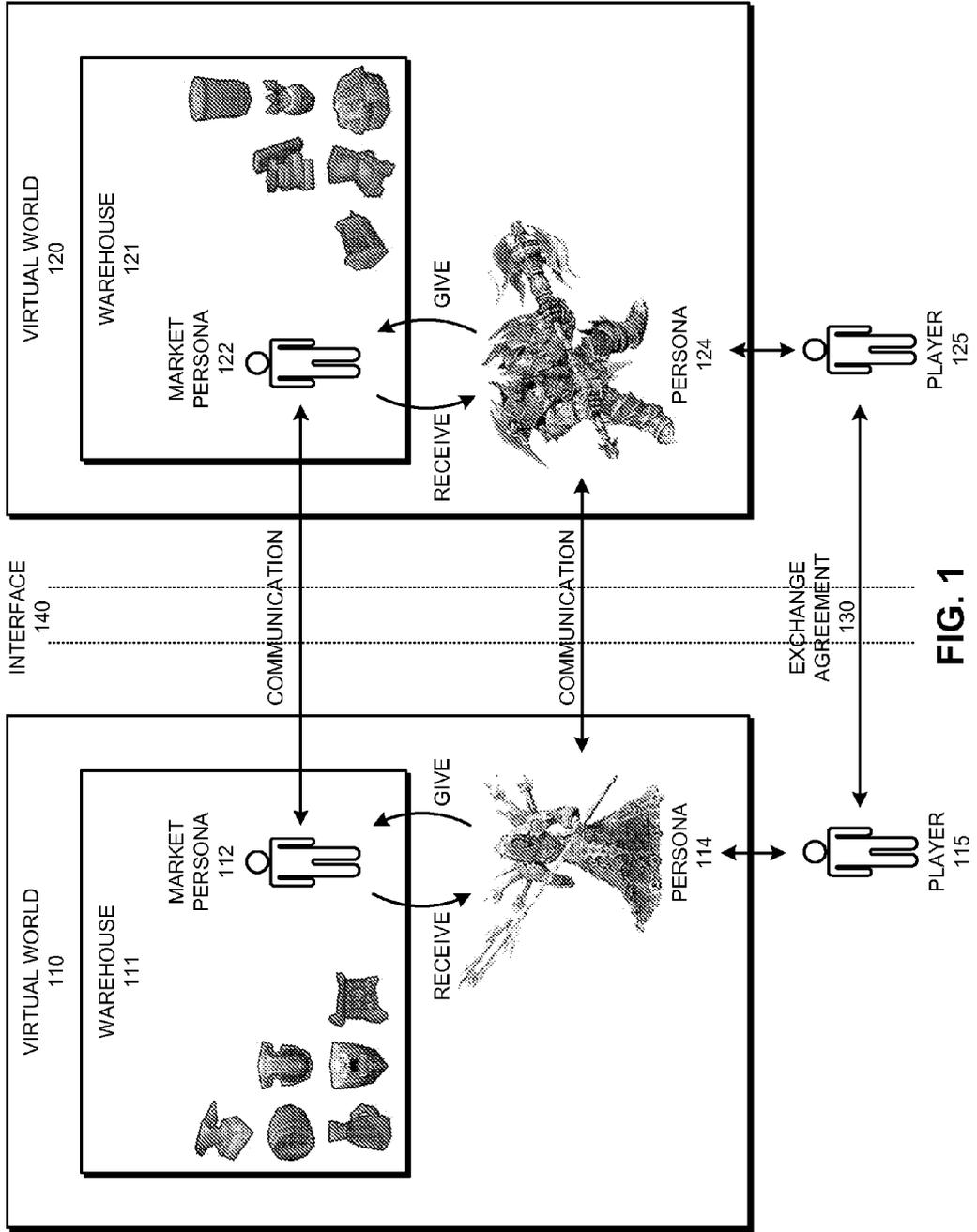


FIG. 1

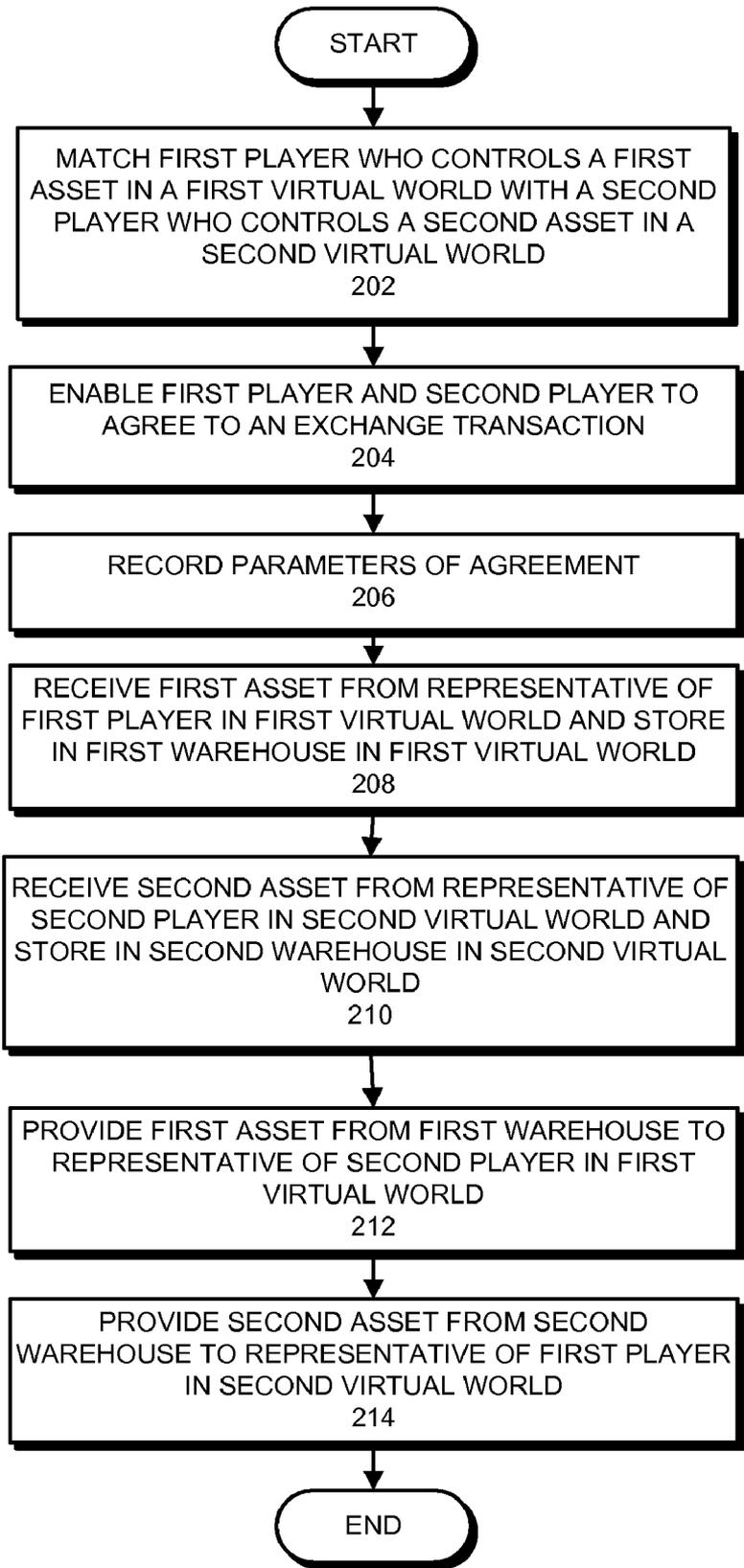


FIG. 2

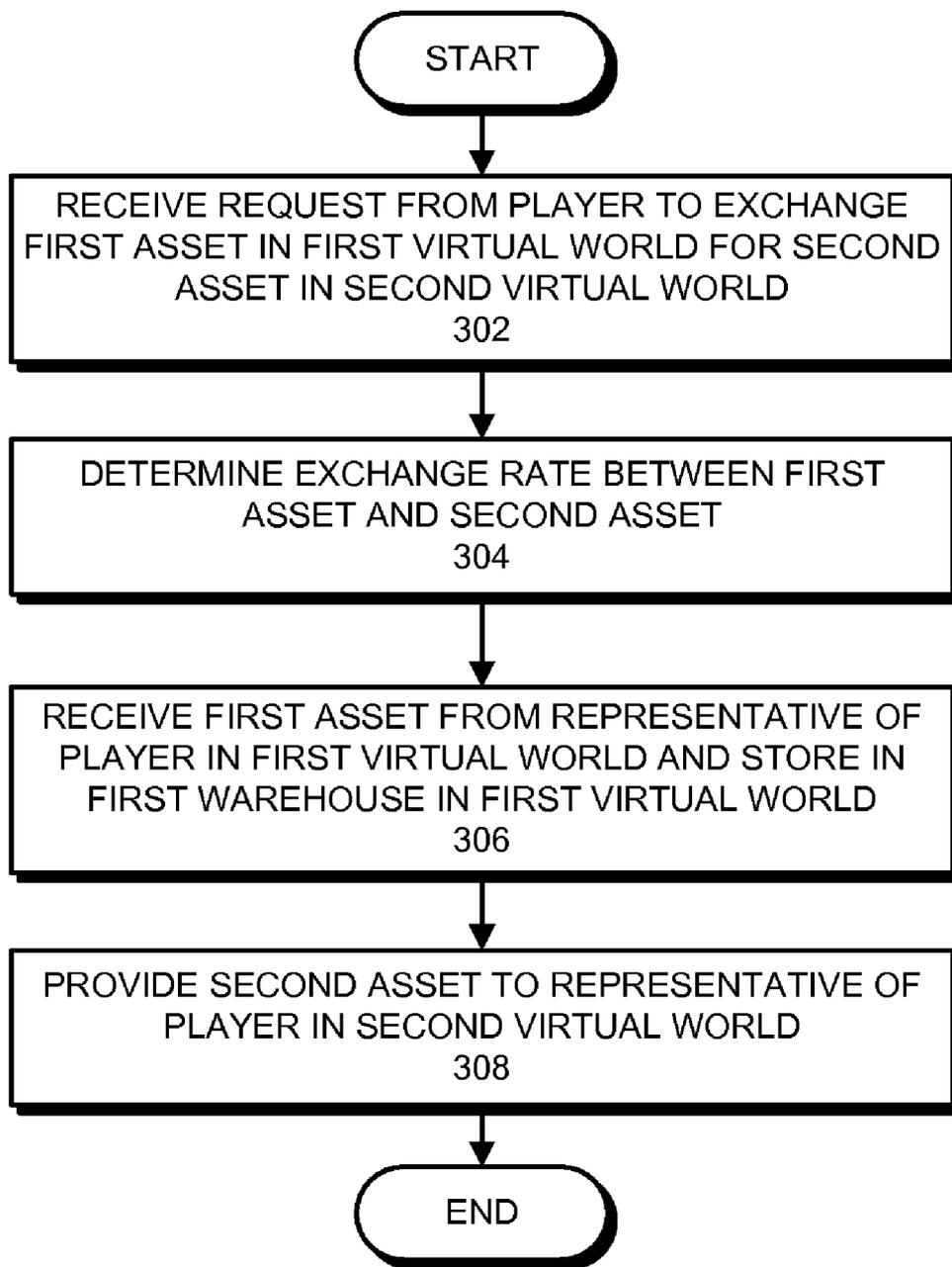


FIG. 3

EXCHANGING ASSETS BETWEEN ON-LINE VIRTUAL WORLDS

RELATED ART

[0001] The present invention relates to systems for exchanging assets between on-line virtual worlds.

[0002] Tens of millions of people presently participate in online "virtual worlds," which provide simulated environments for participants (players) to inhabit and interact with other players. These virtual worlds include fantasy worlds, such as Second Life™, or massively multiplayer online games, such as World of Warcraft™ or EVE Online™.

[0003] While participating in these virtual worlds, players typically spend a large amount of time and effort accumulating assets. For example, these assets can include swords or potions in World of Warcraft™, or houses, clothing, or virtual-world currency such as Linden Dollars in Second Life™. Players also exchange these assets with other players or merchants within the same virtual world to achieve various goals. For example, World of Warcraft™ provides auction houses to facilitate buying and selling various assets and Second Life users establish stores within the virtual world to facilitate the same.

[0004] Although it is relatively easy to trade assets within a virtual world, it is considerably harder to trade assets between virtual worlds. For example, a long-time player of World of Warcraft™ may want to transition to playing EVE Online™. However, the player may not want to spend a significant amount of time accumulating assets in EVE Online™ if the player has already spent a lot of time accumulating assets in World of Warcraft™. In this example, it would be advantageous for the player to be able to exchange assets in World of Warcraft™ for assets in EVE Online™. As these virtual worlds develop larger and more complex virtual assets and sales, the desirability of exchanges between worlds will grow.

SUMMARY

[0005] Some embodiments of the present invention provide a system that facilitates exchanging assets between online virtual worlds. During operation, the system receives a first asset from a representative of a first player who controls the first asset in a first virtual world, and receives a second asset from a representative of a second player who controls the second asset in the second virtual world. Next, the system provides the first asset to a representative of the second player in the first virtual world, and provides the second asset to a representative of the first player in the second virtual world.

[0006] In some embodiments, upon receiving the first asset, the system stores the first asset in a first warehouse in the first virtual world, and before providing the first asset, the system retrieves the first asset from the first warehouse. Similarly, upon receiving the second asset, the system stores the second asset in a second warehouse in the second virtual world, and before providing the second asset, the system retrieves the second asset from the second warehouse.

[0007] In some embodiments, a first market persona in the first virtual world is responsible for receiving the first asset from the representative of the first player and providing the first asset to the representative of the second player. Similarly, a second market persona in the second virtual world is responsible for receiving the second asset from the representative of the second player and providing the second asset to the representative of the first player.

[0008] In some embodiments, prior to receiving the first asset, the facilitates forming an agreement to exchange the first asset with the second asset by matching the first player who controls the first asset in a first virtual world with the second player who controls the second asset in a second virtual world, and then enabling the first player and the second player to form an agreement on an exchange between the first asset and the second asset.

[0009] In some embodiments, the system records the agreement and uses parameters from the recorded agreement to suggest real exchange rates for future exchanges involving the first asset and/or the second asset.

[0010] In some embodiments, the system uses the recorded agreement, along with other recorded agreements associated with other exchanges, to establish an exchange rate between a first currency in the first virtual world and a second currency in the second virtual world.

[0011] In some embodiments, matching the first player with the second player additionally involves authenticating the first player and the second player.

[0012] Some embodiments of the present invention provide a system that facilitates exchanging assets between online virtual worlds. During operation, the system receives a request from a player who controls a first asset in a first virtual world to exchange the first asset for a second asset in a second virtual world. Next, the system determines a real exchange rate between the first asset and the second asset based on equal asset values for the first asset and the second asset. The system then receives the first asset from a representative of the player in the first virtual world, and provides the second asset to a representative of the player in the second virtual world.

BRIEF DESCRIPTION OF THE FIGURES

[0013] FIG. 1 illustrates a system which facilitates exchanging assets between online virtual worlds in accordance with an embodiment of the present invention.

[0014] FIG. 2 presents a flow chart illustrating how two players in different virtual worlds exchange assets with each other in accordance with an embodiment of the present invention.

[0015] FIG. 3 presents a flow chart illustrating how a single player exchanges assets in different virtual worlds in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

[0016] The following description is presented to enable any person skilled in the art to make and use the invention, and is provided in the context of a particular application and its requirements. Various modifications to the disclosed embodiments will be readily apparent to those skilled in the art, and the general principles defined herein may be applied to other embodiments and applications without departing from the spirit and scope of the present invention. Thus, the present invention is not limited to the embodiments shown, but is to be accorded the widest scope consistent with the principles and features disclosed herein.

[0017] The data structures and code described in this detailed description are typically stored on a computer-readable storage medium, which may be any device or medium that can store code and/or data for use by a computer system. The computer-readable storage medium includes, but is not limited to, volatile memory, non-volatile memory, magnetic and optical storage devices such as disk drives, magnetic tape,

CDs (compact discs), DVDs (digital versatile discs or digital video discs), or other media capable of storing computer-readable media now known or later developed.

[0018] The methods and processes described in the detailed description section can be embodied as code and/or data, which can be stored in a computer readable storage medium as described above. When a computer system reads and executes the code and/or data stored on the computer-readable storage medium, the computer system perform the methods and processes embodied as data structures and code and stored within the computer-readable storage medium. Furthermore, the methods and processes described below can be included in hardware modules. For example, the hardware modules can include, but are not limited to, application-specific integrated circuit (ASIC) chips, field-programmable gate arrays (FPGAs), and other programmable-logic devices now known or later developed. When the hardware modules are activated, the hardware modules perform the methods and processes included within the hardware modules.

Overview

[0019] Embodiments of the present invention provide a system which allows a player in a first virtual world to exchange a non-monetary asset with another player in a second virtual world without having to: exchange the asset for currency of the first virtual world; convert the currency from the first virtual world to currency in the real world; convert the real currency to the currency of the second virtual world; and purchase the asset in the second world. Hence, the system essentially provides an efficient barter system (and also lets players exchange assets when there is no system for conversion/purchase in real-world currencies). In some embodiments, this is accomplished by using derived asset values and real exchange rates to convert between assets. This is useful, for example, if a “player” in one world is tired or bored and wants to try out another world without losing too much value in the assets generated in the world he is leaving (e.g., the player is sick of World of Warcraft™ and wants to move to Second Life™ and the player exchanges assets with one or more people who want to do the reverse).

[0020] Hence, in some embodiments of the present invention, the system facilitates matching players who would like to exchange assets in a first virtual world for assets in a second virtual world with a complementary player in the second virtual world who would like to exchange their assets for assets in the first virtual world. For example, a player may want to move entirely from one virtual world to another, or a business may want to balance assets between two virtual worlds.

[0021] The system can also provide a way for those players to converse about what each player would like to exchange, which enables the players to work out an equitable exchange. For example, a first player in a first virtual world could agree with a second player in a second virtual world to exchange two swords in the first virtual world for one ship in a second virtual world.

[0022] The system can also record transactions in a database. The system can use these recorded transactions to establish values for objects in worlds where there is no built-in way of valuing objects in a cross-world currency or in the currencies of other worlds. For example, if we know the value of the two swords to be \$400 Linden Dollars (L) in Second Life™, and the two swords are traded for one ship in a second virtual world, then the ship can be inferred to have a value equivalent

to \$400 L for future exchanges between the worlds. (Note that the value of that asset could be expressed in either the currency of Second Life™ as \$400 L or in a cross-world currency (US dollars) determined by the Linden exchange rate with US dollars.)

[0023] In another example, if we know a horse is equal in value to four boxes of dental floss in a first virtual world, and three horses in the first virtual world are traded for one suite of armor in a second virtual world, then one suit of armor in the second virtual world can be inferred to have a value equivalent to 12 boxes of dental floss in the first virtual world.

[0024] The system can also use the accumulated data to suggest values for future transactions. For example, the system can inform a party that during previous transactions, the same items in a second virtual world had a value of x currency units in a first virtual world (or in a cross-world currency).

[0025] The system can additionally use the accumulated data to establish an exchange rate between in-world currencies and cross-world currencies (e.g., US dollars) where no such exchange rate has been established previously. For example, suppose a ship in a second virtual world cost 100 quatloos in that world’s currency, and during an exchange transaction the ship in the second virtual world was traded for an asset worth \$400 L in Second Life™. Moreover, assume that \$400 L in Second Life™ is equivalent to \$2 US. This allows us to infer that 100 quatloos=\$2 US. An actual exchange rate could be determined by averaging (or other mechanism) over a number of transactions in which such valuations are made.

[0026] The system can also go beyond the barter model and can operate on the basis of exchanges of equal asset value rather than exchange of assets themselves. Thus, the system could build up and host a warehouse of goods in each virtual world. Then, if a player in a first virtual world wants to move the value of some or all of his assets from the first virtual world to a second virtual world, he could exchange his assets in the first virtual world for delivery of an equal value of assets in the second virtual world from the system’s warehouse of goods in the second virtual world. Hence, the system can effectively function as a market-maker.

[0027] We describe various embodiments of the present invention in more detail below.

Online Virtual Worlds

[0028] FIG. 1 illustrates a system which facilitates exchanging assets between online virtual worlds in accordance with an embodiment of the present invention. More specifically, FIG. 1 illustrates two online virtual worlds **110** and **120**. Virtual worlds **110** and **120** provide simulated environments for players to inhabit and interact with other players. These virtual worlds can include reality simulation worlds, such as Second Life™, or massively multiplayer online games, such as World of Warcraft™ or EVE Online™. In general, virtual worlds **110** and **120** can include any computer-based simulated environment which enable players to interact with other players and/or simulated players. Note that virtual worlds **110** and **120** can be different virtual worlds. For example, virtual world **110** can be Second Life™ while virtual world **120** can be World of Warcraft™.

[0029] Virtual worlds **110** and **120** can also be different instances of the same virtual world. For example, some online games allow players to inhabit different instances of the same

game, and the present invention can be used to facilitate exchanges of assets between players in the different instances of the same game.

[0030] Note that an asset can include any item that a player has rights to (or control over) in the virtual world. For example, an asset can be a sword, a potion or even currency in a virtual world. More generally, the asset can also include any rights or powers within the virtual world if such rights or powers are transferable. For example, the asset can include the right to cross a property belonging to another player in the virtual world, or the power to walk on water within the virtual world.

[0031] Virtual worlds **110** and **120** are inhabited by a number of personas (or characters) who are controlled by players. More specifically, virtual world **110** includes a persona **114** who is controller by a player **115**, and virtual world **120** includes a persona **124** who is controlled by a player **125**. Note that players typically control personas (or characters) by entering commands through one or more input devices, such as a keyboard or a mouse.

[0032] Virtual worlds **110** and **120** also include warehouses for storing assets that are received from personas and are to be given to other personas. These warehouses can be associated with “market personas,” who actually exchange the assets with the personas. More specifically, virtual world **110** includes warehouse **111** and market persona **112**, wherein market persona **112** exchanges various assets from warehouse **111** with persona **114**. Similarly, virtual world **120** includes warehouse **121** and market persona **122**, wherein market persona **122** exchanges various assets from warehouse **121** with persona **124**.

[0033] One embodiment of the present invention provides a system which facilitates exchanging assets between persona **114** in virtual world **110** and persona **124** in virtual world **120**. To facilitate this process, this system provides an interface **140** between the virtual worlds. Interface **140** facilitates communication between: (1) market personas **112** and **122**, (2) personas **114** and **124** and (3) players **115** and **125**. This communication enables players **115** and **125** to arrive at an exchange agreement **130** and to coordinate the associated exchange of assets.

Exchanging Assets between Two Players

[0034] FIG. 2 presents a flow chart illustrating how two players in different virtual worlds can exchange assets with each other in accordance with an embodiment of the present invention. First, the system matches a first player who controls a first asset in a first virtual world with a second player who controls a second asset in a second virtual world (step **202**). Next, the system enables the first player and the second player to reach an agreement on an exchange between the first asset and the second asset (step **204**). This can involve allowing players **115** and **125** to communicate with each other, either directly through a text message, an email or a phone call, or indirectly through their respective personas **114** and **124**.

[0035] Next, the system records parameters of the agreement (step **206**). This enables the system to use parameters from the agreement to suggest real exchange rates for future exchanges involving the first asset and/or the second asset.

[0036] Some embodiments of the present invention provide mechanisms to establish trust between players. For example, in some embodiments, players have digital certificates signed by a certificate authority (such as Verisign™) to establish their identities. In these embodiments, the system allows the

players to digitally sign communications with their corresponding private keys so the communications can be authenticated as originating from a trusted source. Additionally, the system can maintain ratings for how well players execute their agreed-upon transactions based on feedback from other players.

[0037] Next, the system facilitates the actual exchange of assets. More specifically, the system receives the first asset from a representative of the first player in the first virtual world and stores the first asset in a first warehouse in the first virtual world (step **208**). Next, the system receives the second asset from a representative of the second player in the second virtual world and stores the second asset in a second warehouse in the second virtual world (step **210**). The system then provides the first asset from the first warehouse to a representative of the second player in the first virtual world (step **212**), and similarly provides the second asset from the second warehouse to a representative of the first player in the second virtual world (step **214**).

[0038] Note that the first warehouse in the first virtual world could issue a “receipt” or “claim” on an asset in the first warehouse without the player in the virtual world actually having to take the item out of the warehouse. Then, players could exchange those claims with other players in the first virtual world, thereby further refining the valuation model. Note that these receipts or claims would be similar to real currency when it was based on the gold standard (when currency was actually a gold certificate).

[0039] Moreover, to ensure that the exchange of assets takes place in proper sequence, the system can keep the first and second assets in “escrow” during the exchange process. For example, when the system receives the first asset from the representative of the first player, the system can keep the first asset in escrow, which means the system will not release the first asset to a representative of the second player until a representative of the second player deposits the second asset in the second warehouse. Similarly, when the system receives the second asset from the representative of the second player, the system can keep the second asset in escrow, so that system will not release the second asset to a representative of the first player until a representative of the first player deposits the first asset in the first warehouse.

Exchanging Assets for a Single Player

[0040] FIG. 3 presents a flow chart illustrating how a single player exchanges assets in different virtual worlds in accordance with an embodiment of the present invention. Unlike the situation illustrated in FIG. 2 where two players exchange assets, in this situation a single player exchanges assets between virtual worlds based on a real exchange rate established by previous transactions involving the same assets or related assets.

[0041] During operation, the system receives a request from a player who controls a first asset in a first virtual world to exchange the first asset for a second asset in a second virtual world (step **302**). Next, the system determines a real exchange rate between the first asset and the second asset based on equal asset values for the first asset and the second asset (step **304**).

[0042] This real exchange rate can be established in a number of ways. For example, the real exchange rate can be a “derived exchange rate” which is derived from transaction records for previous barter-exchange transactions. For example, if a player exchanged two swords in a first virtual

world for a ship in a second virtual world, and another player exchanged a ship in the second virtual world for four horses in the second virtual world, the system can infer that a sword in the first virtual world is worth two horses in the second virtual world. Alternatively, the real exchange rate can be established by a centralized authority who is responsible for establishing real exchange rates.

[0043] Referring back to FIG. 3, the system next receives the first asset from a representative of the player in the first virtual world (step 306). After the first asset is received, the system provides the second asset to a representative of the player in the second virtual world (step 308).

[0044] The foregoing descriptions of embodiments have been presented for purposes of illustration and description only. They are not intended to be exhaustive or to limit the present description to the forms disclosed. Accordingly, many modifications and variations will be apparent to practitioners skilled in the art. Additionally, the above disclosure is not intended to limit the present description. The scope of the present description is defined by the appended claims.

What is claimed is:

1. A method for facilitating an exchange of assets between online virtual worlds, comprising:

receiving a first asset from a representative of a first player who controls the first asset in a first virtual world;

receiving a second asset from a representative of a second player who controls the second asset in a second virtual world;

providing the first asset to a representative of the second player in the first virtual world; and

providing the second asset to a representative of the first player in the second virtual world.

2. The method of claim 1,

wherein upon receiving the first asset, the method further comprises storing the first asset in a first warehouse in the first virtual world, and before providing the first asset, the method further comprises retrieving the first asset from the first warehouse; and

wherein upon receiving the second asset, the method further comprises storing the second asset in a second warehouse in the second virtual world, and before providing the second asset, the method further comprises retrieving the second asset from the second warehouse.

3. The method of claim 1,

wherein a first market persona in the first virtual world is responsible for receiving the first asset from the representative of the first player and providing the first asset to the representative of the second player; and

wherein a second market persona in the second virtual world is responsible for receiving the second asset from the representative of the second player and providing the second asset to the representative of the first player.

4. The method of claim 1, wherein prior to receiving the first asset, the method further comprises facilitating formation of an exchange agreement by:

matching the first player who controls the first asset in a first virtual world with the second player who controls the second asset in a second virtual world; and

enabling the first player and the second player to form an agreement on an exchange between the first asset and the second asset.

5. The method of claim 4, further comprising:

recording the agreement; and

using parameters from the recorded agreement to suggest real exchange rates for future exchanges involving the first asset and/or the second asset.

6. The method of claim 5, further comprising using the recorded agreement along with other recorded agreements associated with other exchanges to establish an exchange rate between a first currency in the first virtual world and a second currency in the second virtual world.

7. The method of claim 1, wherein matching the first player with the second player additionally involves authenticating the first player and the second player.

8. A method for facilitating an exchange of assets between online virtual worlds, comprising:

receiving a request from a player who controls a first asset in a first virtual world to exchange the first asset for a second asset in a second virtual world;

determining a real exchange rate between the first asset and the second asset based on equal asset values for the first asset and the second asset; and

receiving the first asset from a representative of the player in the first virtual world; and

providing the second asset to a representative of the player in the second virtual world.

9. The method of claim 8,

wherein receiving the first asset involves storing the first asset in a first warehouse in the first virtual world; and wherein providing the second asset involves retrieving the second asset from a second warehouse in the second virtual world.

10. The method of claim 8,

wherein a first market persona in the first virtual world is responsible for receiving the first asset from the representative of the player; and

wherein a second market persona in the second virtual world is responsible for providing the second asset to the representative of the player.

11. The method of claim 8, wherein determining the real exchange rate between the first asset and the second asset involves inferring an exchange based on previous exchanges involving the first asset, the second asset, and possibly related exchanges.

12. The method of claim 8, wherein prior to determining the real exchange rate, the method further involves authenticating the player.

13. A computer-readable storage medium storing instructions that when executed by a computer cause the computer to perform a method for facilitating an exchange of assets between online virtual worlds, the method comprising:

receiving a first asset from a representative of a first player who controls the first asset in a first virtual world;

receiving a second asset from a representative of a second player who controls the second asset in a second virtual world;

providing the first asset to a representative of the second player in the first virtual world; and

providing the second asset to a representative of the first player in the second virtual world.

14. The computer-readable storage medium of claim 13, wherein upon receiving the first asset, the method further comprises storing the first asset in a first warehouse in the first virtual world, and before providing the first

asset, the method further comprises retrieving the first asset from the first warehouse; and
 wherein upon receiving the second asset, the method further comprises storing the second asset in a second warehouse in the second virtual world, and before providing the second asset, the method further comprises retrieving the second asset from the second warehouse.

15. The computer-readable storage medium of claim **13**, wherein a first market persona in the first virtual world is responsible for receiving the first asset from the representative of the first player and providing the first asset to the representative of the second player; and
 wherein a second market persona in the second virtual world is responsible for receiving the second asset from the representative of the second player and providing the second asset to the representative of the first player.

16. The computer-readable storage medium of claim **13**, wherein prior to receiving the first asset, the method further comprises facilitating formation of an exchange agreement by:
 matching the first player who controls the first asset in a first virtual world with the second player who controls the second asset in a second virtual world; and
 enabling the first player and the second player to form an agreement on an exchange between the first asset and the second asset.

17. The computer-readable storage medium of claim **16**, wherein the method further comprises:
 recording the agreement; and
 using parameters from the recorded agreement to suggest real exchange rates for future exchanges involving the first asset and/or the second asset.

18. The computer-readable storage medium of claim **17**, wherein the method further comprises using the recorded agreement along with other recorded agreements associated with other exchanges to establish an exchange rate between a first currency in the first virtual world and a second currency in the second virtual world.

19. The computer-readable storage medium of claim **13**, wherein matching the first player with the second player additionally involves authenticating the first player and the second player.

20. A computer-readable storage medium storing instructions that when executed by a computer cause the computer to perform a method for facilitating an exchange of assets between online virtual worlds, comprising:
 receiving a request from a player who controls a first asset in a first virtual world to exchange the first asset for a second asset in a second virtual world;
 determining a real exchange rate between the first asset and the second asset based on equal asset values for the first asset and the second asset; and
 receiving the first asset from a representative of the player in the first virtual world; and
 providing the second asset to a representative of the player in the second virtual world.

21. The computer-readable storage medium of claim **20**, wherein receiving the first asset involves storing the first asset in a first warehouse in the first virtual world; and
 wherein providing the second asset involves retrieving the second asset from a second warehouse in the second virtual world.

22. The computer-readable storage medium of claim **20**, wherein a first market persona in the first virtual world is responsible for receiving the first asset from the representative of the player; and
 wherein a second market persona in the second virtual world is responsible for providing the second asset to the representative of the player.

23. The computer-readable storage medium of claim **20**, wherein determining the real exchange rate between the first asset and the second asset involves inferring an exchange based on previous exchanges involving the first asset, the second asset, and possibly related exchanges.

24. The computer-readable storage medium of claim **20**, wherein prior to determining the real exchange rate, the method further involves authenticating the player.

25. An apparatus that facilitates exchanging assets between online virtual worlds, comprising:
 a first market persona in a first virtual world, wherein the first market person is configured to,
 receive a first asset from a representative of a first player who controls the first asset in a first virtual world, and provide the first asset to a representative of the second player in the first virtual world;
 a second market person in a second virtual world, wherein the second market persona is configured to,
 receive a second asset from a representative of a second player who controls the second asset in a second virtual world, and
 provide the second asset to a representative of the first player in the second virtual world.

26. The apparatus of claim **25**,
 wherein upon receiving the first asset, the first market persona is configured to store the first asset in a first warehouse in the first virtual world, and before providing the first asset, the first market persona is configured to retrieve the first asset from the first warehouse; and
 wherein upon receiving the second asset, the second market persona is configured to store the second asset in a second warehouse in the second virtual world, and before providing the second asset, the second market persona is configured to retrieve the second asset from the second warehouse.

27. An apparatus that facilitates exchanging assets between online virtual worlds, comprising:
 a request-receiving mechanism configured to receive a request from a player who controls a first asset in a first virtual world to exchange the first asset for a second asset in a second virtual world;
 an exchange-rate-determining mechanism configured to determine a real exchange rate between the first asset and the second asset based on equal asset values for the first asset and the second asset;
 an asset-receiving mechanism configured to receive the first asset from a representative of the player in the first virtual world; and
 an asset-providing mechanism configured to provide the second asset to a representative of the player in the second virtual world.

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