

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey D. Mullen
Application No. : NOT YET ASSIGNED
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For : LOCATION-BASED GAMES AND
AUGMENTED REALITY SYSTEMS
Group Art Unit : NOT YET ASSIGNED
Examiner : NOT YET ASSIGNED

Hon. Commissioner for Patents Pittsburgh, PA 15238
P.O. Box 1450 August 27, 2016
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Sir:

Prior to examination of this application,
applicant amends the application as follows:

Amendments to the Specification is reflected in
the listing of claims which begins on page 2 of this paper.

Amendments to the Claims are reflected in the
listing of claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 4 of this paper.

Amendments to the Specification:

Please replace paragraph 1 of the specification, which begins on line 3 of page 1 of the specification with the following paragraph showing amendments.

--This application is a continuation of U.S. Patent Application No. 13/973,997, filed on August 22, 2013, which is a continuation of U.S. Patent Application No. 11/281,812, filed on August 16, 2005, which claims the benefit of U.S. Provisional Patent Application No. 60/628,475 filed on August 16, 2004 and titled "Location-Based Games and Augmented Reality Systems," which ~~is~~ are all hereby incorporated by reference herein in their ~~its~~ entirety.--

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-3. (cancelled).

4. (new) A computer-readable medium having program logic thereon for performing the method comprising:

providing 3-D video game indicia to a head-mounted display of a head-mounted device with respect to a physical playfield based on video game logic associated with a video game, wherein said head-mounted device includes a processor;

utilizing a detector to determine landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape characteristics in providing said video game; and

utilizing a locating device to determine the physical location of said locating device on said physical playfield, wherein said video game logic utilizes the physical location of said locating device in providing said video game.

REMARKS/ARGUMENTS

Summary of Applicant's Amendments

Applicant has cancelled claims 1-3 without prejudice and solely in order to expedite prosecution.

Applicant has added new claim 4 in order to more particularly point out and distinctly claim the subject matter that applicant regards as the invention.

Conclusion

Applicant respectfully submits that this application, including the pending claims, is in condition for allowance. Reconsideration and prompt allowance of this application are respectfully requested.

The Director is hereby authorized to charge any fees required in conjunction with this filing, or credit any overpayment of the same, to Deposit Account No. 50-3855, Order No. JDM/008 CON2.

Respectfully Submitted,

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SMALL ENTITY
JDM/008

LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

Cross-Reference to Related Applications

5 **[0001]** This application claims the benefit of U.S. Provisional Patent Application No. 60/628,475 (Docket No. JDM/008 PROV) filed on August 16, 2004 and titled "Location-Based Games and Augmented Reality Systems," which is hereby incorporated by reference herein in its entirety.

Background of the Invention

10 **[0002]** This invention relates to location-based game systems.

15 **[0003]** Virtual Reality (VR) systems have been developed in which a user is provided with a non-transparent head-mounted display. This display provides images to the user such that the user is immersed in a virtual, alternate reality. A user cannot see his/her physical environment while immersed in such a virtual, alternate reality. Accordingly, VR systems are deficient because a user cannot easily move around a physical environment while immersed in the virtual reality because a user cannot see his/her

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- 2 -

physical environment. If a user begins to physically move in his/her physical environment without being able to see his/her physical environment then the user may trip, or bump into, a physical object (e.g., a rock or chair).

5 **[0004]** As a result of the mobility constraints of traditional VR systems, a user is traditionally placed on a platform that is surrounded by padded safety rails. A user cannot move outside of this protected platform and moves through the virtual, alternate reality created by the VR system through the use of a manual joystick. Such a VR system is deficient because it severely limits the way that a user may interact with the virtual, alternate reality provided by the VR system.

10 **[0005]** Traditional manual controls occasionally have a primary control and a number of supplemental controls. Such a primary control occasionally takes the form of a joystick. The primary control occasionally provides the main control signal to a video game. Traditionally, the main control signal controls the location of a video game character in a virtual world. Such controls, however, are deficient because the controls require unnatural user movement to generate the primary control signal. It is therefore desirable to provide a primary control device that does not require unnatural user movement to generate a primary control signal to a video game.

Summary of the Invention

30 **[0006]** A handheld location-based game system is provided in which a user's physical position on a physical playfield (e.g., the physical world, a

- 3 -

physical environment, or a defined physical playfield) correlates to a video game character's location in a virtual playfield. In this manner, a video game character may be controlled without the need for a joystick. A handheld location-based game system is also provided that includes manual controls. Such manual controls may be utilized during location-based gameplay. An Augmented Realty (AR) game system may also be provided as, for example, a location-based game system and may display virtual indicia on a semi-transparent head-mounted display such that a user can see both virtual indicia and his/her physical environment. Virtual indicia may also be provided that interacts with a physical environment. For example, information may be provided to an AR game system about a user's physical environment. Furthering this example, the location of a doorway in a room may be provided to an AR video game such that a virtual character may be seen by a user of an AR display to walk through a doorway and disappear. Thus, a video game system may be provided that augments a user's environment to provide a video game. As the video game progresses, the user may interact with his/her physical environment in order to play a virtual game(e.g., by walking through his/her environment and shooting at virtual ducks flying through the air).

[0007] A switch may also provided that allows a user to manually play a location-based game (e.g., an AR game). In this manner, a user may be able to obtain functionality from the location-based game system when the user is not able to move. Such a benefit may be utilized, for example, when the user is a passenger in a moving car or sick in bed.

- 4 -

[0008] A location-based game can, however, be provided while a player is in bed or is in a car. For example, a location-based game could be implemented based on the movement of a car such that the movement of the car is translated into a control signal for the game (e.g., the location of a car in a game). Such a video game system may be embedded in a vehicle (e.g., a car). If a car is safely utilized on a large parking lot, a number of games may be realized as location-based games (e.g., as augmented reality games where game graphics are selectively provided on the vehicle's dash/windows). While in bed, a location-based game can be provided by translating small differences in location of the system (or a controller for a system). The system (or a controller to the system) can, for example, be a fishing rod such that the movement of a flick of the system is used to generate a control signal for casting a virtual rod in a virtual video game system.

[0009] A playmat is provided that may be packaged with a handheld location-based game system. If the handheld system is dedicated to a single game (e.g., the handheld system is not enabled to download additional games, play additional games, or receive cartridge-based or disc-based games) then the playmat may be representative of that single game. Additionally, such a single game dedicated system (or any system or any controller) may be shaped similar to, for example, the main character of the video game, or any character or characteristic of a video game, in order to increase the whimsical and festive nature of playing the game.

- 5 -

[0010] A playmat for a location-based system (e.g., an AR system) may correlate to a particular virtual playfield. Doing so may assist the user in playing the handheld location-based game. Using the classic game of FROGGER as an example, the virtual playfield of FROGGER may be the same for each level (disregarding the types of virtual computer controlled objects used in each level). Thus, a FROGGER playmat may include indicia representative of this virtual playfield. Additional non-playfield indicia may be provided on the playmat to provide additional location-based game information to a user. For example, a "START" circle may be provided on the playmat. Such a "START" circle may correlate to the location where the user can start each level.

[0011] In this manner, the location-based game may be configured (e.g., scaled) such that user movements on the playmat playfield correlate to location-based game movements on the virtual playfield. Thus, the location-based game may utilize the knowledge of the origin location (e.g., the START location) and the playmat perimeters (e.g., physical playfield perimeters) to provide a location-based game. Such a playmat may also be beneficial to locating devices that may accumulate errors over time. As such the location-based game and the playmat may be configured to reduce the chance of such accumulation errors. For example, if a locating device accumulates noticeable location errors after 30 seconds of gameplay, each game level may be limited to a particular period of time (e.g., 30 seconds). In configuring the size of the playmat, and appropriately scaling the location-based game to the playmat, the amount of time before noticeable errors

- 6 -

accrue can be manipulated. Similarly, the average amount of time before noticeable errors accrue can be determined such that an appropriate time limit for finishing a level can be subsequently determined.

5 Persons skilled in the art will appreciate that a number of location-based systems can be fabricated in which noticeable errors may never accrue. One such example may be a hybrid locating system that uses an inertial positioning system (e.g., any number of
10 accelerometers and/or gyroscopes) to determine location between signals received from a positioning device (e.g., a GPS device).

[0012] Taking FROGGER as an example, a user may be given 30 seconds to travel between the "START" location
15 and an "END" location on the playmat. After the user has completed a level (or dies), that user may be instructed to return to the origin position such that the locating device may reset so that the errors accumulated during the last level is removed but the
20 location-based game knows where the user is. Multiple playmats may be packaged together with a location-based game. Playmats that are similar but have different sizes may also be packaged together with a location-based game. Persons skilled in the art will appreciate
25 that a location-based game can measure the exact location of a device (e.g., via a positioning system such as a GPS system) and/or follow the movement of a device to determine changes in movement (e.g., via any number of accelerometers and/or gyroscopes) or a hybrid
30 of different types of sensors.

[0013] Playmats may also include holes such that they may be easily pegged into the ground or such that gaming components may be attached to the playmat at

- 7 -

particular locations. For example, if the locating device is a local positioning system, positioning transmitters may be positioned at pre-determined locations on the playmat (e.g., holes cut into the playmat for receiving the transmitters) to expedite the correct setup of the local positioning systems.

5 [0014] Systems and methods of scaling information from physical playfields to a video game system are also provided. Systems and methods of storing such information are also provided.

10 [0015] A location-based gaming system with a head-mounted display is provided such that video game indicia may be overlaid onto the user's physical playfield. Such a head-mounted display may be transparent such that a user can see through the display in areas where virtual indicia is not displayed. In this manner, the user may travel as fast as he/she wants to without risk of bumping into, or tripping over, a physical object. The display may also be non-transparent. A camera, however, may be provided on, or around, the head-mounted display to capture the physical environment. The physical environment can then be manipulated by a processor such that, for example, virtual indicia (e.g., a video game character or component is added) is added to the physical environment. The combination of the physical environment and virtual indicia can then be displayed to a user on a head-mounted display (or any type of display) such that a user can still see his/her physical environment even with a non-transparent display. As such, a non-transparent video game system is provided that can provide both augmented reality and virtual reality functionalities.

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- 8 -

[0016] Such overlays may include games in which only video game characters and interactive objects are overlaid onto the physical environment. As a result, the user's physical environment may be structurally
5 kept the same.

[0017] To increase the safety of a game that allows for a high-level of user mobility, such video game indicia may be provided with different contrasts (e.g., strength) at different distances from a user such that
10 at least close virtual objects/characters are semi-transparent such that close, physical hazards may be recognized by a user. Similarly, no virtual indicia may be allowed to come within a certain distance of a user (from the user's perspective). Thus, a virtual
15 indicia (e.g., a video game character) may never block a hazardous object that is close to a user.

[0018] A landscape detector may be provided with a location-based game system such that information on the physical terrain of the user's physical environment may
20 be utilized by the gaming system. If the locating device is a GPS device (or if the area has already been scanned), landscape information may be retrieved from memory that stores such information.

[0019] The information provided by the landscape
25 detector may be utilized, for example, to position where portions of a video game playfield, objects, and characters may be positioned on a display (e.g., on a head-mounted display). Such information may also be used, for example, to control the movement
30 characteristics of computer-controlled video game characters and indicia. A directional device may also be included to determine the direction and/or pitch that the user (e.g., the head-mounted display) is

- 9 -

facing. Such information may be utilized to determine the rotation of a users head as well as the user's visual perspective. Thus, the head-mounted display may, in itself, provide control signals to a video game.

5 **[0020]** To simplify the process of providing an augmented video game system, a video game may be played in the game system in an ever-changing virtual world. Portions of this game, and perspectives of those

10 portions, may be selectively displayed to the user at a particular time. In this manner, the complexity of an augmented reality game may be simplified such that the augmented system renders a non-visible game based on control signals and, for example, portions of this game

15 are selected and provided to a display based on the control signals. Thus, any type of video game hardware, or software, may be utilized and a module may be provided for the image selection process. Such a module can also configure the image to be displayed to

20 a user (e.g., aligned with a user's physical terrain) or another device (e.g., another module) can be utilized to correlate selected indicia on a physical terrain. Such modules can also convert control signals provided by an AR game controller (e.g., head-mounted

25 movement sensors and/or positioning systems) to control signals understood by any game system. As such, a classic 3-Dimensional video game (e.g., Goldeneye 007 or Pacman 3D) can be played on a classic video-game system (e.g., Nintendo 64 or Playstation), yet be

30 provided as an AR game system. This may be accomplished through the use of an add-on module that may, for example, translate control signals communicated between the game system and add-on module,

- 10 -

selective images (and audio) from the game system to display on the AR display, and determine how to display the selected images (and audio) on the AR display (and AR sound system).

- 5 **[0021]** Such an add-on module can interface via character control interfaces and audio/video outputs on a game system. In such a configuration, the add-on module may receive just static images/sounds. Thus, the add-on module may be provided with information to
- 10 process the image, determine the location of video game indicia (e.g., a video game enemy) and determine the action of video game indicia (e.g., a video game enemy shooting). Such information may be provided in a look-up table provided on a remote database such that copies
- 15 of images for a number of, or all of, video game indicia for any particular game can be obtained and compared to the received still images. Thus, the module can determine how video game indicia is being presented in the game such that the video game indicia
- 20 can be appropriately presented on an AR display. Furthermore, an AR add-on module can be interfaced to the control processor of a game system (or any component of a video game system such as the system's rendering device). Such an interface may, for example,
- 25 directly skew what is being rendered and how it is being rendered for later use in an AR display. Such an interface may also, for example, monitor the movement and status of video game indicia directly from the video game system (e.g., directly from the processor).
- 30 **[0022]** An AR game system may be utilized in many applications. For example, an AR game system may be utilized in the military training of soldiers. To accommodate such an application the landscape of a pre-

- 11 -

determined area (e.g., a particular square area of a military based) may be scanned at a point before a game is played. Virtual objects may be generated using this scanned information that correspond to physical
5 objects. Such a process may be utilized when the landscape is being scanned as a game is playing. Thus, the video game system may construct a virtual world similar to the scanned physical world and generate computer-controlled characters (and interactive or
10 impenetrable objects) on the physical world. Such a pre-scanned system may be relatively inexpensive. If the virtual game characters are computer-controlled enemy combatants (or manually controlled characters by instructors at a stationary game device or manually
15 controlled characters by instructors using a location-based game device on a different, location-synched playfield) then military soldiers may be trained in a variety of safe, combat-realistic situations.

[0023] The systems and methods of the present
20 invention may be utilized for any type of Augmented Reality (AR) application and is not limited to video games. For example, AR applications for wearable-computers may be provided. In one such application, virtual advertisements can be displayed on a user's
25 head-mounted display to augment these virtual advertisements over the real world. The display of virtual advertisements may be provided to such a wearable computer when the wearable computer reaches a particular location. The virtual advertisements can be
30 displayed within a physical environment based on the characteristics of the physical environment (e.g., displayed in front of you if nobody is walking in front of you or displayed above the heads of people walking

- 12 -

in front of you if people are walking in front of you). Similarly, AR-phone calls may be realized such that the image of the person you are calling is displayed in your physical environment (e.g., the person you are
5 having a telephone conversation is displayed as walking besides you or a two-dimensional video is displayed in front of you).

Brief Description of the Drawings

[0024] The principles and advantages of the present
10 invention can be more clearly understood from the following detailed description considered in conjunction with the following drawings, in which the same reference numerals denote the same structural elements throughout, and in which:

15 **[0025]** FIG. 1 is an illustration of a handheld location-based game system and accompanying playmat constructed in accordance with the principles of the present invention;

[0026] FIG. 2 is an illustration of a handheld
20 location-based game system in the shape of the virtual character that the location-based game system controls constructed in accordance with the principles of the present invention;

[0027] FIG. 3 is an illustration of scaling a
25 virtual playfield to a physical playfield constructed in accordance with the principles of the present invention;

[0028] FIG. 4 is an illustration of landscape
30 detection constructed in accordance with the principles of the present invention;

[0029] FIG. 5 is an illustration of virtual impenetrable object construction on a playfield based

- 13 -

on detected landscape objects constructed in accordance with the principles of the present invention;

5 **[0030]** FIG. 6 is an illustration of computer-controlled character positioning and movement based on detected landscape objects constructed in accordance with the principles of the present invention;

10 **[0031]** FIG. 7 is an illustration of virtual playfield mapping that includes physically detected impenetrable objects constructed in accordance with the principles of the present invention;

[0032] FIG. 8 is an illustration of computer controls for video game characters in a location-based game constructed in accordance with the principles of the present invention;

15 **[0033]** FIG. 9 is an illustration of different data storage structures for a location-based game constructed in accordance with the principles of the present invention;

20 **[0034]** FIG. 10 is an illustration of displaying video game characters in a semi-visible display for a location-based game constructed in accordance with the principles of the present invention;

25 **[0035]** FIG. 11 is an illustration of displaying video game characters with different transparencies for a location-based game constructed in accordance with the principles of the present invention;

30 **[0036]** FIG. 12 is an illustration of computer controlled movement of video game characters in a virtual playfield constructed in accordance with the principles of the present invention;

[0037] FIG. 13 is an illustration of pre-scanning a physical playfield constructed in accordance with the principles of the present invention; and

- 14 -

[0038] FIG. 14 is an illustration of a location-based game topology constructed in accordance with the principles of the present invention.

5 Detailed Description of the Drawings

[0039] U.S. Provisional Patent Application No. 60/603,481 filed on August 20, 2004 entitled "Wireless Devices With Flexible Monitors and Keyboards" (Docket No. JDM/007 PROV) and U.S. Patent Application No. 11/208,943 filed on August 22, 2005 entitled "Wireless Devices With Flexible Monitors and Keyboards" (Docket No. JDM/007) are hereby incorporated by reference herein in their entirety.

[0040] U.S. Provisional Patent Application No. 60/560,435 filed on April 7, 2004 entitled "Advanced Cooperative Defensive Military Tactics, Armor, and Systems" (Docket No. JDM/006 PROV) and U.S. Patent Application No. 11/101,782 filed on April 7, 2005 entitled "Advanced Cooperative Defensive Military Tactics, Armor, and Systems" (Docket No. JDM/006) are hereby incorporated by reference herein in their entirety.

[0041] U.S. Provisional Application No. 60/560,435 filed on September 2, 2003 entitled "Systems and Methods for Location Based Games and Employment of the Same on Location Enabled Devices" (Docket No. JDM/005 PROV) and U.S. Patent Application No. 10/932,536 filed on September 1, 2004 entitled "Systems and Methods for Location-Based Games and Employment of the Same on Location-Enabled Devices" (Docket No. JDM/005) are hereby incorporated by reference herein in their entirety.

- 15 -

[0042] U.S. Patent Application No. 10/797,801 filed on March 9, 2004 titled "Systems and Methods for Providing Remote Incoming Call Notification for Wireless Telephones" (Docket No. JDM/004) is hereby
5 incorporated by reference herein in its entirety.

[0043] U.S. Provisional Patent Application No. 60/367,967 filed on March 25, 2002 entitled "Systems and Methods for Locating Cellular Phones" (Docket No. JDM/002 PROV) and U.S. Patent Application No.
10 10/400,296 filed on March 25, 2003 titled "Systems and Methods for Locating Wireless Telephones and Security Measures for the Same" (Docket No. JDM/002) are hereby incorporated by reference herein in their entirety.

[0044] Turning first to FIG. 1, gaming system 100 is
15 provided that includes handheld game system 101 and playmat 150.

[0045] Gaming system 100 may be a location-based game system in which the physical location (or physical movement) of a user on a physical playfield determines
20 the virtual location (or virtual movement) of a virtual character on a virtual playfield. Location information may be obtained through, for example, any type of triangulation technique such as a GPS system or a localized positioning system (LPS). For example, the
25 time it takes multiple signals from multiple transmitters to reach device 101 may be utilized to determine the position of device 101. Location information may alternatively be obtained through various cell phone or wireless LAN location techniques.
30 For example, a user's signal strength between multiple hubs or base stations may be utilized to determine that user's location. As per another example, inertial movement sensors such as accelerometers and/or

- 16 -

gyroscopes may be utilized to keep track of a user's movement in a particular direction. In this manner, the user's location may be determined and updated based on the user's movements. Hybrids of such systems may also be utilized. For example, an accelerometer may be utilized to keep track of a user's position until a second locating signal is provided (e.g., a GPS system). In this manner, a GPS signal may be the master locating signal while the accelerometer provides location updates between GPS signals. Generally, device 140 is the locating device (or locating devices) for game system 101.

[0046] Game system 101 may include manual controls 120 and manual control switch 132 that turns ON and OFF location-based controls. In this manner, a user may still obtain functionality from game system 101 while, for example, sitting on a park bench. ON/OFF switch 131 may control when device 101 is turned ON and OFF.

[0047] Persons skilled in the art will appreciate that controls similar to manual controls 120 and 131 may also be provided on an AR game system. Thus, a user may use manual controls to control the location of a video game character in an AR game (e.g., control what first-person perspective is displayed on an AR display) without physically moving. A user may also use manual controls similar to manual controls 120 and 131 to toggle between an AR and VR game, toggle between AR and VR configurations of a game, and toggle from a location-based control scheme to a manual control scheme after an AR game configuration has been toggled to a VR game configuration. Thus, if a user is located in an environment that makes location-based AR gameplay difficult, (e.g., a small-room or in a car), the user

- 17 -

can instruct the game system to provide a VR version of the game to be played with a manual controller. Thus, a user may instruct an AR/VR game system to display all virtual indicia on a head-mounted display (and/or
5 render all virtual indicia) and not allow any areas of the display to become transparent. Thus, a user may instruct an AR/VR game system to switch from location-based control to manual input control. For systems with multiple control signals generated from multiple
10 control devices, a switch for alternate control schemes may be provided for each control device. For example, a user may turn a location-based sensor in a head-mounted display off, thus allowing a directional pad on a controller to control the location of a video-game
15 character (a user may also turn a switch associated with the directional pad ON). Yet, the user may decide not turn OFF inertial movement sensors in a hand-held controller, thus deciding not to, for example, use control buttons or a directional pad to replace the
20 functionality of the inertial movement sensors. Thus, a user may still swing around a hand-held controller to register internal sensor readings as control signals to, for example, swing around a video game object (e.g., a sword or lightsaber) in a game (e.g., a VR
25 game) when the user is sitting in a car even though the user could, for example, switch to a directional pad for the control the video game object. Additional examples of a video game object controlled by one or more inertial sensors may include, for example, a
30 fishing rod, tennis racket, baseball bat, pool cue, football (e.g., throwing a football), baseball (e.g., throwing a football), steering wheel, clutch, gun (or another object-projecting device or projectile), horse-

- 18 -

racing whip, frisbee, net, boxing gloves, or any type of object or action.

[0048] Persons skilled in the art will appreciate that a location-based game system may not require a controller in addition to a game system. For example, game system 101 may be fabricated with just one or more location sensors and/or inertial movement sensors without any additional manual controls. In one example, game system 101 may be a low-cost system that only provides a primary control signal to move a virtual character in a virtual world (e.g., move a frog through an environment). Additional manual controls may be provided on a game system (e.g., controls 120) and a game system may include connection ports to receive additional devices such as additional controllers, other game systems, displays (e.g., a TV or a head-mounted display), memory, add-on modules (e.g., software and/or hardware upgrade modules), or any type of peripheral.

[0049] Playmat 120 may be provided in order to increase the whimsical and festive nature of playing game system 101. For example, playmat 120 may include indicia similar to environment indicia in a particular game. Playmat 150 may be sized according to the characteristics of a game, or virtual environment, on system 101. For example, if a game on game system 101 has a water component and a land component, playmat 1450 may have indicia of a water component (e.g., indicia 152) and land component (e.g., indicia 151). The size of each of these components may correspond to the movement needed of device 101 to travel across these components in a virtual environment. For example, if a user has to move 5 feet to cross the land

- 19 -

component on a level of a game provided by game system
101 then the land component of playmat 150 may be 5
feet long.

[0050] Playmats may be distributed with game system
5 101 in kits. In this manner, multiple playmats may be
included in such a kit (e.g., a retail package) that
correspond to different environmental indicia on the
game. So, for example, the kit may include a level 1
playmat and a level 2 playmat. Alternatively, multiple
10 versions of the same playmats may be included of the
same level (e.g., have the same type of indicia), but
may be fabricated in different sizes. Alternatively a
playmat with an adjustable size may be provided.
Alternatively still, a playmat may be provided with
15 multiple different play areas (e.g., one half is used
for level 1, the second half is used for level two)
that can utilize both sides of the mat (e.g., one side
is used for level 1, the second side is used for level
two). By including different playmats, or by defining
20 different playmat areas, a user may use a different
playmat, or playmat area, depending on how much
physical movement is needed to move a virtual game
character. Control of a virtual game character may be
adjustable such that, for example, one mode is provided
25 where a 1 foot movement moves the virtual character 1
pixel while a second mode is provided where a 2 foot
movement moves the character 1 pixel. Playmat 150 may
include apertures 180 such that playmat 150 may be
secured to a surface (e.g., pegged into the ground).
30 Indicia may also be located on the playmat that
corresponds to objects in the game. For example, the
goal of the game may be included as indicia on a
playmat (e.g., indicia 160).

- 20 -

[0051] Some game systems may use a reference location such that a user is requested to return to that reference location before playing, for example, a particular level (e.g., the next level after a level has been completed). Such a reference position may also be included as indicia on the playmat (e.g., indicia 170). Game system 101 may include display 102 for displaying a video game (e.g., displaying a 2-dimensional or 3-dimensional image). Location device 140 (e.g., a positioning system and/or inertial movement sensing system) may control the movement of a video game character in a virtual world. The movement of the video game character in the virtual world may be displayed on display 102. Display 102 may be, for example, a transparent display capable of having virtual indicia displayed selective portions of the display. Thus, a user may look down through display 102 and see playmat 150. Any number of virtual indicia may be, in the example of FROGGER, a frog, a number of moving cars and busses, and a number of moving logs). Thus, the static environment of the video game may not need to be displayed on such a transparent display because indicia representative of this static environment may exist on playmat 150. In this manner, a user may look down through a transparent display and see the portion of playmat 150 that is aligned beneath the transparent display. If virtual indicia is supposed to be in the area of the virtual world that corresponds to the area of playmat 150 being viewed through a transparent display of system 101, then that virtual indicia may be appropriately displayed on the transparent display screen. Persons skilled in the art will appreciate that when a user is looking through a

- 21 -

transparent display toward ground, the visibility of virtual indicia may be limited. Functionality may be provided in game system 101 such that display 102 is a transparent display that can be held up to a user's eyes. Thus, the direction, the location, and the pitch of game system 101 may, for example, be determined and utilized to determine what, and where, virtual indicia are displayed on such a transparent display.

[0052] Persons skilled in the art will appreciate that a head-mounted display (or a display that is held-up to a user's eyes) may be provided with any number of horizontal, vertical, or otherwise aligned two-dimensional images or three-dimensional images. For example, to reduce the complexity of a hand-held game system 101 with the functionality of a hold-to-eye AR system, the virtual indicia may be provided on the display such that the virtual indicia is provided as flat, horizontal two-dimensional images hovering over playmat 150. One advantage of such a two-dimensional example may be that functionally the size of display screen 102 becomes the size of playmat 150 when viewed through display 102 when display 102 is provided as a transparent display operable to display virtual images. Another advantage is that the same processing that is utilized to render a two-dimensional game (e.g., a two-dimensional FROGGER game) may be utilized to render a two-dimensional AR game. Game system 101 may include a clip 111 attached to game system 101 via band 110.

[0053] FIG. 2 shows handheld game system 200 that is fabricated in a shape similar to a virtual character that a user controls by moving game system 200. As illustrated, game system 200 shows the classic game of FROGGER in which the main character is a frog.

- 22 -

Handheld game system 200 is fabricated to resemble a frog, thus adding to the whimsical and festive nature of the functionality of the location-based game.

Characteristics other than the shape may be manipulated to increase the whimsical and festive nature of a game system. The paint scheme of the system may, for example, be associated to the colors of a virtual indicia operable of being provided by the game system.

[0054] FIG. 3 shows one mapping embodiment in which actual playfield 310 may be scaled to virtual playfield 350. The use of a virtual playfield may be utilized, for example, in systems in which movement scaling is desired. In this manner, a user may be provided with the ability to control how far a particular physical movement (e.g., a 1 foot movement) moves a virtual character (e.g., 1 pixel or 2 pixels). The use of a virtual playfield may also be utilized in systems in which multiple players are on the same virtual playfield. Accordingly, location information may be transmitted directly to a second game device or via an intermediary device such as a database (e.g., a database remote from the multiple game devices). Such a database may push information received from one game device to another game device. Alternatively, the gaming device may periodically, or continually, check the database to see if new information is available or what information is available. In order to share information, such as location information, between two or more gaming devices, a security measure may be provided. For example, the user of one gaming device may request that the user of a second gaming device grant permission for the user of the requesting gaming device to retrieve location information of the

- 23 -

requested user's game device from a remote database. The requested user may then use his/her game device to grant permission. Permissions can be granted, for example, for the duration of a particular game between the players, any game between the players for a particular game, any game between the players for any game, a particular length of time (e.g., a day or a week), or a particular time of day (e.g., after-school). Additional parental controls may be provided that allow a third-party to change the permissions of a game device (e.g., such that a child cannot play multiplayer during school hours). The identification of an individual to a game device may, for example, be done via a username and password. A game device may be operable to communicate wirelessly with any number of services. Thus, a parent may go on the internet and contact a server/database that is operable to communicate with a gaming device, identify himself/herself, and change the permissions the child has for using the system. Such a parental control may be operable to prohibit any type of multiple play or games that exceed a particular maturity rating (e.g., a child may be allowed to access everyone games, but not teen or adult games).

25 **[0055]** A parent, the user, or a third-party, may prohibit play within particular areas or may prohibit game information being sent in particular areas. For example, the manufacturer may prohibit the a game system from sending location information to game systems located in different regions such that U.S. players cannot play against Japanese players. Alternatively, the manufacturer may prohibit a U.S. region game to be played on U.S. region system, or any

- 24 -

region system, outside of the U.S. (e.g., in Japan). A game, or game system, may be operable to store a log of game play and a history of where the game device has been located over time. In this manner, games may be
5 fabricated in which the game world corresponds to an actual area of the physical world (such as the planet Earth or New York City). As such, a New York City game may be provided in which you travel New York City playing the game. Accordingly, the game may prompt a
10 player to go to a particular location (e.g., Times Square) to play a mini-game associated to that location (e.g., a Times Square game) in order to obtain a virtual item (e.g., a Times Square T-shirt).

[0056] A location-based game (e.g., an AR game) may
15 have its own virtual currency system such that any user can exchange real money for the virtual currency system, with the game manufacturer taking a percentage cut, and the virtual currency can be used to buy/sell items. A user can be provided with the option to then
20 convert the virtual currency back to real currency (e.g., the U.S. dollar) with the game manufacturer again taking a percentage of the conversion. In this manner, a number of advertising schemes may be provided in a video game, or an augmented application, such as
25 an AR video game. For example, an advertiser may buy advertising space at a particular location. A user may view the location at the particular location. If a user enters a physical store, or a virtual store, associated with the advertisements location then the
30 user may be given a portion of the proceeds of the money collected by the advertiser. Alternatively, an advertiser may designate a maximum amount of advertising money the advertiser is willing to spend

- 25 -

for a particular amount of time and the amount of money the advertiser is desirous of paying for each entering, or qualified, customer. A qualified customer may be, for example, any user that enters the store with a device operable to display/receive the advertisement, any user whose entrance denotes the first known entrance of that user to a particular location, any user whose entrance denotes the first known entrance of that user to a particular chain of stores (e.g., McDonalds), or any user that interacts with the advertisement before entering the store. When a user is determined to be a qualified a user, a percentage of the advertiser's fee for that qualified user may go to the video game manufacturer (or other third-party such a location-based advertisement service) and a percentage of the advertiser's fee for that qualified user may go to the qualified user. Alternatively, for example, the store that gave up its virtual advertising space (e.g., in an AR game where physical locations in the world are a part of gameplay) may get a percentage (e.g., the qualified user's percentage). Thus, a store can virtually advertise to an AR video game (or another location-based service such as an AR information application run on a wearable computer) where third party advertisements are provided by an advertising service. Each store (or chain of stores) may define a particular type of third-party virtual advertisement to be displayed (e.g., sporting good ads) and, for example, a minimum price per qualified customer that needs to be met to provide the third-party advertisement over a default advertisement chosen by the store (e.g., the stores advertisement).

- 26 -

[0057] Location scaling may be advantageously utilized in a number of situations. For example, one player may scale his/her physical movement differently than another player in order to produce a
5 handicap/advantage or to allow for two players to play an AR game that are located on different physical playfields having different sizes. Thus, cousins can play against/with each other in the same virtual environment even though one player is located in a
10 small, fenced-in backyard in Texas while the other player is located in wide, open soccer field in Minnesota.

[0058] Information on the actual playfield and virtual playfield may be stored on the memory of a
15 portable device, an intermediary device, or both. Also, information about the actual playfield may be stored on the portable device while the virtual playfield is stored, for example, on an intermediary device. Information about a playfield may include, for
20 example, the parameters of the playfield, scaling information, and the status of the playfield (e.g., where a particular user is located in an actual playfield and where a user is located in a virtual playfield). The information about a playfield may also
25 include where actual objects are located (e.g., the areas of an actual playfield where impenetrable objects such as house or boulder are located). The information about a playfield may also include where virtual
30 objects are located (e.g., the areas of a virtual playfield where a virtual sword or treasure is located).

[0059] Additionally, actual playfield data may not be stored at all so that only virtual playfield data is

- 27 -

stored (and scaling information to convert the information to information useable on a particular actual playfield). Thus, scaling may be done only at an intermediary device (or other game device) such that the intermediary device (or other game device) scales right before information is transmitted to a game device. Alternatively, scaling may be done at the game system level such that scaled information may be written directly into a virtual playfield (e.g., such that the intermediary device or other game systems do not have any knowledge of how information is scaled). In this manner, a standard type of location information may be used to transmit information between devices. Such a standard may be 10 pixels for 1 foot such that devices only need to transmit data in the standard and the devices themselves can be set to scale the standard location information in any manner without affecting, for example, remote devices. Further still, virtual playfield data may not be stored at all and actual playfield data may be utilized to operate the game. Such playfields may take the form of, for example, a matrix of data, a matrix of vectors, or a matrix of matrices. In one embodiment, each matrix location may correspond to a pixel or a group of pixels (or a location or a group of locations). A user's location (and/or the location of game characters or game objects) may be stored in such matrices and utilized to operate the game.

[0060] Suppose a game system is configured such that recognition of movement along actual playfield 310 is recognized by moving through areas that are 1 foot by 1 foot. Suppose a virtual playfield 350 operates under a similar scheme only that the recognition of movement

- 28 -

along the virtual playfield is recognized as movement through areas that are .5 foot by .5 foot area. Gameplay between two players located in two different playfields (both of which could be actual or virtual) may occur by simply transmitting the number of location areas that a particular player has traveled through (e.g., player 1 travels vertically two area locations). Such a number may be scaled such that the user's actual movement of 5 location areas (e.g., 5 feet) is transmitted to the process controlling virtual playfield as 10 location areas (e.g., 10 feet). As stated above, each system and/or intermediary may have its own virtual playfield for a one or multiplayer game. Persons skilled in the art will appreciate that a two player game may be provided on a single game system. Particularly, a number of wireless controllers may be provided. A user can set up how much movement of a controller in an actual world would be required to move a virtual character a particular distance in a virtual world. Thus, a user can control the speed of his/her virtual character compared to other users.

[0061] A user therefore may start at origin 0 (noted on actual playfield 310 as position 10, 5 or information/location 301) and move up 3 feet and to the left 1 foot to be at location L (noted on actual playfield 310 as position 7, 4 or information/location 302). In this manner, data may be stored on a matrix (or other data structure such as a database accessed by a memory pointer) corresponding to an actual playfield location (e.g., matrix location 7, 4). Actual playfield data (such as actual location information) may then be scaled and stored on a second playfield data structure (e.g., as location 14, 8 on a second

- 29 -

matrix) such that, for example, a scaling functionality can be provided. Generally, locations on different playfields are scaled according to a relationship between the structure of the two playfields. Multiple
5 types of information can be written to a matrix such as a matrix for a virtual playfield. For example, a player identifier and scaling information may be stored in a matrix location. Persons skilled in the art will appreciate that the location of a user can also be
10 stored in data structures as location information or the location can be determined based on where non-location information is stored in a storage structure (e.g., where in a matrix a players identification information is stored). Information about virtual
15 indicia such as virtual characters and objects may also be stored in such a virtual playfield.

[0062] A playfield may also have event data (such as data E at location 1, 6 on playfield 310 or information/location 303). Event data may trigger an
20 action if someone occurs at that event location, in relation to that event location, or in relation to the event data. For example, event data may be configured such that if a user (e.g., a manually controlled virtual character) enters location storing event
25 data E, or location 303, an event occurs (e.g., the level is completed or the game develops in a particular way). As per another example, event data may be configured such that if a user accomplishes a goal (e.g., shoots a rocket-propelled grenade at the
30 location and the rocket-propelled grenade hits, or enters the location, then the event data may change the characteristics of the location such that an

- 30 -

impenetrable location becomes an accessible via an access pathway).

[0063] A processor may move, operate, the virtual objects in such a virtual playfield according to code
5 representative of the game. Code representative of the game can take account of particular situations such as, when example, a computer-controlled video game character nears, or enters the location of, a player-controlled video game character. The code can use this
10 information and other information (e.g., additional manual control information from a player such as the status of ATTACK and DEFEND buttons) to determine what happens to the manually or computer-controlled game character on the virtual playfield. Thus, the video
15 game can, for example, be executed on the system(s) housing the virtual playfield. If, for example, the virtual playfield is located on a remote system such as a remote database (or a game system remote from head-mounted displays) each separate gaming device, or head-
20 mounted displays, may only need to have the ability to receive and display video/sound representative of the video game environment and send location and control information to the system playing the video-game. Such an embodiment provides light-weight and inexpensive
25 head-mounted displays or game devices and may not need to store an actual playfield. Such devices can transmit location and control information scaled to a standard format (e.g., 0.5 foot movements) as well as other information such as the direction the user is
30 facing, the perspective of the user (e.g., how the user's head is tilted such as the pitch and roll of the head) and the status of any additional buttons. Persons skilled in the art will appreciate that sensors

- 31 -

can be utilized to determine the pitch, yaw, or roll of a device such as a head-mounted display and such information may be utilized by an AR game system (e.g., utilized to select and display virtual indicia on a virtual display).

5 **[0064]** In a dedicated single player game with no scaling capabilities, for example, actual playfield matrix 310 (or a playfield matrix) may be utilized to store location information and operate the game. As a result, the actual playfield matrix 310 may be visualized as a virtual playfield matrix. In this manner, a processor may periodically (or in real time) update the location of game objects or the status of the game (e.g., environment objects, enemy objects, and interactive objects) based on particular characteristics of the game. For example, if, for any period or at any time, a user's location corresponds to the location of an end object (as stored in actual matrix 310) then the game may determine that the game has ended and display associated graphics to the user by way of a display.

15 **[0065]** In a multiplayer game with two portable systems and a remote intermediary, the intermediary may, for example, utilize playfield matrix 350 to update game locations while the individual systems use different playfield matrices. One portable system may, for example, have a playfield matrix similar to playfield matrix 310. The other portable system may have, for example, a playfield matrix similar to playfield matrix 350. As a result, even though data is handled at a different scale on each portable system, the data is scaled to the same matrix (e.g., the same virtual playfield). Thus, the two portable systems may

- 32 -

easily play with each other - even if the two portable systems are using completely different playfields of different sizes (e.g., one player is playing on a basketball court in Japan while a second player is playing in his/her backyard in the USA). Such players may chose an actual playfield dimension from a variety of dimensions (e.g., 10 feet by 10 feet or 20 feet by 20 feet) and information may be stored according to these dimensions and transmitted to an intermediary (e.g., a database stored on a remote database). Information may be transmitted periodically or in real time. Information may be received periodically or in real time (in order to, for example, obtain opponent player information). Transmissions may alternatively occur when information changes. The portable systems may be in charge of transmitting/receiving. The intermediary (or intermediaries) may be in charge of transmitting/receiving. Or, for example, the portable system may be in charge of transmitting information when that portable system's location changes and the intermediary may be in charge of transmitting information (e.g., when the portable system receives information) when the opponent player's (or any one of multiple opponent players) location changes or a game characteristic changes (e.g., the location of a virtual game character not associated to an actual user changes).

[0066] FIG. 4 shows semi-visible display 451 in which an AR game is provided. Landscape detector 451 may be provided in such a system such that the location of actual environmental objects may be determined and utilized in the game. In environment 410, environmental objects 411 and 412 are present.

- 33 -

Accordingly, landscape detector may determine the location of environmental objects 411 and 412 and record this location in memory (e.g., in a remote or local playfield matrix or data structure). The game
5 may be then utilize such environmental objects to change the characteristics of the game (e.g., where virtual game characters not associated to actual users may move in a virtual environment). Thus, computer-controlled characters may not be able to move into
10 areas with such environmental objects and the movement profiles of a computer-controlled character may change as a result of the environmental object. As such, a default traveling route that a computer-controlled character is coded to travel (or a default behavior
15 that a character is coded with) may be changed due to an environmental object.

[0067] Landscape detector 451 may take multiple forms. For example, landscape detector 451 may measure the distance to objects and the shape of the object.
20 This may be done for example by sound/light sensing (e.g., reflective sensing such as sound/light echoing or color sensing with respect to light source) or any type of object/distance sensing (e.g., infrared). A camera may be utilized to take a picture/video of the
25 environment. Video processing features may be utilized to determine landscape as, for example, a user moves around the landscape. Such determined landscape may be stored in the game system (or a remote system) and utilized to determine where to place virtual images on
30 a display (e.g., a head-mounted display) based on the alignment of that display to the actual environment.
~ Landscape sensing may be done throughout game play or at set times (e.g., before a game is started or

- 34 -

periodically). Such information may be stored in memory as part of an environment profile and associated with location information such as global information such that the environmental profile may be utilized
5 whenever that user plays in that environment (e.g., at a particular longitude and latitude coordinate).

[0068] Alternatively still, environmental data may be coded directly into the game. For example, if the military desires an AR system for special operations
10 warfare then a particular field may be utilized for game play. That particular field may include environmental objects and the location and size of these environmental objects may be coded directly into the system (e.g., on a playfield matrix or data
15 structure). Virtual interfaces may help code such data by allowing a user to, for example, pick shapes and place them on a virtual playfield and manipulate the shapes until they correspond to actual shapes on an actual playfield. In this manner, functionality may
20 also be added to objects. For example, if the object is a house, the object may be coded as hollow and may allow a user to pass through a particular portion of the object (e.g., the portion that correlates to a doorway) but not other portions of the object (e.g.,
25 the portion that correlates to wall). Virtual objects generated by a Location-Based (LB) or AR game (or other AR or LB service) that do not correspond to actual objects may operate in a similar manner (such that if a user tries to pass through a wall his/her perspective
30 does not change). This may be an advantage over scanning techniques because scanning techniques may denote the object as solid if the door is closed when scanning occurs.

- 35 -

[0069] As a result of system 400, virtual characters may be displayed on display 452 and augmented over reality. Using the above example, computer controlled enemy soldiers may be played in the house and may have the functionality of only being able to move inside of the house (manually controlled enemy soldiers may similarly be restrained from moving out of the house). Therefore, U.S. soldiers using augmented reality system 400 may be able to train with highly skilled virtual combatants in real environments. Such combatants may also be controlled remotely by other users (e.g., instructors) operating in a similarly sized real building on a different field. In this manner, live rounds may be used in a safe environment (if, for example, only 1 person is playing in each actual environment). Sensors may be placed on a physical door to the building to determine whether the door is OPEN or CLOSED. Alternatively, the landscape detector may be configured to recognize open doors or the AR system may determine that an access pathway is available in a real world once a user enters into such an access pathway (e.g., a location the game system thinks is blocked may be changed to unblocked after a game system moves into the location). Thus, the status of an actual, physical object (e.g., a door) may affect the game. Using the above examples, enemy soldiers may be able to move out of the building once an access pathway is created that leads into the house (e.g., where computer controlled characters, or other indicia can only leave through such access pathways or other exits). Access pathways may also be created in virtual objects not present in the physical, actual world. For example, a virtual house, or other object, may be

- 36 -

augmented over a user's environment. If a user tries to pass through the object improperly (e.g., without opening a door or performing another action such as blowing a hole in the virtual object), the user may be able to walk forward in his/her physical environment, but the augmented reality perspective/scene provided to the user may not change. Actions (e.g., solutions) may be stored in the game that, when triggered, create an access pathway in a virtual object. Such an action may be, for example, pressing an OPEN button, or performing an OPEN function, on a virtual door, blowing a hole into a virtual wall via a gun or bomb, placing a virtual key (e.g., a virtual key obtained earlier in a game) near the virtual door or a virtual keyhole associated to a door, properly using an alphanumeric virtual access pad on the alphanumeric door, or getting past a particular stage in the game (e.g., lighting a computer-controlled virtual game character on fire so that the virtual game character crashes through the door).

[0070] Device 400 may have any component of a location-base game including, for example, positioning systems (e.g., GPS systems) and movement sensors (e.g., accelerometers and/or gyroscopes). Furthermore, additional sensors may be utilized to determine pitch that the head-mounted display is pointed, the height of the head-mounted display, the roll of the head-mounted display, and the direction that the head-mounted display is pointed. The perspective of virtual game characters may be, for example, determined by such pitch, height, roll, direction, and location information.

- 37 -

[0071] FIG. 500 shows virtual environments 501 and 550 that may be rendered using actual environment data may be used in, for example, a location-based game (e.g., an AR game) in a variety of different ways.

5 Persons skilled in the art will appreciate that environments of a figure (e.g., such as environments 501 and 550) may also be considered playfields (e.g., virtual game playfields) or may be virtual indicia (e.g., virtual game objects and characters) augmented over actual, physical environments.

[0072] In one methodology, actual, physical objects are scanned in by a landscape detector (or manually entered) may be virtualized as virtual objects in the video game. Thus, information regarding actual, physical environmental objects may be saved on a virtual playfield that stores information for a game such as a game matrix/database or other data structure. Persons skilled in the art will appreciate that such virtual objects may be displayed to a user or may be used only as game information that game code uses to execute a game. In an example where virtual environmental objects are displayed back to a user that has associated physical environmental objects in his/her view, the virtual environmental objects may be augmented to replace, or lay over, the physical, objects. Such a technique may be utilized to provide a more seamless execution of an AR game as virtual characters may be aligned with the virtual objects. Thus, if the game becomes misaligned to the landscape on a display (e.g., a semi-visible head-mounted display), the characters may still be aligned with the virtual environmental objects and the misalignment may not be noticed. Also, physical objects may be

- 38 -

recognized as described above, their appearance manipulated, and then used to augment a viewer's perspective of the actual environmental object. For example, suppose a game has a number of immobile, non-hollow objects (e.g., crashed spaceships, dead dinosaurs, gigantic trees), the size of scanned in environmental objects (e.g., houses, boulders, trees) may be compared to the size of the game objects. Objects that are close in size to an environmental objects may be rendered in the location of the actual, physical environmental object until, for example, all of the actual, physical environmental objects have been augmented with environmental game objects. Such a feature may increase the available area of a playfield that a user may walk to. Such a feature may make playing the same game in different playfields appear different as virtual environmental objects are placed differently in the different playfields. Such a difference may result in a difference in the difficulty of the game.

[0073] In environment 501, environmental objects 511 and 512 may be virtualized as a 2-D object in a 3-D space. Alternatively, as shown in environment 550, environmental objects 511 and 512 are virtualized as 3-D objects in a 3-D space (e.g., either by 3-D objects or 2-D objects that define the perimeter of the 3-D object. If the environmental sensor can only sense the distance to an object and, for example, the 2-D size of the object then program logic may be provided to generate a 3-D image from the sensed 2-D image. For example, program logic may assume that a 2-foot tall and 2-foot wide 2-D object is 2-feet deep and, in this manner, may determine depth information based on height

- 39 -

and width information. Such depth information may be updated as more information is gathered (e.g., as a user walks to a point where the depth of the object may be sensed). Persons skilled in the art will appreciate that two still images of an object taken from different perspectives may be utilized to determine additional dimensions of an object when compared to when only a single image is evaluated. Thus, the information on the actual environment may be ever-changing and utilized continually, or periodically, by the game system.

[0074] In another methodology, virtual environmental data may be utilized to display virtual environments on areas of the head-mounted display (or other display). This can provide numerous functionalities. For example, if two players play on different field with different objects, virtual objects from an opponents field may be generated on a user's field such that both opponents have the same type of area to play in. Each user may then not be able to move into environmental objects from other player's environments. Alternatively still, the location of actual environmental objects may determine the placement of, for example, non-interactive and/or impenetrable virtual objects. For example, if an augmented reality game has an item shop, that item shop may be overlaid over a large actual environmental object (e.g., a wall) such that the user's "free space" is maximized.

[0075] FIG. 6 shows virtual character movement between environmental objects in environments 610 and 600. Persons skilled in the art will appreciate that environments of a figure (e.g., such as environments 610 and 600) may also be considered playfields (e.g.,

- 40 -

virtual game playfields) or may be virtual indicia (e.g., virtual game objects and characters) augmented over actual, physical environments. In environment 601, no environmental objects may be present.

5 Therefore, logic may be provided such that virtual character 610 moves along path 611 while virtual character 620 moves along path 621. In environment 650, actual environmental object may be present and stored in memory as virtual objects 651 and 652.

10 Alternatively, no actual environmental objects may have been scanned but virtual objects may otherwise be provided at the locations of virtual objects 651 and 652 (e.g., may be originally coded into a game's code or intelligently placed at the locations based on the

15 actual environment). If the stored location of virtual objects 651 impedes on the planned movement of virtual characters, then program logic (e.g., game code) may manipulate the movement path of virtual characters around these virtual objects. If the movement path is

20 dynamic (e.g., not laid out) then such virtual environment locations may not be "moved into" by a dynamic virtual character. Persons skilled in the art will appreciate that a number of intelligent placement features of virtual objects/characters may be provided.

25 For example, a virtual object/character may be placed in the middle of a particular open space to maximize the change of the virtual object/character coming within a particular distance of a user (e.g., to maximize the virtual object/character's field of vision

30 on the virtual playfield). Alternatively, virtual objects/characters may be played in locations determined to be strategically advantageous. For example, if there is only a single entrance to a

- 41 -

playfield or playfield area (e.g., a doorway to a room) then virtual objects/characters can be spread about either behind virtual objects placed in the playfield (from the perspective someone standing in the door) or
5 placed such that multiple objects/characters have different perspective angles to the door (e.g., such that virtual enemy soldiers can cover the doorway from different angles). Thus, cooperative defensive and offensive tactics may be used by the virtual game
10 objects/characters.

[0076] Visibility of virtual objects/characters may be set and modified for a head-set augmented reality system. For example, a user may define a virtual visibility of 100 feet. Virtual barriers may then be
15 provided (e.g., rendered and augmented on a display) at this proximity (or at predefined boundaries) to immerse the user in the augmented world. For example, if a child is playing in a city, then the visual barriers may take the form of fog and this may hide any
20 skyscrapers that may take away from the believability of the augmented reality.

[0077] FIG. 7 shows a playfield data structure in which environmental object data 701 (e.g., barrier information data) may be stored. Such a playfield data
25 structure may be used as the primary information structure for the game such that program logic refers to information in the playfield structure to determine game events (e.g., point scoring, deaths, level completions).

30 **[0078]** FIG. 8 shows expanded virtual character information (shows as information C 802 and information Cc 801) stored in a playfield data structure. If a character takes up more than one pixel (or more than

- 42 -

one data block if data blocks are associated with size) then one of the data locations may be the controlling location Cc. Thus, program logic may just move the controlling character information data Cc and then this
5 controlling character information may be utilized to generate surrounding character information (e.g., C). Any sort of character information may be associated to, for example, a control location or any character information. For example, the distance a computer-
10 controlled virtual character can see (e.g., the distance at which the character can read information on a virtual playfield) can be associated to the control information (e.g., the control location) for that character. As per another example, the distance a
15 character can use a particular attack (e.g., project a projective using sling-shot versus shooting a bullet out of a gun) can be related, in a game's code) the control information (e.g., the control location) for that character.

20 **[0079]** FIG. 9 shows possible data structures that may be utilized for a playfield data structure. Matrix of pointers 910, matrix of descriptors 920, matrix of vectors 930, or matrix of tables/matrices 940 may be utilized. Matrix of pointers 910 may be, for example,
25 pointers that point to memory locations in which a large amount of information is stored (e.g., in which a vector of information is stored). Matrix of descriptors 920 may be, for example, a matrix of the information needed for a particular playfield location.
30 Matrix of vectors 930 may have one or more matrix locations associated to one or more playfield locations and may include complex information in any form (e.g., vector form or table form as shown in matrix of tables

- 43 -

940). Any data structures such as any type of database may be utilized or, alternatively, actions and information may be written as additional code into a games code or, alternatively still, used by a games code as code updates.

5 **[0080]** FIG. 10 shows virtual characters 1010 and 1060 generated on display screens 1001 and 1051. Depending on the distance of virtual characters (either controlled by an opponent or computer controlled) from the display (or locating device on the system), the size of virtual characters that are shown may be manipulated. In this manner, a user is provided augmented reality indicia that is scaled to the perspective of that user (e.g., height, pitch, roll, distance and location of the perspective). As such a true three-dimensional virtual object/character can be provided whose size scales according to the height, pitch, roll, distance, and location of the perspective to the virtual object/character (e.g., the perspective of a user).

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25 **[0081]** Logic may be included such that virtual characters (either controlled by an opponent or computer controlled) are transparent (e.g., virtual object/character 1160 of environment 1150 of FIG. 11) or non-transparent (e.g., virtual object/character 1110 of environment 1101 of FIG. 11). A user may be able to manually control the transparency or the contrast of indicia that is being displayed. Transparent objects may offer the additional functionality of making the environment safer to move in. For example, a user may trip over a rock if that user is in an "invincible mode" and runs through a virtual character and that character covers the rock by being non-transparent. A

30

- 44 -

user is less likely to trip over a rock if that user can see the rock, in some form, through a character. The transparency of a character may also change depending on the user's distance from that character.

5 For example, far-away characters may be semi-transparent (noting they can't interact with you yet such as they can't shoot you yet) while characters that you are sharing a location with are almost entirely-transparent. Persons skilled in the art will
10 appreciate that the transparency of a virtual object may be changed by, for example, changing the number of pixels that define an image are displayed. The smaller amount of pixels that are used to depict a character that are used, the more transparent a character (or
15 virtual object) may become.

[0082] Virtual characters (either opponent-controlled or computer controlled) may have certain functionalities that have certain functionality envelopes. For example, a virtual controlled character
20 may have an interactive object like a weapon (e.g., a gun) that may shoot an interactive bullet over a particular distance. Such envelopes may take any form. For example, if a virtual character has a force field then the force field may be mapped around, for example,
25 a controlling location a particular distance. Thus, an event may occur if a different character (such as a user-operated character) walks into this envelope (e.g., the user's health may decrease).

[0083] As illustrated in FIG. 1200, such envelopes
30 may be utilized to determine how far a virtual character may see. For example, one character (e.g., information C1 1201) may only see in the direction that character is facing (e.g., information S1 1202). A

- 45 -

second character may see in a particular direction around that character (e.g., information S2 1203). These envelopes may overlap (e.g., information S3 1204) such that if a user walks into S1, C1 can attack (or
5 some other functionality may be utilized by the game). If a user walks into S2, C2 can attack (or some other functionality may be utilized by the game). If a user walks into S3, C1 and C2 can attack (or some other functionality may be utilized by the game).

10 **[0084]** FIG. 13 shows system 1300 in which sections of an actual playfield are scanned in before gameplay begins. Such scanning may be utilized from the perimeter of an area (or multiple perimeters). Alternatively, the game may be fabricated to utilize
15 scanning from the center of an area and the user may be directed to rotate at a particular speed for a particular period of time (or until a particular number of rotations have occurred). Alternatively, a virtual configuration indicia (e.g., a virtual character) may
20 be displayed on a display (e.g., a user's head-mounted display during set up). Manual controls may allow a user to change the location of the configuration indicia and acknowledge when desired configuration is obtained. Thus, a user may look at a particular
25 portion of an actual playfield, move his/her head up and down, and continually change and acknowledge the location of the virtual indicia so that the virtual indicia is aligned with the landscape (e.g., is standing on the landscape). The game code (e.g., the
30 code aligning the image on the display) may be dynamically updated such that as a user moves his/her head, the perspective to the virtual indicia changes and a user can change any misalignment that occurs at

- 46 -

any perspective and such misalignment errors may be used to update the game's code (or rendering/alignment code). Manually entered acknowledgment information for alignment via manual controls may be utilized to
5 generate a representation of the physical landscape a user is playing the game on. Thus, actual, physical environmental data can either be, for example, scanned by a location detector prior to a game (or during a game), built using a computer administration interface,
10 or manually entered on the fly via configuration and acknowledgment controls.

[0085] FIG. 14 shows game system 1401 and network topology 1450.

[0086] Game system 1401 may include, for example,
15 any number of power sources 1420, output devices 1425, memory 1430, connection terminal (e.g., input, output interfaces) 1435, additional components 1440, location devices (e.g., GPS, LPS, accelerometers, gyroscopes, inertial movement sensors, hybrid location systems)
20 1445, manual input controls 1450, wireless transmitters and receivers 1455 and other communication transmitters and receivers (e.g., blue tooth, WiFi, wireless LAN, infrared, radio), landscape device 1465.

[0087] Topology 1450 may include remote facilities
25 such as content or administrator facilities 1480 with intermediaries such as remote databases 1481 (or content providers), network 1451 (e.g., a wireless network such as a wireless LAN based network).

Internet portals 1461 and 1471 may also be provided
30 such that information may be published and downloaded from web-based game systems (e.g., via cellular phone game systems). Portable gaming devices 1460 (e.g., handheld device 100 of FIG. 1 or head-mounted device

- 47 -

452 of FIG. 2 or a cell phone) may be utilized as game systems. Alternatively, stationary devices (e.g., home game systems) may be utilized to generate virtual game characters on an augmented reality system. As
5 mentioned, wireless phones may include location devices such that wireless phones may, for example, download program logic and be utilized a location-based game systems or as control devices for augmented reality game systems. Any third-party service may be utilized
10 by an AR game system (or an AR wearable computer). For example, cell phone, or another wireless communication service, may be provided to an AR device. Location security services (e.g., permission control services or encryption/compression services) may also be utilized
15 by an AR system.

[0088] Persons skilled in the art will also appreciate that the present invention is not limited to only the embodiments described. Instead, the present invention more generally involves providing location-
20 based games and AR systems. Persons skilled in the art will also appreciate that the apparatus of the present invention may be implemented in other ways than those described herein. For example, the AR capabilities may be utilized for AR advertising in which advertisement
25 signs are provided outside of certain locations (e.g., outside a GPS signal that denotes you are near a GAP clothing store). Such an advertisement may be positioned, for example, based on a landscape detector, perspective determining devices, or particular
30 locations. All such modifications are within the scope of the present invention, which is limited only by the claims that follow.

- 48 -

What is Claimed is:

1. An augmented reality game system comprising:

a head-mounted display operable to overlay virtual indicia onto a physical playfield;

5 memory comprising video game logic operable to provide a video game;

a processor for utilizing said video game logic to provide video game indicia to said head-mounted display based on said video game logic, wherein
10 said processor is coupled to said memory and said head-mounted display;

a detector for determining landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape
15 characteristics in providing said video game; and

a locating device operable to determine the physical location of said locating device on the physical playfield, wherein said video game logic utilizes the physical location of said locating device
20 in providing said video game.

2. A location-based game system comprising:
memory comprising video game logic for providing a video game;

a processor operable to utilize said
5 video game logic to provide said video game;

at least one manual control;

a locating device operable to determine the physical location of said locating device on a physical playfield; and

- 49 -

10 a switch that determines whether said at
least one manual control or said locating device
determines the location of a video game character in
said video game.

3. A location-based game system for
providing a video game comprising:

 a handheld game device comprising:

 a locating device operable to
5 determine a physical location for said locating device,
wherein said physical location determines a virtual
location for a virtual game character in a virtual
playfield of said video game; and

 a playmat having indicia representative
10 of said virtual playfield comprising:

 a length L, wherein said length L
is utilized by said video game;

 a width W, wherein said length W is
utilized by said video game.

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LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

Abstract of the Disclosure

Handheld location based games are provided in which a user's physical location correlates to the
5 virtual location of a virtual character on a virtual playfield.

Augmented Reality (AR) systems are provided in which video game indicia are overlaid onto a user's physical environment. A landscape detector is provided
10 that may obtain information about the user's landscape, in addition to the user's location, in order to provide overlaying information to an AR head-mounted display and control information to non-user controlled video game characters.

1/14
100

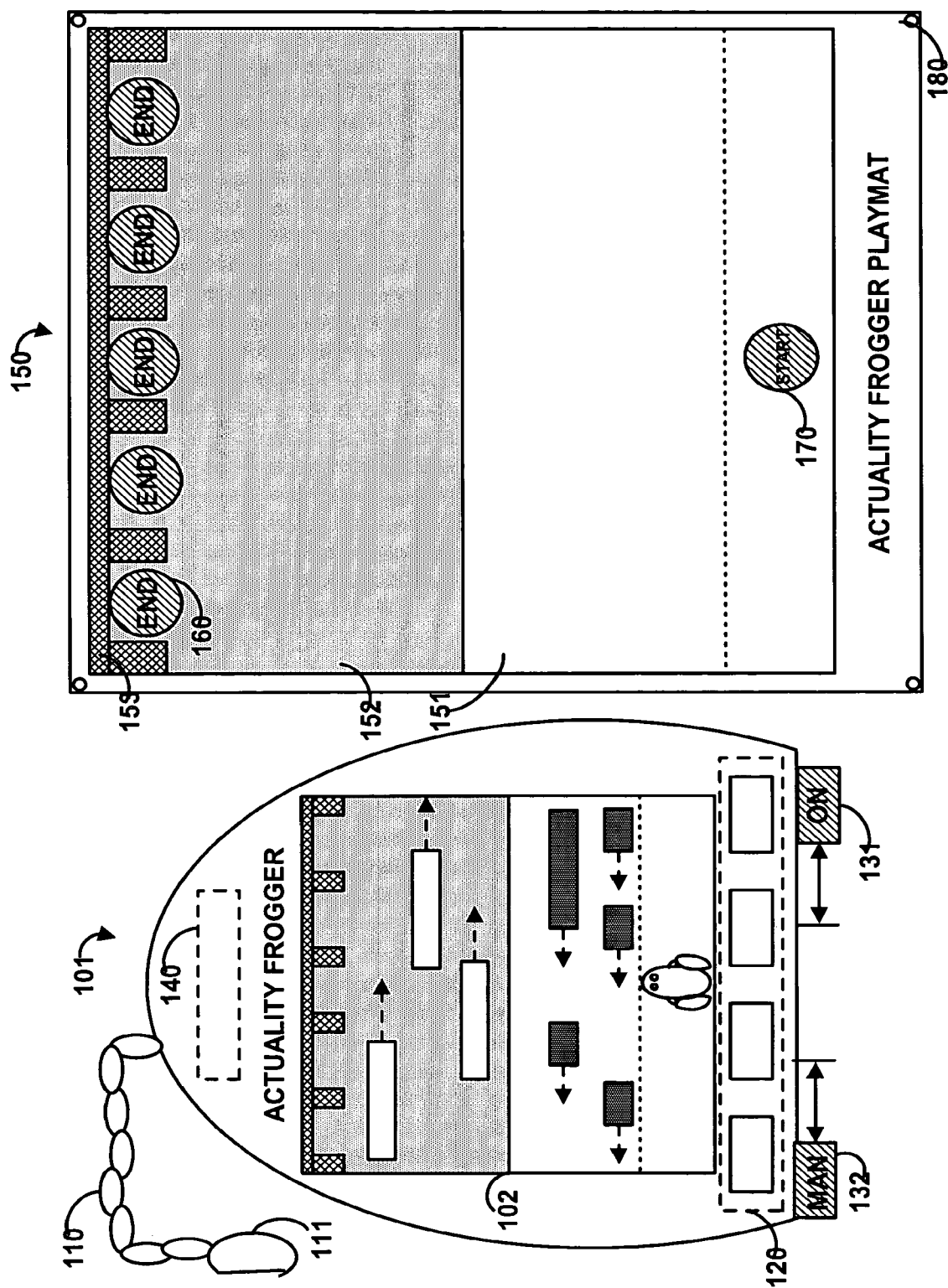


FIG. 1

2/14
200

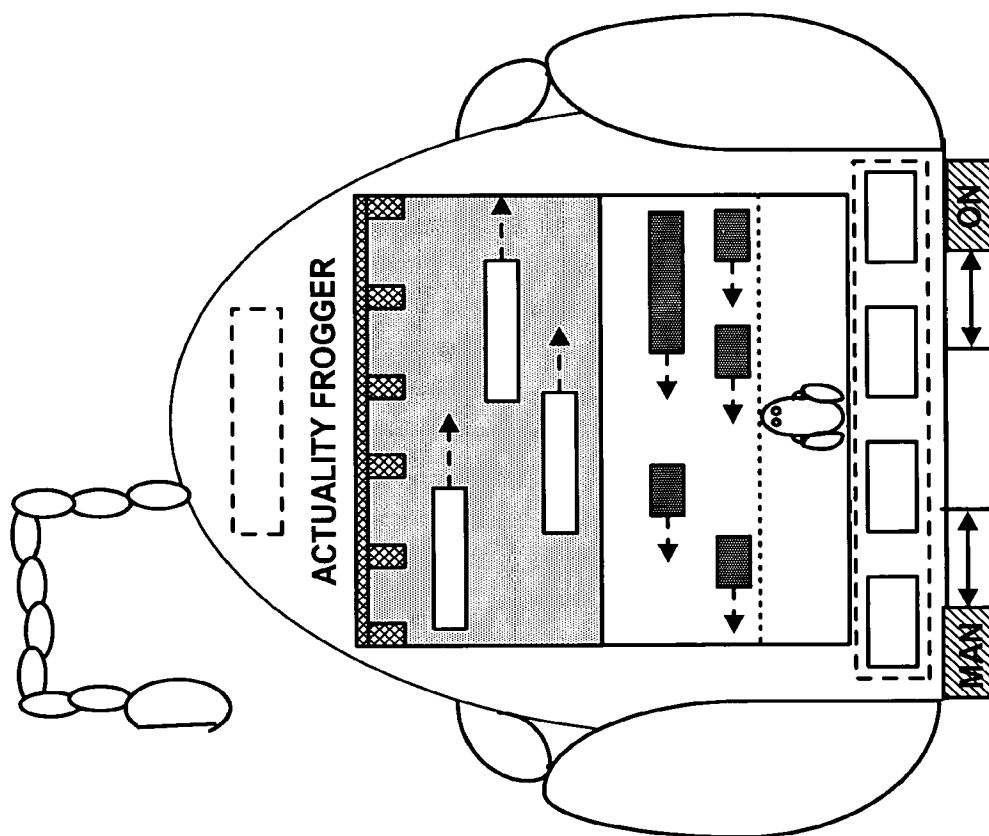


FIG. 2

3/14
300

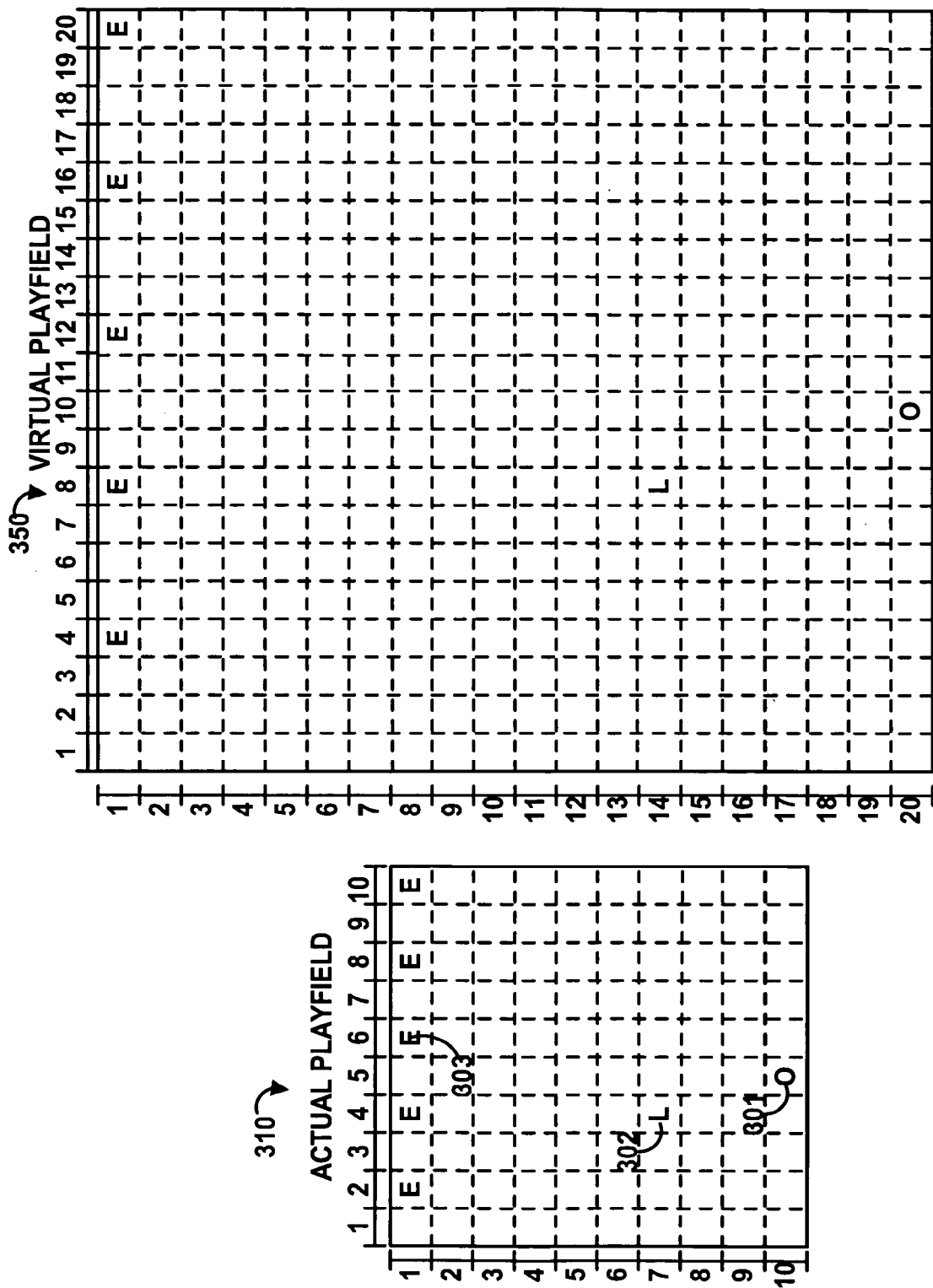


FIG. 3

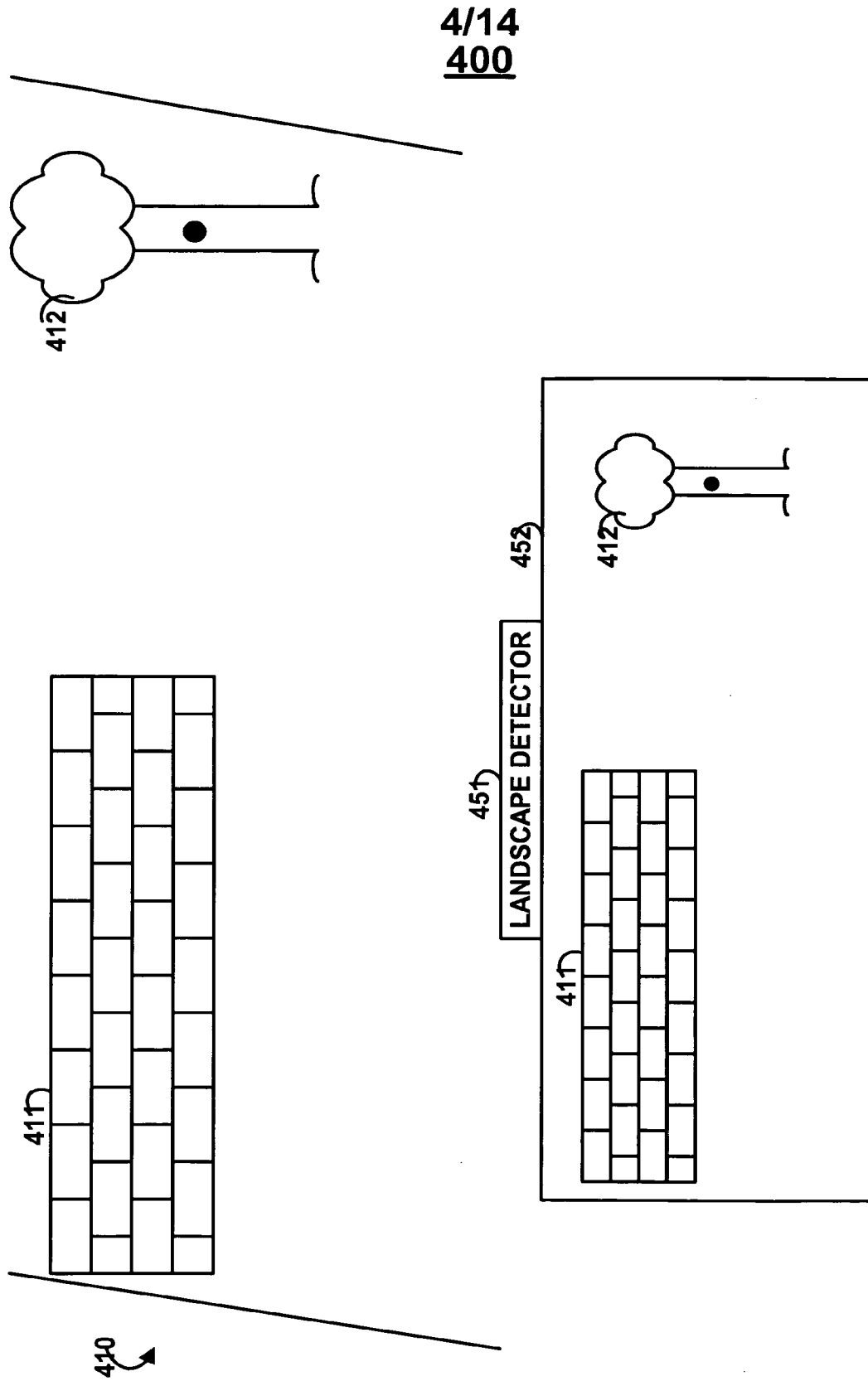


FIG. 4

5/14
500

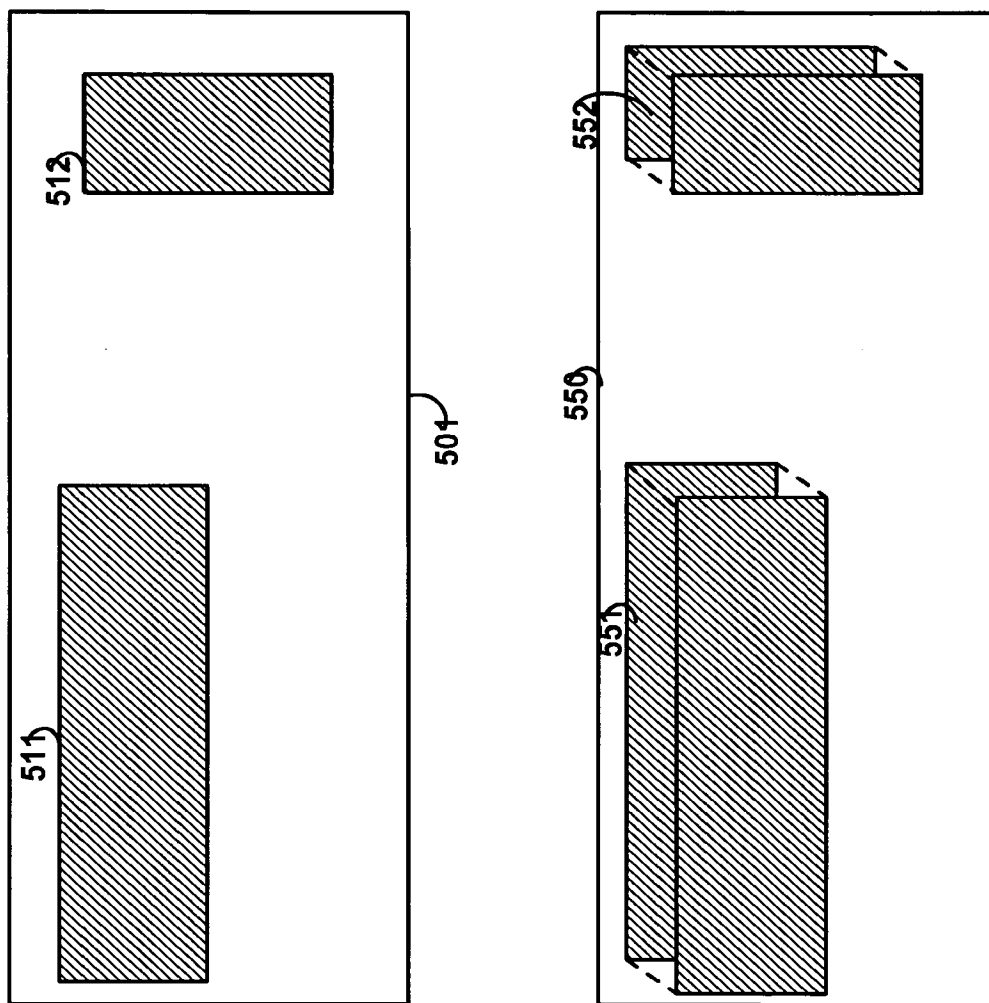


FIG. 5

6/14
600

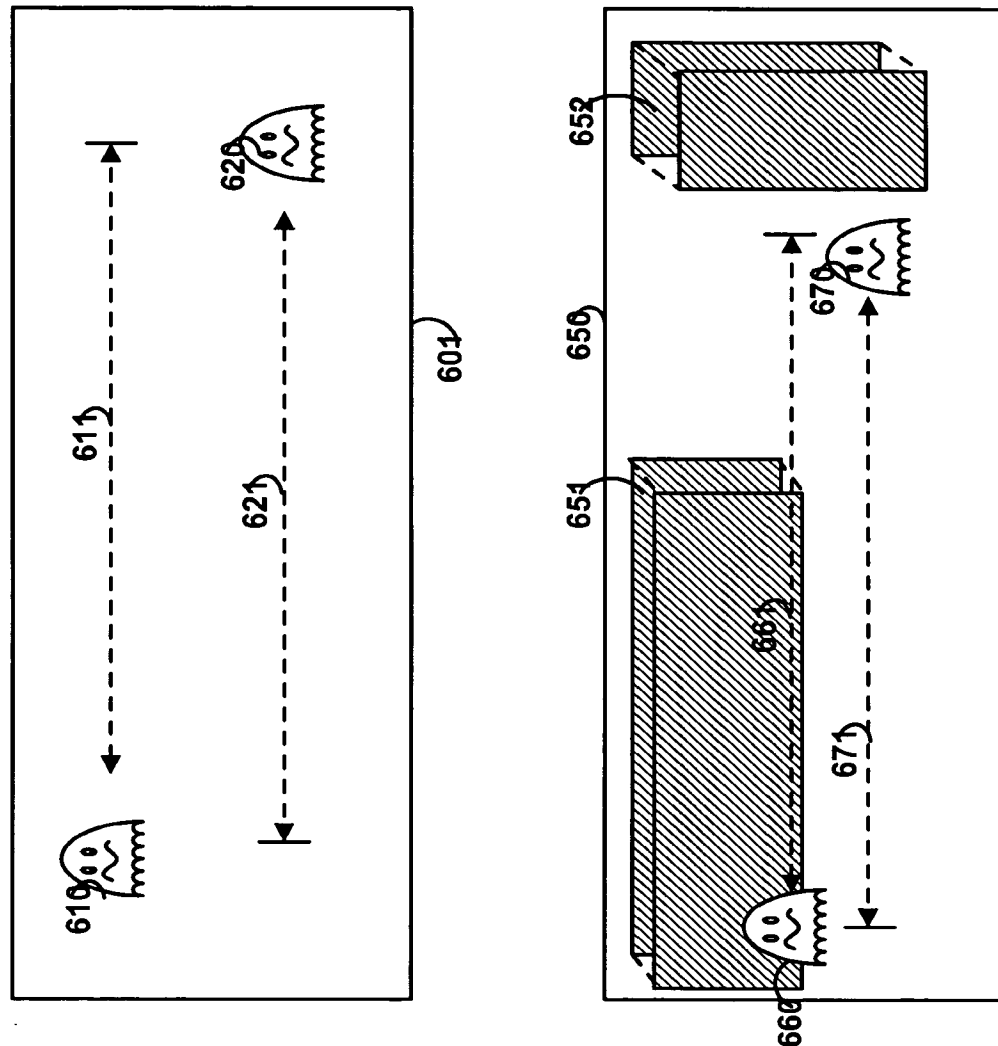


FIG. 6

7/14
700

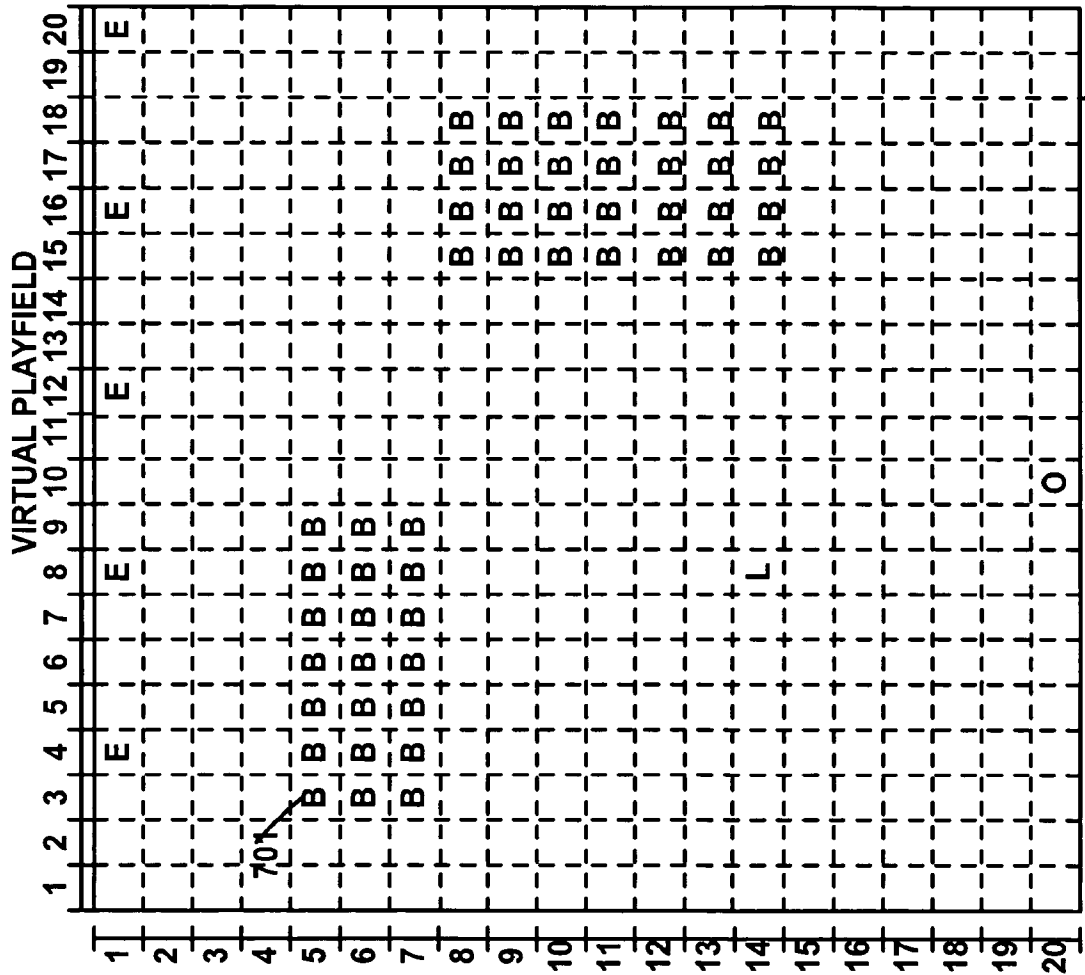


FIG. 7

8/14
800

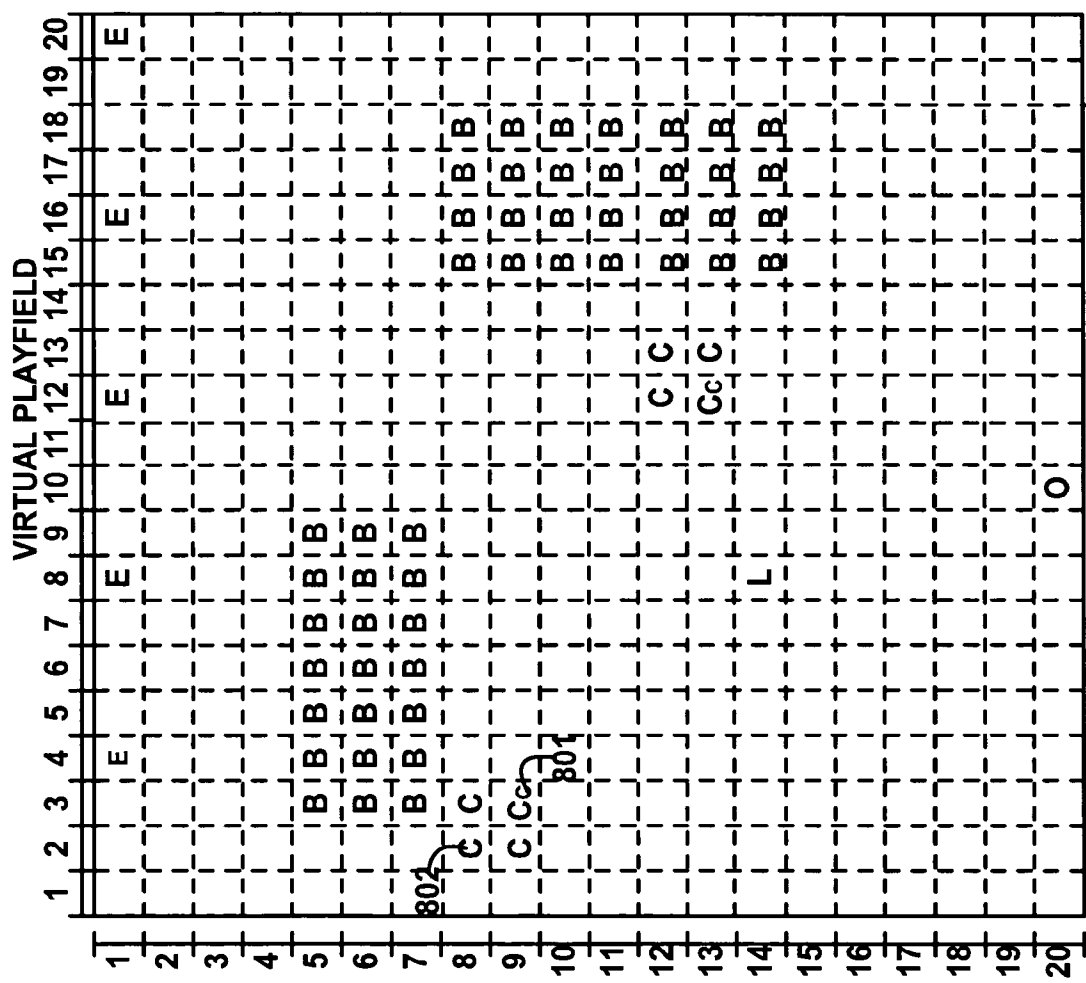
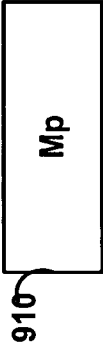


FIG. 8

MATRIX OF POINTERS (E.G., POINTER FOR MEMORY LOCATION ASSOCIATED TO POSITION X, Y or X,Y,Z)



MATRIX OF DESCRIPTOR/INFORMATION (E.G., DESCRIPTOR/INFORMATION FOR POSITION X, Y or X,Y,Z)



930

MATRIX OF VECTORS (VECTOR FOR POSITION X, Y or X,Y,Z)

V1	V2	V3	V4	V5
----	----	----	----	----

9/14
900

940

MATRIX OF TABLES (TABLE FOR POSITION X, Y or X,Y,Z)

T1	T2	T3	T4	T5
----	----	----	----	----

FIG. 9

10/14
1000

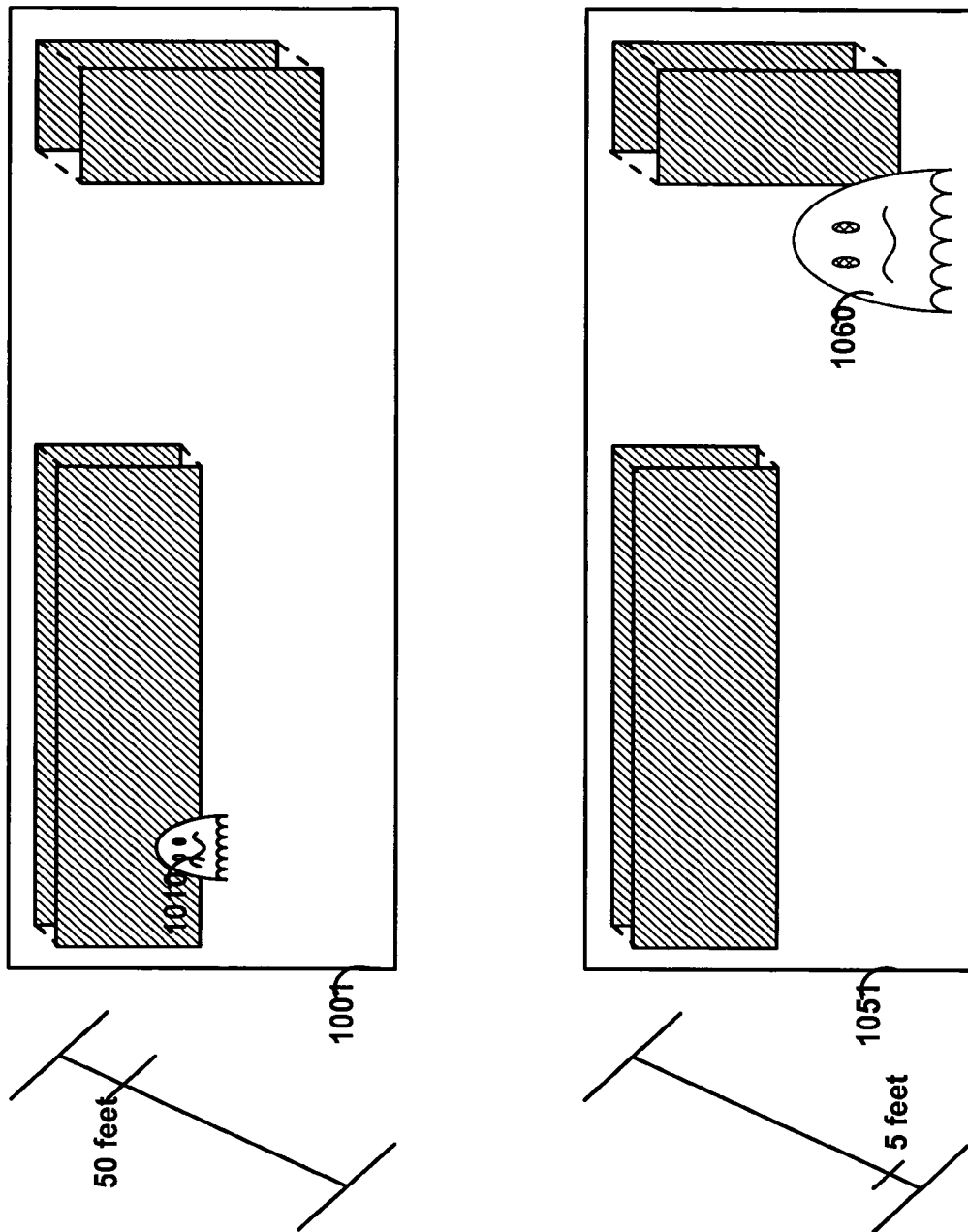


FIG. 10

11/14
1100

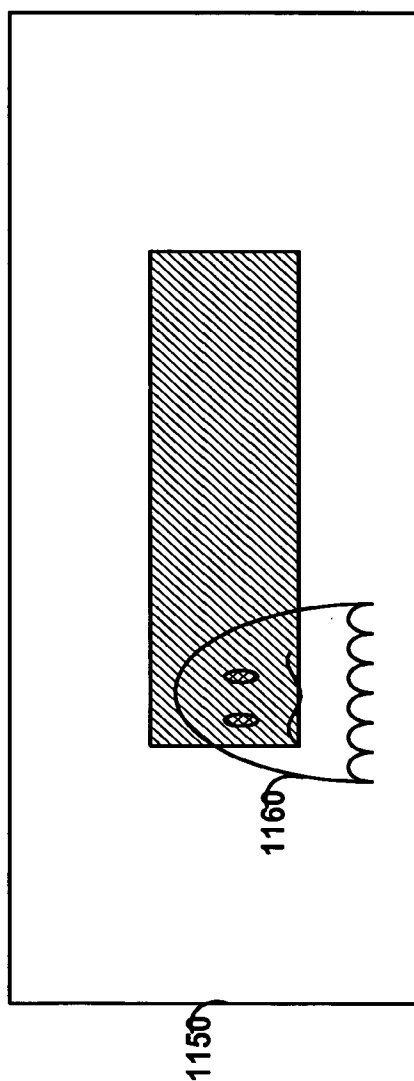
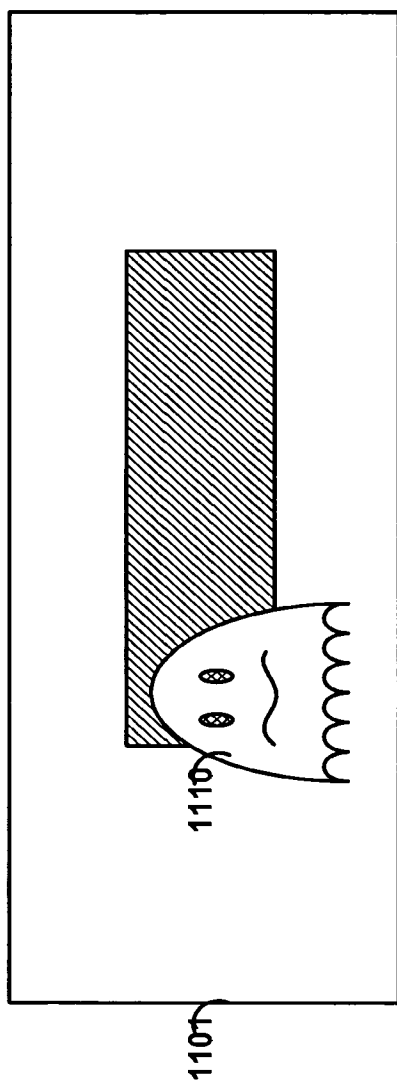


FIG. 11

12/14
1200

VIRTUAL PLAYFIELD

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1				E				E			E			E					E	
2																				
3																				
4																				
5				B	B	B	B	B	B											
6				B	B	B	B	B	B											
7				B	B	B	B	B	B											
8				S ₂	S ₂	S ₂	S ₂	S ₂						B	B	B	B			
9				S ₂	C ₂	C ₂	S ₂	S ₂	S ₂	1203				B	B	B	B			
10				S ₂	C ₂	C ₂	S ₂	S ₂	S ₂					B	B	B	B			
11				S ₂	S ₂	S ₂	S ₂	S ₂	S ₂					B	B	B	B			
12				S ₂	S ₂	S ₂	S ₂	S ₃	S ₁	S ₁	S ₁	C ₁	C ₁							
13				S ₂	S ₂	S ₂	S ₂	S ₃	S ₁	S ₁	S ₁	S ₁	C ₁	C ₁						
14								L												
15																				
16																				
17																				
18																				
19																				
20																				

FIG. 12

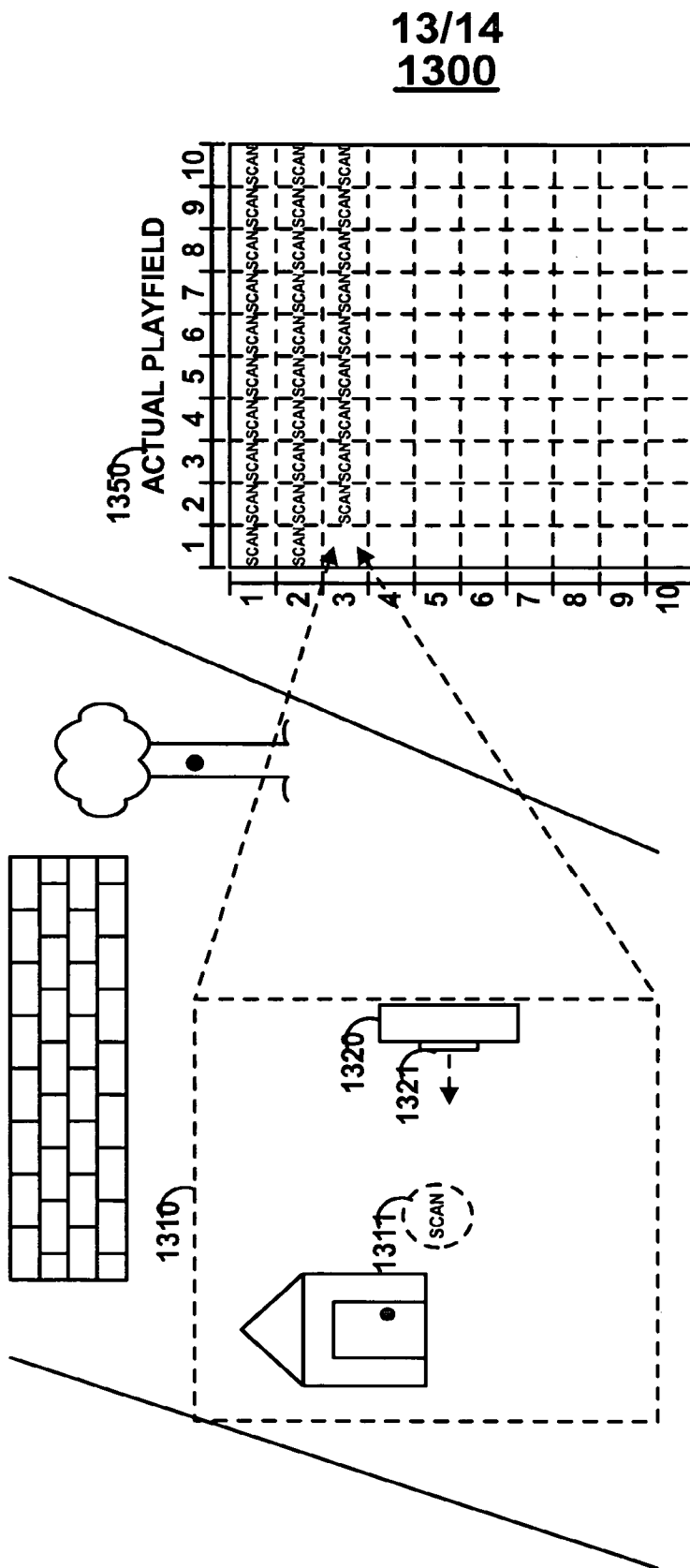


FIG. 13

14/14

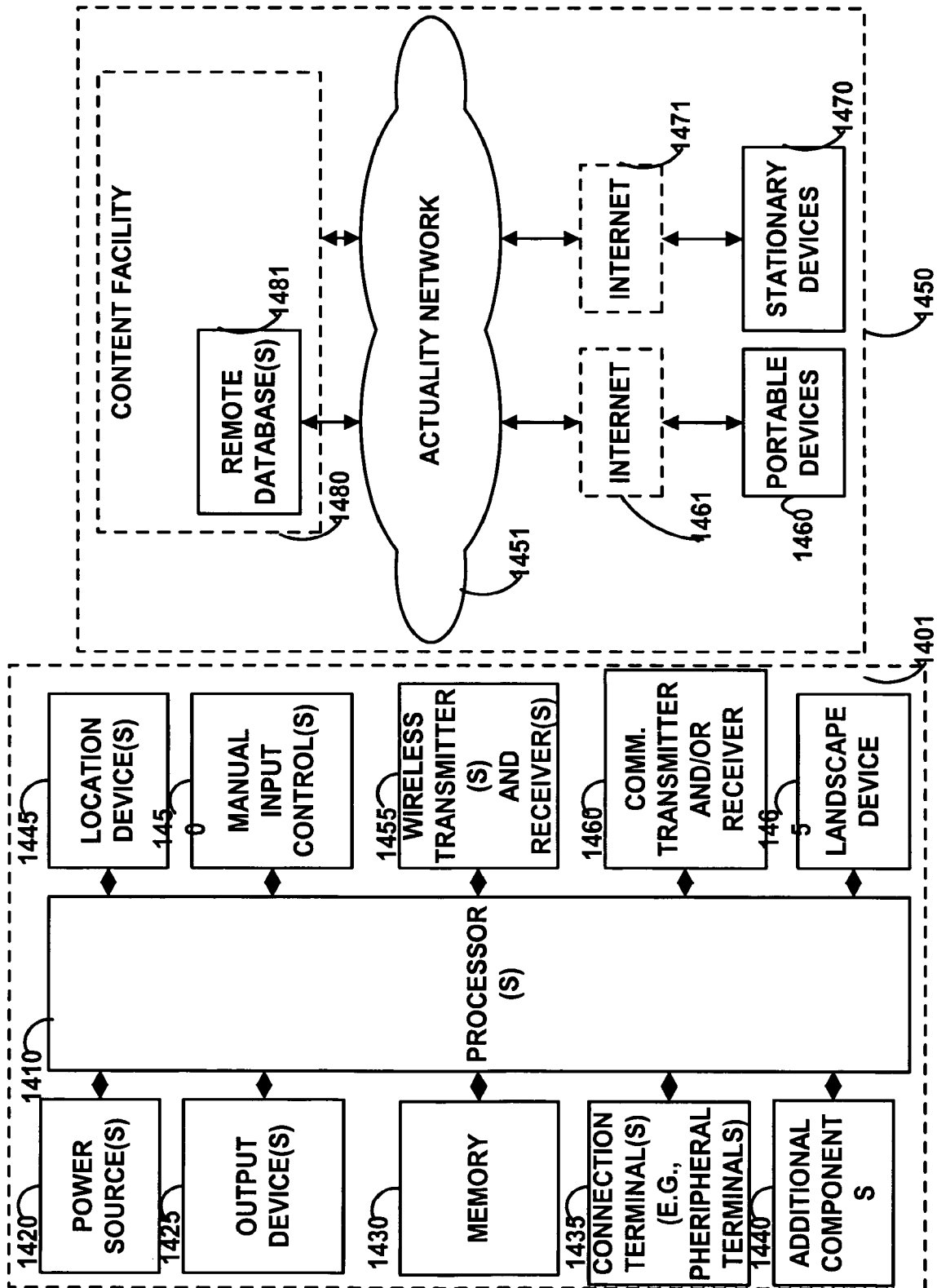


FIG. 14

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DECLARATION

I, Jeffrey D. Mullen, declare that I am a citizen of the United States of America, respectively residing at and having post office addresses at 350 West 43rd Street, New York, New York 10036; and

that I verily believe myself to be the original and first inventor of the invention or discovery in:

LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

which is described and claimed in the attached specification, and for which a patent is sought;

that I have reviewed and do understand the content of said specification, including the claims, and acknowledge my duty to disclose to the United States Patent and Trademark Office information known by myself to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56;

that I do not know and do not believe that this invention or discovery was ever known or used in the United States of America before my invention or discovery thereof, or patented or described in any printed publication in any country before my invention or discovery thereof, or more than one year prior to this application; or in public use or on sale in the United States of America more than one year prior to this application; that this invention or discovery has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an

application filed by myself or my legal representatives or assigns more than twelve months prior to this application; and that no application for patent or inventor's certificate on this invention or discovery has been filed in any country foreign to the United States of America by myself or my legal representatives or assigns;

I hereby claim the benefit under Title 35, United States Code § 119(e) to the United States provisional applications listed below.

60/628,475
(Application Serial No.)

November 16, 2004
(Filing Date)

and I request that communications be sent to:

Jeffrey D. Mullen
350 West 43rd St., Apt. 5H
New York, NY 10036

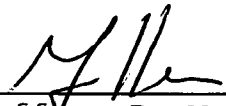
and that telephone calls be directed to:

Jeffrey D. Mullen
(914) 837-7741

Wherefore, I pray that Letters Patent be granted to myself for the invention or discovery described and claimed in the attached specification and claims, and I hereby subscribe my name to the foregoing specification, claims, and declaration.

I declare, further, that I understand the English language and that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and, further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

11/16/2005
Date


Jeffrey D. Mullen

Electronic Patent Application Fee Transmittal

Application Number:

Filing Date:

Title of Invention:

LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

First Named Inventor/Applicant Name:

Jeffrey David Mullen

Filer:

Jeffrey David Mullen

Attorney Docket Number:

JDM/008 CON2

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360

Pages:

Claims:

Miscellaneous-Filing:

Petition:

Patent-Appeals-and-Interference:

Meta Exhibit 1016

Meta v. Mullen - Page 0072

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				730

Electronic Acknowledgement Receipt

EFS ID:	25618064
Application Number:	15140451
International Application Number:	
Confirmation Number:	9352
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS
First Named Inventor/Applicant Name:	Jeffrey David Mullen
Customer Number:	32733
Filer:	Jeffrey David Mullen
Filer Authorized By:	
Attorney Docket Number:	JDM/008 CON2
Receipt Date:	27-APR-2016
Filing Date:	
Time Stamp:	22:40:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 730
RAM confirmation Number	6432
Deposit Account	503855
Authorized User	MULLEN, JEFFREY D.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Meta Exhibit 1016

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	JDM-008CON2--ADS.pdf	169130	no	6
			8ef69076298a5b9bbebd9a21027f8a1ee4da461b		
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
2		JDM-008CON2-- PreliminaryAmendment.pdf	142542	yes	4
			9b62bfe9c9de1a1b7cc1387b9785c38048700fb0		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Preliminary Amendment		1	1	
	Specification		2	2	
	Claims		3	3	
	Applicant Arguments/Remarks Made in an Amendment		4	4	
Warnings:					
Information:					
3		JDM-008-Spec-Claims-Abstract- Figs-OathDec.pdf	2540413	yes	67
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	Document Description		Start	End	
	Specification		1	47	
	Claims		48	49	
	Abstract		50	50	
	Drawings-other than black and white line drawings		51	64	

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Warnings:							
Information:							
Total Files Size (in bytes):			2887059				
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.							

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	JDM/008 CON2
		Application Number	Not yet assigned
Title of Invention	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

- ☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1				
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118
If applicant is not an inventor, indicate the authority to file for the patent on behalf of the inventor, the inventor is:				
Prefix	Given Name	Middle Name	Family Name	Suffix
	Jeffrey	David	Mullen	
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service				
City	Pittsburgh	State/Province	PA	Country of Residenceⁱ USA
Citizenship under 37 CFR 1.41 (b)ⁱ		USA		
Mailing Address of Applicant:				
Address 1		1310 Riverfront Drive		
Address 2				
City	Pittsburgh	State/Province	PA	
Postal Code	15238	Countryⁱ	USA	
If the representative for the inventor is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Residence Information of the Inventor's Representative:				
Residence Information (Select One) ☐ US Residency ☐ Non US Residency ☐ Active US Military Service				
City		State/Province		Country of Residence
Citizenship under 37 CFR 1.41 (b)ⁱ				
Mailing Address of the Inventor's Representative:				
Address 1				
Address 2				
City		State/Province		
Postal Code		Countryⁱ		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	JDM/008 CON2
		Application Number	Not yet assigned
Title of Invention	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS		

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
☐ An Address is being provided for the correspondence information of this application.	
Customer Number	32733
Email Address	Jmullen54@aol.com

Application Information:

Title of the Invention	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS		
Attorney Docket Number	JDM/008 CON2	Small Entity Status Claimed ☒	
Application Type	non-provisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	JDM/008 CON2
	Application Number	Not yet assigned
Title of Invention	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS	

Publication Information:	
☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not been and will not be the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.			
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ US Representative (37 CFR 11.9)
Customer Number	32733		

Domestic Priority Information:

This section allows for the applicant to claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c). Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
This application	continuation	13/973,997	2013-08-22
13/973,997	continuation	11/281,812	2005-11-16
11/281,812	non-provisional	60/628,475	2004-11-16
Additional Domestic Priority Data may be generated within this form by selecting the Add button.			

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).			
Application Number	Country i	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			☐ Yes ☒ No
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	JDM/002 CON2
		Application Number	Not yet assigned
Title of Invention	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS		

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.				
Assignee 1				
If the Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information:				
Address 1				
Address 2				
City		State/Province		
Country i		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee Data may be generated within this form by selecting the Add button.				

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.					
Signature	/Jeffrey D. Mullen/			Date (YYYY-MM-DD)	2016-04-27
First Name	Jeffrey	Last Name	Mullen	Registration Number	52,056

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USP TO becomes aware of a violation or potential violation of law or regulation.

SCORE Placeholder Sheet for IFW Content

Application Number: 15140451

Document Date: 04/27/2016

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY,DOCKET,NO	TOT CLAIMS	IND CLAIMS
15/140,451	04/27/2016	3714	730	JDM/008 CON2	1	1

CONFIRMATION NO. 9352

FILING RECEIPT



0000000082825606

32733
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

Date Mailed: 05/11/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Jeffrey David Mullen, Pittsburgh, PA;

Applicant(s)

Jeffrey David Mullen, Pittsburgh, PA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/973,997 08/22/2013 PAT 9352216
which is a CON of 11/281,812 11/16/2005 PAT 8585476
which claims benefit of 60/628,475 11/16/2004

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 05/11/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/140,451**

Projected Publication Date: To Be Determined - pending completion of Corrected Papers

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

Preliminary Class

463

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/140,451				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A				
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	300		N/A				
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	1	minus 20 = *	x 40 =	0.00	OR					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *	x 210 =	0.00						
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00						
			TOTAL	730		TOTAL				
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2

CONFIRMATION NO. 9352

FORMALITIES LETTER



32733
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

Date Mailed: 05/11/2016

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
 - The drawings submitted to the Office are not electronically reproducible because portions of figures 1, 2, 6 and 10 are missing and/or blurry.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

A new inventor's oath or declaration that identifies this application (e.g., by Application Number and filing date) is required. The inventor's oath or declaration does not comply with 37 CFR 1.63 in that it:

- does not state that the above-identified application was made or authorized to be made by the person executing the oath or declaration.

Jeffrey David Mullen

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebs>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/solbrich/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey D. Mullen
Application No. : 15/140,451
Confirmation No. : 9352
Filed : August 22, 2013
For : LOCATION-BASED GAMES AND
AUGMENTED REALITY SYSTEMS
Group Art Unit : 3714
Examiner : not yet determined

Hon. Commissioner for Patents Pittsburgh, PA 15116
P.O. Box 1450 November 11, 2016
Alexandria, VA 22313-1450

Response to Notice To File Corrected Application Papers

Sir:

This is in reply to the communication dated May 11, 2016. A four-month extension of time is applicable hereto and is being submitted herewith. In response to the action, applicant amends the application as follows:

Remarks/Arguments begin on page 2 of this paper.

REMARKS/ARGUMENTS

Summary of Notice

The Notice To File Corrected Application Papers notes that the drawings are not acceptable because portions of FIGS. 1, 2, 6, and 10 are missing and/or blurry.

A copy of the Notice is being submitted herewith.

Applicant's Response

The Notice To File Corrected Application Papers alleged that the drawings are not acceptable because portions of FIGS. 1, 2, 6, and 10 are missing and/or blurry.

Applicant called the office toward the beginning of the week of November 7th, 2016.

Applicant requested clarification on the objection as applicant could not determine the drawing objection.

Applicant noted that the exact same drawings were filed in both parent Application No 11/281,812, now U.S. Patent No. 8,585,476 and Application No. 13/973,997, now Patent No. 9,352,216 and that the drawings were approved. Both applications are now issued patents.

Furthermore, a related continuation was filed, Application No 15/168,203, after the filing of the present application with the exact same drawings. Those drawings were also approved.

Accordingly, the exact same drawings were filed and approved in all three of the related applications to

the present application - two of which are now issued patents.

The application assistant stated that applicant should respond with a communication stating such facts. The application assistant stated that another application assistant would provide a telephonic communication to applicant. Applicant received a voicemail and returned the call. Applicant has yet to receive any additional call or information.

Applicant called the Patent Office again on November 10, 2016. A new application assistant reviewed the situation and recommended that applicant provide a response stating that the other cases had the same drawings and were allowed.

Accordingly, applicant respectfully submits that the drawings meet the drawing requirements. There are no errors in the drawings. The drawings were approved in all three other related non-provisional applications - two of which are now issued patents.

In light of the foregoing, applicant respectfully requests that the drawing objection be withdrawn.

Conclusion

Applicant respectfully submits that this application, including the pending claims, is in condition for allowance. Reconsideration and prompt allowance of this application are respectfully requested.

The Director is hereby authorized to charge any fees required in conjunction with this filing, or credit any overpayment of the same, to Deposit Account No. 50-3855, Order No. JDM/008 CON.

Respectfully Submitted,

/Jeffrey D. Mullen/

Jeffrey D. Mullen

Applicant (Reg. No. 52,056)

Customer No. 32733

2212 Hassinger Lane

Glenshaw, PA 15116

Mobile: (914) 837-7741



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2

CONFIRMATION NO. 9352

FORMALITIES LETTER



32733
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

Date Mailed: 05/11/2016

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
 - The drawings submitted to the Office are not electronically reproducible because portions of figures 1, 2, 6 and 10 are missing and/or blurry.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

A new inventor's oath or declaration that identifies this application (e.g., by Application Number and filing date) is required. The inventor's oath or declaration does not comply with 37 CFR 1.63 in that it:

- does not state that the above-identified application was made or authorized to be made by the person executing the oath or declaration.

Jeffrey David Mullen

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebs>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/solbrich/

Electronic Patent Application Fee Transmittal

Application Number:	15140451			
Filing Date:	27-Apr-2016			
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS			
First Named Inventor/Applicant Name:	Jeffrey David Mullen			
Filer:	Jeffrey David Mullen			
Attorney Docket Number:	JDM/008 CON2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 4 months with \$0 paid	2254	1	1100	1100
Miscellaneous:				
Total in USD (\$)				1100

Electronic Acknowledgement Receipt

EFS ID:	27481688
Application Number:	15140451
International Application Number:	
Confirmation Number:	9352
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS
First Named Inventor/Applicant Name:	Jeffrey David Mullen
Customer Number:	32733
Filer:	Jeffrey David Mullen
Filer Authorized By:	
Attorney Docket Number:	JDM/008 CON2
Receipt Date:	11-NOV-2016
Filing Date:	27-APR-2016
Time Stamp:	06:26:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1100
RAM confirmation Number	111416INTEFSW06283100
Deposit Account	503855
Authorized User	Jeffrey Mullen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

Meta Exhibit 1016

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	JDM-008CON2--ResponseToNoticeToFileCorrected.pdf	139569	no	4
			1e53ad3feba542323c30724c9685da03b25b6ea4		
Warnings:					
Information:					
2	Transmittal Letter	JDM-008CON2--NTFCAP.pdf	80898	no	2
			c703df0a5245d8624832446128e5af2365affbea6		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30442	no	2
			815a89a86a499d0e9939fc806b4596f9fc9a50a4		
Warnings:					
Information:					
Total Files Size (in bytes):			250909		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/140,451	04/27/2016	3714	730	JDM/008 CON2	1	1

32733
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

CONFIRMATION NO. 9352
UPDATED FILING RECEIPT



Date Mailed: 11/16/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Jeffrey David Mullen, Pittsburgh, PA;

Applicant(s)

Jeffrey David Mullen, Pittsburgh, PA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/973,997 08/22/2013 PAT 9352216
which is a CON of 11/281,812 11/16/2005 PAT 8585476
which claims benefit of 60/628,475 11/16/2004

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 05/11/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/140,451**

Projected Publication Date: 02/23/2017

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

Preliminary Class

463

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2

CONFIRMATION NO. 9352

INFORMAL NOTICE



32733
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

Date Mailed: 11/16/2016

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

A new inventor's oath or declaration that identifies this application (e.g., by Application Number and filing date) is required. The inventor's oath or declaration does not comply with 37 CFR 1.63 in that it:

- does not state that the above-identified application was made or authorized to be made by the person executing the oath or declaration.

Jeffrey David Mullen

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/tgebre/

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/140,451	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)	OR	RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	1	minus 20 = *	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
			TOTAL	730		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	OR	RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	OR	RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2	9352
32733	7590	01/27/2017		
JEFFREY D. MULLEN 2212 Hassinger Lane Glenshaw, PA 15116			EXAMINER ELISCA, PIERRE E	
			ART UNIT	PAPER NUMBER
			3716	
			MAIL DATE	DELIVERY MODE
			01/27/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 15/140,451	Applicant(s) MULLEN, JEFFREY DAVID	
	Examiner PIERRE E. ELISCA	Art Unit 3716	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/27/2016.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) ☐ Notice of References Cited (PTO-892) | 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____. | 4) ☐ Other: ____. |

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.
2. Claim 1 is currently pending and have been examined. Claims 1-3 are cancelled.
3. This communication is to response to Application No. 15/140,451 filed on 04/27/2016.
4. This application is a continuation of U.S. application No. 13/973,997 filed on 08/22/2013 now U.S Patent 9,352,216 See MPEP 201.07. In accordance with MPEP 609.02 A.2 and MPEP 2001.06 (b) (last paragraph), the Examiner has reviewed and considered the prior art cited in the Parent Application. Also in accordance with MPEP 2001.06 (b) (last paragraph), all documents cited or considered 'of record' in the Parent Application are now considered cited or 'of record' in this application. Additionally, Applicant(s) are reminded that a listing of the information cited or 'of record' in the Patent Application need not be resubmitted in this application unless Applicants desire the information to be printed on a patent issuing from this application. See MPEP 609.02 A. 2. Finally, Applicants are reminded that the prosecution history of the Patent Application is relevant in this application.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claim 1 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter because the claim(s) as a whole, considering all claim elements both individually and in combination, do not amount to significantly more than an abstract idea.

Claim 1 recites "A computer-readable medium having program logic...". However, the Examiner interprets the limitation detailed above as software per se. The computer-readable medium of claim 1 does not define any structural and functional interrelationships with a general purpose for permitting the claimed functions to be realized. In contrast, a statutory claim would define structural and functional interrelationships between data structures or functional parts and a computer which permit the data functions to be realized. Thus, claim 1 is rejected as being non-statutory as described above.

Applicant is advised to amend the claim 1 as follows: --a computer-readable medium which stored program logic (or program code), when executed by a processor, cause the processor to perform ...---.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially

Art Unit: 3716

created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Pat. No.9,352,216. Although the conflicting claims are not identical, they are not patentably distinct from each other. Accordingly, it would have been obvious to those in possession of the invention defined by claim 1 to observe that the limitations described in claim 1 are already incorporated in claims 1-20 of U.S. Pat. No.9,352,216. Therefore, one of ordinary skill in the art would have realized that by adding the limitations of: "game logic associated with a video game, wherein said head-mounted device includes a processor" is an obvious

Art Unit: 3716

expedient since the remaining elements perform the same functions as before. In re Karlson, 136 USPQ 184 (CCPA 1963).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PIERRE E. ELISCA whose telephone number is (571)272-6706. The examiner can normally be reached on 6:30 to 7:00, Monday - Thursday. Hotelier.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dmitri Suhol can be reached on 571 272 4430. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PIERRE E. ELISCA/

Application/Control Number: 15/140,451

Page 6

Art Unit: 3716

Primary Examiner, Art Unit 3716



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2

CONFIRMATION NO. 9352

PUBLICATION NOTICE



OC00000089419651

32733
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

Title:LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

Publication No.US-2017-0050113-A1

Publication Date:02/23/2017

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey D. Mullen
Application No. : 15/140,451
Confirmation No. : 9352
Filed : April 27, 2016
For : LOCATION-BASED GAMES AND
AUGMENTED REALITY SYSTEMS
Group Art Unit : 3716
Examiner : Pierre E. Elisca

Hon. Commissioner for Patents Pittsburgh, PA 15116
P.O. Box 1450 July 24, 2017
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Sir:

Prior to examination of this application,
applicant amends the application as follows:

Amendments to the Claims are reflected in the
listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-3. (cancelled).

4. (currently amended) A computer-readable medium ~~having~~ with stored program logic thereon, when executed by a processor, cause the processor to perform for performing the method comprising:

providing 3-D video game indicia to a head-mounted display of a head-mounted device with respect to a physical playfield based on video game logic associated with a video game, wherein said head-mounted device includes a processor;

utilizing a detector to determine landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape characteristics in providing said video game; and

utilizing a locating device to determine the physical location of said locating device on said physical playfield, wherein said video game logic utilizes the physical location of said locating device in providing said video game.

5. (new) The computer-readable medium of claim 4, further comprising utilizing a wireless communications service.

6. (new) The computer-readable medium of claim 4, further comprising utilizing a cell phone service.

7. (new) The computer-readable medium of claim 4, further comprising utilizing manual input controls.

8. (new) The computer-readable medium of claim 4, further comprising utilizing a WiFi receiver.

9. (new) The computer-readable medium of claim 4, further comprising utilizing a blue tooth receiver.

10. (new) The computer-readable medium of claim 4, further comprising utilizing a radio receiver.

11. (new) The computer-readable medium of claim 4, further comprising utilizing an infrared receiver.

12. (new) The computer-readable medium of claim 4, further comprising utilizing a remote database.

13. (new) The computer-readable medium of claim 4, further comprising utilizing a remote database through a network.

14. (new) The computer-readable medium of claim 4, further comprising determining a pitch of said head-mounted display.

15. (new) The computer-readable medium of claim 4, further comprising determining a pitch of said head-

mounted display and determining a roll of said head-mounted display.

16. (new) The computer-readable medium of claim 4, further comprising determining a pitch of said head-mounted display, determining a roll of said head-mounted display, and determining a height of said head-mounted display.

17. (new) The computer-readable medium of claim 4, further comprising utilizing a source of power, a memory, a peripheral terminal, a wireless receiver, and manual input controls.

18. (new) The computer-readable medium of claim 4, further comprising utilizing a peripheral terminal.

19. (new) The computer-readable medium of claim 4, further comprising utilizing a source of power and a peripheral terminal.

20. (new) The computer-readable medium of claim 4, further comprising utilizing a parental control to limit video game types allowed to be accessed by said system.

21. (new) The computer-readable medium of claim 4, wherein a virtual currency system is associated with said video game.

22. (new) The computer-readable medium of claim 4, wherein a paid advertising is provided in said video game.

23. (new) The computer-readable medium of claim 4, further comprising utilizing manual controls, wherein a pitch of said head-mounted display is determined and a roll of said head-mounted display is determined.

REMARKS/ARGUMENTS

Summary of Applicant's Amendments

Applicant has amended claim 4 without prejudice and solely in order to expedite prosecution.

Applicant has added new claims 5-23 without prejudice and solely in order to expedite prosecution.

No new subject matter has been added. Applicant reserves the right to claim any subject matter from any claim amendment or cancellation in any number of continuation or divisional applications.

The 35 U.S.C. 101 Rejection

The Examiner provided a rejection in view of 35 U.S.C. 101. Without prejudice and solely in order to expedite prosecution, applicant has amended claim 4. Accordingly, applicant respectfully requests that the Examiner's rejection of claim 4 be withdrawn.

The Double Patenting Rejection

The Examiner provided a double patenting rejection with respect to U.S. Patent No. 9,352,216. Applicant submits herewith a Terminal Disclaimer. Accordingly, applicant respectfully submits that the Examiner's rejection be withdrawn.

New Claims 5-23

As shown above, claim 4 is patentable. Accordingly, applicant respectfully submits that claims 5-23 are patentable for depending from a patentable base claim.

Conclusion

Applicant respectfully submits that this application, including the pending claims, is in condition for allowance. Reconsideration and prompt allowance of this application are respectfully requested.

The Director is hereby authorized to charge any fees required in conjunction with this filing, or credit any overpayment of the same, to Deposit Account No. 50-3855, Order No. JDM/008 CON2.

Respectfully Submitted,

/Jeffrey D. Mullen/
Jeffrey D. Mullen
Applicant (Reg. No. 52,056)
Customer No. 32733
2212 Hassinger Lane
Glenshaw, PA 15116
Mobile: (914) 837-7741

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey D. Mullen
Application No. : 15/140,451
Confirmation No. : 9352
Filed : April 28, 2016
For : LOCATION-BASED GAMES AND
AUTOMATED REALITY SYSTEMS
Group Art Unit : 3716
Examiner : PIERRE E ELISCA

Hon. Commissioner for Patents Pittsburgh, PA 15116
P.O. Box 1450 July 24, 2017
Alexandria, VA 22313-1450

TERMINAL DISCLAIMER
UNDER 37 C.F.R. § 1.321(b,c)

Sir:

Jeffrey D. Mullen, the undersigned, a U.S. citizen residing at 2212 Hassinger Lane, Glenshaw PA 15116, represents that he is the owner of the entire, right, title and interest of the following United States patent and pending United States patent application:

1. U.S. Patent No. 9,352,216, issued on Application No. 13/973,997, filed August 22, 2013.

2. Application No. 15/140,451, filed April 27, 2016 as a continuation of Application No. 13/973,997, filed August 22, 2013.

The undersigned hereby disclaims the terminal portion of the term of any patent to be issued on the present application, Application No. 15/140,451, which would extend

beyond the expiration date of the full statutory term of U.S. Patent No. 9,352,216.*

The undersigned agrees that any patent to be issued on the present Application No. 15/140,451 shall be enforceable only for and during such period as such patent and U.S. Patent No. 9,352,216 shall be commonly owned, this agreement to run with any patent to be issued on Application No. 15/140,451 and to be binding upon the grantee of such patent and its successors and assigns.

The undersigned does not disclaim any terminal part of the term of any patent, to be issued on the above-identified Application No. 15/140,451, that would extend to the expiration date of the full statutory term of U.S. Patent No. 9,352,216,* in the event that U.S. Patent No. 9,352,216: (a) expires for failure to pay a maintenance fee, (b) is held unenforceable, (c) is found invalid, (d) is statutorily disclaimed in whole or terminally disclaimed under 37 C.F.R. § 1.321(a,b), (e) has all claims cancelled by a reexamination certificate, or (f) is otherwise terminated prior to expiration of its statutory term.

July 24, 2017

By: /Jeffrey D. Mullen/

Date

Jeffrey D. Mullen
Applicant
2212 Hassinger Lane
Glenshaw, PA 15116

* It is applicant's intention that if any change in the patent statutes delays the expiration date of U.S. Patent No. 9,352,216, or if U.S. Patent No. 9,352,216 is hereafter awarded further patent term adjustment under 35 U.S.C. § 154(b), then the date beyond which the term of any patent to issue on this application is disclaimed shall change along with the expiration date of the parent patent.

Electronic Patent Application Fee Transmittal

Application Number:	15140451			
Filing Date:	27-Apr-2016			
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS			
First Named Inventor/Applicant Name:	Jeffrey David Mullen			
Filer:	Jeffrey David Mullen			
Attorney Docket Number:	JDM/008 CON2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	700	700
Miscellaneous:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
Total in USD (\$)				860

Electronic Acknowledgement Receipt

EFS ID:	29863559
Application Number:	15140451
International Application Number:	
Confirmation Number:	9352
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS
First Named Inventor/Applicant Name:	Jeffrey David Mullen
Customer Number:	32733
Filer:	Jeffrey David Mullen
Filer Authorized By:	
Attorney Docket Number:	JDM/008 CON2
Receipt Date:	24-JUL-2017
Filing Date:	27-APR-2016
Time Stamp:	06:48:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$860
RAM confirmation Number	072417INTEFSW06495300
Deposit Account	503855
Authorized User	Jeffrey Mullen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

Meta Exhibit 1016

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		JDM-008CON2-- ReplyToOfficeAction.pdf	145505	yes	7
			4c6da2a9a2cd75916866871b68f4eb50cb155b14		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	7	
Warnings:					
Information:					
2	Terminal Disclaimer Filed	JDM-008CON2--TD.pdf	132021	no	2
			a8ba5e448d0fcc877f3b691483b6aeebae3ab999		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32361	no	2
			6d22b8067cb9459abe3df677593f4f9b89f185a0		
Warnings:					
Information:					
Total Files Size (in bytes):			309887		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 15/140,451		Filing Date 04/27/2016		☐ To be Mailed		
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO											
APPLICATION AS FILED – PART I											
(Column 1)			(Column 2)								
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.								TOTAL			
APPLICATION AS AMENDED – PART II											
(Column 1)			(Column 2)			(Column 3)					
AMENDMENT	07/24/2017		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA			
	Total (37 CFR 1.16(i))		* 20		Minus	** 20		= 0			
	Independent (37 CFR 1.16(h))		* 1		Minus	*** 3		= 0			
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
								TOTAL ADD'L FEE		0	
(Column 1)			(Column 2)			(Column 3)					
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA			
	Total (37 CFR 1.16(i))		*		Minus	**		=			
	Independent (37 CFR 1.16(h))		*		Minus	***		=			
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
								TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

SLIE
KAREN VESTAL

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Application Number 	Application/Control No. 15/140,451	Applicant(s)/Patent under Reexamination MULLEN, JEFFREY DAVID	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 7/24/17	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
Lawana Hixon

U.S. Patent and Trademark Office



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2	9352

32733 7590 09/14/2017
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

EXAMINER

ELISCA, PIERRE E

ART UNIT	PAPER NUMBER
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3716

MAIL DATE	DELIVERY MODE
-----------	---------------

09/14/2017

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 15/140,451	Applicant(s) MULLEN, JEFFREY DAVID	
	Examiner PIERRE E. ELISCA	Art Unit 3716	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/24/2017.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 4-23 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 4-23 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____.
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 4) ☐ Other: ____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.
2. Claims 4-23 are currently pending and have been examined. Claims 1-3 are cancelled and claims 5-23 are added.
3. This communication is in response to Applicant's terminal disclaimer filed on 07/24/2017.

TERMINAL DISCLAIMER

4. Terminal disclaimer filed on 07/24/2017 is approved.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
6. Claims 4-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter because the claim(s) as a whole, considering all claim elements both individually and in combination, do not amount to significantly more than an abstract idea.

Art Unit: 3716

For example, claim 1 recites "A computer-readable medium having program logic...".

However, the Examiner interprets the limitation detailed above as software per se. The

computer-readable medium of claim 4 does not define any structural and functional

interrelationships with a general purpose for permitting the claimed functions to be realized. In

contrast, a statutory claim would define structural and functional interrelationships between data

structures or functional parts and a computer which permit the data functions to be realized.

Thus, claims 4-23 are rejected as being non-statutory as described above.

Applicant is advised to amend the claim 4 as follows: --a **non-transitory** computer-readable medium which stored program logic (or program code), when executed by a processor, cause the processor to perform ...---.

RESPONSE TO ARGUMENTS

7. Applicant's arguments with respect to claims 4-23 have been considered but they not persuasive.

REMARKS

8. In regard to Applicant's arguments filed on 07/24/2017, Applicant argues that without prejudice and solely in order to expedite prosecution, Applicant has amended claim 4.

However, in order to expedite prosecution, Applicant is advised to add a **NON TRANSITORY** into the claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to PIERRE E. ELISCA whose telephone number is (571)272-6706. The Examiner can normally be reached on 6:30AM to 7:00PM, Monday - Thursday. Hoteler.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dmitri Suhol can be reached on 571 272 4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3716

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey D. Mullen
Application No. : 15/140,451
Confirmation No. : 9352
Filed : April 27, 2016
For : LOCATION-BASED GAMES AND
AUGMENTED REALITY SYSTEMS
Group Art Unit : 3716
Examiner : Pierre E. Elisca

Hon. Commissioner for Patents Pittsburgh, PA 15116
P.O. Box 1450 March 14, 2018
Alexandria, VA 22313-1450

RESPONSE

Sir:

This is in response to the Office Action dated September 14, 2017. In response, applicant amends the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-3. (cancelled).

4. (currently amended) A non-transitory computer-readable medium with stored program logic thereon, when executed by a processor, cause the processor to perform ~~for performing~~ the method comprising:

providing 3-D video game indicia to a head-mounted display of a head-mounted device with respect to a physical playfield based on video game logic associated with a video game, wherein said head-mounted device includes a processor;

utilizing a detector to determine landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape characteristics in providing said video game; and

utilizing a locating device to determine the physical location of said locating device on said physical playfield, wherein said video game logic utilizes the physical location of said locating device in providing said video game.

5. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a wireless communications service.

6. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a cell phone service.

7. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing manual input controls.

8. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a WiFi receiver.

9. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a blue tooth receiver.

10. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a radio receiver.

11. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing an infrared receiver.

12. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a remote database.

13. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a remote database through a network.

14. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising determining a pitch of said head-mounted display.

15. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising determining a pitch of said head-mounted display and determining a roll of said head-mounted display.

16. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising determining a pitch of said head-mounted display, determining a roll of said head-mounted display, and determining a height of said head-mounted display.

17. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a source of power, a memory, a peripheral terminal, a wireless receiver, and manual input controls.

18. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a peripheral terminal.

19. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a source of power and a peripheral terminal.

20. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing a parental control to limit video game types allowed to be accessed by said system.

21. (currently amended) The non-transitory computer-readable medium of claim 4, wherein a virtual currency system is associated with said video game.

22. (currently amended) The non-transitory computer-readable medium of claim 4, wherein a paid advertising is provided in said video game.

23. (currently amended) The non-transitory computer-readable medium of claim 4, further comprising utilizing manual controls, wherein a pitch of said head-mounted display is determined and a roll of said head-mounted display is determined.

REMARKS/ARGUMENTS

Summary of Applicant's Amendments

Applicant has amended claims 4-23 without prejudice and solely in order to expedite prosecution.

No new subject matter has been added. Applicant reserves the right to claim any subject matter from any claim amendment or cancellation in any number of continuation or divisional applications.

The 35 U.S.C. 101 Rejection

The Examiner provided a rejection in view of 35 U.S.C. 101.

Without prejudice and solely in order to expedite prosecution, applicant has amended claims 4-23.

Accordingly, applicant respectfully requests that the Examiner's rejection of claims 4-23 be withdrawn.

Conclusion

Applicant respectfully submits that this application, including the pending claims, is in condition for allowance. Reconsideration and prompt allowance of this application are respectfully requested.

The Director is hereby authorized to charge any fees required in conjunction with this filing, or credit any overpayment of the same, to Deposit Account No. 50-3855, Order No. JDM/008 CON2.

Respectfully Submitted,

/Jeffrey D. Mullen/
Jeffrey D. Mullen
Applicant (Reg. No. 52,056)
Customer No. 32733
2212 Hassinger Lane
Glenshaw, PA 15116
Mobile: (914) 837-7741

Electronic Patent Application Fee Transmittal

Application Number:	15140451			
Filing Date:	27-Apr-2016			
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS			
First Named Inventor/Applicant Name:	Jeffrey David Mullen			
Filer:	Jeffrey David Mullen			
Attorney Docket Number:	JDM/008 CON2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	700	700
Miscellaneous:				
Total in USD (\$)				700

Electronic Acknowledgement Receipt

EFS ID:	32044706
Application Number:	15140451
International Application Number:	
Confirmation Number:	9352
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS
First Named Inventor/Applicant Name:	Jeffrey David Mullen
Customer Number:	32733
Filer:	Jeffrey David Mullen
Filer Authorized By:	
Attorney Docket Number:	JDM/008 CON2
Receipt Date:	14-MAR-2018
Filing Date:	27-APR-2016
Time Stamp:	06:55:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 700
RAM confirmation Number	031418INTEFSW06560700
Deposit Account	503855
Authorized User	Jeffrey Mullen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

Meta Exhibit 1016

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		JDM-008CON2-- ReplyToOfficeAction.pdf	146146	yes	7
			adeaa01de607eb5651545460c6cf53c3bbca1657b		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	7	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30582	no	2
			6001b1d91a4e898a3c697a2a32d3fe968a4105df		
Warnings:					
Information:					
Total Files Size (in bytes):			176728		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/140,451		Filing Date 04/27/2016		☐ To be Mailed				
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO												
APPLICATION AS FILED - PART I												
		(Column 1)	(Column 2)									
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)					
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A							
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A	N/A		N/A							
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A							
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 = *		x \$40 =								
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 = *		x \$210 =								
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).										
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))												
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL							
APPLICATION AS AMENDED - PART II												
		(Column 1)		(Column 2)	(Column 3)							
AMENDMENT	03/14/2018	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)				
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	x \$50 =		0				
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0	x \$230 =		0				
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE		0				
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)				
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =						
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =						
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						HSLIE						
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						LELAND WATKINS						
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".												
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.												

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

32733 7590 05/14/2018
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

EXAMINER

ELISCA, PIERRE E

ART UNIT

PAPER NUMBER

3716

DATE MAILED: 05/14/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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15/140,451

04/27/2016

Jeffrey David Mullen

JDM/008 CON2

9352

TITLE OF INVENTION: LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0	\$0	\$500	08/14/2018

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Fax** **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

32733 7590 05/14/2018
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2	9352

TITLE OF INVENTION: LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0	\$0	\$500	08/14/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
ELISCA, PIERRE E	3716	463-032000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2	9352

32733 7590 05/14/2018
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

EXAMINER

ELISCA, PIERRE E

ART UNIT PAPER NUMBER

3716

DATE MAILED: 05/14/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<i>Notice Requiring Inventor's Oath or Declaration</i>	Application No. 15/140,451	Applicant(s) Jeffrey David Mullen	
	Examiner ELISCA, PIERRE E	Art Unit 3716	

This notice is an attachment to the Notice of Allowability (PTOL-37), or the Notice of Allowability For A Design Application (PTOL-37D).

An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor has not yet been submitted.

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor (for any inventor for which a compliant oath, declaration, or substitute statement has not yet been submitted) **MUST** be filed no later than the date on which the issue fee is paid. See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application.

A properly executed inventor's oath to declaration has not been received for the following inventor(s):

If applicant previously filed one or more oaths, declarations, or substitute statements, applicant may have received an informational notice regarding deficiencies therein.

The following deficiencies are noted:

INFORMAL ACTION PROBLEMS

A new inventor's oath or declaration that identifies this application (e.g., by Application Number and filing date) is required. The inventor's oath or declaration does not comply with 37 CFR 1.63 in that it:

- does not state that the above-identified application was made or authorized to be made by the person executing the oath or declaration: **Jeffrey David Mullen**.

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 15/140,451	Applicant(s) MULLEN, JEFFREY DAVID	
	Examiner PIERRE E. ELISCA	Art Unit 3716	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/14/2018.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 4-23. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. ☒ Notice of References Cited (PTO-892) | 5. ☒ Examiner's Amendment/Comment |
| 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3716

REASONS FOR ALLOWANCE

1. The present application is being examined under the pre-AIA first to invent provisions.
2. This is an Examiner's statement of reason for allowance.
3. Regarding the claimed terms, the Examiner notes that a "general term must be understood in the context in which the inventor presents it." *In re Glaug* 283 F.3d 1335, 1340, 62 USPQ2d 1151, 1154 (Fed. Cir. 2002). Therefore the Examiner must interpret the claimed terms as found on pages 1-47 of the specification. Clearly almost all the general terms in the claims may have multiple meanings. So where a claim term "is susceptible to various meanings, . . . the inventor's lexicography must prevail" *Id.* Using these definitions for the claims, the claimed invention was not reasonably found in the prior art.
4. The closest prior art Ohshima et al (U.S. Pat. No. 6,951,515) which discloses an augmented reality game system. However, Ohshima singularly or in combination fail to disclose the recited feature:
5. As per claims 1 "utilizing a detector to determine landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape characteristics in providing said video game, and utilizing a location device to determine the physical location of said locating device on the physical playfield, wherein said video

Art Unit: 3716

game logic utilizes the physical location of said locating device in providing said video game”.

6. Please amend abstract as follows:

Handheld location based games are provided in which a user's physical location correlates to the virtual location of a virtual character on a virtual playfield. Augmented Reality (AR) systems are provided in which video game indicia are overlaid onto a user's physical environment. A landscape detector is provided that may obtain information about the user's landscape, in addition to the user's location, in order to provide overlaying information to an AR head-mounted display and control information to non-user controlled video game characters.

7. As per claim 1 “providing 3-D video game indicia to a transparent head-mounted display with respect to a physical playfield based on video game logic, utilizing a detector to determine landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape characteristics in providing said video game, and utilizing a locating device to determine the physical location of said locating device on said physical playfield, wherein said video game logic utilizes the physical location of said locating device in providing said video game”.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to PIERRE E. ELISCA whose telephone number is

Art Unit: 3716

(571)272-6706. The Examiner can normally be reached on 6:00AM to 4:30PM, Monday - Thursday. Hoteler.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dmitri Suhol can be reached on 571 272 4430. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3

Notice of References Cited	Application/Control No. 15/140,451		Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID	
	Examiner PIERRE E. ELISCA		Art Unit 3716	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6,951,515 B2	10-2005	Ohshima; Toshikazu	A63F13/10	463/31
*	B	US-6,346,929 B1	02-2002	Fukushima; Nobuo	G06F3/013	345/156
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 9352

SERIAL NUMBER 15/140,451	FILING or 371(c) DATE 04/27/2016 RULE	CLASS 463	GROUP ART UNIT 3716	ATTORNEY DOCKET NO. JDM/008 CON2	
APPLICANTS INVENTORS Jeffrey David Mullen, Pittsburgh, PA; ** CONTINUING DATA ***** This application is a CON of 13/973,997 08/22/2013 PAT 9352216 which is a CON of 11/281,812 11/16/2005 PAT 8585476 which claims benefit of 60/628,475 11/16/2004 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY ** 05/11/2016					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/PIERRE E ELISCA/</u> Examiner's Signature	☐ Met after Allowance P.E Initials	STATE OR COUNTRY PA	SHEETS DRAWINGS 14	TOTAL CLAIMS 1	INDEPENDENT CLAIMS 1
ADDRESS JEFFREY D. MULLEN 2212 Hassinger Lane Glenshaw, PA 15116 UNITED STATES					
TITLE LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS					
FILING FEE RECEIVED 730	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

<i>Index of Claims</i> 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID
	Examiner PIERRE E ELISCA	Art Unit 3716

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant		☐ CPA		☒ T.D.		☐ R.1.47			
CLAIM		DATE							
Final	Original	04/12/2018							
	1								
	2								
	3								
1	4	=							
2	5	=							
3	6	=							
4	7	=							
5	8	=							
6	9	=							
7	10	=							
8	11	=							
9	12	=							
10	13	=							
11	14	=							
12	15	=							
13	16	=							
14	17	=							
15	18	=							
16	19	=							
17	20	=							
18	21	=							
19	22	=							
20	23	=							

Refine Search

Search Results

Terms	Documents
L1 and detect\$3 near3 landscap\$3 near3 characteristic\$1	6

Database:

EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletin Database
Foreign Patent Retrieval

Search Type: ☒ **Prior Art** ☐ **Interference**

Search:

L2

Order By: ☒ **Date** ☐ **Hits**

Search History

DATE: Sunday, April 15, 2018

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Order By	<u>Set Name</u> Side by Side	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u> Result Set	<u>Set Name</u> Grid	<u>Set Name</u> Classification
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Prior Art Searches

DB=PGPB,USPT,USOC; PLUR=YES; OP=OR

Date	<u>L2</u>	L1 and detect\$3 near3 landscap\$3 near3 characteristic\$1	6	<u>L2</u>	<u>L2</u>	<u>L2</u>	Review all
Date	<u>L1</u>	(locat\$3 near3 gam\$3) and (three-dimensional or three dimensional or 3-d or 3d) near3 video near3 gam\$3	902	<u>L1</u>	<u>L1</u>	<u>L1</u>	

END OF SEARCH HISTORY

Issue Classification 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID	
	Examiner PIERRE E ELISCA	Art Unit 3716	

CPC						
Symbol					Type	Version
A63F		13		65	F	2014-09-02
A63F		13		25	I	2014-09-02
A63F		13		216	I	2014-09-02
A63F		13		211	I	2014-09-02
A63F		13		525	I	2014-09-02
A63F		13		327	I	2014-09-02
A63F		2300		8082	A	2013-01-01
A63F		2300		5573	A	2013-01-01
A63F		2300		69	A	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)		
/PIERRE E ELISCA/ Primary Examiner.Art Unit 3716	4/14/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	14

Issue Classification 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID
	Examiner PIERRE E ELISCA	Art Unit 3716

☐ Claims renumbered in the same order as presented by applicant								☐ CPA		☒ T.D.		☐ R.1.47			
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1	14	17												
	2	15	18												
	3	16	19												
1	4	17	20												
2	5	18	21												
3	6	19	22												
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8	11														
9	12														
10	13														
11	14														
12	15														
13	16														

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 20	
/PIERRE E ELISCA/ Primary Examiner.Art Unit 3716 (Primary Examiner) _____ (Date) _____		O.G. Print Claim(s) 1	O.G. Print Figure 14

Search Notes 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID
	Examiner PIERRE E ELISCA	Art Unit 3716

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
463	1	4/12/2018	P.E
463	31	4/12/2018	P.E
463	32	4/12/2018	P.E

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
West Search	4/12/2018	P.E

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
463/ A63F	1/ 13/10	4/12/2018	P.E
463/ G07F	32/ 17/3211	4/12/2018	P.E

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL **(Submitted Only via EFS-Web)**

Application Number	15140451	Filing Date	2016-04-27	Docket Number (if applicable)	JDM/008 CON2	Art Unit	3716
First Named Inventor	Jeffrey D. Mullen			Examiner Name	PIERRE E. ELISCA		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☐ Amendment/Reply

☒ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
 (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
 The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to
 Deposit Account No 503855

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Patent Practitioner Signature

☒ Applicant Signature

Applicant Signature			
Applicant 1			Remove
Signature	Jeffrey D. Mullen/	Date (YYYY-MM-DD)	2018-08-14
Name	Jeffrey D. Mullen		
Click ADD for additional Applicant Signature			Add

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jeffrey D. Mullen
Application No. : 15/140,451
Confirmation No. : 9352
Filed : April 27, 2016
For : LOCATION-BASED GAMES AND
AUGMENTED REALITY SYSTEMS
Group Art Unit : 3716
Examiner : Pierre E. Elisca

Hon. Commissioner for Patents Pittsburgh, PA 15116
P.O. Box 1450 August 14, 2018
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with 37 C.F.R. §§ 1.56 and 1.97,
applicant wishes to call the attention of the Examiner to the
following documents:

Patent Documents

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5,704,538	Norton et al.	01-1998
5,717,414	Bergsneider	02-1998
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Foreign Patent Documents

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Non-Patent Literature

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<http://en.wikipedia.org/w/index.php?title=Mortal_Kombat_4&printable=yes>

For the above-identified documents that are United States patents, copies of these documents are not being submitted herewith.

Documents above were cited in parent Application No. 11/281,812 filed on November 16, 2005. Applicant respectfully requests the Examiner review the prosecution history of this application including all communications from the United States Patent and Trademark Office contained therein (e.g., the Office Actions contained therein).

Applicant also respectfully requests the Examiner review the prosecution history of related Application No. 13/973,997 including all communications from the United States Patent and Trademark Office contained therein (e.g., the Office Actions contained therein).

Applicant also respectfully requests the Examiner review the prosecution history of related Application No. 15/168,203 including all communications from the United States Patent and Trademark Office contained therein (e.g., the Office Actions contained therein).

It is respectfully requested that these documents be (1) fully considered by the Patent and Trademark Office during examination of this application; and (2) printed on any patent which may issue on this application. Applicant requests that a copy of Form PTO/SB/08A, as considered and initialed by the Examiner, be returned with the next communication.

Applicant hereby submits that not all of the patent documents and non-patent literature submitted herein may be, in fact, prior art to the present application. Applicant reserves the right to dispute whether references, or subject matter within references, are prior art to the present application (e.g., continuation-in-part subject matter filed after the filing date of the present application).

This Statement is being submitted after an office action on the merits. In accordance with 37 C.F.R. § 1.97(a)(4), the fee is being submitted herewith. An early and favorable action is respectfully requested.

Respectfully submitted,

/Jeffrey D. Mullen/

Jeffrey D. Mullen
Applicant (Reg. No. 52,056)
Customer No. 32733
2212 Hassinger Lane
Glenshaw, PA 15116
Mobile: (914) 837-7741

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if known	
				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
Sheet	1	of	4	Attorney Docket Number	JDM/008 CON2

U.S. PATENT DOCUMENTS					
Examiner initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number – Kind Code ² (if known)			
		5,662,523	09-1997	Yasumaru	
		5,704,836	01-1998	Norton et al.	
		5,717,414	02-1998	Bergsneider	
		5,724,660	03-1998	Kauser	
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		5,913,727	06-1999	Ahdoot	
		6,011,653	01-2000	Karasawa	
		6,015,344	01-2000	Kelly et al.	
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		6,102,802	08-2000	Armstrong	
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		6,346,929	02-2002	Fukushima et al.	
		6,351,261	02-2002	Reichien	
		6,361,438	03-2002	Morihiro	

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if known	
				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
Sheet	2	of	4	Attorney Docket Number	JDM/008 CON2

		6,378,390	04-2002	Saito	
		6,411,266	06-2002	Maguire	
		6,520,853	02-2003	Suzuki	
		6,522,312	02-2003	Ohshima et al.	
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		6,989,831	01-2006	Ebersole et al.	
		7,008,323	03-2006	Hayashi	

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if known	
				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
Sheet	3	of	4	Attorney Docket Number	JDM/008 CON2

		7,038,699	05-2006	Sato et al.	
		7,050,078	05-2006	Dempski	
		7,055,101	05-2006	Abott et al.	
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		2002/0082068	06-2002	Singhal	
		2002/0082082	06-2002	Stamper et al.	

Examiner Signature		Date Considered	
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1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

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Substitute for form 1449A/PTO				Complete if known		
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number		15/140,451
				Filing Date		April 27, 2016
				First Named Inventor		Jeffrey D. Mullen
				Art Unit		3716
				Examiner Name		Pierre E. Elisca
(use as many sheets as necessary)				Attorney Docket Number		JDM/008 CON2
Sheet	4	of	4			

		2002/0090985	07-2002	Tochner et al.	
		2003/0144047	07-2003	Sprogis	
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		2006/0105838	05-2006	Mullen	
		2006/0148490	07-2006	Bates	
		2006/0258420	11-2006	Mullen	
		2007/0281765	12-2006	Mullen	
		2007/0281766	12-2006	Mullen	
		2008/0015018	01-2008	Mullen	
		2008/0015024	01-2008	Mullen	

FOREIGN PATENT DOCUMENTS						
Examiner initials*	Cite No. ¹	Foreign Patent Document Country Code ³ - Number ⁴ - Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		WO02073287	09-1992	Yonezawa et al.		

Examiner Signature		Date Considered	
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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if known	
				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
Sheet	5	of	4	Attorney Docket Number	JDM/008 CON2

NON PATENT LITERATURE DOCUMENTS			
Examiner initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Wikipedia, Super Dodge Ball – Wikipedia, the free encyclopedia. Accessed December 14, 2010. http://en.wikipedia.org/wiki/Super_Dodge_Bal	
		GameFAQs: Super Dodge Ball (NES) FAQ/Walkthrough by TOKADasrik. Accessed December 14, 2010. http://www.gamefaqs.com/nas/587662-super-dodge-ball/faqs/34823	
		Youtube.com Screenshot of Super Dodge Ball Walkthrough with Commentary (Part 1 of 2). Accessed: December 14, 2010. http://www.youtube.com/watch?v=E1IUWmr65JA	
		"First Person Indoor/outdoor Augmented Reality Application: ARQuake," written by Thomas et al, and published February 2002	
		Halo: Combat Evolved, Wikipedia description, http://en.wikipedia.org/wiki/Halo_%28game%29	
		Quake Game Manual, Release circa 1996	
		"Antti Kotanen, Marko Hannikainen, Helena Leppakoski, Hamalainen "Experiments on Local Positioning with Bluetooth" Proceedings of the International Conference on Information Technology: Computers and Communications (ITCC '03) April, 2003	
		Mortal Kombat instruction booklet for Super Nintendo, 1992, Licensed from Midway.	
		Mortal Kombat 4 (released October 15, 1997). Published by Midway Games < http://en.wikipedia.org/w/index.php?title=Mortal_Kombat_4&printable=yes >	

Examiner Signature		Date Considered	
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Electronic Patent Application Fee Transmittal

Application Number:	15140451			
Filing Date:	27-Apr-2016			
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS			
First Named Inventor/Applicant Name:	Jeffrey David Mullen			
Filer:	Jeffrey David Mullen			
Attorney Docket Number:	JDM/008 CON2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	80	80
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	650	650
Total in USD (\$)				730

Electronic Acknowledgement Receipt

EFS ID:	33468801
Application Number:	15140451
International Application Number:	
Confirmation Number:	9352
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS
First Named Inventor/Applicant Name:	Jeffrey David Mullen
Customer Number:	32733
Filer:	Jeffrey David Mullen
Filer Authorized By:	
Attorney Docket Number:	JDM/008 CON2
Receipt Date:	14-AUG-2018
Filing Date:	27-APR-2016
Time Stamp:	19:31:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 730
RAM confirmation Number	081518INTEFSW00005914503855
Deposit Account	503855
Authorized User	Jeffrey Mullen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

Meta Exhibit 1016

37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	JDM-008CON2--Declaration.pdf	58092	no	3
			48649f2f855b7939032d19311c3008b0bbc92a0f		
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	JDM-008CON2--RCE.pdf	697803	no	3
			dc75bae379cd927dad94ee69095935cd9b2193dd		
Warnings:					
Information:					
3	Transmittal Letter	JDM-008CON2--IDS.pdf	75236	no	7
			4782299ff5e1eb59b441212cd83aef071b3c59c2		
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	JDM-008CON2--IDS--PTO_SB_08A.pdf	311845	no	5
			132fe766571c4965d974d38b7e7c322de73227a5		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
5	Non Patent Literature	References1.pdf	12223620	no	45
			75594ad06b19157de315ffb0fed4490838469273		
Warnings:					
Information:					
6		References2.pdf	5585526	yes	109
			cf454c5bd1b95148562049c577159454ddbde42b		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Foreign Reference	52	109
	Non Patent Literature	1	51

Warnings:

Information:

7	Non Patent Literature	References3.pdf	1288690	no	27
			803500334907c5f5a2df3513002fd20d3fca7b4d		

Warnings:

Information:

8	Fee Worksheet (SB06)	fee-info.pdf	31736	no	2
			3b153135599ca66f1340cff65426f192e37a7858		

Warnings:

Information:

Total Files Size (in bytes):			20272548
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

DECLARATION

I, Jeffrey David Mullen, declare that I am a citizen of the United States and that I reside in Glenshaw, Pennsylvania; and have a post office address at 2212 Hassinger Lane, Glenshaw, Pennsylvania 15116;

that I verily believe myself to be the original and first inventor of the invention or discovery in:

LOCATED-BASED GAMES AND AUGMENTED REALITY SYSTEMS

the application, including specification, of which was filed on April 27, 2016, as U.S. Application No. 15/140,451;

that the above-identified application was made or authorized to be made by me;

that I have reviewed and do understand the content of said application, including the claims, and acknowledge my duty to disclose to the United States Patent and Trademark Office information known by me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56;

that I do not know and do not believe that this invention or discovery was ever known or used in the United States of America before my invention or discovery thereof, or patented or described in any printed publication in any country before my invention or discovery thereof, or more than one year prior to this application; or in public use or on sale in the United States of America more than one year prior to this application; that this invention or discovery has not been patented or made the subject of an

inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application; and that no application for patent or inventor's certificate on this invention or discovery has been filed in any country foreign to the United States of America by me or my legal representatives or assigns;

I hereby claim the benefit under Title 35, United States Code § 119(e) to the United States provisional applications listed below;

60/628,475
(Application Serial No.)

November 16, 2004
(Filing Date)

and I claim priority under Title 35, United States Code § 120 to the United States non-provisional applications listed below;

11/281,812
(Application Serial No.)

November 16, 2005
(Filing Date)

13/973,997
(Application Serial No.)

August 22, 2013
(Filing Date)

and I request that communications be sent to:

Jeffrey D. Mullen
2212 Hassinger Lane
Glenshaw, PA 15116

and that telephone calls be directed to:

Jeffrey D. Mullen
(914) 837-7741

Wherefore, I pray that Letters Patent be granted to me for the invention or discovery described and claimed in the attached application, and I hereby subscribe my name to the foregoing application, including the claims, and declaration.

I declare, further, that I understand the English language and that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and, further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment of not more than five (5) years, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

August 14, 2018

Date

/Jeffrey D. Mullen/

Jeffrey David Mullen

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
19 September 2002 (19.09.2002)

PCT

(10) International Publication Number
WO 02/073287 A2

(51) International Patent Classification⁷: **G02B 27/00**

(21) International Application Number: PCT/JP02/02297

(22) International Filing Date: 12 March 2002 (12.03.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2001-071117 13 March 2001 (13.03.2001) JP

(71) Applicant (for all designated States except US): **CANON KABUSHIKI KAISHA** [JP/JP]; 3-30-2, Shimomaruko, Ohta-ku, Tokyo 146-8501 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **YONEZAWA,**

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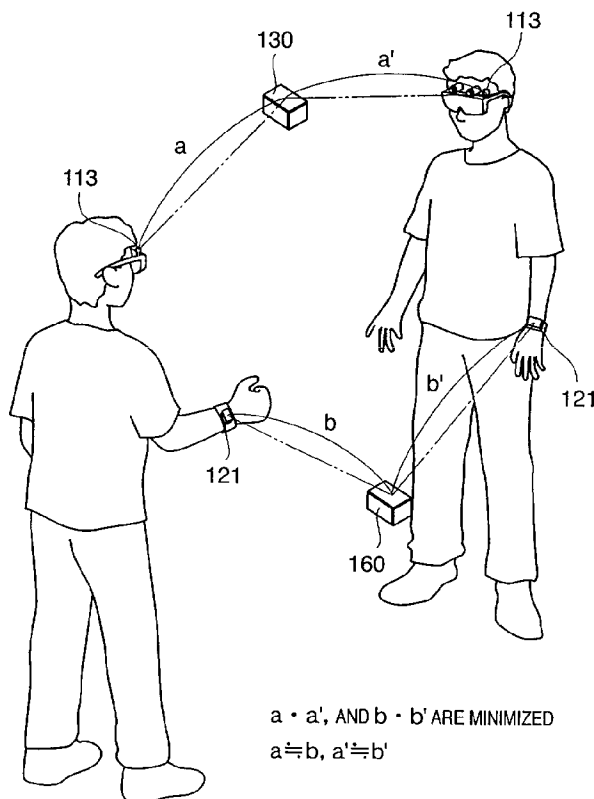
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(54) Title: MIXED REALITY SYSTEM WHICH REDUCES MEASUREMENT ERRORS OF VIEWPOINT POSITION AND DIRECTION OF OBSERVER



(57) Abstract: ABSTRACT A mixed reality system which reduces positional shifts between a real space picture and a virtual space picture with an inexpensive arrangement is disclosed. The mixed reality system according to this invention detects the viewpoint position and direction of an observer and the position and direction of another region of the observer by using reception results on signals output from a transmitter. In this mixed reality system, the transmitter is positioned such that the distance between the transmitter and a receiver used for the measurement of the viewpoint position and direction of the observer becomes shorter than the distance between the transmitter and a receiver used for the measurement of the position and direction of another region of the observer. This makes it possible to reduce measurement errors of the line-of-sight position and direction which are more dominant over positional shifts.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

DESCRIPTION

MIXED REALITY SYSTEM WHICH REDUCES
MEASUREMENT ERRORS OF VIEWPOINT POSITION AND
DIRECTION OF OBSERVER

5

TECHNICAL FIELD

The present invention relates to an augmented or
mixed reality system which creates and displays a mixed
reality space picture by combining a real space picture
10 received from a video camera or the like and a virtual space
picture created by CG or the like, and a head mounted display
apparatus which can be used for the mixed reality system.

The present invention also relates to a method of
determining the position of a transmitter used to measure
15 the position and direction of a predetermined region of an
observer in the above mixed reality system.

BACKGROUND ART

In a mixed reality system, to merge a real space with
20 a virtual space, the 3D coordinates and direction of a real
space object by using some means. As methods of acquiring
these pieces of information, for example, the following
method are realized: a method using a position/direction
measurement apparatus typified by FASTRAK (trademark)
25 available from Polhemus Inc. in the US, a method of
combining information obtained by image processing of a
real space picture based on known camera parameters with

information obtained by a gyro, and a method of measuring the position and direction of a real space object by using a special multi-eye camera.

Apparatuses used in these methods are expensive, and
5 besides, have measurement errors. To reduce such measurement errors, a measurement apparatus which is more expensive rather than cost-effective is required, which is one of the factors that hinder a reduction in the cost of a mixed reality system.

10 Fig. 22 shows an example of how a conventional position/direction measurement apparatus typified by FASTRAK available from Polhemus Inc. in the US.

Referring to Fig. 22, reference numerals 300a and 300b denote observers; 301, an HMD (Head Mounted Display)
15 used by an observer to observe a mixed real space; 302, a position/direction measurement receiver mounted on the HMD 301; and 304, a position/direction measurement transmitter hidden by a wall. The observers 300a and 300b stand to face each other in a set 310. Each observer can freely determine
20 a viewpoint position and line-of-sight direction within a movable area 311.

Reference numeral 312 denotes a mixed real space picture observable area. When the observer 300a or 300b sees this mixed real space picture observable area 312,
25 he/she can observe, through the HMD 301, a mixed real space picture obtained by merging a CG picture as a virtual space picture with a real space picture. When the observer does

not see the mixed real space picture observable area 312,
only a real space picture is displayed on the HMD 301. A
virtual space picture is displayed at a position determined
on the basis of the viewpoint position and line-of-sight
5 direction of the observer. It is therefore important to
reduce measurement errors of the viewpoint position and
line-of-sight direction when the observer sees the mixed
real space picture observable area 312.

As shown in Fig. 22, if, however, the receiver 302
10 is fixed to the left side of the HMD 301 to measure the
viewpoint position and line-of-sight direction of an
observer, the distance between the receiver 302 and the
transmitter 304 becomes long. This may result in an
increase in measurement errors.

15

DISCLOSURE OF INVENTION

The present invention has been made in consideration
of the above problem in the prior art, and has as its object
to reduce positional shifts between a real space picture
20 and a virtual space picture with an inexpensive
arrangement.

According to the first aspect of the present
invention, a mixed reality system which creates and
displays a mixed real space picture by combining a real
25 space picture with a virtual space picture, characterized
by comprising a transmitter, a first receiver which
receives a signal generated by said transmitter to measure

a viewpoint position and direction of an observer, and a second receiver which receives a signal generated by said transmitter to measure a position and direction of another body region of the observer, wherein said transmitter is
5 positioned such that a distance between said transmitter and said first receiver becomes shorter than a distance between said transmitter and said second receiver.

According to the second aspect of the present invention, a head mounted display apparatus which is used
10 in a mixed reality system that creates and displays a mixed real space picture by combining a real space picture with a virtual space picture, and which can mount a receiver used to measure a viewpoint position and direction of an observer to be mounted, characterized in that a plurality of mount
15 portions for detachably mounting said receiver are formed.

According to the third aspect of the present invention, a method of positioning a transmitter in a mixed reality system which includes the transmitter, a first receiver which receives a signal generated by the
20 transmitter to measure a viewpoint position and direction of an observer, and a second receiver which receives a signal generated by the transmitter to measure a position and direction of another body region of the observer, and creates and displays a mixed real space picture by combining
25 a real space picture with a virtual space picture, characterized in that said transmitter is positioned such that a distance between the transmitter and the first

receiver becomes shorter than a distance between the transmitter and the second receiver.

BRIEF DESCRIPTION OF DRAWINGS

5 The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

10 Fig. 1 is a view showing the schematic arrangement of a mixed reality system to which the third embodiment of the present invention is applied;

 Fig. 2 is a view showing the arrangement of an HMD;

 Fig. 3 is a flow chart showing the processing of
15 creating a mixed real space picture;

 Figs. 4A and 4B are views showing a real space picture example and virtual space picture;

 Fig. 5 is a view showing an ideal (with no error in position sensor measurement values) mixed real space
20 picture corresponding to the real space picture example and virtual space picture example in Figs. 4A and 4B;

 Fig. 6 is a view showing a mixed real space picture corresponding to the real space picture example and virtual space picture example in Figs. 4A and 4B in a case where
25 an error exists only in an eye position sensor measurement value;

 Fig. 7 is a view showing a mixed real space picture

corresponding to the real space picture example and virtual space picture example in Figs. 4A and 4B in a case where an error exists only in a hand position sensor measurement value;

5 Fig. 8 is a view for explaining the distance relationship between a position sensor transmitter and a position sensor in the first embodiment of the present invention;

 Fig. 9 is a view for explaining the distance
10 relationship between a position sensor transmitter and a position sensor in the second embodiment of the present invention;

 Fig. 10 is a view for explaining the distance relationship between a position sensor transmitter and a
15 position sensor in the third embodiment of the present invention;

 Fig. 11 is a view showing the schematic arrangement of a mixed reality system to which the third embodiment of the present invention is applied;

20 Fig. 12 is a view showing the schematic arrangement of a mixed reality system to which the fourth embodiment of the present invention is applied;

 Fig. 13 is a view for explaining the distance relationship between a position sensor transmitter and a
25 position sensor in the fourth embodiment of the present invention;

 Fig. 14 is a view showing the schematic arrangement

of a mixed reality system to which the fifth embodiment of the present invention is applied;

Fig. 15 is a view for explaining the distance relationship between position sensor transmitters and
5 position sensors in the fifth embodiment of the present invention;

Fig. 16 is a view showing the schematic arrangement of a mixed reality system to which the sixth embodiment of the present invention is applied;

10 Fig. 17 is a perspective view showing a case where the HMD according to the sixth and seventh embodiments is viewed from the direction of a photographing unit;

Fig. 18 is a perspective view showing a case where the HMD according to the sixth and seventh embodiments is
15 viewed from the direction of a display unit;

Fig. 19 is a block diagram showing a hardware arrangement corresponding to one observer in the system shown in Fig. 16;

Fig. 20 is a view for explaining the mount position
20 of a position sensor (receiver) in the sixth embodiment of the present invention;

Fig. 21 is a view for explaining the mount position of a position sensor (receiver) in the seventh embodiment of the present invention; and

25 Fig. 22 is a view for explaining an example of a problem in the prior art.

BEST MODE OF CARRYING OUT THE INVENTION

Preferred embodiments of the present invention will now be described in detail in accordance with the accompanying drawings.

5

[First Embodiment]

Fig. 1 is a view showing the schematic arrangement of a mixed reality system to which the first embodiment of the present invention is applied. An observer 100 is
10 wearing an HMD (Head Mounted Display) 110 on the head and a glove 120 on his/her hand.

As shown in Fig. 2, the HMD 110 is comprised of a video camera 111, LCD 112, position/direction measurement apparatus receiver (eye position sensor) 113, and optical
15 prisms 114 and 115. The video camera 111 photographs a real space picture at/in the viewpoint position and line-of-sight direction of the observer through the optical prism 115. The eye position sensor 113 is used to measure the viewpoint position and line-of-sight direction of an
20 observer. The LCD 112 displays a mixed real space picture. This picture is guided to the pupil of the observer through the optical prism 114.

The glove 120 incorporates a hand position sensor 121 and speaker 122 (not shown). The hand position sensor 121
25 is used as a sensor for measuring the position and direction of the hand of the observer. The speaker 122 generates a sound corresponding to an event that has occurred at the

position of the hand. This sound may be a sound generated when the user touches or hits a virtual space object with his/her hand, a sound generated when the condition of a virtual space object displayed in synchronism with the position of the hand changes, or the like.

Reference numeral 130 denotes a position/direction measurement apparatus transmitter (position sensor transmitter); and 131, a position/direction measurement apparatus body (position sensor body). The eye position sensor 113, hand position sensor 121, and position sensor transmitter 130 are connected to the position sensor body 131. Magnetism is transmitted from the position sensor transmitter 130. This magnetism is received by the eye position sensor 113 and hand position sensor 121. The position sensor body 131 calculates the position and direction of the eye and hand on the basis of the reception intensity signal from the hand position sensor 121. As this position/direction measurement apparatus, FASTRAK available from Polhemus Inc. in the US or the like can be used.

Reference numeral 140 denotes a processing apparatus for creating a mixed real space picture for one observer and displaying it on the HMD 110. This processing apparatus 140 is comprised of, for example, a personal computer, a video capture card, a video card having a CG function, a sound card, and the like. The HMD 110, speaker 122, and position sensor body 131 are connected to the processing

apparatus 140.

A procedure for creating a mixed real space picture in the processing apparatus 140 will be described next with reference to the flow chart of Fig. 3.

5 First of all, the processing apparatus 140 receives a viewpoint position, a line-of-sight direction, and the position and direction of the hand transmitted from the position sensor body 131 (step S301). Note that the operation in step S301 uses thread S311 of periodically
10 receiving the viewpoint position, the line-of-sight direction, and the position and direction of the hand transmitted from the position sensor body 131.

The virtual space time is then updated, and the state of the virtual space (the type, position, and condition of
15 a virtual space object) is updated (step S302). In this case, if there is a virtual space object whose position and direction change in synchronism with the position and direction of a real space object, the state of such an object is also updated. If, for example, the user is made to see
20 that he/she is always wearing a glove as a virtual space object on his/her hand, the position and direction of the glove are updated in accordance with changes in the position and direction of the hand in step S302.

If the relationship between the position and
25 direction (the hand position and viewpoint position) of the real space object and the position and direction of the virtual space object is then checked, and it is determined

that a predefined event has occurred, the state of the virtual space is updated in accordance with the event (step S303). For example, the occurrence of an even corresponds to a case where it is determined that the user touches the
5 virtual space object with his/her hand. Updating the state of a virtual space in accordance with this event may be equivalent to changing, for example, the picture of the touched virtual space object into a picture of an explosion.

A real space picture at/in the viewpoint position and
10 line-of-sight direction of the observer which is obtained from the video camera 111 is received (step S304). This operation in step S304 uses thread S314 of periodically acquiring the real space picture obtained from the video camera 111 through a video capture card.

15 A virtual space picture at/in the viewpoint position and line-of-sight direction of the observer, which are obtained in step S301, is created in accordance with the state of virtual space updated in steps S302 and S303 (step S305).

20 Finally, the virtual space picture created in step S305 is combined with the real space picture received in step S304, and the resultant picture is output to the LCD 112 of the HMD 110 (step S306). The above processing is repeatedly executed until some terminating operation is
25 performed (step S307).

A method unique to this embodiment will be described next, which is used to reduce the differences in position

and direction between a virtual space object and a real space object in a mixed real space picture observed by each observer.

If the position/direction measurement apparatus can
5 properly measure the viewpoint position and line-of-sight direction of an observer and the position and direction of the hand, there are no differences in position and direction between the virtual space object and the real space object. Consider the real space picture shown in Fig. 4A and the
10 virtual space picture shown in Fig. 4B. In this case, ideally, a mixed reality picture like the one shown in Fig. 5 is created. In practice, however, the position/direction measurement apparatus uses magnetism or ultrasonic waves, and hence is very susceptible to
15 disturbances and has a small measurable range. The actual position/direction measurement apparatus can measure with effective accuracy only within a range of about 80 cm from the position sensor transmitter. It is also known that even in measurement in a space without any ferromagnetic object,
20 position and direction measurement errors monotonously increase with an increase in distance between the position sensor transmitter and the position sensor (receiver). In order to improve this situation, it is important to minimize the distance between the position sensor transmitter and
25 the receiver.

Measurement errors in the position/direction measurement apparatus pose a more serious problem in the

measurement of viewpoint position and line-of-sight direction. If measurement errors about the hand position and direction increase, only a positional shift occurs between the hand the virtual space object that moves in
5 synchronism with the hand, as shown in Fig. 7. If, however, measurement errors about the viewpoint position and line-of-sight direction increase, positional shifts occur with respect to all virtual space objects as well as a positional shift with respect to the hand, as shown in
10 Fig. 6.

The principal object of the first embodiment is therefore to improve the measurement accuracy of the eye position sensor 113. To reduce positional shifts between a real space object and a virtual space object, the position
15 sensor transmitter 130 is placed such that the distance between the eye position sensor 113 and the position sensor transmitter 130 becomes shorter than the distances between the position sensor transmitter 130 and the remaining sensors connected to the position sensor body 131 at the
20 positions and directions at/in which the respective position sensors are used with high frequencies, as shown in Fig. 8, thereby improving the measurement accuracy of the viewpoint position and line-of-sight direction as compared with the measurement accuracy of the position and
25 direction of the remaining position sensors. This makes it possible to make positional shifts with respect to all the virtual space objects less noticeable.

The position of the position sensor transmitter 130 cannot be specified but should be changed flexibly depending on the type of mixed reality picture the mixed reality system displays and the position and direction
5 viewed by an observer.

Assume that a plurality of observers exist. In this case, mixed reality can be further augmented by setting a situation in which the observers can observe each other. In general, therefore, the direction in which each observer
10 observes with a high frequency becomes the horizontal direction. In such a situation, placing the position sensor transmitter 130 above the head of the observer as shown in Fig. 8 makes it possible to have the merits of this embodiment and prevent a picture of the transmitter, which
15 should not be combined as a real space object in the mixed real space, from being combined. In addition, this allows the observer to freely move in all directions. Furthermore, since measurement errors caused when the observer moves become equal to each other in all directions, management
20 is facilitated. As described above, a mixed real space picture without any unnecessary real object, which has high quality as a whole, can be observed while the freedom of movement is ensured.

25 [Second Embodiment]

The second embodiment exemplifies a case where a position sensor transmitter 130 is placed such that the

distance from a hand position sensor 121 is shortened, as well as the distance from an eye position sensor 113, at/in the viewpoint position and line-of-sight direction at/in which the hand is observed with a high frequency and at/in
5 the hand position and direction, as shown in Fig. 9.

In the second embodiment, in a situation where an observer frequently observes the hand, the position sensor transmitter 130 is so placed as to shorten the distance between the eye position sensor 113 and the position sensor
10 transmitter 130 as well as the distance between the hand position sensor 121 and the position sensor transmitter 130. This makes it possible to reduce measurement errors in both the eye position sensor 113 and the hand position sensor 121. As compared with the first embodiment, a virtual space
15 object that moves in synchronism with the hand can be observed while the object is localized on the hand with a small error.

Obviously, the posture of an observer in which the hand is frequently observed depends on the contents of a
20 mixed real space picture which the mixed reality system is to present to the observer. For this reason, the position sensor transmitter 130 must be adjusted such that the distance from the hand position sensor 121 becomes almost equal to the distance from the eye position sensor 113 when
25 the hand is frequently observed.

This embodiment has exemplified the case where the position of a virtual space object is changed in synchronism

with the hand. However, the present invention is not limited to this, and can also be applied to a case where the position of a virtual space object is changed in synchronism with another body region such as a foot.

5

[Third Embodiment]

Fig. 11 is a view showing the schematic arrangement of a mixed reality system to which the third embodiment is applied. This system is based on the assumption that two
10 observers simultaneously observe the same mixed real space. This system includes two systems each identical to the one shown in Fig. 1. Note that a position sensor transmitter 130 and position sensor body 131 are shared by the two observers to realize a reduction in the total cost of the
15 mixed real space system. The position sensor body 131 is connected to only one processing apparatus 140 and is not connected to the other processing apparatus 140. For this reason, the processing apparatuses 140 for the respective observers are connected to each other through a network 150
20 to allow the processing apparatus 140 to which the position sensor body 131 is not connected to create a mixed real space picture.

In the third embodiment, as shown in Fig. 10, at the position where each observer observes a hand with a high
25 frequency, the position sensor transmitter 130 is so placed as to almost match the distance (a or a') between an eye position sensor 113 for each observer and the position

sensor transmitter 130 with the distance (b or b') between
a hand position sensor 121 and the position sensor
transmitter 130. In addition, the position sensor
transmitter 130 is so placed as to minimize the respective
5 distances (a, a', b, and b').

With this arrangement, each observer can observe a
virtual space object that moves in synchronism with a hand
with a small position shift on the hand.

Note that positional shifts can be made uniform with
10 respect to all observers by placing the position sensor
transmitter 130 such that the distance (a) between the eye
position sensor 113 for a given observer and the position
sensor transmitter 130 becomes almost equal to the distance
(a') between the eye position sensor 113 for the other
15 observer and the position sensor transmitter 130, and the
distance (b) between the hand position sensor 121 for a
given observer and the position sensor transmitter 130
becomes almost equal to the distance (b') between the hand
position sensor 121 for the other observer and the position
20 sensor transmitter 130.

The procedure executed by each processing apparatus
140 is almost the same as that in the first embodiment except
that the processing apparatus 140 to which the position
sensor body 131 controls the position sensor body 131
25 through a position/direction acquisition thread in thread
S311 in Fig. 3 to acquire measurement values. This
processing apparatus 140 then accesses the network 150 to

distribute the measurement values obtained by the respective position sensors to the other processing apparatus.

The processing apparatus 140 to which the position
5 sensor body 131 is not connected accesses the network
through a position/direction acquisition thread in thread
S311 in Fig. 3 to acquire the measurement values obtained
by the respective position sensors which are sent from the
processing apparatus 140 to which the position sensor body
10 131 is connected.

[Fourth Embodiment]

The fourth embodiment is obtained by developing the
first embodiment to have one each of a position sensor
15 transmitter and a position sensor body for one position
sensor. In this case, two components, i.e., a position
sensor transmitter and position sensor body, are required
for one position sensor, and hence the cost increases
accordingly. However, a viewpoint position, a
20 line-of-sight direction, and the position and direction of
the hand can be measured with high accuracy.

Fig. 12 is a view showing the schematic arrangement
of a mixed reality system to which the fourth embodiment
is applied. This system additionally has a hand position
25 sensor transmitter 160 and position sensor body 161 as
compared with the arrangement of the first embodiment shown
in Fig. 1. The hand position sensor body 161 is connected

to a processing apparatus 140, and the hand position sensor transmitter 160 is connected to the hand position sensor body 161. A hand position sensor 121 is designed to receive magnetism from the hand position sensor transmitter 160.

- 5 In this embodiment, a position sensor transmitter 130 and position sensor body 131 function as dedicated devices for the eyes.

The hand position sensor transmitter 160 is so placed as to shorten the distance between the hand position sensor 121 and the hand position sensor transmitter 160 at/in the hand position and direction where an observer observes the hand with a high frequency. The position sensor transmitter 130 is so placed as to shorten the distance between an eye position sensor 113 and the eye position sensor transmitter 130.

Although the procedure executed by the processing apparatus 140 is almost the same as that in the first embodiment except that in thread S311 in Fig. 3, a position/direction acquisition thread controls the plurality of position sensor bodies 131 and 161 to acquire measurement values from the respective sensor bodies.

By arranging the dedicated position sensor transmitter and position sensor body for each position sensor in this manner, positional shifts between a real space picture and a virtual space picture can be further reduced in the viewpoint position, the line-of-sight direction, and the hand position and direction where the

hand is observed with high frequencies, as compared with the second embodiment. This allows the observer to observe a mixed real space picture with higher quality.

The fourth embodiment is especially effective in preventing an observer from feeling a positional shift when a translucent virtual space object like seawater or a virtual space picture almost equal in size to a hand (real space picture) is to be expressed as if it were always on the hand of the observer.

Assume that a virtual space object is not translucent. In this case, if the virtual space object is larger than the hand, the hand is completely hidden by the virtual space object. Even if, therefore, a slight positional shift occurs, the resultant mixed real space picture does not look strange to the observer. In the case of a translucent virtual space object equal in size to a hand, even with a slight positional shift, the hand cannot be hidden by the virtual space object, and the positional shift between the hand and the virtual space object is seen by the observer. Furthermore, in the case of a translucent virtual space object, a positional shift between a virtual space object and a real space object is always seen by the observer regardless of the size of the virtual space object.

Even in such a situation, this embodiment can prevent the observer from observing positional shifts between the virtual space object and the real space object.

Note that the quality of a mixed real space picture

can be improved by placing the eye position sensor transmitter 130 above the head of the observer, as shown in Fig. 13, as in the first embodiment. In addition, if possible, the hand position sensor transmitter 160 may be placed below the hand position at/in the hand position and direction where the observer uses the system with a high accuracy. With this arrangement, the hand position sensor transmitter 160 does not interfere with the field of view of the observer in the horizontal direction, thereby presenting a mixed real space picture with higher quality.

[Fifth Embodiment]

Fig. 14 is a view showing the arrangement of a mixed reality system to which the fifth embodiment is applied. In this embodiment, as in the fourth embodiment, position sensor transmitters 130 and 160 and position sensor bodies 131 and 161 are respectively provided for an eye position sensor 113 and hand position sensor 121 to allow high-accuracy measurement of a viewpoint position, a line-of-sight direction, and the position and direction of the hand. In addition, the position sensor transmitters 130 and 160 and position sensor bodies 131 and 161 are shared by two observers to attain a reduction in cost.

The two position sensor bodies 131 and 161 are connected to only one processing apparatus 140 and are not connected to the other processing apparatus 140. The processing apparatuses 140 for the respective observers are

therefore connected to each other through a network 150 to allow the processing apparatus 140 to which the position sensor bodies 131 and 161 are not connected to create a mixed real space picture.

5 In this embodiment, as shown in Fig. 15, the distance between the eye position sensor 113 for each observer and the eye position sensor transmitter 130 and the distance between the hand position sensor 121 and the hand position sensor transmitter 160 are minimized at a position where
10 each observer makes observations with a high frequency. In addition, the eye position sensor transmitter 130 and hand position sensor transmitter 160 are placed such that the distances between the eye position sensors 113 for the respective observers and the position sensor transmitter
15 130 become almost equal to each other, and the distances between the hand position sensors 121 for the respective observers and the hand position sensor transmitter 160 become almost equal to each other.

20 With this arrangement, all observers can observe a high-quality mixed real picture with positional shifts between a virtual object and a real object being further reduced, and positional shifts are made uniform to all the observers.

25 The procedure executed by each processing apparatus 140 is the same as that in the first embodiment except that the processing apparatus 140 to which the position sensor bodies 131 and 161 are connected controls the position

sensor bodies 131 and 161 through a position/direction acquisition thread in thread S311 in Fig. 3 to acquire measurement values. The apparatus then accesses the network 150 to distribute the measurement values obtained
5 by the respective position sensors to the other processing apparatus.

If the eye position sensor transmitter 130 is placed above the head of an observer and the hand position sensor transmitter 160 is placed below the hand position where the
10 observer observes the hand with a high frequency as in the fourth embodiment, the position sensor transmitters 130 and 160 do not interfere with the field of view of the observer in the horizontal direction. This allows the observer to observe a high-quality mixed real space picture in the
15 direction in which a mixed real space is observed with a high frequency.

[Sixth Embodiment]

Fig. 16 is a view showing the schematic arrangement
20 of a mixed reality system to which the sixth embodiment is applied. Referring to Fig. 16, reference numerals 300a and 300b denote observers who observe mixed real space pictures created in this system. Each of the observers 300a and 300b wears an HMD 301 on which a receiver 302 is mounted.
25 Each observer can observe a mixed real space corresponding to position/direction measurement values through the HMD 301.

Reference numeral 306 denotes a position/direction measurement apparatus. A transmitter 304 and receiver 302 are connected to this position/direction measurement apparatus 306. The magnetism generated from the
5 transmitter 304 is received by the receiver 302. The position/direction measurement apparatus 306 then measures the viewpoint position and line-of-sight direction of the observer from the strength of magnetism.

The position/direction measurement apparatus 306 is
10 connected to a processing apparatus 307 to be always notified of the viewpoint position and line-of-sight direction of the observer from the position/direction measurement apparatus 306. The processing apparatus 307 creates a mixed real space picture corresponding to the
15 viewpoint position and line-of-sight direction of each observer on the basis of this information, and displays it on the HMD 301.

The processing apparatuses 307 for the respective observers are connected to each other through a network 330.
20 The respective processing apparatuses 307 share the viewpoint positions and line-of-sight directions of the respective observers and the position and direction of a virtual space object by using the network 330. This allows a given observer to display a virtual space object at the
25 position of the other observer.

Figs. 17 and 18 are perspective views of the HMD 301 to which the sixth embodiment is applied. Fig. 17 is a

perspective view from the direction of a photographing unit.
Fig. 18 is a perspective view from the direction of a
display unit.

Reference numeral 201 denotes an HMD display unit.

5 This HMD display unit 201 includes two units, i.e., a
right-eye display 201R and left-eye display 201L, each of
which has a color liquid crystal and prism. A mixed real
space picture corresponding to the viewpoint position and
line-of-sight direction of an observer is displayed on each
10 display unit.

Reference numerals 204 to 208 denote constituent
members for headmounting. To mount the HMD 301 on the head,
the observer wears it while the length adjusting portion
206 is loosened by the adjuster 205. After the forehead
15 pad 208 is brought into tight contact with the forehead,
the length adjusting portion 206 may be fastened by the
adjuster 205 to bring the temple bridges 204 and occiput
pad 207 into tight contact with the temple and occipital
portion of the observer, respectively.

20 Reference numeral 203 denotes an HMD photographing
unit for photographing a real space picture at/in the
viewpoint position and line-of-sight direction of an
observer. This HMD photographing unit 203 includes two
units, i.e., a right-eye photographing unit 203R and
25 left-eye photographing unit 203L, each of which is formed
by an NTSC compact video camera. The photographed real
space picture is superimposed on a virtual space picture

to create a mixed real space picture.

The receiver 302 is used to receive magnetism generated by the transmitter 304 as information for the measurement of the viewpoint position and line-of-sight direction of the observer. As the mount portions of the receiver 302 for the HMD 301, three portions, i.e., receiver joints 200R, 200L, and 200C, are formed. The receiver 302 can be detachably mounted on an arbitrary joint of these receiver joints 200R, 200L, and 200C. Referring to Figs. 17 and 18, the receiver 302 is mounted on the receiver joint 200R on the right side in the direction of the light of sight of the observer. However, the receiver 302 can be amounted on the receiver joint 200L on the left side in the direction of the light of sight of the observer or the receiver joint 200C on the median line of the observer.

In this embodiment, the receiver joints 200R, 200L, and 200C are designed to have receptacles in which the receiver 302 is fitted to be fixed. However, other detachable joint (mount) schemes may be used.

Reference numeral 210 denotes a receiver signal line, which is exposed outside the HMD 301 at a position near the receiver joint 200C. This receiver signal line 210 is long enough to allow the receiver 302 to be mounted on either of the receiver joints 200R, 200L, and 200C.

Reference numeral 209 denotes a tied linear member obtained by binding various kinds of lines, e.g., signal lines and power feed lines to the HMD photographing unit

203 and the like and the above receiver signal line 210. The tied linear member 209 is attached to the occipital portion mount portion 207. Signal lines and power feed lines to the right and left displays 201R and 201L, HMD
5 photographing units 203R and 203L, and the like in the tied linear member 209 pass through the right and left temple mount portions 204.

Fig. 19 is a block diagram showing a hardware arrangement corresponding to one observer in the system
10 shown in Fig. 16. The processing apparatus 307 incorporates a right-eye video capture board 350, left-eye video capture board 351, right-eye graphic board 352, left-eye graphic board 353, I/O interface 354, and network interface 359. These constituent elements are connected
15 to a CPU 356, HDD 355, and memory 357.

The left- and right-eye video capture boards 351 and 350 are respectively connected to the left- and right-eye video cameras 203L and 203R, and convert pictures actually photographed by these video cameras 203L and 203R into
20 pictures in a form that can be processed by the processing apparatus 307 with a virtual space picture. The left- and right-eye graphic boards 353 and 352 are respectively connected to the left- and right-eye display units (devices) 201L and 201R to perform display control on the
25 left- and right-eye display units 201L and 201R.

The I/O interface 354 is connected to the position/direction measurement apparatus 306. The

network interface 359 is connected to the network 330. Note that each of the processing apparatuses 140 according to the first to fifth embodiments is constituted by the same constituent elements as those of the processing apparatus
5 307 according to this embodiment.

An outline of processing performed by the mixed reality system according to this embodiment will be described next. In this system, (1) a real space picture at/in the current viewpoint position and line-of-sight
10 direction of an observer is acquired, (2) the viewpoint position and line-of-sight direction of the observer are acquired, and (3) a virtual space picture at/in the acquired viewpoint position and line-of-sight direction is created. In this case, the positional relationship between an object
15 in a virtual space viewed from the viewpoint position and an object in a real space in consideration of the position, shape, and the like of the object in the real space which are stored in advance, (4) the real space picture is superimposed on the virtual space picture to create a mixed
20 real space picture, and (5) the mixed real space picture is presented to the observer. By repeating this series of operations, the observer is made to experience a mixed real space picture.

In this series of operations, acquisition processing
25 of a real space picture at/in the current viewpoint position and line-of-sight direction of the observer is performed by the video capture boards 350 and 351. More specifically,

the video capture boards 350 and 351 convert video signals from the video cameras 203R and 203L into digital signals and continuously store them in the memory 357. The viewpoint position and line-of-sight direction of the observer are kept transmitted from the position/direction measurement apparatus 306 to the processing apparatus 307 through the I/O interface 354.

The processing apparatus 307 updates the time in a virtual space on the basis of a program stored in the memory 357 and calculates the position and direction of the virtual space object again. A virtual space picture corresponding to the viewpoint position and direction of the observer, which are acquired through the I/O interface 354, is created.

In this case, by defining in advance an object existing in a real space such that it exists in a virtual space, a virtual space picture can also be created in consideration of the positional relationship between the real space object and the virtual space object. For example, a virtual space object can be seen as if it were hidden behind a real wall.

Finally, the real space picture and virtual space picture created in the memory 357 are superimposed on each other to create a mixed real space picture. The created mixed real space picture is displayed on the HMD displays 201R and 201L under the control of the graphic boards 352 and 353.

A method of mounting the receiver 302, which is a characteristic feature of this embodiment, will be described next. Fig. 20 shows a state where the receiver 302 is mounted on a right receiver joint 210R of the HMD 301 for the observer 300a, and the receiver 302 is mounted on left receiver joint 210L of the HMD 301 for the observer 300b in the same situation as that shown in Fig. 22 which shows the problem in the prior art.

Assume that the transmitters 304 for measuring the viewpoint positions and line-of-sight directions of the observers 300a and 300b are placed at the positions in Fig. 20. In this case, by selecting receiver joints for mounting the receivers 302 in the above manner, the distances between the transmitters 304 and receivers 302 used by the observers 300a and 300b are shortened when both the observers 300a and 300b set their viewpoint positions in movable areas 311, and line-of-sight directions are set in the direction of a mixed real space picture observable area 312. In other words, position/direction measurement errors can be reduced in a situation where the observers 300a and 300b make observations with high frequencies.

In addition, by selecting mount positions for the receivers 302 as shown in Fig. 20, since the observers 300a and 300b, receivers 302, and transmitters 304 are symmetrical about a line segment 313 passing through the center of the mixed real space picture observable area 312, measurement errors of positions and directions associated

with the two observers 300a and 300b can be made uniform.

[Seventh Embodiment]

The seventh embodiment is applied to a case where
5 transmitters 304 are placed in front of observers 300a and
300b, as shown in Fig. 21.

When the transmitters 304 are placed in front of the
observers 300a and 300b in this manner, receivers 302 are
mounted on central receiver joints 200C of HMDs 301 to
10 minimize the distances between the receivers 302 on the HMD
301 and the transmitters 304.

In this case, as in the sixth embodiment,
position/direction measurement errors can be reduced in a
situation where the observers 300a and 300b make
15 observations with high frequencies. In addition,
position/direction measurement errors associated with the
two observers 300a and 300b can be made uniform.

As described above, according to the first to seventh
embodiments positional shifts between a real space picture
20 and a virtual space picture can be reduced by the method
requiring no cost, i.e., adjusting the mount position of
the transmitter for position/direction measurement or the
mount position of the receiver on each HMD.

The present invention is not limited to the above
25 embodiments. For example, as the transmitters and
receivers (position/direction measurement apparatus), for
example, devices based on an ultrasonic scheme instead of

a magnetic scheme can be used. In addition, the respective embodiments described above can be properly combined with each other.

As has been described above, according to the present
5 invention, positional shifts between a real space picture and a virtual space picture can be reduced with an inexpensive arrangement.

Furthermore, the present invention can be applied to the system comprising either a plurality of units or a single
10 unit. It is needless to say that the present invention can be applied to the case which can be attained by supplying programs which execute the process defined by the present system or invention.

CLAIMS

1. A mixed reality system which creates and displays a mixed real space picture by combining a real space picture with a virtual space picture, characterized by comprising:
- 5 a transmitter;
- a first receiver which receives a signal generated by said transmitter to measure a viewpoint position and direction of an observer; and
- a second receiver which receives a signal generated
- 10 by said transmitter to measure a position and direction of another body region of the observer,
- wherein said transmitter is positioned such that a distance between said transmitter and said first receiver becomes shorter than a distance between said transmitter
- 15 and said second receiver.
2. The mixed reality system according to claim 1, characterized in that said transmitter is positioned such that the distance between said transmitter and said first receiver always become shorter than the distance between
- 20 said transmitter and said second receiver within at least a predetermined movement range of the observer.
3. The mixed reality system according to claim 1, characterized in that the mount position of said transmitter for measuring the viewpoint position and
- 25 direction of the observer is above the head of the observer.
4. The mixed reality system according to claim 1, characterized in that said transmitter is shared by said

plurality of first and second receivers.

5. The mixed reality system according to claim 1, characterized in that said receiver and transmitter receive and transmit magnetism or an ultrasonic wave.

5 6. A head mounted display apparatus which is used in a mixed reality system that creates and displays a mixed real space picture by combining a real space picture with a virtual space picture, and which can mount a receiver used to measure a viewpoint position and direction of an observer
10 to be mounted,

characterized in that a plurality of mount portions for detachably mounting said receiver are formed.

7. The head mounted display apparatus according to claim 6, characterized in that said mount portions are formed at
15 least on a median line of the observer and both left and right sides in a line-of-sight direction of the observer.

8. The head mounted display apparatus according to claim 6 or 7, characterized in that a signal line connected to said receiver extends from a portion near said mount portion
20 on the median line to the outside.

9. The head mounted display apparatus according to claim 6, characterized in that said receiver receives magnetism or an ultrasonic wave.

10. A method of positioning a transmitter in a mixed
25 reality system which includes the transmitter, a first receiver which receives a signal generated by the transmitter to measure a viewpoint position and direction

of an observer, and a second receiver which receives a signal generated by the transmitter to measure a position and direction of another body region of the observer, and creates and displays a mixed real space picture by combining
5 a real space picture with a virtual space picture,

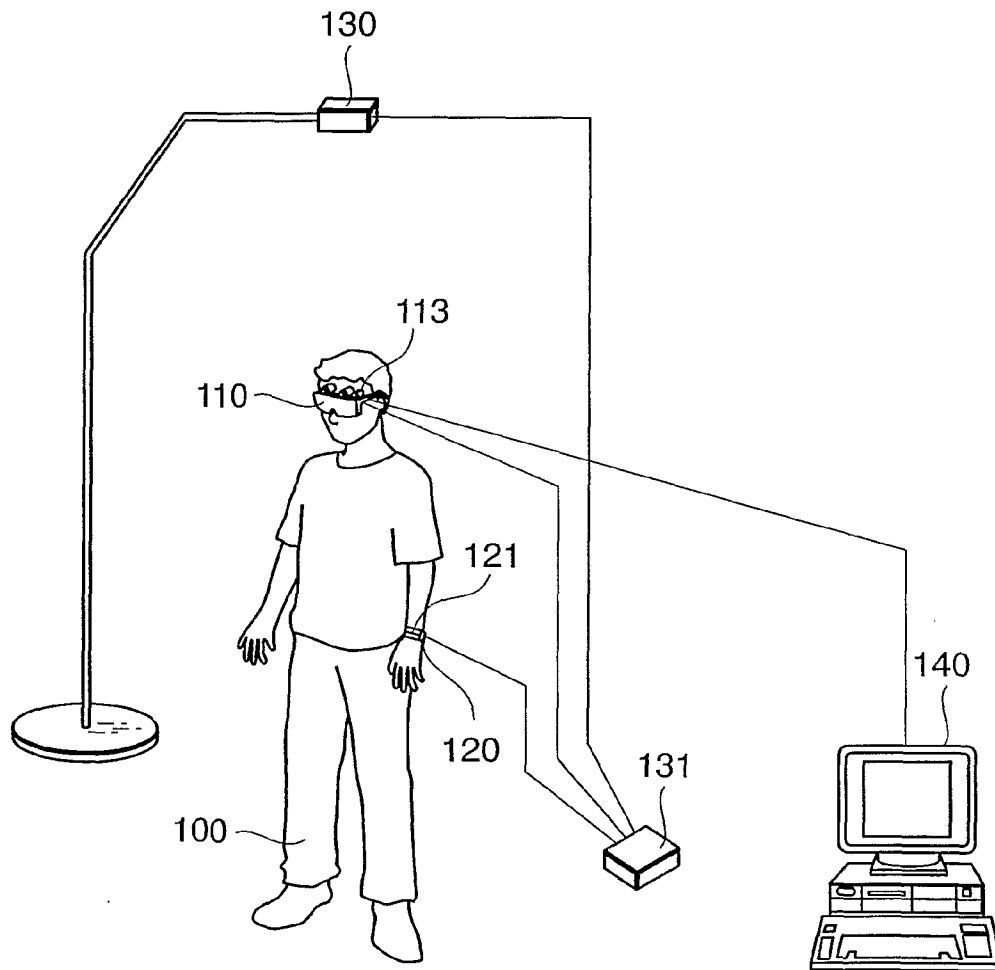
characterized in that said transmitter is positioned such that a distance between the transmitter and the first receiver becomes shorter than a distance between the transmitter and the second receiver.

10 11. The method of positioning the transmitter in the mixed reality system according to claim 10, characterized in that said transmitter is positioned such that the distance between said transmitter and said first receiver always become shorter than the distance between said
15 transmitter and said second receiver within at least a predetermined movement range of the observer.

12. The method of positioning the transmitter in the mixed reality system according to claim 10, characterized in that the mount position of said transmitter for measuring
20 the viewpoint position and direction of the observer is above the head of the observer.

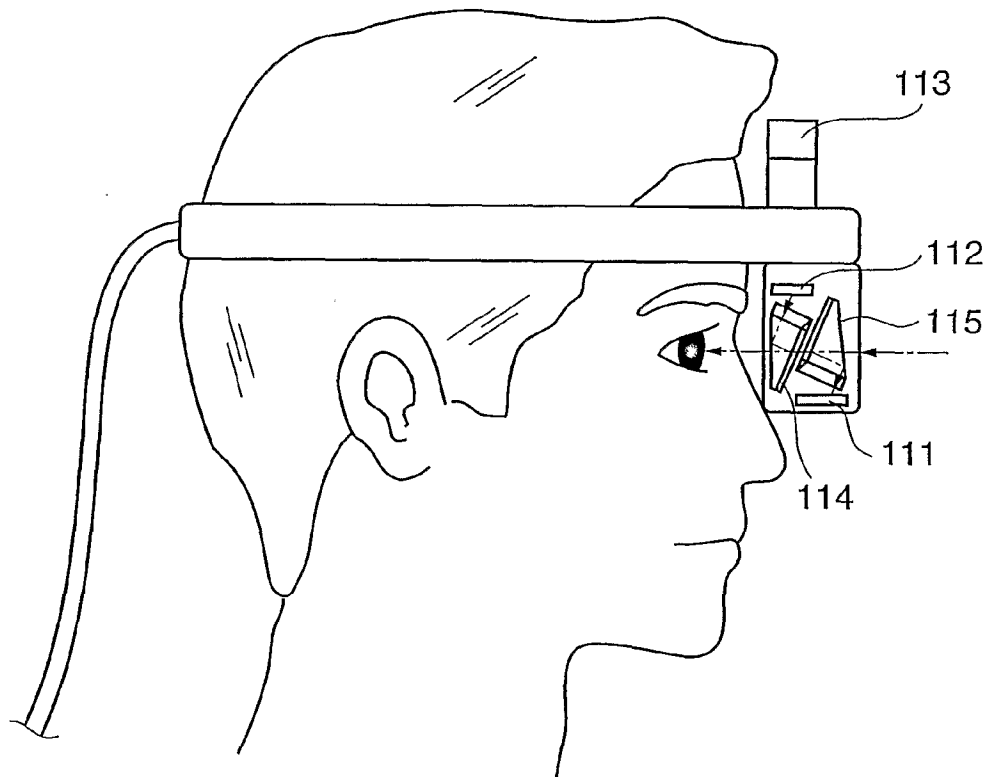
13. The method of positioning the transmitter in the mixed reality system according to claim 10, characterized in that said transmitter is shared by said plurality of
25 first and second receivers.

1/22

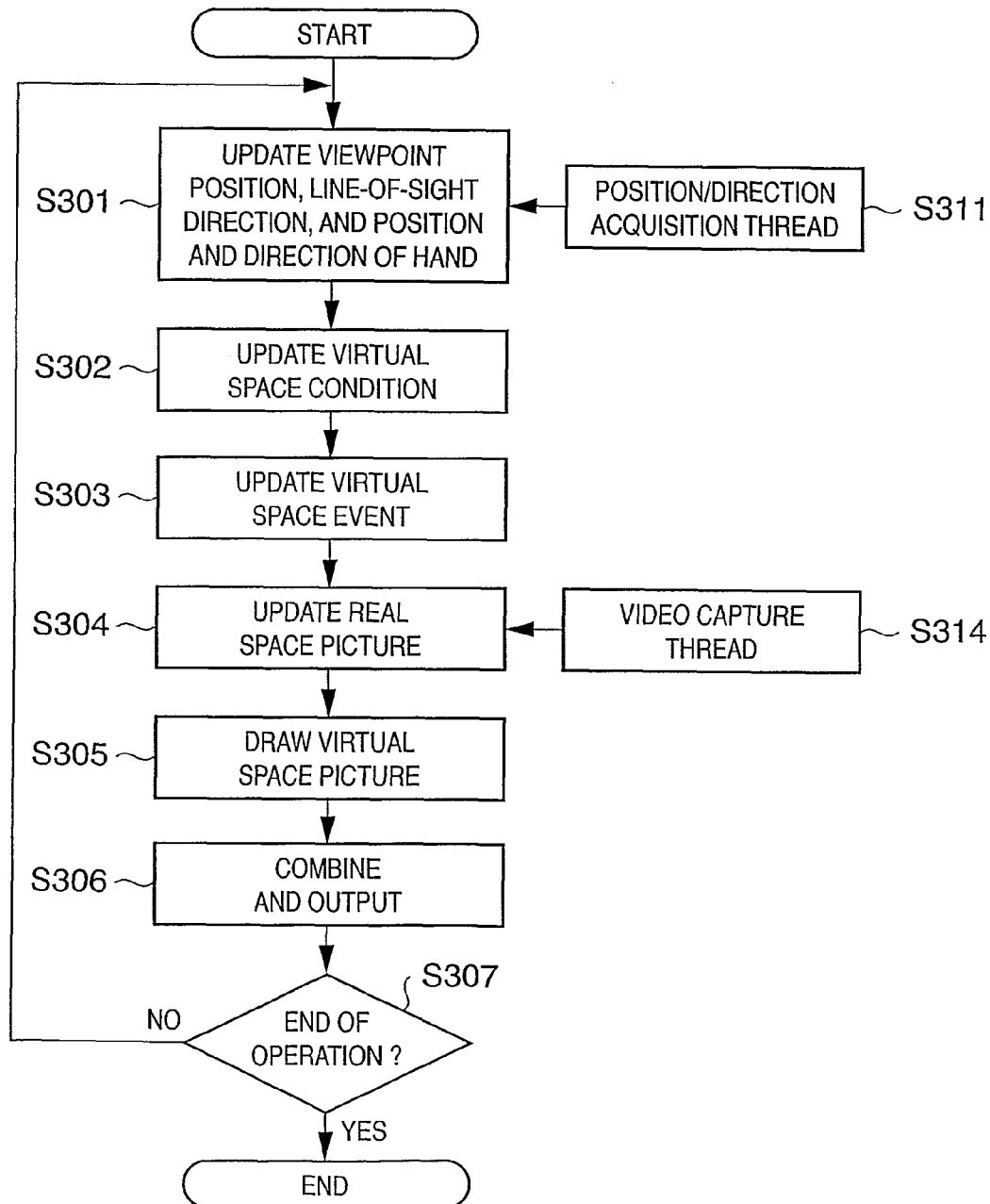
FIG. 1

2/22

FIG. 2



3/22

FIG. 3

4/22

FIG. 4A

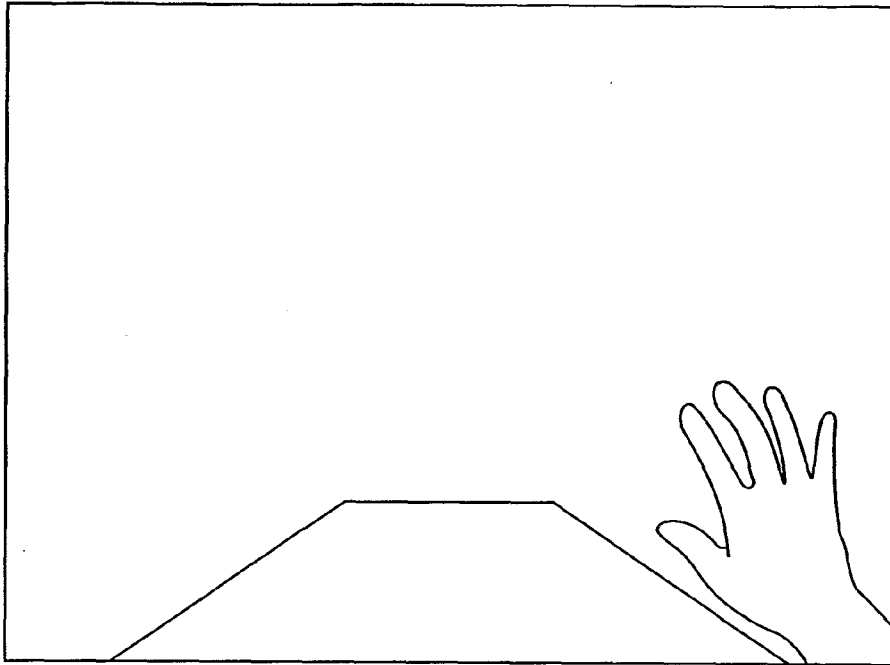
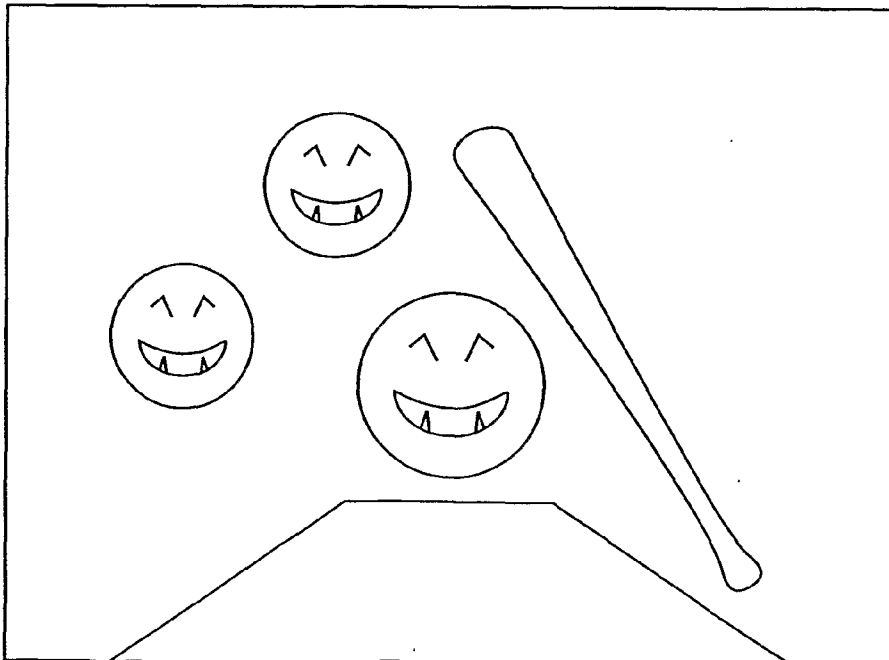
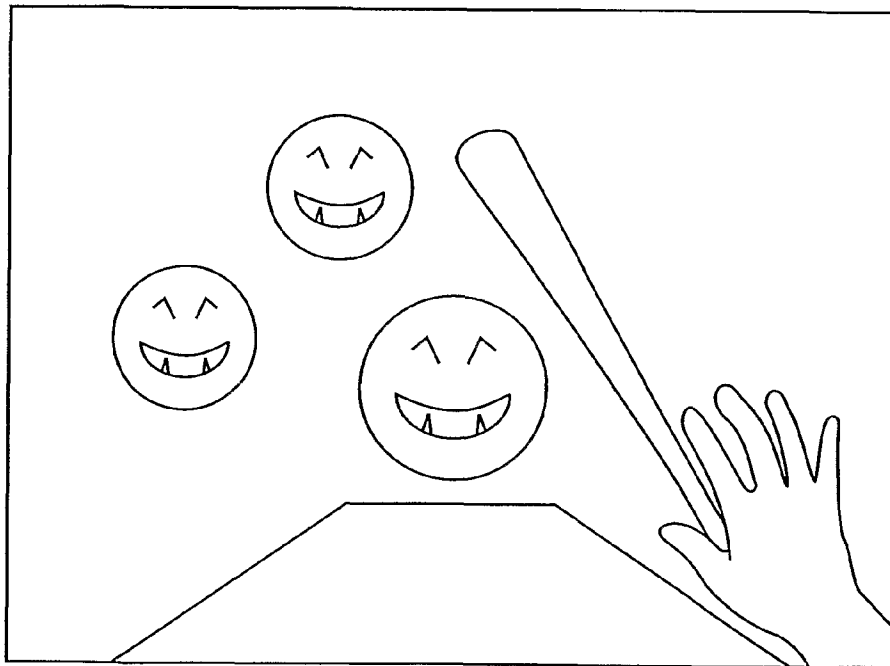


FIG. 4B



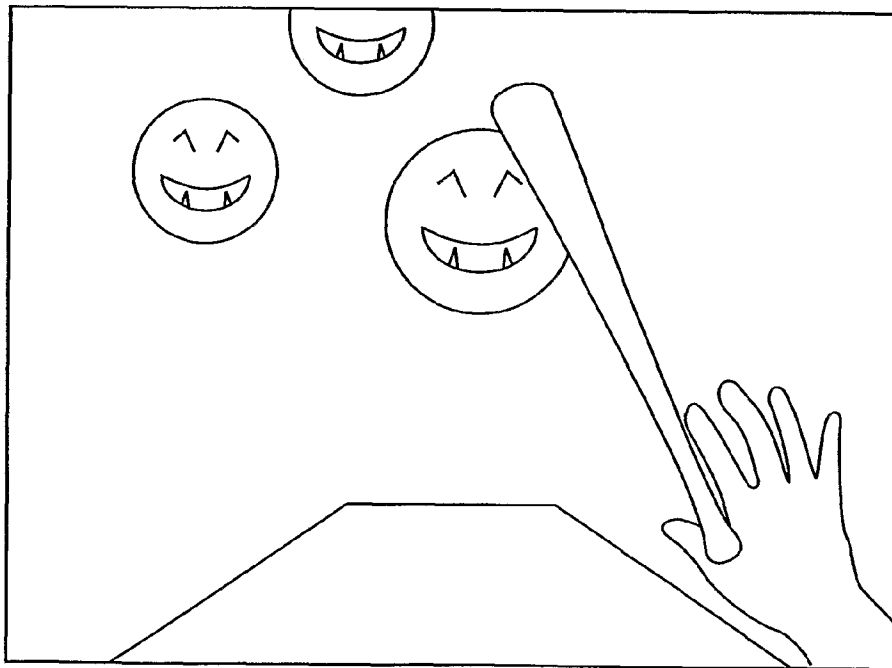
5/22

FIG. 5



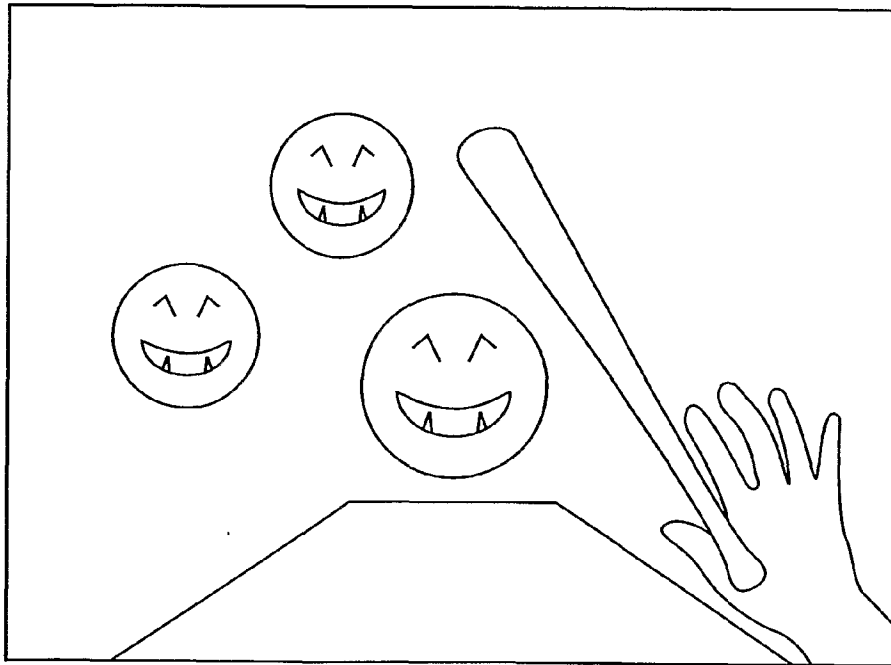
6/22

FIG. 6

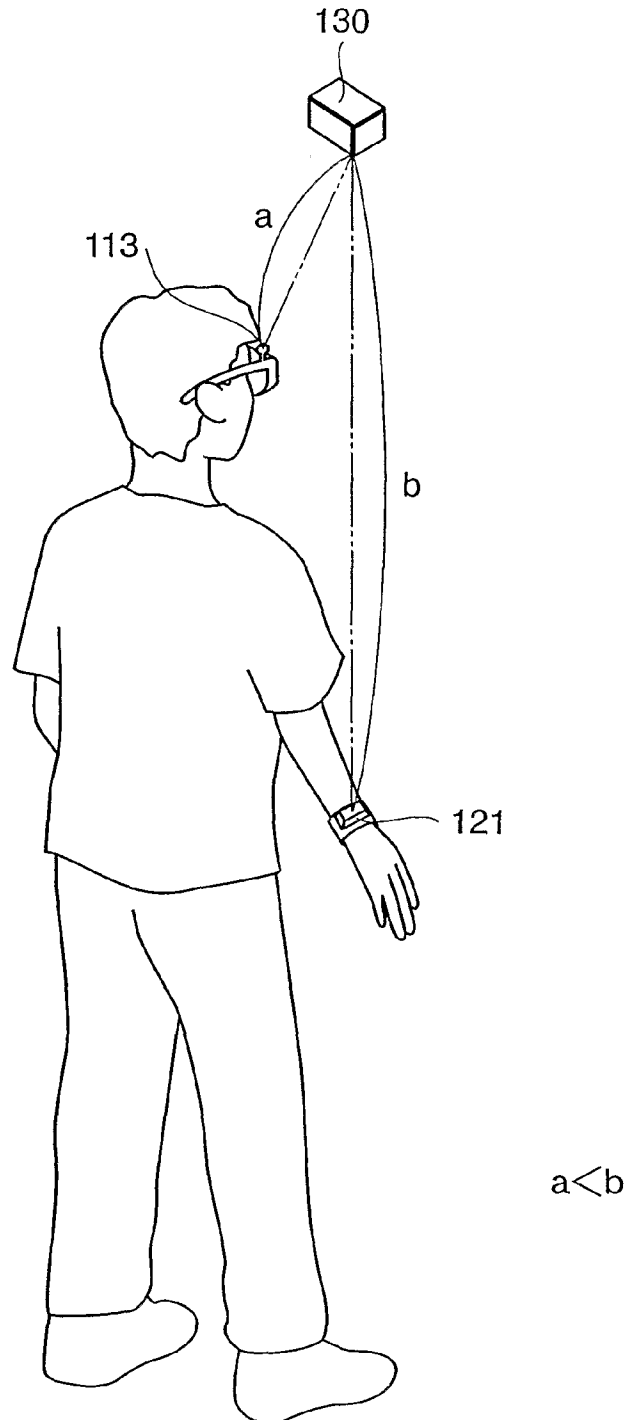


7/22

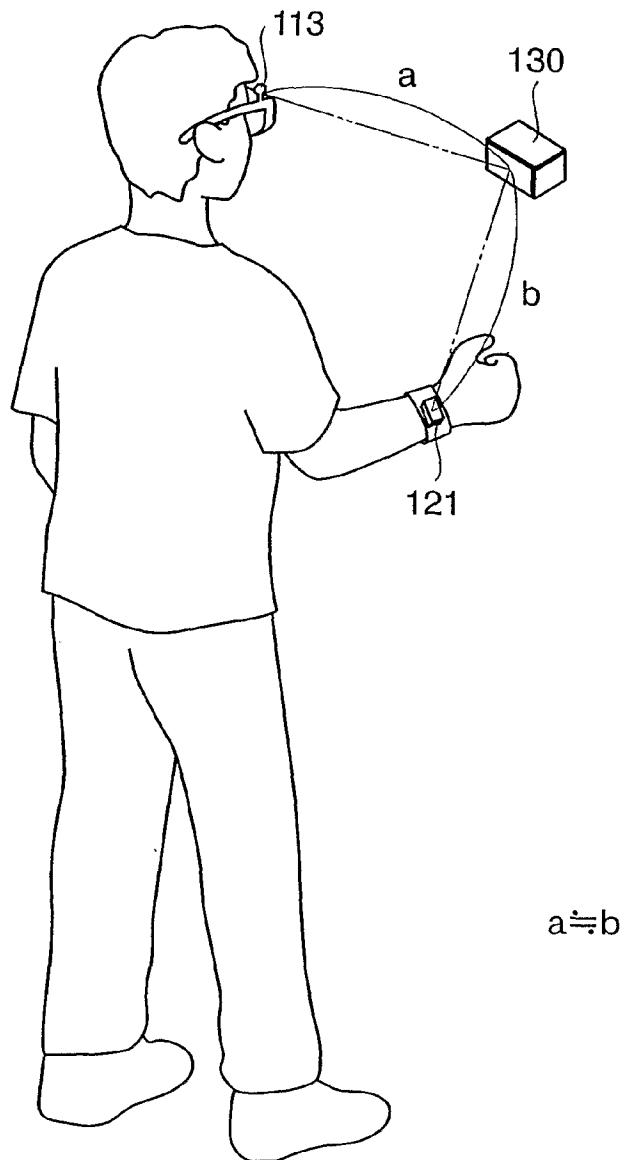
FIG. 7



8/22

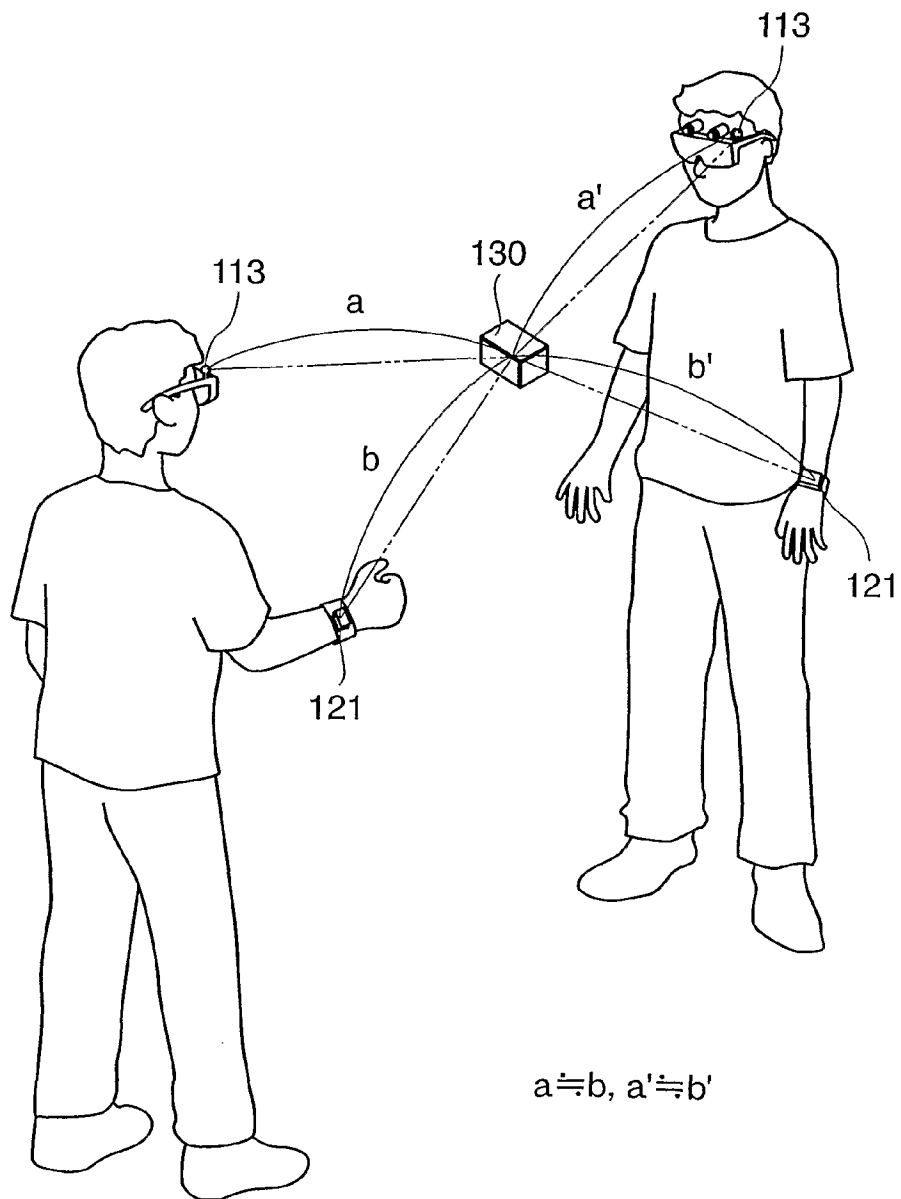
FIG. 8

9/22

FIG. 9

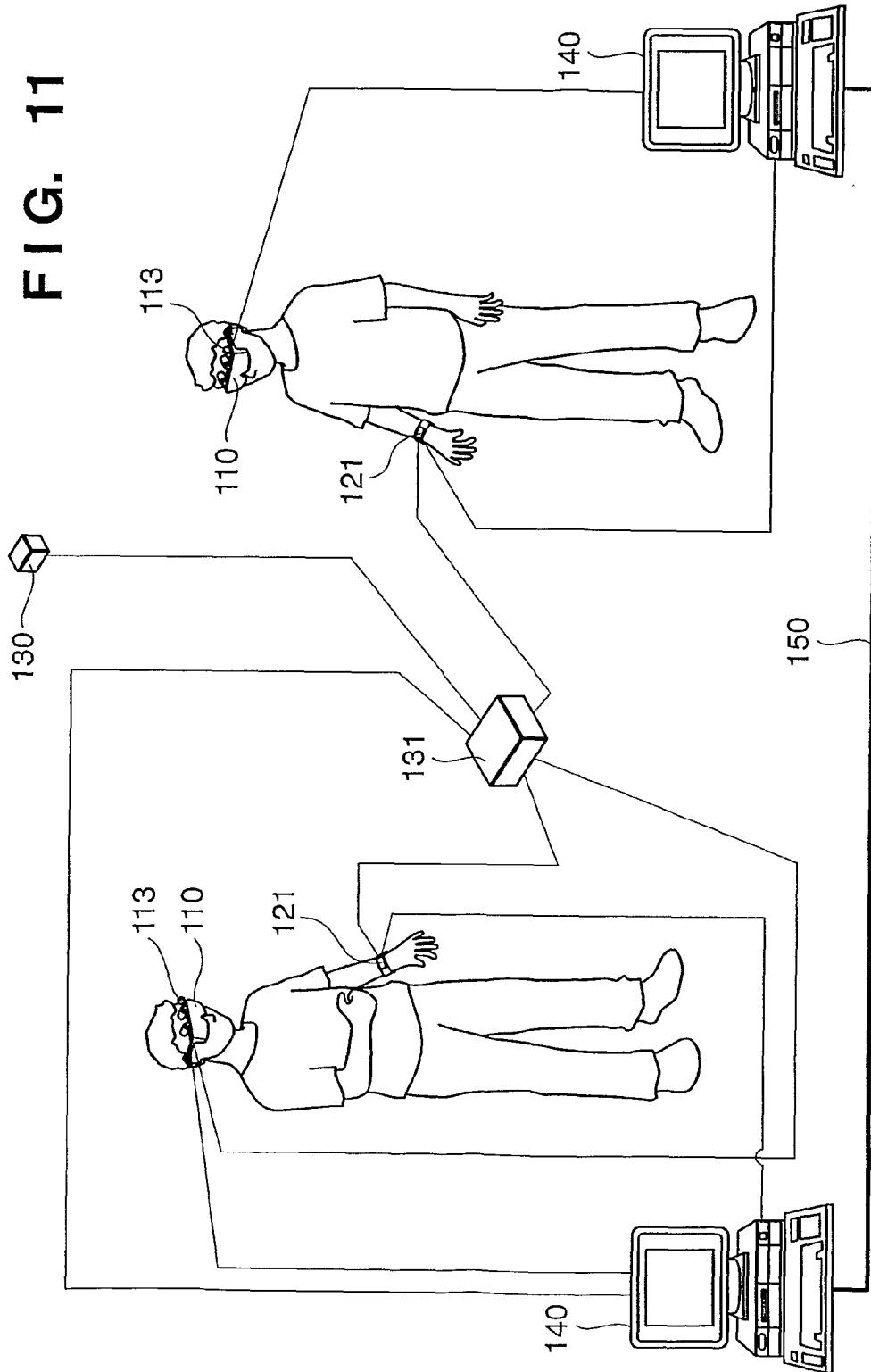
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FIG. 10

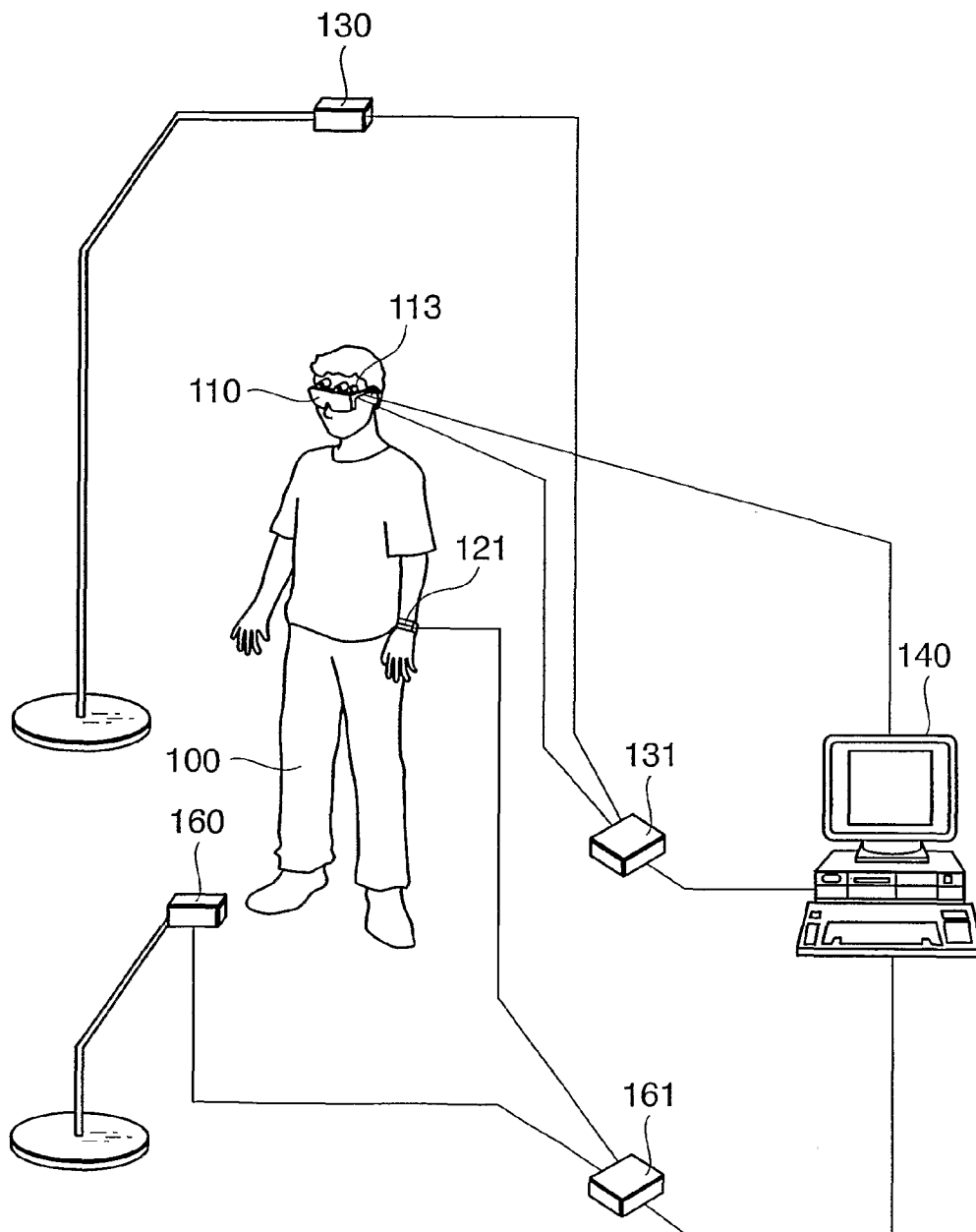


11/22

FIG. 11

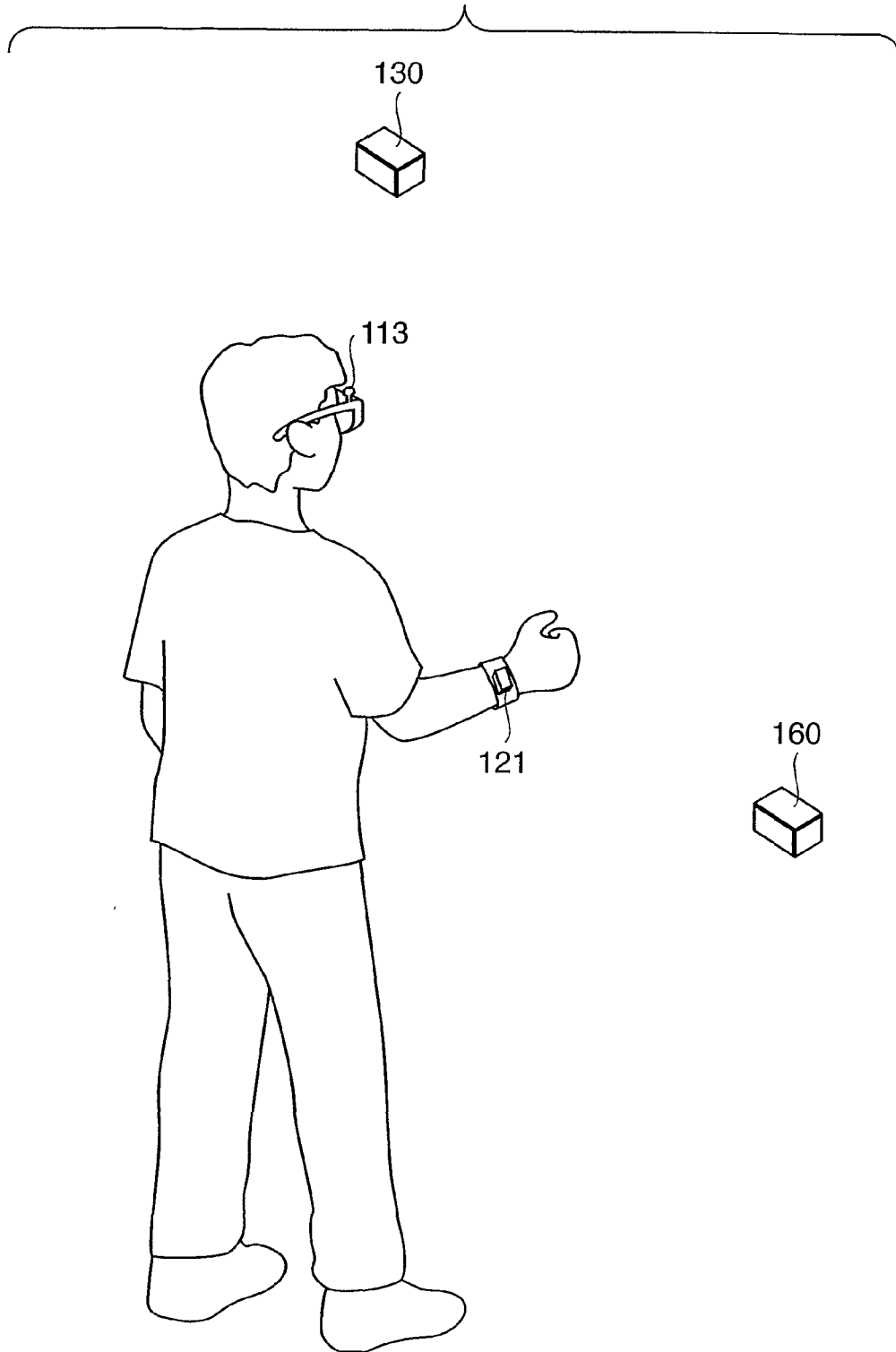


12/22

FIG. 12

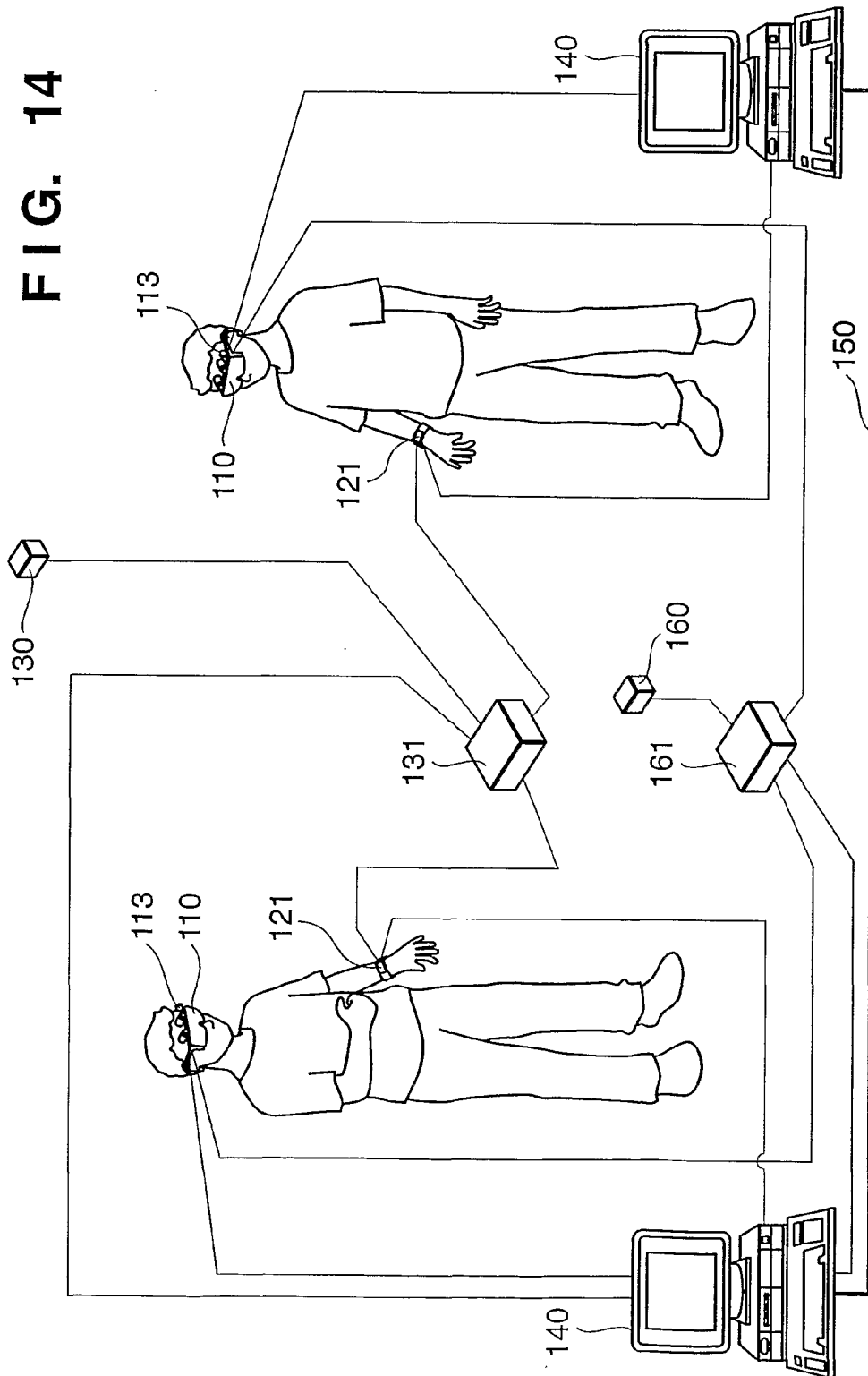
13/22

FIG. 13

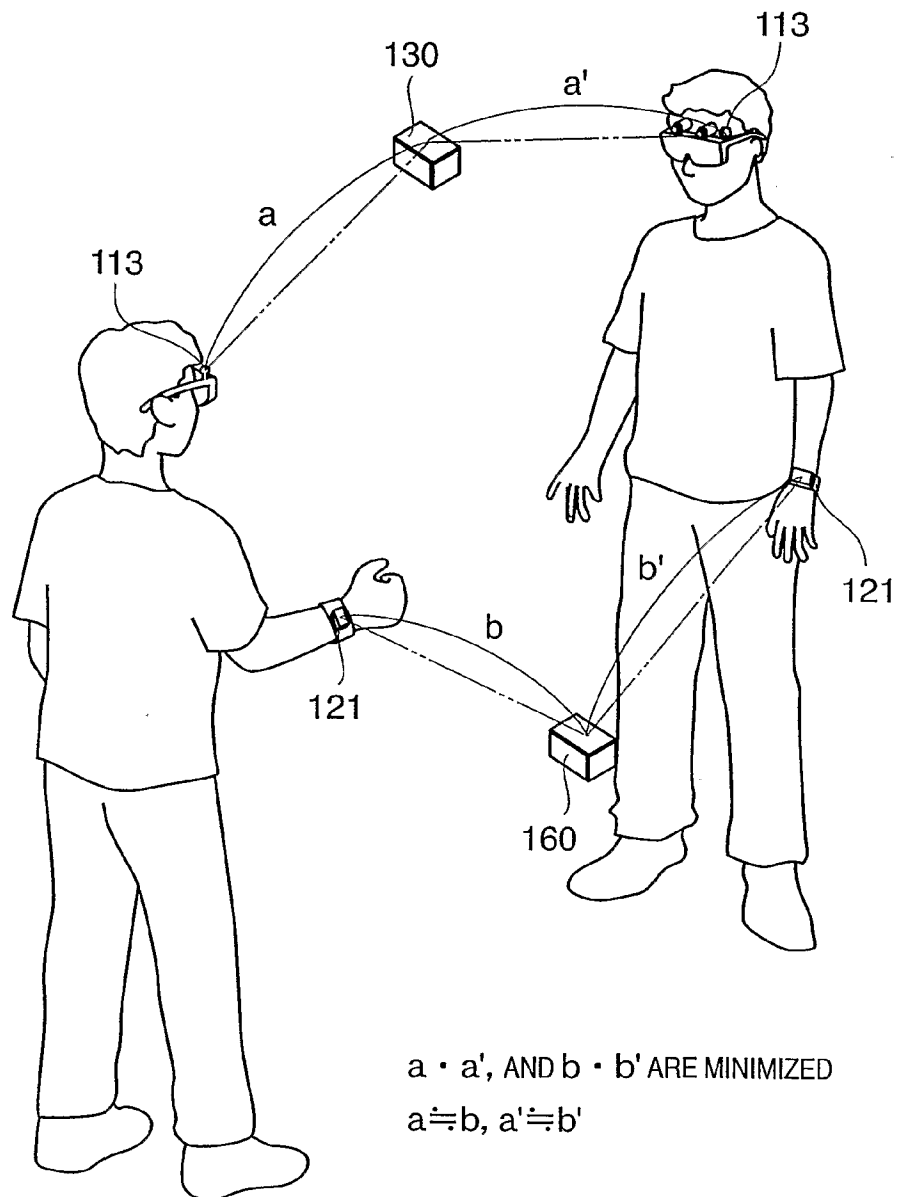


14/22

FIG. 14

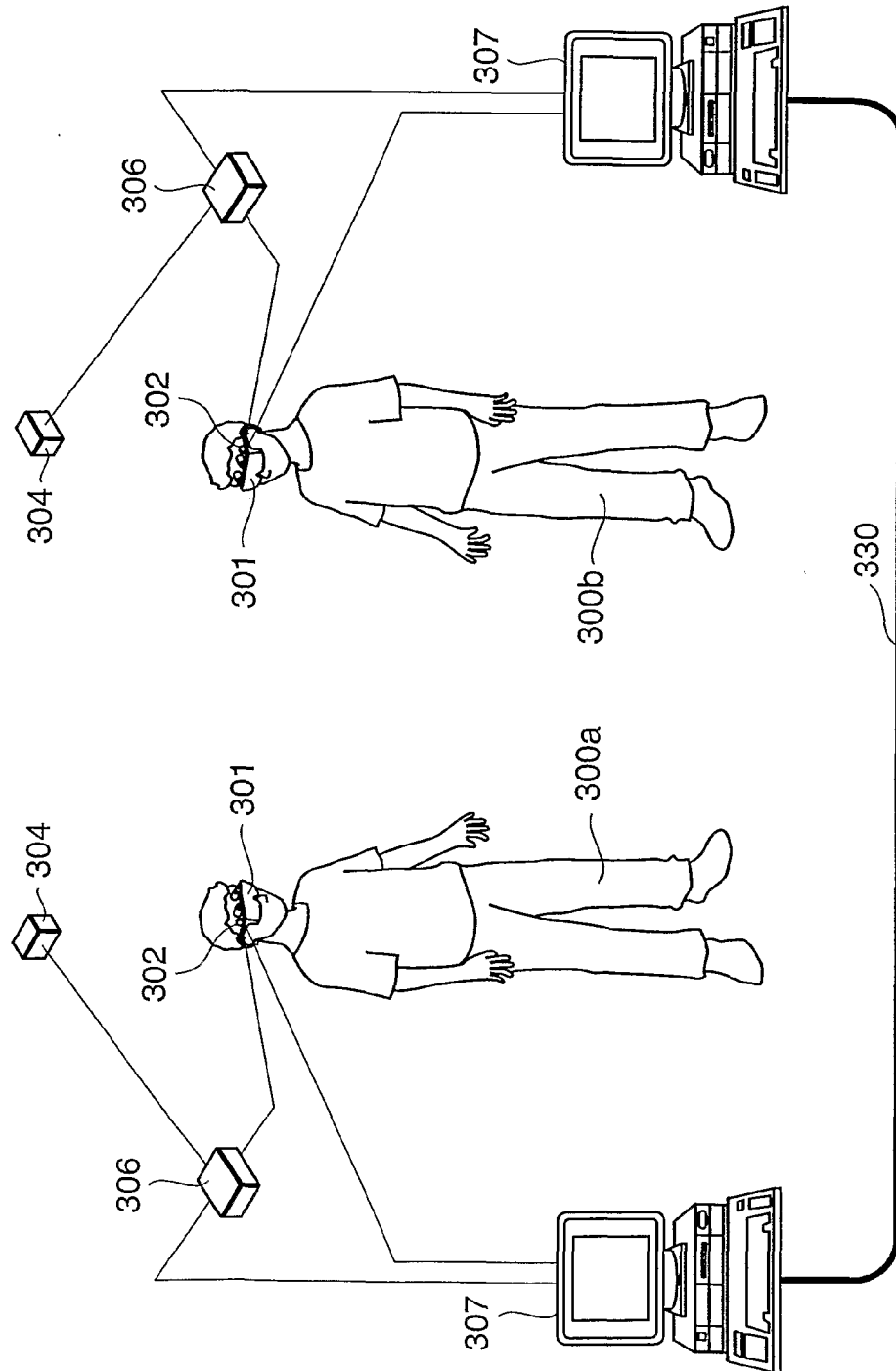


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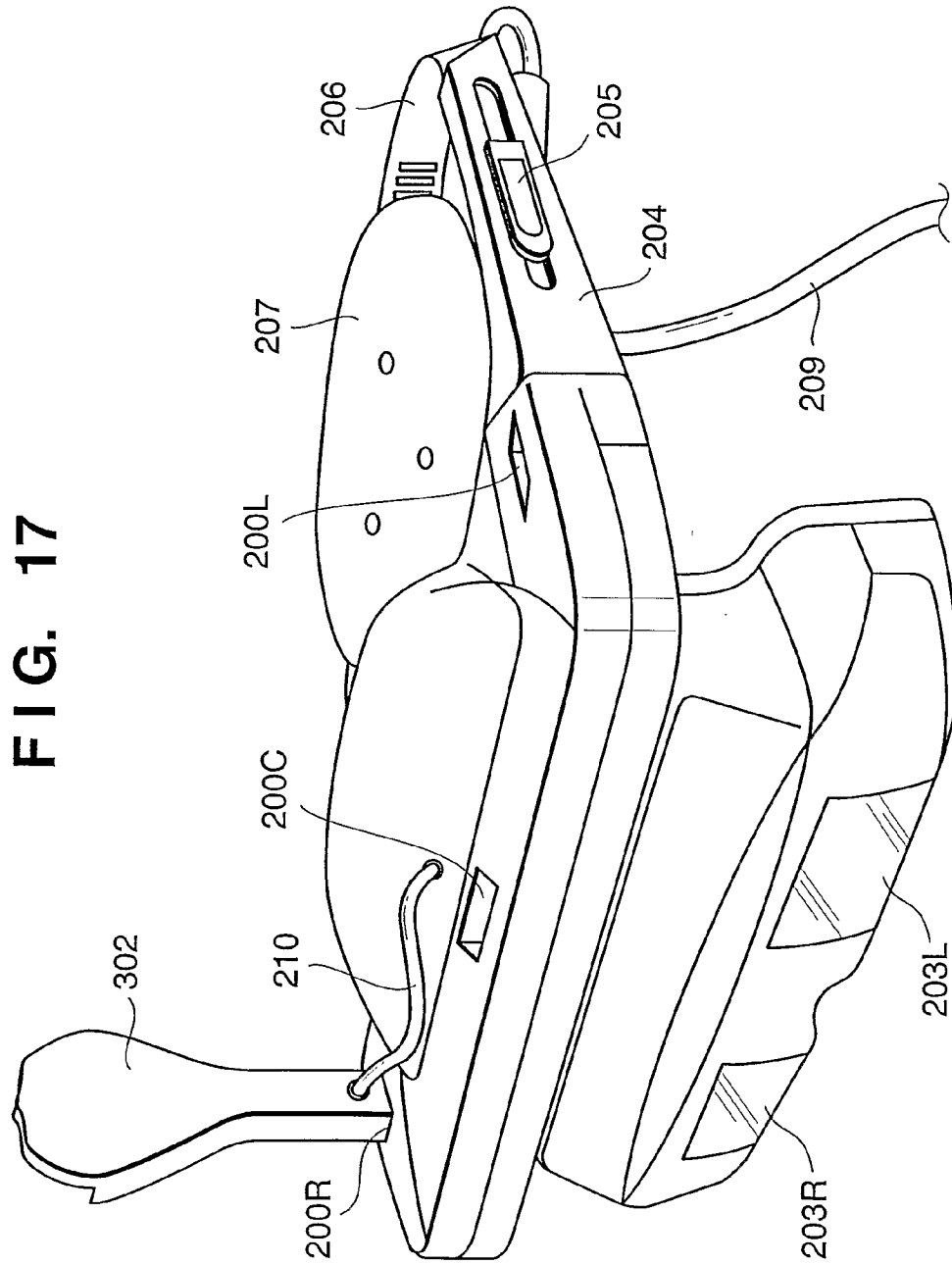
FIG. 15

16/22

FIG. 16



17/22



18/22

FIG. 18

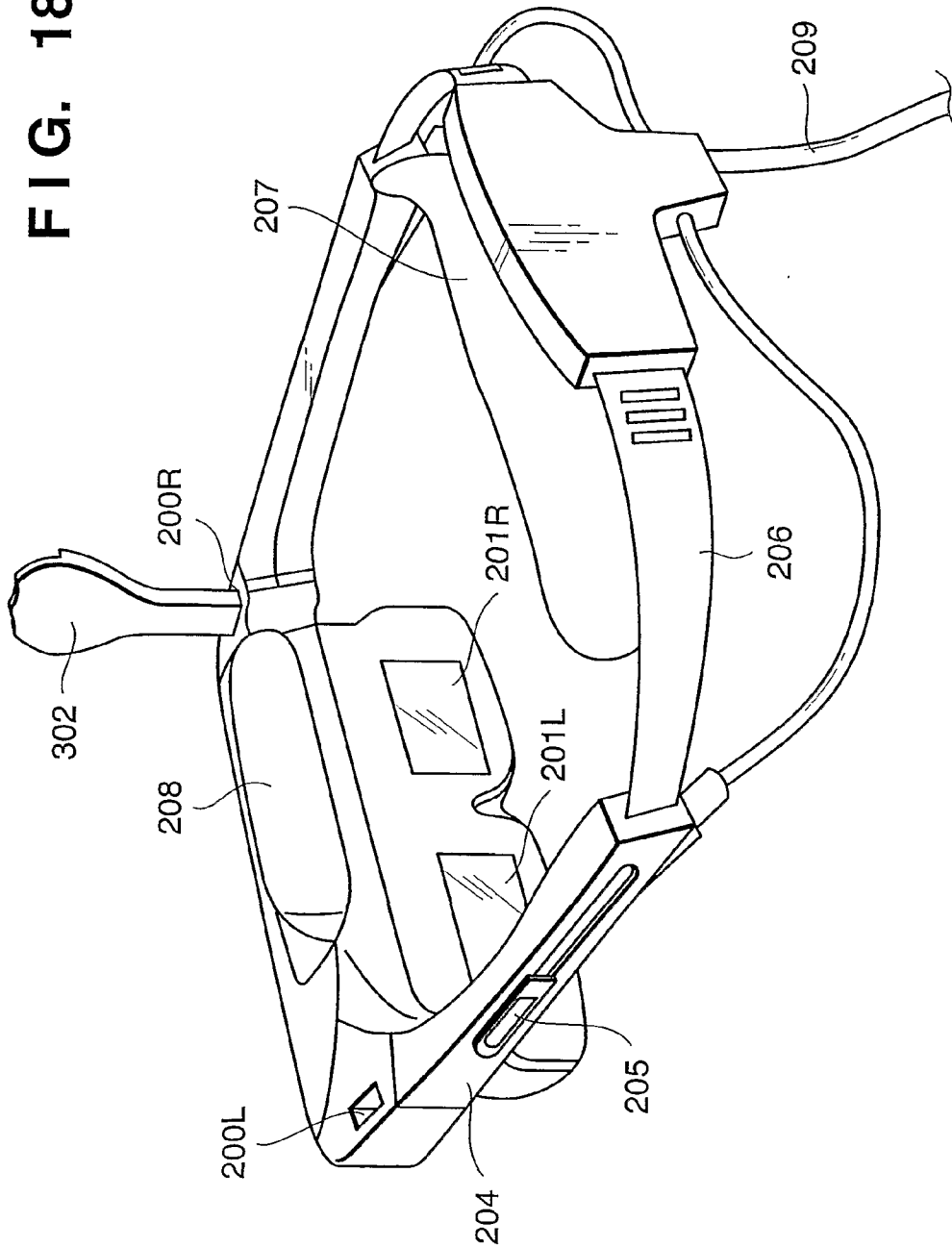
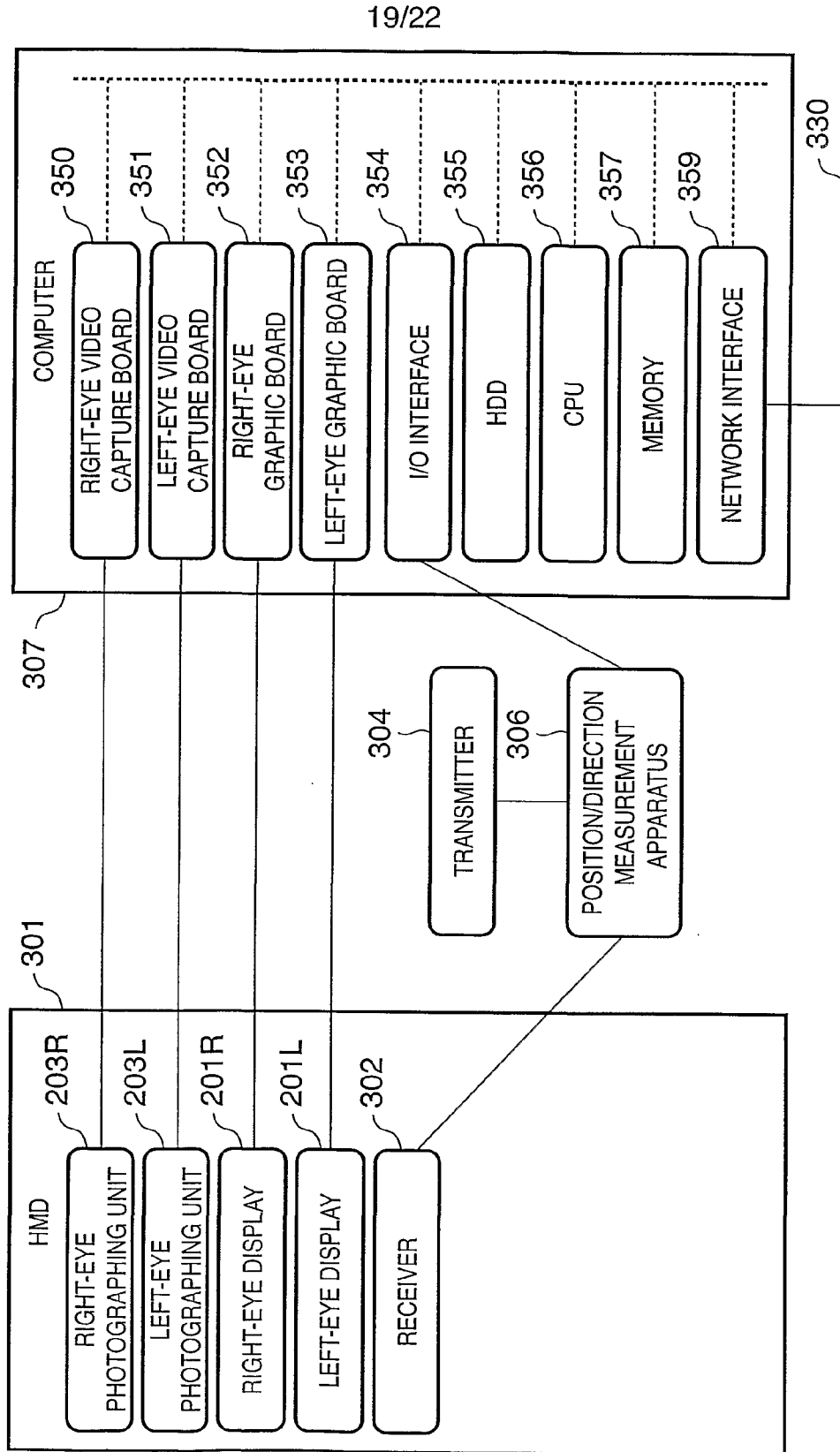
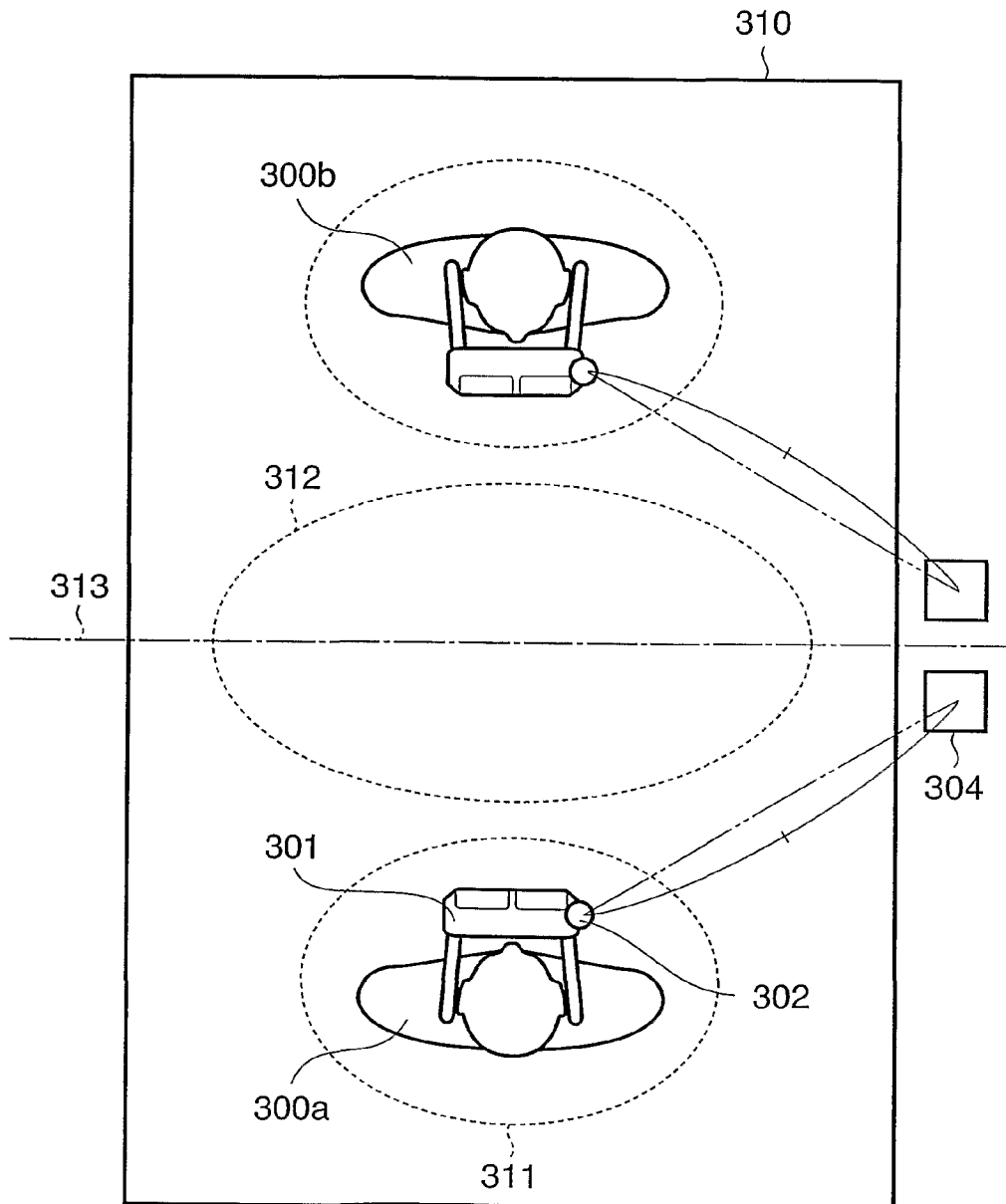


FIG. 19



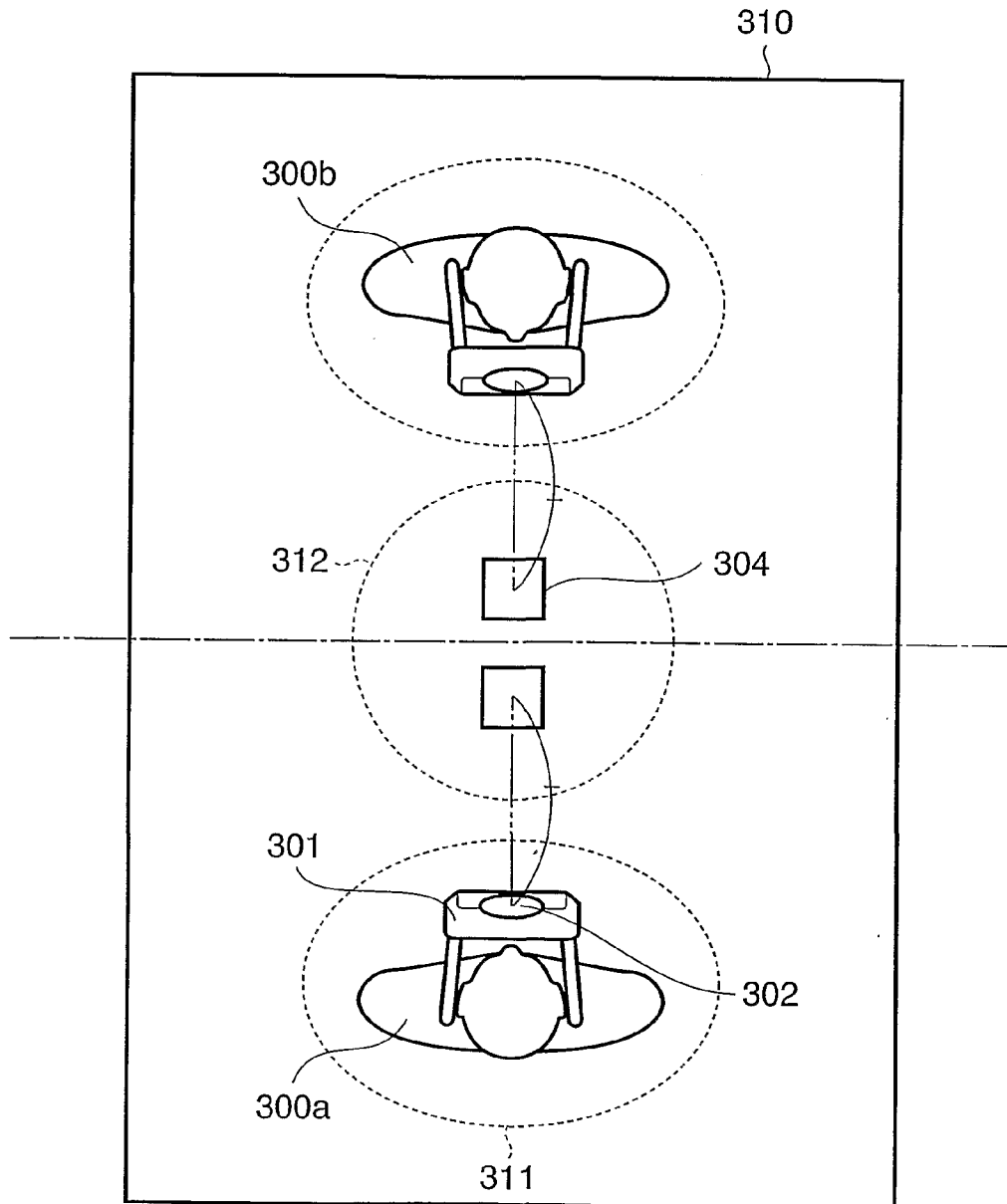
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FIG. 20



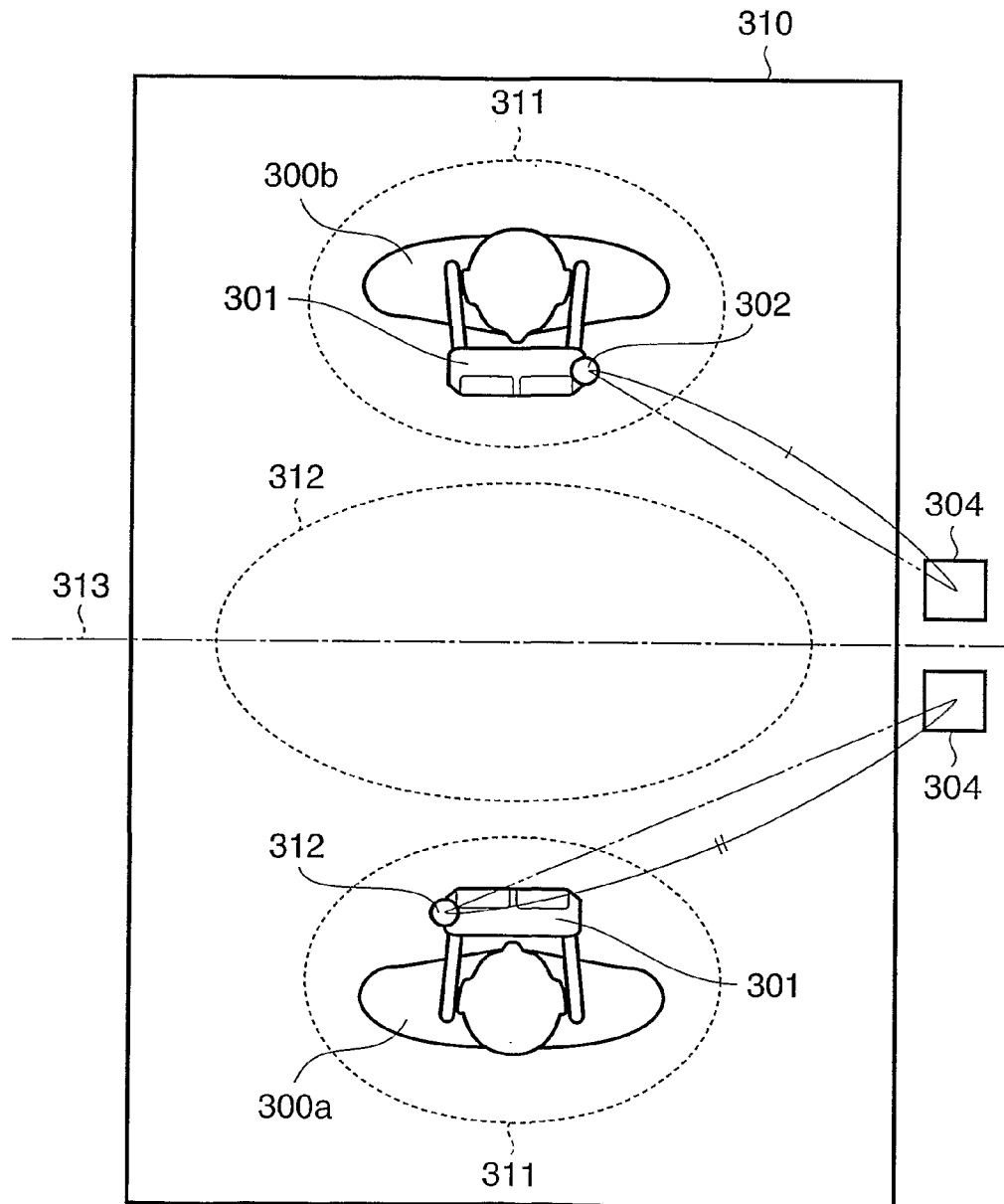
21/22

FIG. 21



22/22

FIG. 22





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NOTICE OF ALLOWANCE AND FEE(S) DUE

32733 7590 09/14/2018
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

EXAMINER

ELISCA, PIERRE E

ART UNIT

PAPER NUMBER

3716

DATE MAILED: 09/14/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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15/140,451

04/27/2016

Jeffrey David Mullen

JDM/008 CON2

9352

TITLE OF INVENTION: LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0	\$0	\$500	12/14/2018

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2	9352

TITLE OF INVENTION: LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0	\$0	\$500	12/14/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
ELISCA, PIERRE E	3716	463-032000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/140,451	04/27/2016	Jeffrey David Mullen	JDM/008 CON2	9352

32733 7590 09/14/2018
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

EXAMINER

ELISCA, PIERRE E

ART UNIT PAPER NUMBER

3716

DATE MAILED: 09/14/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 15/140,451	Applicant(s) MULLEN, JEFFREY DAVID	
	Examiner PIERRE E. ELISCA	Art Unit 3716	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE filed on 08/14/2018.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 4-23. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. ☒ Notice of References Cited (PTO-892) | 5. ☒ Examiner's Amendment/Comment |
| 2. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3716

The present application is being examined under the pre-AIA first to invent provisions.

REASONS FOR ALLOWANCE

1. The present application is being examined under the pre-AIA first to invent provisions.

2. This is an Examiner's statement of reason for allowance.

3. Regarding the claimed terms, the Examiner notes that a "general term must be understood in the context in which the inventor presents it." *In re Glaug* 283 F.3d 1335, 1340, 62 USPQ2d 1151, 1154 (Fed. Cir. 2002). Therefore the Examiner must interpret the claimed terms as found on pages 1-47 of the specification. Clearly almost all the general terms in the claims may have multiple meanings. So where a claim term "is susceptible to various meanings, . . . the inventor's lexicography must prevail" *Id.* Using these definitions for the claims, the claimed invention was not reasonably found in the prior art.

4. The closest prior art Ohshima et al (U.S. Pat. No. 6,951,515) which discloses an augmented reality game system. However, Ohshima singularly or in combination fail to disclose the recited feature:

5. As per claims 1 "utilizing a detector to determine landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape characteristics in providing said video game, and utilizing a location device to determine

Art Unit: 3716

the physical location of said locating device on the physical playfield, wherein said video game logic utilizes the physical location of said locating device in providing said video game”.

6. Please amend abstract as follows:

Handheld location based games are provided in which a user's physical location correlates to the virtual location of a virtual character on a virtual playfield. Augmented Reality (AR) systems are provided in which video game indicia are overlaid onto a user's physical environment. A landscape detector is provided that may obtain information about the user's landscape, in addition to the user's location, in order to provide overlaying information to an AR head-mounted display and control information to non-user controlled video game characters.

7. As per claim 1 “providing 3-D video game indicia to a transparent head-mounted display with respect to a physical playfield based on video game logic, utilizing a detector to determine landscape characteristics of said physical playfield, wherein said video game logic utilizes said landscape characteristics in providing said video game, and utilizing a locating device to determine the physical location of said locating device on said physical playfield, wherein said video game logic utilizes the physical location of said locating device in providing said video game”.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to PIERRE E. ELISCA whose telephone number is (571)272-6706. The Examiner can normally be reached on 6:30 to 5:00PM, Monday - Thursday. Hotelier.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dmitri Suhol can be reached on 571 272 4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3

Notice of References Cited	Application/Control No. 15/140,451		Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID	
	Examiner PIERRE E. ELISCA		Art Unit 3716	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6,951,515 B2	10-2005	Ohshima; Toshikazu	A63F13/10	463/31
*	B	US-6,346,929 B1	02-2002	Fukushima; Nobuo	G06F3/013	345/156
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Index of Claims</i> 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID
	Examiner PIERRE E ELISCA	Art Unit 3716

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☒ T.D.				☐ R.1.47			
CLAIM		DATE													
Final	Original	04/12/2018	08/27/2018												
	1														
	2														
	3														
1	4	=	=												
2	5	=	=												
3	6	=	=												
4	7	=	=												
5	8	=	=												
6	9	=	=												
7	10	=	=												
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9	12	=	=												
10	13	=	=												
11	14	=	=												
12	15	=	=												
13	16	=	=												
14	17	=	=												
15	18	=	=												
16	19	=	=												
17	20	=	=												
18	21	=	=												
19	22	=	=												
20	23	=	=												

Search Notes 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID
	Examiner PIERRE E ELISCA	Art Unit 3716

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
463	1	4/12/2018	P.E
463	31	4/12/2018	P.E
463	32	4/12/2018	P.E

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
West Search	4/12/2018	P.E

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
463/ A63F	1/ 13/10	4/12/2018	P.E
463/ G07F	32/ 17/3211	4/12/2018	P.E

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BIB DATA SHEET

CONFIRMATION NO. 9352

SERIAL NUMBER 15/140,451	FILING or 371(c) DATE 04/27/2016 RULE	CLASS 463	GROUP ART UNIT 3716	ATTORNEY DOCKET NO. JDM/008 CON2	
APPLICANTS INVENTORS Jeffrey David Mullen, Pittsburgh, PA; ** CONTINUING DATA ***** This application is a CON of 13/973,997 08/22/2013 PAT 9352216 which is a CON of 11/281,812 11/16/2005 PAT 8585476 which claims benefit of 60/628,475 11/16/2004 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY ** 05/11/2016					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/PIERRE E ELISCA/</u> Examiner's Signature	☐ Met after Allowance P.E Initials	STATE OR COUNTRY PA	SHEETS DRAWINGS 14	TOTAL CLAIMS 1	INDEPENDENT CLAIMS 1
ADDRESS JEFFREY D. MULLEN 2212 Hassinger Lane Glenshaw, PA 15116 UNITED STATES					
TITLE LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS					
FILING FEE RECEIVED 810	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

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Substitute for form 1449A/PTO				Complete if known		
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number		15/140,451
				Filing Date		April 27, 2016
				First Named Inventor		Jeffrey D. Mullen
				Art Unit		3716
				Examiner Name		Pierre E. Elisca
(use as many sheets as necessary)				Attorney Docket Number		JDM/008 CON2
Sheet	1	of	4			

U.S. PATENT DOCUMENTS					
Examiner initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number – Kind Code ² (if known)			
		5,662,523	09-1997	Yasumaru	
		5,704,836	01-1998	Norton et al.	
		5,717,414	02-1998	Bergsneider	
		5,724,660	03-1998	Kauser	
		5,741,182	04-1998	Lipps et al.	
		5,802,274	09-1998	Dorak et al.	
		5,815,411	09-1998	Ellenby et al.	
		5,902,343	05-1999	Hale et al.	
		5,913,727	06-1999	Ahdoot	
		6,011,653	01-2000	Karasawa	
		6,015,344	01-2000	Kelly et al.	
		6,080,063	06-2000	Khosla	
		6,102,802	08-2000	Armstrong	
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		6,287,200	09-2001	Sharma	
		6,320,495	11-2001	Sporgis	
		6,337,668	01-2002	Berstis	
		6,346,929	02-2002	Fukushima et al.	
		6,351,261	02-2002	Reichien	
		6,361,438	03-2002	Morihiro	

Examiner Signature	/PIERRE E ELISCA/	Date Considered	08/27/2018
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if known	
				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
Sheet	2	of	4	Attorney Docket Number	JDM/008 CON2

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		7,008,323	03-2006	Hayashi	

Examiner Signature	/PIERRE E ELISCA/	Date Considered	08/27/2018
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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if known	
				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
Sheet	3	of	4	Attorney Docket Number	JDM/008 CON2

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Examiner Signature	/PIERRE E ELISCA/	Date Considered	08/27/2018
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Substitute for form 1449A/PTO				Complete if known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
Sheet	4	of	4	Attorney Docket Number	JDM/008 CON2

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		2003/0144047	07-2003	Sprogis	
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FOREIGN PATENT DOCUMENTS						
Examiner initials*	Cite No. ¹	Foreign Patent Document Country Code ³ - Number ⁴ - Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		WO02073287	09-1992	Yonezawa et al.		

Examiner Signature	/PIERRE E ELISCA/	Date Considered	08/27/2018
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO				Complete if known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	15/140,451
				Filing Date	April 27, 2016
				First Named Inventor	Jeffrey D. Mullen
				Art Unit	3716
				Examiner Name	Pierre E. Elisca
(use as many sheets as necessary)				Attorney Docket Number	JDM/008 CON2
Sheet	5	of	4		

NON PATENT LITERATURE DOCUMENTS			
Examiner initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Wikipedia, Super Dodge Ball – Wikipedia, the free encyclopedia. Accessed December 14, 2010. http://en.wikipedia.org/wiki/Super_Dodge_Bal	
		GameFAQs: Super Dodge Ball (NES) FAQ/Walkthrough by TOKADasrik. Accessed December 14, 2010. http://www.gamefaqs.com/nes/587662-super-dodge-ball/faqs/34823	
		Youtube.com Screenshot of Super Dodge Ball Walkthrough with Commentary (Part 1 of 2). Accessed: December 14, 2010. http://www.youtube.com/watch?v=E1IUWmr65JA	
		"First Person Indoor/outdoor Augmented Reality Application: ARQuake," written by Thomas et al, and published February 2002	
		~~Halo: Combat Evolved Wikipedia description~~ ~~http://en.wikipedia.org/wiki/Halo_%28game%29~~	
		Quake Game Manual, Release circa 1996	
		"Antti Kotanen, Marko Hannikainen, Helena Leppakoski, Hamalainen "Experiments on Local Positioning with Bluetooth" Proceedings of the International Conference on Information Technology: Computers and Communications (ITCC '03) April, 2003	
		Mortal Kombat instruction booklet for Super Nintendo, 1992, Licensed from Midway.	
		Mortal Kombat 4 (released October 15, 1997). Published by Midway Games < http://en.wikipedia.org/w/index.php?title=Mortal_Kombat_4&printable=yes >	

Examiner Signature	/PIERRE E ELISCA/	Date Considered	08/27/2018
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

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Issue Classification 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID	
	Examiner PIERRE E ELISCA	Art Unit 3716	

CPC						
Symbol					Type	Version
A63F		13	/	00	F	2013-01-01
A63F		13	/	211	I	2014-09-02
A63F		13	/	216	I	2014-09-02
A63F		2300	/	8082	A	2013-01-01
A63F		2300	/	1062	A	2013-01-01
A63F		2300	/	406	A	2013-01-01
A63F		2300	/	50	A	2013-01-01
A63F		2300	/	5573	A	2013-01-01
A63F		2300	/	69	A	2013-01-01
A63F		13	/	25	I	2014-09-02
A63F		13	/	327	I	2014-09-02
A63F		13	/	525	I	2014-09-02
A63F		13	/	65	I	2014-09-02
A63F		13	/	26	I	2014-09-02
			/			

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)	O.G. Print Claim(s)	O.G. Print Figure
/PIERRE E ELISCA/ Primary Examiner.Art Unit 3716	8/27/2018	1	14
(Primary Examiner)	(Date)		

Issue Classification 	Application/Control No. 15140451	Applicant(s)/Patent Under Reexamination MULLEN, JEFFREY DAVID
	Examiner PIERRE E ELISCA	Art Unit 3716

☐ Claims renumbered in the same order as presented by applicant								☐ CPA		☒ T.D.		☐ R.1.47			
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1	14	17												
	2	15	18												
	3	16	19												
1	4	17	20												
2	5	18	21												
3	6	19	22												
4	7	20	23												
5	8														
6	9														
7	10														
8	11														
9	12														
10	13														
11	14														
12	15														
13	16														

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 20	
/PIERRE E ELISCA/ Primary Examiner.Art Unit 3716 (Primary Examiner) _____ (Date) _____		O.G. Print Claim(s) 1	O.G. Print Figure 14

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

JEFFREY D. MULLEN
 2212 HASSINGER LANE
 GLENSHAW, PENNSYLVANIA 15116

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Jeffrey D. Mullen	(Depositor's name)
/Jeffrey D. Mullen/	(Signature)
12/14/2018	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15140451	04/27/2016	Jeffrey David Mullen	JDM/08 CON2	9352

TITLE OF INVENTION:

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$500	\$0.00	\$500	12/14/2018
EXAMINER	ART UNIT	CLASS-SUBCLASS			

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1__
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2__
- 3__

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 503855

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Jeffrey D. Mullen/

Date 12/14/2018

Typed or printed name Jeffrey D. Mullen

Registration No. 52,056

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	15140451			
Filing Date:	27-Apr-2016			
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS			
First Named Inventor/Applicant Name:	Jeffrey David Mullen			
Filer:	Jeffrey David Mullen			
Attorney Docket Number:	JDM/008 CON2			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				500

Electronic Acknowledgement Receipt

EFS ID:	34592120
Application Number:	15140451
International Application Number:	
Confirmation Number:	9352
Title of Invention:	LOCATION-BASED GAMES AND AUGMENTED REALITY SYSTEMS
First Named Inventor/Applicant Name:	Jeffrey David Mullen
Customer Number:	32733
Filer:	Jeffrey David Mullen
Filer Authorized By:	
Attorney Docket Number:	JDM/008 CON2
Receipt Date:	14-DEC-2018
Filing Date:	27-APR-2016
Time Stamp:	14:59:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 500
RAM confirmation Number	121718INTEFSW00001294503855
Deposit Account	503855
Authorized User	Jeffrey Mullen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

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37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	JDM-008CON2--IF.pdf	232037	no	2
			4ba5fda6f4d3cdd37059a03051ed033cd17f ab4e		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30034	no	2
			fd06e2778f21528624b269c4f5f575792b30 6188		

Warnings:

Information:

Total Files Size (in bytes):			262071
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/140,451	01/15/2019	10179277	JDM/008 CON2	9352

32733 7590 12/22/2018
JEFFREY D. MULLEN
2212 Hassinger Lane
Glenshaw, PA 15116

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Jeffrey David Mullen, Pittsburgh, PA;

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