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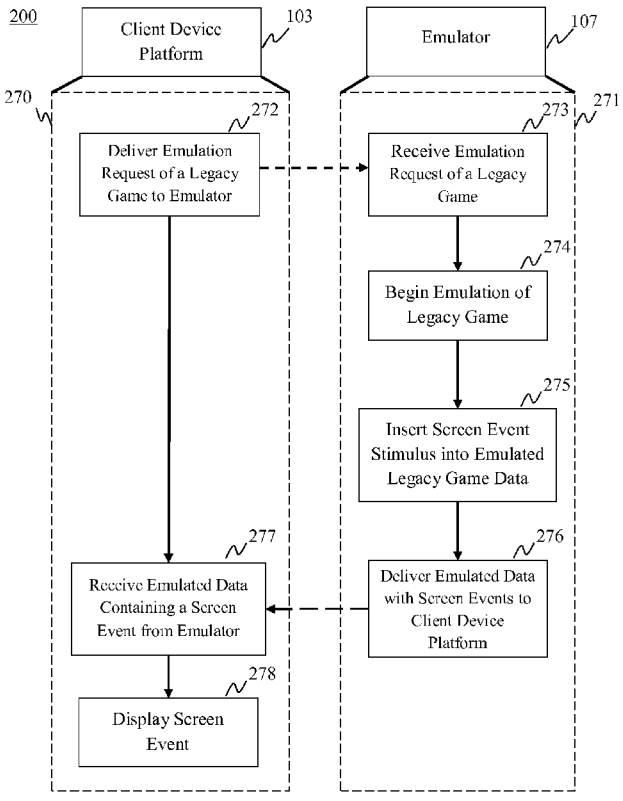
(54) Title: CONVERSION OF HAPTIC EVENTS INTO SCREEN EVENTS



(57) Abstract: Embodiments of the present invention describe the addition of a screen event stimulus to emulated legacy game data when a haptic stimulus is present in the emulated legacy game data. The client device platform may then use the screen event stimulus to generate a screen event when the game is displayed on the display unit of the client device platform. This invention enables a client device platform to provide a visual representation of the haptic information that may not be able to be otherwise communicated to the game player. It is emphasized that this abstract is provided to comply with the rules requiring an abstract that will allow a searcher or other reader to quickly ascertain the subject matter of the technical disclosure. It is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims.

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CONVERSION OF HAPTIC EVENTS INTO SCREEN EVENTS

CLAIM OF PRIORITY

This Application is a PCT International Application claiming the priority benefit of commonly-assigned U.S. Patent Application Number 13/791,420, filed March 8, 2013, the entire disclosures of which are incorporated herein by reference.

U.S. Patent Application Number 13/791,420 claims the priority benefit of commonly-assigned U.S. Provisional Patent Application Number 61/666,665 filed June 29, 2012, the entire disclosures of which are incorporated herein by reference.

CROSS-REFERENCE TO RELATED APPLICATION

This application is related to commonly-assigned, co-pending provisional application no. 61/666,628, and entitled "DETERMINING TRIGGERS FOR CLOUD-BASED EMULATED GAMES" (Attorney Docket Number SCEA12004US00), filed June 29, 2012, the entire disclosures of which are incorporated herein by reference.

This application is related to commonly-assigned, co-pending provisional application no. 61/666,645, and entitled "HAPTIC ENHANCEMENTS FOR EMULATED VIDEO GAME NOT ORIGINALLY DESIGNED WITH HAPTIC CAPABILITIES" (Attorney Docket Number SCEA12005US00), filed June 29, 2012, the entire disclosures of which are incorporated herein by reference.

This application is related to commonly-assigned, co-pending provisional application no. 61/666,679 entitled "SUSPENDING STATE OF CLOUD-BASED LEGACY APPLICATION", (Attorney Docket Number SCEA12007US00) to Victor Suba Miura et al, June 29, 2012, the entire disclosures of which are incorporated herein by reference.

FIELD OF THE DISCLOSURE

This disclosure relates to a method and apparatus for video game emulation. Among other things, this disclosure describes a method and apparatus for inserting screen events stimulus into emulated game data when there is a haptic stimulus present.

BACKGROUND OF THE INVENTION

Haptic feedback is a tactile feedback mechanism that utilizes the sense of touch. When used in conjunction with a control system the tactile feedback provides sensory cues to the user which indicates a certain event is happening to the object being controlled. For example, in

an airplane simulation, the addition of haptic feedback to a joystick controller in the form of vibrations allows the user to more easily perceive the turbulence.

In a controller, an electrical stimulus activates an actuator which then provides mechanical motion to the controller. The mechanical motion is often vibratory. Early haptic feedback systems utilized electromagnetic technologies that moved a central mass with an applied magnetic field. Newer technologies such as electroactive polymers, piezoelectric, electrostatic and subsonic audio wave surface actuation can be used to create haptic feedback as well. These technologies allow for a more dynamic range of sensations to be produced.

In video games and simulators, haptic feedback has become a common addition to controllers. The haptic feedback capabilities in devices like Sony Computer Entertainment's Dual Shock family of controllers provide a more immersive gaming experience. However, not all gaming systems utilize controllers that can produce haptic feedback. For example, games played on a computer with the use of a keyboard and a mouse often do not support haptic feedback. Additionally, controllers that can generate haptic feedback may have their haptics functionality disabled by the user or they may be broken. Therefore, a controller may not have the haptic functionality envisioned by the game's original designer when legacy games are emulated for playback on different systems then the one they were originally designed for.

Therefore, there is a need in the art to provide a game player who does not receive haptic feedback from their controller a way to visually perceive when haptic feedback would otherwise be generated without having to alter the code of a legacy game.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a schematic diagram of a client device platform and an emulator communicating over a network according to an aspect of the present disclosure.

FIG. 1B is a prior art block diagram describing the response of a client device platform receiving a haptic stimulus.

FIG. 1C is a block diagram describing the response of a client device platform receiving a screen event stimulus instead of a haptic stimulus according to an aspect of the present disclosure.

FIG. 1D is a block diagram describing the response of a client device platform receiving a screen event stimulus and a haptic stimulus according to an additional aspect of the present disclosure.

FIG. 2 is a flow diagram illustrating a method of adding haptics to an emulated game according to an aspect of the present disclosure.

FIG. 3A is a block diagram describing the instructions for how a client device platform displays screen event stimulus in an emulated game according to an aspect of the present disclosure.

FIG. 3B is a block diagram describing the instructions for how an emulator inserts a screen event stimulus when a haptic stimulus is identified while emulating a game according to an aspect of the present disclosure.

DESCRIPTION OF THE SPECIFIC EMBODIMENTS

Although the following detailed description contains many specific details for the purposes of illustration, anyone of ordinary skill in the art will appreciate that many variations and alterations to the following details are within the scope of the invention. Accordingly, the aspects of the present disclosure described below are set forth without any loss of generality to, and without imposing limitations upon, the claims that follow this description.

According to an embodiment of the present invention, when a controller is not capable of generating a haptic response the emulator inserts a screen event stimulus into the emulated game data. The client device platform may then use the screen event stimulus to generate a screen response when the game is displayed on a display unit.

FIG. 1A is a schematic of an embodiment of the present invention. Emulator **107** may be accessed by a client device platform **103** over a network **160**. Client device platform **103** may be one of a plurality of client device platforms **103** that are each able to access the same emulator **107** over the network **160**. Client device platform **103** may also access alternative emulators **107**.

Client device platform **103** may include a central processor unit (CPU) **131**. By way of example, a CPU **131** may include one or more multiple core processors, e.g., a dual-core, quad-core or Cell processors. The client device platform **103** may also include a memory **132**

(e.g., RAM, DRAM, ROM, and the like). The CPU **131** may execute a process-control program **133**, portions of which may be stored in the memory **132**. The client device platform **103** may also include well-known support circuits **140**, such as input/output (I/O) circuits **141**, power supplies (P/S) **142**, a clock (CLK) **143** and cache **144**. The client device platform **103** may optionally include a mass storage device **134** such as a disk drive, CD-ROM drive, tape drive, or the like to store programs and/or data. The client device platform **103** may also optionally include a display unit **137**. The display unit **137** may be in the form of a cathode ray tube (CRT) or flat panel screen that displays text, numerals, or graphical symbols. The display unit **137** may also be capable of displaying a screen event **147**. By way of example and not by way of limitation, a screen event **147** may be a brief wiggle of the image on the screen, blurring the image on the screen, a temporary change in the brightness or contrast of an image on the screen or any other temporary alteration or combination of alterations to the image on the screen.

A controller **145** may be connected to the client device platform **103** through the I/O circuit **141** or it may be directly integrated into the client device platform **103**. The controller **145** may facilitate interaction between the client device platform **103** and a user. The controller **145** may include a keyboard, mouse, joystick, light pen, hand-held controls or other device. According to embodiments of the present invention the controller **145** may not be capable of producing a haptic response **146**. By way of example and not by way of limitation, the controller **145** may completely lack the ability to produce a haptic response **146**, or the controller **145** may have the ability to produce a haptic response **146**, but the feature has been switched off by the user or is broken.

The client device platform **103** may include a network interface **139**, configured to enable the use of Wi-Fi, an Ethernet port, or other communication methods. The network interface **139** may incorporate suitable hardware, software, firmware or some combination of two or more of these to facilitate communication via an electronic communications network **160**. The network interface **139** may be configured to implement wired or wireless communication over local area networks and wide area networks such as the Internet. The client device platform **103** may send and receive data and/or requests for files via one or more data packets over the network **160**.

The preceding components may exchange signals with each other via an internal system bus **150**. The client device platform **103** may be a general purpose computer that becomes a

special purpose computer when running code that implements embodiments of the present invention as described herein.

The emulator **107** may include a central processor unit (CPU) **131'**. By way of example, a CPU **131'** may include one or more multiple core processors, e.g., a dual-core, quad-core or Cell processors. The emulator **107** may also include a memory **132'** (e.g., RAM, DRAM, ROM, and the like). The CPU **131'** may execute a process-control program **133'**, portions of which may be stored in the memory **132'**. The emulator **107** may also include well-known support circuits **140'**, such as input/output (I/O) circuits **141'**, power supplies (P/S) **142'**, a clock (CLK) **143'** and cache **144'**. The emulator **107** may optionally include a mass storage device **134'** such as a disk drive, CD-ROM drive, tape drive, or the like to store programs and/or data. The emulator **107** may also optionally include a display unit **137'** and user interface unit **138'** to facilitate interaction between the emulator **107** and a user who requires direct access to the emulator **107**. The display unit **137'** may be in the form of a cathode ray tube (CRT) or flat panel screen that displays text, numerals, or graphical symbols. The user interface unit **138'** may include a keyboard, mouse, joystick, light pen, or other device. The emulator **107** may include a network interface **139'**, configured to enable the use of Wi-Fi, an Ethernet port, or other communication methods.

The network interface **139'** may incorporate suitable hardware, software, firmware or some combination of two or more of these to facilitate communication via the electronic communications network **160**. The network interface **139'** may be configured to implement wired or wireless communication over local area networks and wide area networks such as the Internet. The emulator **107** may send and receive data and/or requests for files via one or more data packets over the network **160**.

The preceding components may exchange signals with each other via an internal system bus **150'**. The emulator **107** may be a general purpose computer that becomes a special purpose computer when running code that implements embodiments of the present invention as described herein.

Emulator **107** may access a legacy game **106** that has been selected by the client device platform **103** for emulation through the internal system bus **150'**. There may be more than one legacy game **106** stored in the emulator. The legacy games **106** may also be stored in the memory **132'** or in the mass storage device **134'**. Additionally, one or more legacy games

106 may be stored at a remote location accessible to the emulator **107** over the network **160**. Each legacy game **106** contains game code **108**. When the legacy game **106** is emulated, the emulator **107** uses the game code **108** to produce emulated legacy game data **109**.

By way of example, a legacy game **106** may be any game that is not compatible with the client device platform **103**. By way of example and not by way of limitation, the legacy game **106** may have been designed to be played on Sony Computer Entertainment's PlayStation console, but the client device platform **103** is a home computer. By way of example, the legacy game **106** may have been designed to be played on a PlayStation 2 console, but the client device platform **103** is a PlayStation 3 console. Further, by way of example and not by way of limitation, a legacy game **106** may have been designed to be played on a PlayStation console, but the client device platform **103** is a hand held console such as the PlayStation Vita from Sony Computer Entertainment.

FIG. 1B is a block diagram of a system according to the prior art. The client device platform **103** is receiving emulated legacy game data **109** from the emulator **107** over the network connection **160**. Within the emulated legacy game data **109** is a haptic stimulus **111** which is generally used to produce a haptic response **146** in the client device platform **103**. However, in this diagram, controller **145** is not capable of producing a haptic response **146**. Therefore, the haptic stimulus **111** is ignored by the client device platform **103**. By missing the haptic response **146**, the user playing the legacy game **106** is not provided with the same gaming experience as envisioned by the designer of the legacy game **106**.

FIG. 1C is a block diagram of a system similar to that in FIG. 1B, with the exception of emulated legacy game data **109**. Here, according to an embodiment of the present invention the emulator **107** detects that there is a haptic stimulus **111** in the emulated legacy game data **109**, and replaces the haptic stimulus **111** with a screen event stimulus **112**. By way of example and not by way of limitation, the emulator **107** may replace the haptic stimulus **111** by first deleting the haptic stimulus **111** and then generating a screen event stimulus **112** that will be inserted into the emulated legacy game data **109**. Also by way of example, the screen event stimulus **112** may be inserted into the emulated legacy game data **109** before haptic stimulus **111** is removed from the legacy game data. The emulated legacy game data **109** and the screen event stimulus **112** are then delivered to the client device platform **103** over the network **160**. The client device platform **103** is then able to utilize the information in the emulated legacy game data **109** to display the screen event **147** on the display unit **137**. By

way of example, and not by way of limitation, FIG. 1C describes the screen event **147** as a wiggling of the displayed image. However, it should be noted that screen event **147** may also be a blurring of the image on the screen, a temporary change in the brightness or contrast of the image on the screen or any other temporary alteration or combination of alterations to the image on the screen. Therefore, the user playing the game will have a gaming experience more similar to the one envisioned by the game designer.

FIG. 1D provides an additional embodiment of the present invention. The client device platform **103** is receiving emulated legacy game data **109** from the emulator **107** over the network connection **160**. According to this embodiment, the client device platform comprises at least one controller **145** that cannot generate a haptic response **146** and at least one controller **145'** that can generate a haptic response **146**. Therefore, it is desirable to enable controller **145'** to receive the haptic stimulus **111**, while still inserting a screen event stimulus **112** so the user with the controller **145** may visually perceive the haptic response **146**. Within the emulated legacy game data **109** is a haptic stimulus **111** which is generally used to produce a haptic response **146** in the client device platform **103**. However, in this diagram, controller **145** is not capable of producing a haptic response **146**. Therefore, the emulator **107** may insert a screen event stimulus **112** into the emulated legacy game data **109**. Since there is still a controller **145'** that can utilize the haptic stimulus **111** it is not removed and both the haptic stimulus **111** and the screen event stimulus **112** are delivered to the client device platform **103**. The client device platform **103** uses the screen event stimulus to produce the screen event **147**. By way of example, and not by way of limitation, FIG. 1D describes the screen event **147** as a wiggling of the displayed image. However, it should be noted that screen event **147** may also be a blurring of the image on the screen, a temporary change in the brightness or contrast of the image on the screen or any other temporary alteration or combination of alterations to the image on the screen. Additionally, the client device platform **103** uses the haptic stimulus to produce the haptic response **146** in the controller **145'** that is capable of producing haptic feedback.

As shown in FIG. 2, the client device platform **103** and the emulator **107** may be configured to implement a method for inserting a screen event stimulus **112** into the emulated legacy game data **109** when the client device platform is not able to generate a haptic response according to an inventive method **200**. Various aspects of the method **200** may be implemented by execution of computer executable instructions running on the client device

platform **103** and/or the emulator **107**. Specifically, a client device platform **103** may be configured, e.g., by suitable programming, to implement certain client device platform instructions **270**. In addition, an emulator **107** may be configured to implement certain emulation instructions **271**. In FIG. 2 the dashed arrows represent the flow of data between the client device platform **103** and the emulator **107** over the network **160**.

Initially, at **272** the client device platform **103** may deliver information to the emulator **107** indicating that the user has selected a legacy game **106** that he wants emulated. Additionally, the emulation request may also include information that indicates to the emulator **107** that the client device platform **103** does not support haptic responses **146**. The emulator **107** receives this information at block **273** and then proceeds to emulate the chosen legacy game **106** at **274**. While emulating the legacy game **106**, the emulator **107** will check the emulated legacy game data **109** for haptic stimulus **111** at **275**. If a haptic stimulus **111** is found, the emulator **107** will insert a screen event stimulus **112**. By way of example and not by way of limitation, inserting the screen event stimulus **112** may include having the emulator **107** replace the haptic stimulus **111** by first deleting the haptic stimulus **111** and then generating a screen event stimulus **112** that will be inserted into the emulated legacy game data **109**. Also by way of example, inserting the screen event stimulus **112** may include inserting the screen event stimulus **112** into the emulated legacy game data **109** before the haptic stimulus **111** is removed from the legacy game data. Further, by way of example, inserting the screen event stimulus **112** may include inserting the screen event stimulus **112** into the emulated legacy data **109** and not removing the haptic stimulus **111** from the emulated legacy game data **109**. At **276**, the emulated legacy game data **109** which now contains the screen event stimulus **112** is sent to the client device platform **103** over the network connection **160**. The client device platform **103** receives the emulated legacy game data **109** containing the screen event stimulus at **277**, and then utilizes the screen event stimulus **112** to display the screen event **147** at **278**.

As shown in FIG. 3A, a set of client device platform instructions **370** may be implemented, e.g., by the client device platform **103**. The client device platform instructions **370** may be formed on a nontransitory computer readable medium such as the memory **132** or the mass storage device **134**. The client device platform instructions **370** may also be part of the process control program **133**. At **372**, the instructions may include delivering information to the emulator **107** indicating that the user has selected a legacy game **106** that he wants

emulated. Additionally at **372**, the instructions may also include instructions for sending information that indicates to the emulator **107** that the client device platform **103** does not support haptic responses **146**. Thereafter, the client device platform instructions **370** may include instructions for the client device platform **103** to receive both the emulated legacy game data **109** and a screen event stimulus **112** from the emulator at **377**. At **378**, the client device platform **103** may be instructed to use the screen event stimulus **112** to produce a screen event **147** when the client device platform **103** displays the legacy game data **109** on the display device **137**.

As shown in FIG. 3B, a set of emulator instructions **371** may be implemented, e.g., by the emulator **107**. The emulation instructions **371** may be formed on a nontransitory computer readable medium such as the memory **132'** or the mass storage device **134'**. The emulator instructions **371** may also be part of the process control program **133'**. At **373**, the emulator instructions **371** may include instructions for receiving information from the client device platform **103** indicating that the user has selected a legacy game **106** that he wants emulated. Additionally at **373**, the emulator instructions **371** may include instructions for receiving information that the client device platform **103** does not support haptic responses **146**. Thereafter the emulator instructions **371** may include instructions for the emulator **107** to begin emulating the selected legacy game **106** at **374**. At **375**, instructions for emulating the legacy game **106** may include instructions to check the emulated legacy game data **109** for haptic stimulus **111**, and inserting a screen event stimulus **112** whenever a haptic stimulus **111** is present within the emulated legacy game data **109**. By way of example and not by way of limitation, inserting the screen event stimulus **112** may include having the emulator **107** replace the haptic stimulus **111** by first deleting the haptic stimulus **111** and then generating a screen event stimulus **112** that will be inserted into the emulated legacy game data **109**. Also by way of example, inserting the screen event stimulus **112** may include inserting the screen event stimulus **112** into the emulated legacy game data **109** before the haptic stimulus **111** is removed from the legacy game data. Further, by way of example, inserting the screen event stimulus **112** may include inserting the screen event stimulus **112** into the emulated legacy data **109** and not removing the haptic stimulus **111** from the emulated legacy game data **109**. The emulator **107** may have instructions for then instructed to deliver the emulated legacy game data **109** and the screen event stimulus **112** to the client device platform at **376**.

While the above is a complete description of the preferred embodiment of the present invention, it is possible to use various alternatives, modifications and equivalents. Therefore, the scope of the present invention should be determined not with reference to the above description but should, instead, be determined with reference to the appended claims, along with their full scope of equivalents. Any feature described herein, whether preferred or not, may be combined with any other feature described herein, whether preferred or not. In the claims that follow, the indefinite article "A", or "An" refers to a quantity of one or more of the item following the article, except where expressly stated otherwise. The appended claims are not to be interpreted as including means-plus-function limitations, unless such a limitation is explicitly recited in a given claim using the phrase "means for."

WHAT IS CLAIMED IS:

1. In an emulator configured to operate on a network, a method for inserting a screen event stimulus into a set of emulated data, comprising:
a) receiving an emulation request for a game from a client device platform;
b) generating a set of emulated data while emulating the game;
c) inserting a screen event stimulus into the set of emulated data for each instance of a haptic stimulus within the set of emulated data; and
d) delivering the set of emulated data containing the screen event stimulus to the client device platform.

2. The method of claim 1, wherein at c) further includes deleting the haptic stimulus from the set of emulated data.

3. The method of claim 2, wherein the haptic stimulus is deleted from the set of emulated data before the screen event stimulus is inserted into the set of emulated data.

4. The method of claim 2, wherein the screen event stimulus is inserted into the set of emulated data before the haptic stimulus is deleted from the set of emulated data.

5. The method of claim 1, wherein a) further includes receiving information from the client device platform that indicates at least one of one or more controllers is not configured to generate a haptic response.

6. The method of claim 1, wherein the game is stored in a memory component of the emulator.

7. The method of claim 1, wherein the game is stored at a remote location accessible to the emulator over the network.

8. The method of claim 1, wherein the screen event stimulus is configured to cause the client device platform to alter a displayed image.

9. The method of claim 8, wherein the displayed image is altered by being wiggled.

10. The method of claim 8, wherein the displayed image is altered by changing the brightness.

11. The method of claim 8, wherein the displayed image is altered by changing the contrast.

12. The method of claim 8, wherein the displayed image is altered by blurring the image.

13. The method of claim 1, wherein the emulation request is received over a network connection.

14. The method of claim 13, wherein the network connection is a wireless connection.

15. The method of claim 13, wherein the network is a wired connection.

16. The method of claim 13, wherein the network is a local area network.

17. The method of claim 13, wherein the network is a wide area network.

18. A nontransitory computer readable medium containing program instructions for inserting a screen event stimulus into a set of emulated data, and wherein execution of the program instructions by one or more processors of a computer system causes the one or more processors to carry out the steps of:
a) receiving an emulation request for a game from a client device platform;
b) generating a set of emulated data while emulating the game;
c) inserting a screen event stimulus into the set of emulated data for each instance of a haptic stimulus within the set of emulated data; and
d) delivering the set of emulated data containing the screen event stimulus to the client device platform.

19. An emulator configured to operate on a network, comprising:
a processor;
a memory coupled to the processor;
one or more instructions embodied in memory for execution by the processor, the instructions being configured to implement a method inserting a screen event stimulus into a set of emulated data, the method comprising:
a) receiving an emulation request for a game from a client device platform;
b) generating a set of emulated data while emulating the game;
c) inserting a screen event stimulus into the set of emulated data for each instance of a haptic stimulus within the set of emulated data; and
d) delivering the set of emulated data containing the screen event stimulus to the client device platform.

20. In a client device platform configured to operate on a network, a method for adding a screen event to an emulated game, comprising:
a) sending an emulation request for a game to an emulator;
b) receiving the emulated game and a screen event stimulus from the emulator, wherein the screen event stimulus is generated by the emulator; and
c) using the screen event stimulus to generate a screen event on the client device platform.

21. The method of claim 20, wherein the screen event is wiggling a displayed image.

22. The method of claim 20, wherein the screen event is changing the brightness of a displayed image.

23. The method of claim 20, wherein the screen event is changing the contrast of a displayed image.

24. The method of claim 20, wherein the screen event is blurring a displayed image.

25. The method of claim 20, wherein the emulation request is sent over the network.

26. The method of claim 25, wherein the network is a wireless connection.

27. The method of claim 25, wherein the network is a wired connection.

28. The method of claim 25, wherein the network is a local area network.

29. The method of claim 25, wherein the network is a wide area network.

30. The method of claim 20, wherein the client device platform is a personal computer.

31. The method of claim 20, wherein the client device platform is a gaming console.

32. The method of claim 20, wherein the client device platform is a hand held gaming console.

33. The method of claim 20, wherein the client device platform includes one or more controllers.

34. The method of claim 33, wherein at least one controller is not configured to generate a haptic response.

35. The method of claim 34, wherein a) further includes sending information to the emulator that indicates at least one of one or more controllers is not configured to generate a haptic response.

36. A nontransitory computer readable medium containing program instructions for adding a screen event to an emulated game, and wherein execution of the program instructions by one or more processors of a computer system causes the one or more processors to carry out the steps of:
a) sending an emulation request for a game to an emulator;
b) receiving the emulated game and a screen event stimulus from the emulator, wherein the screen event stimulus is generated by the emulator; and
c) using the screen event stimulus to generate a screen event on the client device platform.

37. A client device platform configured to operate on a network, comprising:
a processor;
a memory coupled to the processor;
one or more instructions embodied in memory for execution by the processor, the instructions being configured to implement a method adding a screen event to an emulated game, the method comprising:
a) sending an emulation request for a game to an emulator;
b) receiving the emulated game and a screen event stimulus from the emulator, wherein the screen event stimulus is generated by the emulator; and
c) using the screen event stimulus to generate a screen event on the client device platform.

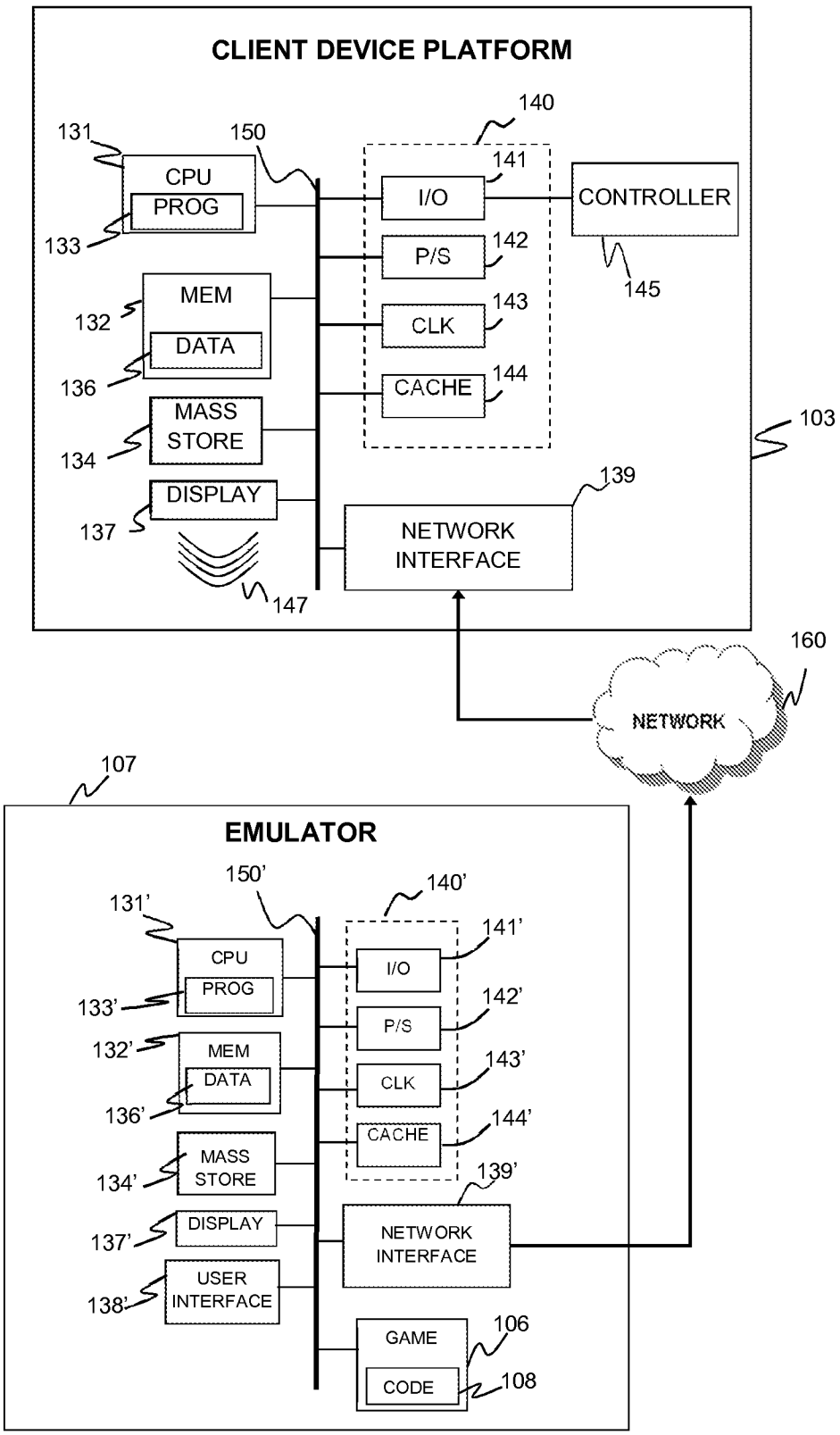
CLIENT DEVICE PLATFORM
131
150
140
141
CPU
PROG
133
I/O
CONTROLLER
P/S
142
145
MEM
132
DATA
143
CLK
136
CACHE
144
MASS STORE
134
103
DISPLAY
139
137
NETWORK INTERFACE
147
160
NETWORK
107
EMULATOR
150'
140'
131'
141'
CPU
I/O
PROG
133'
142'
P/S
132'
MEM
143'
DATA
CLK
136'
144'
CACHE
MASS STORE
134'
139'
DISPLAY
NETWORK INTERFACE
137'
USER INTERFACE
138'
106
GAME
CODE
108

FIG. 1A

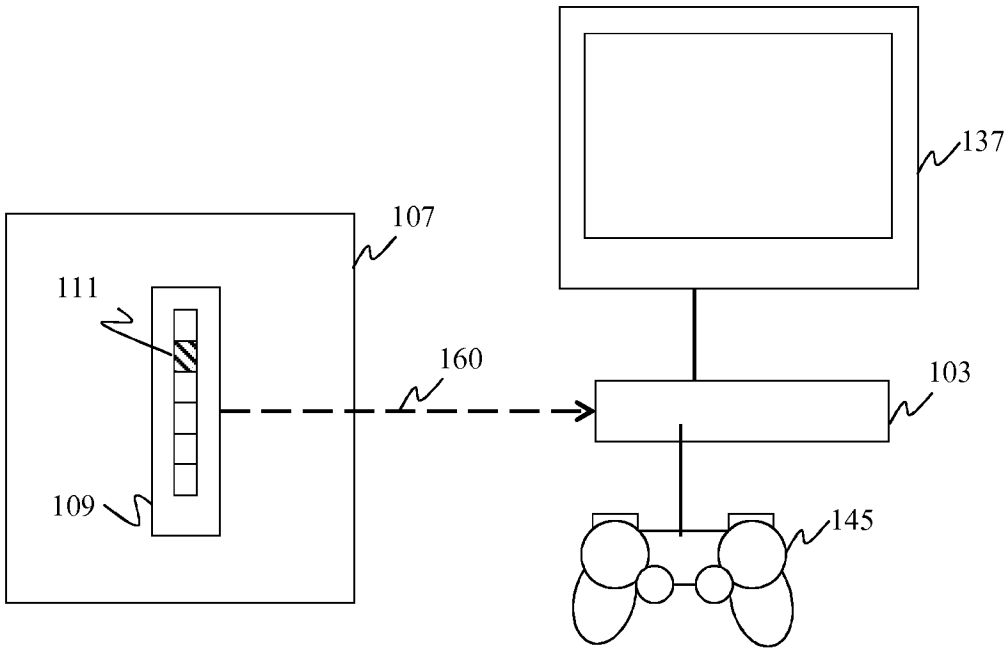

FIG. 1B (Prior Art)

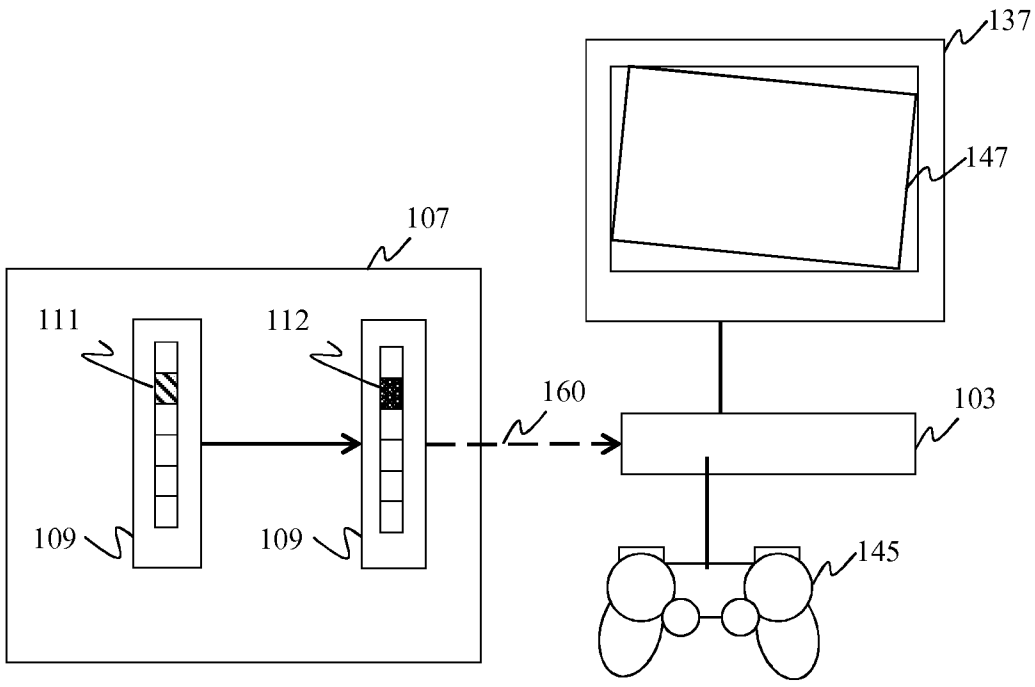

FIG. 1C

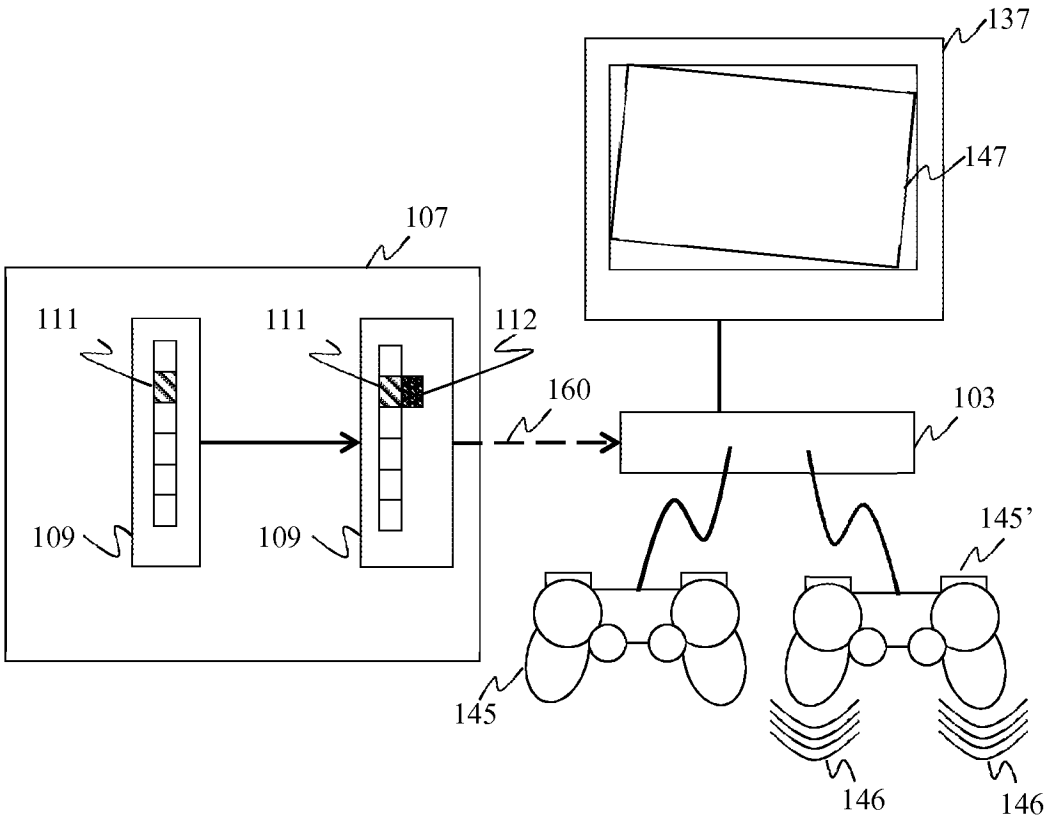

FIG. 1D

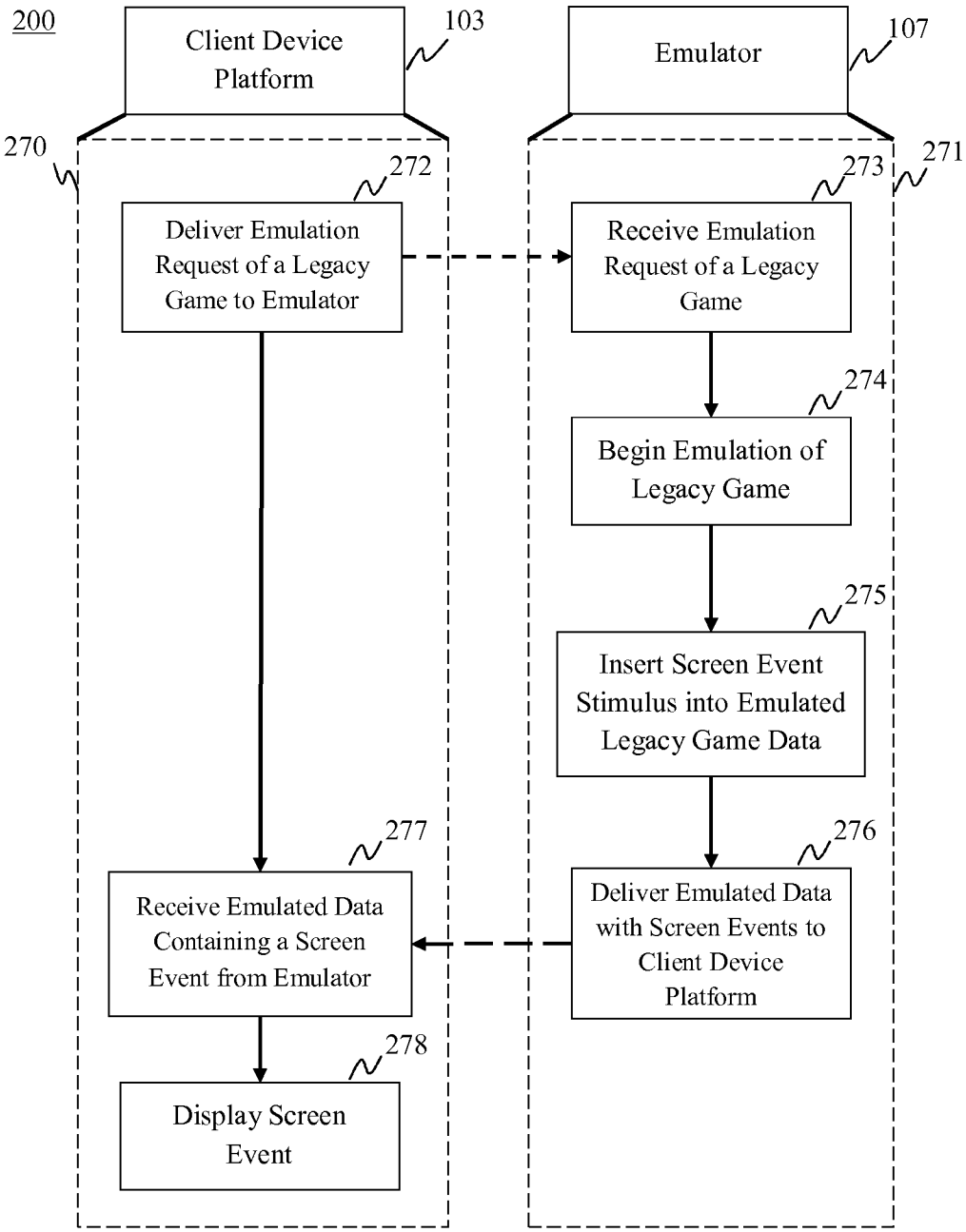
200
Client Device Platform
103
Emulator
107
270
271
272
Deliver Emulation Request of a Legacy Game to Emulator
273
Receive Emulation Request of a Legacy Game
274
Begin Emulation of Legacy Game
275
Insert Screen Event Stimulus into Emulated Legacy Game Data
276
Deliver Emulated Data with Screen Events to Client Device Platform
277
Receive Emulated Data Containing a Screen Event from Emulator
278
Display Screen Event

FIG. 2

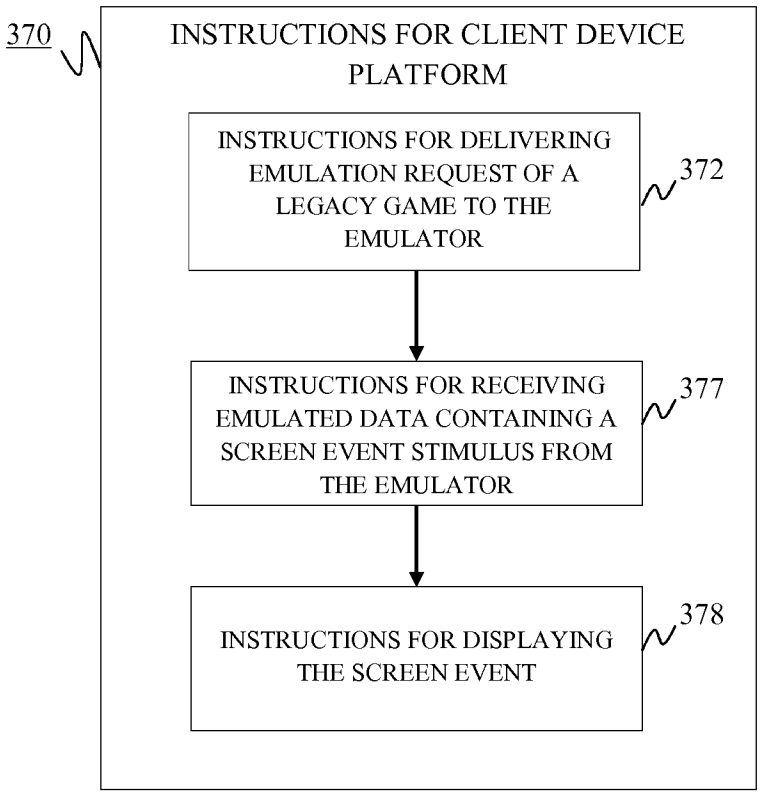
370
INSTRUCTIONS FOR CLIENT DEVICE PLATFORM
INSTRUCTIONS FOR DELIVERING EMULATION REQUEST OF A LEGACY GAME TO THE EMULATOR
372
INSTRUCTIONS FOR RECEIVING EMULATED DATA CONTAINING A SCREEN EVENT STIMULUS FROM THE EMULATOR
377
INSTRUCTIONS FOR DISPLAYING THE SCREEN EVENT
378

FIG. 3A

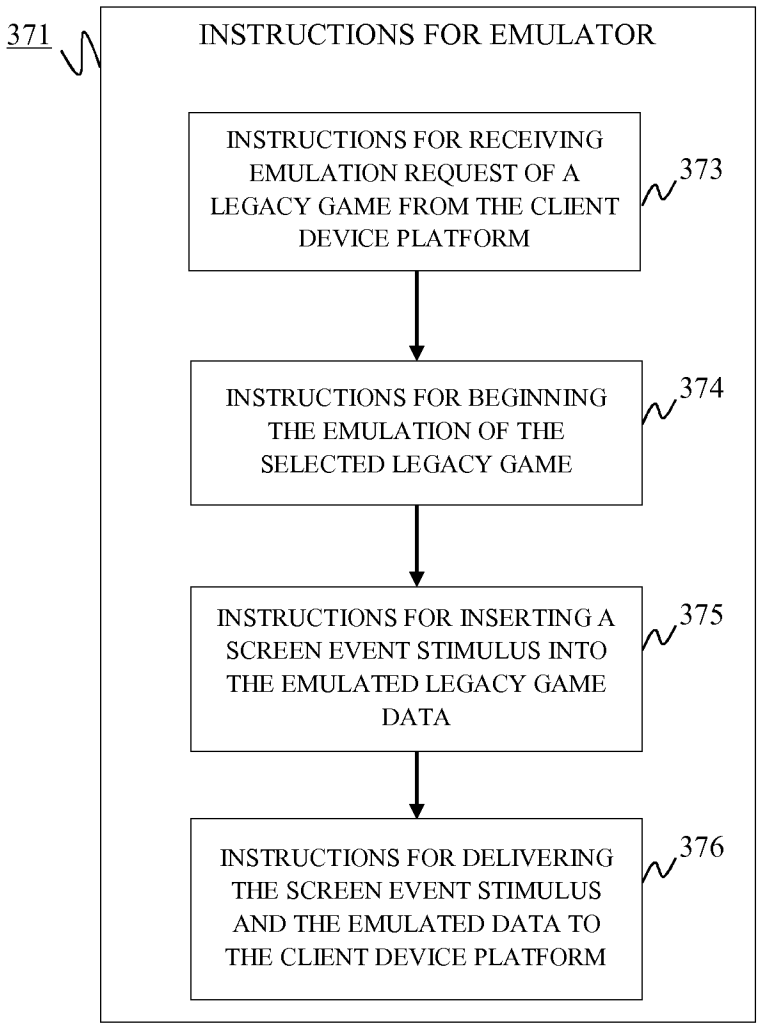
371
INSTRUCTIONS FOR EMULATOR
INSTRUCTIONS FOR RECEIVING EMULATION REQUEST OF A LEGACY GAME FROM THE CLIENT DEVICE PLATFORM
373
INSTRUCTIONS FOR BEGINNING THE EMULATION OF THE SELECTED LEGACY GAME
374
INSTRUCTIONS FOR INSERTING A SCREEN EVENT STIMULUS INTO THE EMULATED LEGACY GAME DATA
375
INSTRUCTIONS FOR DELIVERING THE SCREEN EVENT STIMULUS AND THE EMULATED DATA TO THE CLIENT DEVICE PLATFORM
376

FIG. 3B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 2013/047856

A. CLASSIFICATION OF SUBJECT MATTER

A63F 9/24 *(2006.01)*

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)

A63F 9/00-9/24, 13/00, G06F 9/00-9/455, 17/00

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

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

PatSearch (RUPTO internal), USPTO, PAJ, Esp@cenet, Information Retrieval System of FIPS (http://www.fips.ru)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007/0060363 A1 (IGT) 15.03.2007, [0040], [0044], [0058]-[0096], [0121], fig. 8A, 8B	1-37
Y	US 2009/0082102 A1 (SONY COMPUTER ENTERTAINMENT INC.) 26.03.2009, [0006]-[0018], [0024]-[0068], claims	1-37
PX	US 8435121 B1 (AMAZON TECHNOLOGIES, INC.) 07.05.2013	1-23

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

☐ See patent family annex.

* Special categories of cited documents:

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another 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
13 September 2013 (13.09.2013)	26 September 2013 (26.09.2013)
Name and mailing address of the ISA/ FIPS Russia, 123995, Moscow, G-59, GSP-5, Berezhkovskaya nab., 30-1 Facsimile No. +7 (499) 243-33-37	Authorized officer A. Tokarev Telephone No. (499) 240-25-91