

APPLICATION METHOD AND RELATED APPARATUS OF SIGHTING TELESCOPE IN VIRTUAL ENVIRONMENT

[0001] This application claims priority to Chinese Patent Application No. 201910780269.9,
5 entitled "APPLICATION METHOD AND APPARATUS OF SIGHTING TELESCOPE IN
VIRTUAL ENVIRONMENT, DEVICE, AND STORAGE MEDIUM" filed with the China
National Intellectual Property Administration on August 22, 2019, which is incorporated herein by
reference in its entirety.

FIELD OF THE TECHNOLOGY

10 **[0002]** Embodiments of this application relate to the field of virtual environments, and in
particular, to application of a sighting telescope in a virtual environment.

BACKGROUND OF THE DISCLOSURE

[0003] In an application including a virtual environment, a virtual object in the virtual
environment usually needs to be controlled to move in the virtual environment. A user may control
15 the virtual object to be in a running posture, a walking posture, a standing posture, a flat-lying
posture, a creeping posture, or the like in a three-dimensional (3D) virtual environment. When the
virtual environment is observed, the virtual environment may be observed from a first-person
perspective or a third-person perspective of the virtual object (that is, the virtual environment is
observed from a person perspective), or may be observed by using a sighting telescope accessory.

20 **[0004]** In the related art, a sighting telescope control may be used to switch between the
person perspective observation manner and the sighting telescope accessory observation manner.
That is, when the virtual environment is observed in the person perspective manner, the observation
manner may be switched to the sighting telescope accessory observation manner by tapping the
sighting telescope control. When the virtual environment is observed in the sighting telescope
25 observation manner, the observation manner may be switched to the person perspective manner by
tapping the sighting telescope control.

SUMMARY

[0005] Embodiments of this application provide a method and a related apparatus for application of a sighting telescope in a virtual environment, to resolve the problem of low efficiency and low accuracy of observing a virtual environment. The technical solutions are as follows:

5 **[0006]** In an aspect, a method for application of a sighting telescope in a virtual environment is provided, the method including:

[0007] displaying a first environment interface, the first environment interface including a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further including a sighting telescope control;

[0008] receiving a touch operation on the sighting telescope control and generating a touch signal;

15 **[0009]** displaying a second environment interface according to the touch signal, the second environment interface including a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory; and

[0010] resuming displaying the person perspective picture based on a touch end signal of the touch operation being received.

20 **[0011]** In another aspect, an apparatus for application of a sighting telescope in a virtual environment is provided, the apparatus including:

[0012] a display module, configured to display a first environment interface, the first environment interface including a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further including a sighting telescope control; and

[0013] a receiving module, configured to receive a touch operation on the sighting telescope control and generate a touch signal;

30 **[0014]** the display module being further configured to display a second environment interface according to the touch signal, the second environment interface including a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory; and

[0015] the receiving module being further configured to resume displaying the person perspective picture based on a touch end signal of the touch operation being received.

[0016] In another aspect, a computer device is provided, including a processor and a memory, the memory storing at least one instruction, at least one program, a code set, or an instruction set, the at least one instruction, the at least one program, the code set, or the instruction set being loaded and executed by the processor to implement the method for application of a sighting telescope in a virtual environment according to the foregoing embodiment of this application.

[0017] In another aspect, a storage medium is provided, configured to store a computer program, the computer program being configured to perform the method for application of a sighting telescope in a virtual environment according to the foregoing embodiment of this application.

[0018] In another aspect, a computer program product is provided, the computer program product, when run on a computer, causing the computer to perform the method for application of a sighting telescope in a virtual environment according to the foregoing embodiment of this application.

[0019] The technical solutions provided in the embodiments of this application produce at least the following beneficial effects.

[0020] A sighting telescope control is disposed, and a touch signal and touch end signal are determined according to whether a touch operation on the sighting telescope control is continuous. In this way, only a single touch on the sighting telescope accessory is required to switch between a person perspective picture observed without a sighting telescope accessory and a sighting telescope picture observed with the sighting telescope accessory, thereby improving the efficiency for enabling the sighting telescope accessory, and improving the efficiency and accuracy of observing a virtual environment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] To describe technical solutions in embodiments of this application more clearly, the following briefly introduces the accompanying drawings required for describing the embodiments. Apparently, the accompanying drawings in the following description show only some embodiments of this application, and a person of ordinary skill in the art may still derive other drawings from these accompanying drawings without creative efforts.

[0022] FIG. 1 is a schematic interface diagram of application of a sighting telescope accessory in a virtual environment according to the related art.

[0023] FIG. 2 is a schematic interface diagram of application of a sighting telescope accessory in a virtual environment according to an exemplary embodiment of this application.

5 **[0024]** FIG. 3 is a structural block diagram of a terminal according to an exemplary embodiment of this application.

[0025] FIG. 4 is a schematic diagram of an implementation environment according to an exemplary embodiment of this application.

10 **[0026]** FIG. 5 is a flowchart of a method for application of a sighting telescope in a virtual environment according to an exemplary embodiment of this application.

[0027] FIG. 6 is a schematic display diagram of a sighting telescope accessory according to the embodiment shown in FIG. 5.

[0028] FIG. 7 is a schematic diagram of determining a correspondence between a touch operation and a sighting telescope control according to the embodiment shown in FIG. 5.

15 **[0029]** FIG. 8 is a flowchart of a method for application of a sighting telescope in a virtual environment according to another exemplary embodiment of this application.

[0030] FIG. 9 is a schematic interface diagram corresponding to a hybrid control manner according to the embodiment shown in FIG. 8.

20 **[0031]** FIG. 10 is a schematic diagram of a time line corresponding to the hybrid control manner according to the embodiment shown in FIG. 8.

[0032] FIG. 11 is a flowchart corresponding to a tapping control manner according to an exemplary embodiment of this application.

[0033] FIG. 12 is a flowchart corresponding to a touching-and-holding control manner according to an exemplary embodiment of this application.

25 **[0034]** FIG. 13 is a flowchart corresponding to a hybrid control manner according to an exemplary embodiment of this application.

[0035] FIG. 14 is a flowchart of a method for application of a sighting telescope in a virtual environment according to another exemplary embodiment of this application.

30 **[0036]** FIG. 15 is a structural block diagram of an apparatus for application of a sighting telescope in a virtual environment according to an exemplary embodiment of this application.

[0037] FIG. 16 is a structural block diagram of an apparatus for application of a sighting telescope in a virtual environment according to another exemplary embodiment of this application.

[0038] FIG. 17 is a structural block diagram of a terminal according to an exemplary embodiment of this application.

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DESCRIPTION OF EMBODIMENTS

[0039] To make objectives, technical solutions, and advantages of this application clearer, the following further describes implementations of this application in detail with reference to the accompanying drawings.

[0040] First, terms involved in the embodiments of this application are briefly introduced.

10 **[0041]** Virtual environment: is a virtual environment that is displayed (or provided) when an application runs on a terminal. The virtual environment may be a simulated environment of the real world, or may be a semi-simulated semi-fictional 3D environment, or may be an entirely fictional 3D environment. The virtual environment may be any one of a two-dimensional virtual environment, a 2.5-dimensional virtual environment, and a 3D virtual environment. A description is
15 made by using an example in which the virtual environment is a 3D virtual environment in the following embodiments, but this is not limited. Optionally, the virtual environment is used for a virtual environment battle between at least two virtual roles. Optionally, the virtual environment is used for a battle performed between at least two virtual roles by using virtual guns. Optionally, the virtual environment is used for a battle performed between at least two virtual roles by using virtual
20 guns in a range of a target region, and the range of the target region may be continuously decreased as time goes by in the virtual environment.

[0042] Virtual object: is a movable object in a virtual environment. The movable object may be a virtual character, a virtual animal, a cartoon character, or the like, such as a character, an animal, a plant, an oil drum, a wall, a stone, or the like displayed in a 3D virtual environment.
25 Optionally, the virtual object is a 3D model created based on a skeletal animation technology. Each virtual object has a shape and size in the 3D virtual environment, and occupies some space in the 3D virtual environment.

[0043] Virtual gun: is a virtual weapon that attacks by shooting bullets in a virtual environment. A virtual object may pick up the virtual gun in the virtual environment, and attack by
30 using the virtual gun obtained through picking-up. Optionally, each virtual gun may be provided with at least one slot for fitting at least one gun accessory. For example, An M416 automatic rifle is generally provided with a muzzle slot, a grip slot, a magazine slot, a stock slot, and a sighting

telescope slot, where the sighting telescope slot may be equipped with any one of a red dot sighting telescope, a holographic sighting telescope, a 2X sighting telescope, a 4X sighting telescope, and an 8X sighting telescope. When a player holds the M416 automatic rifle and aims down the sighting telescope, the virtual environment may be magnified to a specific extent for observation according to the sighting telescope equipped on the gun.

[0044] Optionally, in the embodiments of this application, a virtual item being implemented as a virtual gun is used as an example for description. The virtual item is equipped with a sighting telescope accessory, that is, a sighting telescope slot of the virtual gun is equipped with a sighting telescope accessory. Optionally, the sighting telescope accessory may be a mechanical sighting telescope originally equipped on the virtual gun, or may be a sighting telescope picked up by a virtual object in a virtual environment.

[0045] The method provided in this application may be applied to a virtual reality (VR) application, a 3D map application, a military simulation program, a first-person shooting game (FPS), a multiplayer online battle arena game (MOBA), and the like. Application during a game is used as an example for description in the following embodiments.

[0046] A game based on a virtual environment usually includes maps of one or more game worlds. The virtual environment in the game simulates scenes in the real world. A user may control a virtual object in the game to perform actions in the virtual environment such as walking, running, jumping, shooting, combating, driving, switching to virtual weapons, and using a virtual weapon to attack another virtual object, which has high interactivity. In addition, a plurality of users may form a team online to perform an arena game. When a user controls a virtual object to use a virtual weapon to attack a target virtual object, the user selects a suitable virtual weapon to attack the virtual object according to a position or operating habits of the target virtual object.

[0047] In the related art, a sighting telescope control is usually provided in an environment interface for switching between virtual environment observation manners. As shown in FIG. 1, a person perspective picture 100 of a virtual environment observed from a first-person perspective of a virtual object is displayed in a first environment interface. The virtual object holds a virtual item (for example, a virtual gun). The virtual item is equipped with a sighting telescope accessory. A sighting telescope control 110 is superimposed and displayed on the person perspective picture 100. After a user taps the sighting telescope control 110, a sighting telescope picture 120 is displayed. The sighting telescope picture 120 is a picture of the virtual environment observed by using the sighting telescope accessory. The sighting telescope control 110 is superimposed and displayed on the sighting telescope picture 120. The sighting telescope control 110 is displayed in a shape of a

cross shown in FIG. 1 after the sighting telescope accessory is enabled. When the user taps the sighting telescope control 110 again, the sighting telescope accessory is disabled, and displaying the person perspective picture 100 from the first-person perspective is resumed.

[0048] The embodiments of this application provide a method for application of a sighting telescope in a virtual environment. FIG. 2 is a schematic interface diagram of a method for application of a sighting telescope in a virtual environment according to an embodiment of this application. As shown in FIG. 2:

[0049] A person perspective picture 200 of a virtual environment observed from a first-person perspective of a virtual object is displayed in a first environment interface. The virtual object holds a virtual item (for example, a virtual gun). The virtual item is equipped with a sighting telescope accessory. A sighting telescope control 210 is superimposed and displayed on the person perspective picture 200. After a user touches the sighting telescope control 210, a sighting telescope picture 220 is displayed. The sighting telescope picture 220 is a picture of the virtual environment observed by using the sighting telescope accessory. When the user holds to touch the sighting telescope control 210, a terminal keeps displaying the sighting telescope picture 220. When the user releases the touch on the sighting telescope control 210, the terminal disables the sighting telescope accessory and resumes displaying the person perspective picture 200. Picture content of the person perspective picture 200 may be content after change. For example, the picture content is changed due to movement of the virtual object, displacement of stuff in the virtual environment, or the like. Alternatively, the picture content of the person perspective picture 200 may be content that is unchanged.

[0050] The terminal in this application may be a desktop computer, a portable laptop computer, a mobile phone, a tablet computer, an eBook reader, a Moving Picture Experts Group Audio Layer III (MP3) player, a Moving Picture Experts Group Audio Layer IV (MP4) player, or the like. An application supporting a virtual environment is installed and run on the terminal, such as an application supporting a 3D virtual environment. The application may be any one of a VR application, a 3D map application, a military simulation application, a TPS game, an FPS game, and a MOBA game. Optionally, the application may be a standalone application, such as a standalone 3D game application, or may be an online application.

[0051] FIG. 3 is a structural block diagram of an electronic device according to an exemplary embodiment of this application. The electronic device 300 includes an operating system 320 and an application 322.

[0052] The operating system 320 is basic software provided for the application 322 to perform secure access to computer hardware.

[0053] The application 322 is an application supporting a virtual environment. Optionally, the application 322 is an application supporting a 3D virtual environment. The application 322 may be any one of a VR application, a 3D map application, a military simulation application, a TPS game, an FPS game, a MOBA game, and a multiplayer shooting survival game. The application 322 may be a standalone application, such as a standalone 4D game application.

[0054] FIG. 4 is a structural block diagram of a computer system according to an exemplary embodiment of this application. The computer system 400 includes a first device 420, a server 440, and a second device 460.

[0055] An application supporting a virtual environment is installed and run on the first device 420. The application may be any one of a VR application, a 3D map application, a military simulation application, a TPS game, an FPS game, a MOBA game, and a multiplayer shooting survival game. The first device 420 is a device used by a first user. The first user uses the first device 420 to control a first virtual object in the virtual environment to perform an action. The action includes, but is not limited to, at least one of body posture adjustment, crawling, walking, running, cycling, jumping, driving, picking, shooting, attacking, and throwing. For example, the first virtual object is a first virtual character such as a simulated character role or a cartoon character role.

[0056] The first device 420 is connected to the server 440 by using a wireless network or a wired network.

[0057] The server 440 includes at least one of a single server, a plurality of servers, a cloud computing platform, and a virtualization center. The server 440 is configured to provide a backend service for an application supporting a 3D virtual environment. Optionally, the server 440 takes on primary computing work, the first device 420 and the second device 460 take on secondary computing work; alternatively, the server 440 takes on the secondary computing work, and the first device 420 and the second device 460 take on the primary computing work; alternatively, collaborative computing is performed by using a distributed computing architecture among the server 440, the first device 420, and the second device 460.

[0058] An application supporting a virtual environment is installed and run on the second device 460. The application may be any one of a VR application, a 3D map application, a military simulation application, an FPS game, a MOBA game, and a multiplayer shooting survival game.

The second device 460 is a device used by a second user. The second user uses the second device 460 to control a second virtual object in a virtual environment to perform an action. The action includes, but is not limited to, at least one of body posture adjustment, crawling, walking, running, cycling, jumping, driving, picking, shooting, attacking, and throwing. For example, the second
5 virtual object is a second virtual character, such as a simulated character role or a cartoon character role.

[0059] Optionally, the first virtual character and the second virtual character are located in the same virtual environment. Optionally, the first virtual character and the second virtual character may belong to the same team or the same organization, have a friend relationship, or have a
10 temporary communication permission. Optionally, the first virtual character and the second virtual character may alternatively belong to different teams, different organizations, or two groups hostile to each other.

[0060] Optionally, the applications mounted on the first device 420 and the second device 460 are the same, or the applications mounted on the two devices are the same type of applications
15 of different control system platforms. The first device 420 may generally refer to one of a plurality of devices. The second device 460 may generally refer to one of a plurality of devices. The first device 420 and the second device 460 may be the foregoing terminal. In this embodiment, a description is made by using only the first device 420 and the second device 460 as an example. The type of the first device 420 and the type of the second device 460 may be the same or may be
20 different. The device type includes at least one of a game console, a desktop computer, a smartphone, a tablet computer, an eBook reader, an MP3 player, an MP4 player, and a portable laptop computer. In the following embodiments, a description is made by using an example in which the device is a desktop computer.

[0061] A person skilled in the art may learn that there may be more or fewer devices. For
25 example, there may be only one device, or there may be dozens of or hundreds of or more devices. The quantity and the device type of the device are not limited in the embodiments of this application.

[0062] With reference to the foregoing description of the terms and the implementation environment, the method for application of a sighting telescope in a virtual environment according
30 to the embodiments of this application is described. A description is made by using an example in which the method is applied to a terminal. As shown in FIG. 5, the method includes the following steps:

[0063] Step 501. Display a first environment interface, the first environment interface including a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further including a sighting telescope control.

[0064] Optionally, the person perspective picture may be a picture displayed from a first-person perspective of the virtual object, or may be a picture displayed from a third-person perspective of the virtual object. The first-person perspective is a perspective corresponding to a picture that can be observed by the virtual object in the virtual environment, and the picture corresponding to the first-person perspective does not include the virtual object, for example, only arms of the virtual object and the virtual gun can be observed. The third-person perspective is a perspective used by a camera model for observing the virtual object in the virtual environment, the picture corresponding to the third-person perspective includes the virtual object, and generally, the camera model is located behind the virtual object to observe the virtual object, for example, a 3D model of the virtual object and the virtual item (for example, a virtual gun) held by the virtual object can be observed.

[0065] Optionally, when the person perspective picture is displayed from the first-person perspective or the third-person perspective of the virtual object, the person perspective picture further includes an item status bar, and a sighting telescope accessory equipped on the virtual item is displayed in the item status bar. The first-person perspective is used as an example. As shown in FIG. 6, FIG. 6 is a schematic interface diagram of a person perspective picture 61 displayed from the first-person perspective of the virtual object. The person perspective picture 61 includes an item status bar 62, and the item status bar 62 displays a sighting telescope accessory "red dot", namely, a red dot sighting telescope, equipped on the virtual item.

[0066] Optionally, when the person perspective picture is displayed from the third-person perspective of the virtual object, the person perspective picture further includes the virtual item, and the equipped sighting telescope accessory is displayed on the virtual item.

[0067] Step 502. Receive a touch operation on the sighting telescope control and generate a touch signal.

[0068] Optionally, the method is applied to a terminal with a touchscreen. A touch operation performed on the sighting telescope control on the touchscreen is received, and a touch signal is generated. The touch signal is a signal generated when the touch operation begins and used for indicating that the touch operation begins.

[0069] Optionally, a touch operation on the touchscreen is received; first coordinates corresponding to the touch operation on the touchscreen are determined; second coordinates corresponding to a center point of the sighting telescope control on the touchscreen are determined; and when a distance between the first coordinates and the second coordinates being less than a required distance, it is determined that the touch operation is the touch operation performed on the sighting telescope control.

[0070] Optionally, the touchscreen corresponds to a target coordinate system. In the target coordinate system, the first coordinates corresponding to the touch operation are determined, and the second coordinates corresponding to the center point of the sighting telescope control are determined. For example, a description is made by using an example in which a point A is used as a point where the touch operation is located and a point B is used as the center point of the sighting telescope control. When coordinates of the point A are (x1, y1) and coordinates of the point B are (x2, y2), for a manner of calculating a distance between the point A and the point B, refer to the following formula 1:

[0071] Formula 1: $|AB| = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$.

[0072] For example, referring to FIG. 7, when the coordinates of the point A are (-20, 20) and the coordinates of the point B are (20, -10), the distance between A and B is 50. When the required distance is 100, it is determined that the distance between A and B is less than the required distance, that is, the touch operation is the touch operation performed on the sighting telescope control.

[0073] Step 503. Display a second environment interface according to the touch signal, the second environment interface including a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory.

[0074] Optionally, the sighting telescope accessory equipped on the virtual item may be at least one of a mechanical sighting telescope, a basic sighting telescope, a low-power sighting telescope, and a high-power sighting telescope. The mechanical sighting telescope is an original sighting telescope equipped on the virtual item, that is, when a sighting telescope slot of the virtual item is not equipped with other sighting telescopes, the virtual environment may be observed by using the mechanical sighting telescope. The basic sighting telescope is a sighting telescope accessory with no magnification effect in observing the virtual environment, that is, observing the virtual environment at a 1X magnification. Optionally, the basic sighting telescope includes at least one of a red dot sighting telescope and a holographic sighting telescope. The low-power sighting

telescope is a sighting telescope accessory with a low magnification in observing the virtual environment, such as a 2X sighting telescope or a 3X sighting telescope. The high-power sighting telescope is a sighting telescope accessory with a high magnification in observing the virtual environment, such as a 4X sighting telescope, a 6X sighting telescope, an 8X sighting telescope, or a 15X sighting telescope.

[0075] Step 504. Resume displaying the person perspective picture based on a touch end signal of the touch operation being received.

[0076] Optionally, the user touches the sighting telescope control on the touchscreen as the touch operation on the sighting telescope control. When the user releases the touch on the sighting telescope control, the terminal generates the touch end signal.

[0077] Based on the above, in the method for application of a sighting telescope in a virtual environment according to the embodiments of this application, a sighting telescope control is disposed, and according to whether a touch operation on the sighting telescope control is continuous, switching is performed between a person perspective picture observed without a sighting telescope accessory and a sighting telescope picture observed with the sighting telescope accessory. Only a single touch on the sighting telescope control is required to switch between the person perspective picture and the sighting telescope picture, thereby improving the efficiency for enabling the sighting telescope accessory, and improving the efficiency and accuracy of observing a virtual environment.

[0078] In an optional embodiment, there are different sighting telescope control manners according to whether the touch duration of the touch operation reaches the required duration. FIG. 8 is a flowchart of a method for application of a sighting telescope in a virtual environment according to another exemplary embodiment of this application. A description is made by using an example in which the method is applied to a terminal. As shown in FIG. 8, the method includes the following steps:

[0079] Step 801. Display a first environment interface, the first environment interface including a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further including a sighting telescope control.

[0080] Optionally, the person perspective picture may be a picture displayed from a first-person perspective of the virtual object, or may be a picture displayed from a third-person perspective of the virtual object.

[0081] Step 802. Receive a touch operation on the sighting telescope control and generate a touch signal.

[0082] Optionally, the method is applied to a terminal with a touchscreen. A touch operation performed on the sighting telescope control on the touchscreen is received.

5 **[0083]** Optionally, before the touch operation on the sighting telescope control is received, a sighting telescope control manner may be set in a function setting interface. The sighting telescope control manner includes any one of a tapping control manner, a touching-and-holding control manner, and a hybrid control manner. Optionally, the tapping control manner is a manner of enabling the sighting telescope accessory by tapping the sighting telescope control and disabling the
10 sighting telescope accessory by tapping the sighting telescope control. The touching-and-holding control manner is a manner of touching and holding the sighting telescope control to enable the sighting telescope accessory and disabling the sighting telescope accessory when the touch-and-hold operation is ended. The hybrid control manner is a control manner of selecting one of the tapping control manner and the touching-and-holding control manner by using a required
15 duration as a critical duration.

[0084] Optionally, the first environment interface further includes a function setting control. The function setting control is configured to enable the function setting interface, a trigger operation on the function setting control is received, and the function setting interface is displayed according to the trigger operation. The function setting interface includes a sighting telescope setting option.
20 The sighting telescope setting option includes a tapping control option, a touching-and-holding control option, and a hybrid control option. The tapping control option corresponds to the tapping control manner, the touching-and-holding control option corresponds to the touching-and-holding control option, and the hybrid control option corresponds to the hybrid control manner. Optionally, an enabling operation on the hybrid control option is received, with the hybrid control option being
25 used for instructing to determine a disabling manner of the sighting telescope accessory by using the required duration as a critical duration.

[0085] Step 803. Display a second environment interface according to the touch signal, the second environment interface including a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory.

30 **[0086]** Optionally, the sighting telescope accessory equipped on the virtual item may be at least one of a mechanical sighting telescope, a basic sighting telescope, a low-power sighting telescope, and a high-power sighting telescope.

[0087] Step 804. Determine a touch duration of the touch operation based on the touch end signal of the touch operation being received.

[0088] Step 805. Disable the sighting telescope accessory according to the touch end signal based on the touch duration reaching a required duration, and resume displaying the person perspective picture.

[0089] Optionally, when the touch duration of the touch operation reaches the required duration but the touch end signal is not received, the touching-and-holding control manner is determined as a control manner of the sighting telescope accessory, that is, when the touch operation on the sighting telescope control is ended, the sighting telescope control is disabled.

[0090] Optionally, the required duration is a preset duration. For example, the required duration is one second. When the touch duration of the touch operation reaches one second but the touch end signal is not received, the touch end signal is determined as a signal for controlling the sighting telescope accessory to be disabled.

[0091] Step 806. Determine, based on the touch duration not reaching the required duration, a tap signal on the sighting telescope control as a signal for controlling the sighting telescope accessory to be disabled.

[0092] Optionally, when the touch duration of the touch operation does not reach the required duration and the touch end signal is received, the touch operation may be considered as a tap operation.

[0093] Step 807. Disable the sighting telescope accessory based on the tap signal on the sighting telescope control being received, and resume displaying the person perspective picture.

[0094] For example, referring to FIG. 9, a person perspective picture 900 of a virtual environment observed from a first-person perspective of a virtual object is displayed in a first environment interface. A sighting telescope control 910 is superimposed and displayed on the person perspective picture 900. In a first branch, a user performs a touch operation on the sighting telescope control 910, a sighting telescope picture 920 is displayed according to the touch operation, and a touch duration of the touch operation reaches a required duration. When the touch operation ends, displaying the person perspective picture 900 is resumed. In a second branch, a user performs a touch operation on the sighting telescope control 910, a sighting telescope picture 920 is displayed according to the touch operation, and the touch operation is ended before the touch duration reaches the required duration. When a further tap operation on the sighting telescope control 910 is received,

displaying the person perspective picture 900 is resumed. Picture content of the person perspective picture 900 may be changed content, or may be unchanged content.

[0095] For example, referring to FIG. 10, on a time line, a time point S is a moment at which users touch the sighting telescope control, a time point A is a moment at which a first user ends the touch, a time point B is a moment at which a second user ends the touch, and a time point O is a critical moment corresponding to the required duration. The first user needs to tap the sighting telescope control again to disable the sighting telescope accessory after enabling the sighting telescope accessory, and the second user disables the sighting telescope accessory when the touch ends at the time point B.

[0096] Based on the above, in the method for application of a sighting telescope in a virtual environment according to the embodiments of this application, a sighting telescope control is disposed, and a touch signal and touch end signal are determined according to whether a touch operation on the sighting telescope control is continuous. In this way, only a single touch on the sighting telescope accessory is required to switch between a person perspective picture observed without a sighting telescope accessory and a sighting telescope picture observed with the sighting telescope accessory, thereby improving the efficiency for enabling the sighting telescope accessory, and improving the efficiency and accuracy of observing a virtual environment.

[0097] According to the method provided in this embodiment, the required duration is set, and the required duration is used as the critical duration between the tapping control manner and the touching-and-holding control manner, so that the user can determine the control manner of the sighting telescope accessory through a single touch operation, which improves the control efficiency.

[0098] For example, the tapping control manner, the touching-and-holding control manner, and the hybrid control manner are respectively described with reference to drawings:

[0099] First, refer to FIG. 11 for an implementation process of the tapping control manner. The process includes the following steps:

[0100] Step 1101. The sighting telescope accessory is in a disabled state. Optionally, the environment interface displayed on the terminal includes a picture of the virtual environment observed from the first-person perspective or the third-person perspective of the virtual object. Step 1102. Determine whether the user touches the sighting telescope control. Step 1103. Enable the sighting telescope accessory when the user touches the sighting telescope control. Optionally, after the sighting telescope accessory is enabled, the virtual environment is observed by using the

sighting telescope accessory. Step 1104. The user ends the touch on the sighting telescope control. Step 1105. The sighting telescope is in an enabled state. Step 1106. Determine whether the user taps the sighting telescope control again. Step 1107. Disable the sighting telescope accessory when the user taps the sighting telescope control again.

5 **[0101]** Second, refer to FIG. 12 for an implementation process of the touching-and-holding control manner. The process includes the following steps:

[0102] Step 1201. The sighting telescope accessory is in a disabled state. Optionally, the environment interface displayed on the terminal includes a picture of the virtual environment observed from the first-person perspective or the third-person perspective of the virtual object. Step
10 1202. Determine whether the user touches the sighting telescope control. Step 1203. Enable the sighting telescope accessory when the user touches the sighting telescope control. Optionally, after the sighting telescope accessory is enabled, the virtual environment is observed by using the sighting telescope accessory. Step 1204. Determine whether the user ends the touch operation on the sighting telescope control. Step 1205. Disable the sighting telescope accessory when the user
15 ends the touch operation on the sighting telescope control. Step 1206. Keep the sighting telescope accessory enabled before the user ends the touch operation on the sighting telescope control.

[0103] Third, refer to FIG. 13 for an implementation process of the hybrid control manner. The process includes the following steps:

[0104] Step 1301. Select the hybrid control manner. Step 1302. Determine whether the user
20 touches the sighting telescope control. Step 1303. Enable the sighting telescope accessory when the user touches the sighting telescope control. Step 1304. Count a touch duration of the touch operation. Step 1305. Determine whether the user ends the touch on the sighting telescope control. Step 1306. Determine whether to trigger the touching-and-holding control manner when the user ends the touch on the sighting telescope control. Step 1307. Disable the sighting telescope accessory
25 when the touching-and-holding control manner is triggered. Step 1308. Keep the sighting telescope accessory enabled when the touching-and-holding control manner is not triggered. Step 1309. Determine whether a further tap operation on the sighting telescope control is received. Optionally, when a further tap operation on the sighting telescope control is received, the sighting telescope accessory is disabled.

30 **[0105]** In an optional embodiment, after the sighting telescope accessory is enabled, when the virtual environment is observed by using a sighting telescope, a perspective direction may be adjusted through a drag operation. FIG. 14 is a flowchart of a method for application of a sighting telescope in a virtual environment according to another exemplary embodiment of this application.

A description is made by using an example in which the method is applied to a terminal. As shown in FIG. 14, the method includes the following steps:

[0106] Step 1401. Display a first environment interface, the first environment interface including a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further including a sighting telescope control.

[0107] Optionally, the person perspective picture may be a picture displayed from a first-person perspective of the virtual object, or may be a picture displayed from a third-person perspective of the virtual object.

[0108] Step 1402. Receive a touch operation on the sighting telescope control and generate a touch signal.

[0109] Optionally, the method is applied to a terminal with a touchscreen. A touch operation performed on the sighting telescope control on the touchscreen is received.

[0110] Optionally, before the touch operation on the sighting telescope control is received, a sighting telescope control manner may be set in a function setting interface. The sighting telescope control manner includes any one of a tapping control manner, a touching-and-holding control manner, and a hybrid control manner. Optionally, the tapping control manner is a manner of enabling the sighting telescope accessory by tapping the sighting telescope control and disabling the sighting telescope accessory by tapping the sighting telescope control. The touching-and-holding control manner is a manner of touching and holding the sighting telescope control to enable the sighting telescope accessory and disabling the sighting telescope accessory when the touch-and-hold operation is ended. The hybrid control manner is a control manner of selecting one of the tapping control manner and the touching-and-holding control manner by using a required duration as a critical duration.

[0111] Optionally, the first environment interface further includes a function setting control. The function setting control is configured to enable the function setting interface, a trigger operation on the function setting control is received, and the function setting interface is displayed according to the trigger operation. The function setting interface includes a sighting telescope setting option. The sighting telescope setting option includes a tapping control option, a touching-and-holding control option, and a hybrid control option. The tapping control option corresponds to the tapping control manner, the touching-and-holding control option corresponds to the touching-and-holding

control option, and the hybrid control option corresponds to the hybrid control manner. Optionally, an enabling operation on the hybrid control option is received, the hybrid control option being used for instructing to determine a disabling manner of the sighting telescope accessory by using the required duration as a critical duration.

5 **[0112]** Step 1403. Display a second environment interface according to the touch signal, the second environment interface including a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory.

10 **[0113]** Optionally, the sighting telescope accessory equipped on the virtual item may be at least one of a mechanical sighting telescope, a basic sighting telescope, a low-power sighting telescope, and a high-power sighting telescope.

[0114] Optionally, the sighting telescope picture is a picture of the virtual environment observed in a first perspective direction by using the sighting telescope accessory.

[0115] Step 1404. Receive a drag operation determined according to the touch operation.

15 **[0116]** Optionally, after the touch operation is received, a drag operation connected to the touch operation is received before the touch operation is ended.

[0117] Step 1405. Adjust the first perspective direction according to the drag operation, to obtain a second perspective direction.

20 **[0118]** Optionally, the first perspective direction is a perspective direction for a camera model to observe the virtual environment in the form of the sighting telescope accessory. According to a drag direction and a drag distance of the drag operation, the camera model is correspondingly rotated in the virtual environment, and a perspective direction after the rotation is used as the second perspective direction. Optionally, the second perspective direction is also a perspective direction for the camera model to observe the virtual environment in the form of the sighting telescope accessory.

25 **[0119]** Optionally, when the virtual environment is not observed by using the sighting telescope accessory, a speed at which the perspective direction is adjusted is a first adjustment speed. The first perspective direction is adjusted at a second adjustment speed according to the drag operation, to obtain a second perspective direction. The second adjustment speed is less than the first adjustment speed.

30 **[0120]** Step 1406. Display a third environment interface, the third environment interface including a picture of the virtual environment observed in the second perspective direction by using the sighting telescope accessory.

[0121] Step 1407. Disable the sighting telescope accessory and resume displaying the person perspective picture based on a touch end signal of the touch operation being received.

[0122] Optionally, the user touches the sighting telescope control on the touchscreen as the touch operation on the sighting telescope control. When the user releases the touch on the sighting telescope control, the terminal generates the touch end signal.

[0123] Based on the above, in the method for application of a sighting telescope in a virtual environment according to the embodiments of this application, a sighting telescope control is disposed, and according to whether a touch operation on the sighting telescope control is continuous, switching is performed between a person perspective picture observed without a sighting telescope accessory and a sighting telescope picture observed with the sighting telescope accessory. Only a single touch on the sighting telescope control is required to switch between the person perspective picture and the sighting telescope picture, thereby improving the efficiency for enabling the sighting telescope accessory, and improving the efficiency and accuracy of observing a virtual environment.

[0124] According to the method provided in this embodiment, when the sighting telescope accessory is enabled and the virtual environment is observed by using the sighting telescope accessory, the perspective direction of the virtual environment observed is adjusted by receiving the drag operation connected to the touch operation. In this way, the operations of enabling the sighting telescope accessory, adjusting the perspective, and disabling the sighting telescope accessory are implemented in a single touch event, thereby improving the application efficiency of the sighting telescope accessory.

[0125] FIG. 15 is a structural block diagram of an apparatus for application of a sighting telescope in a virtual environment according to an exemplary embodiment of this application. A description is made by using an example in which the apparatus is disposed in a terminal. As shown in FIG. 15, the apparatus includes a display module 1510 and a receiving module 1520.

[0126] The display module 1510 is configured to display a first environment interface, the first environment interface including a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further including a sighting telescope control.

[0127] The receiving module 1520 is configured to receive a touch operation on the sighting telescope control and generate a touch signal.

[0128] The display module 1510 is further configured to display a second environment interface according to the touch signal, the second environment interface including a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory.

[0129] The receiving module 1520 is further configured to resume displaying the person perspective picture based on a touch end signal of the touch operation being received.

[0130] In an optional embodiment, the receiving module 1520 is further configured to determine a touch duration of the touch operation based on the touch end signal of the touch operation being received; and disable the sighting telescope accessory according to the touch end signal based on the touch duration reaching a required duration, and resume displaying the person perspective picture.

[0131] In an optional embodiment, as shown in FIG. 16, the apparatus further includes:

[0132] a determining module 1530, configured to determine, based on the touch duration not reaching the required duration, a tap signal on the sighting telescope control as a signal for controlling the sighting telescope accessory to be disabled.

[0133] The receiving module 1520 is further configured to disable the sighting telescope accessory based on the tap signal on the sighting telescope control being received.

[0134] The display module 1510 is further configured to resume displaying the person perspective picture.

[0135] In an optional embodiment, the receiving module 1520 is further configured to receive a trigger operation on a function setting control;

[0136] the display module 1510 is further configured to display a function setting interface according to the trigger operation, the function setting interface including a sighting telescope setting option, the sighting telescope setting option including a hybrid control option; and

[0137] the receiving module 1520 is further configured to receive an enabling operation on the hybrid control option, the hybrid control option being used for instructing to determine a disabling manner of the sighting telescope accessory by using the required duration as a critical duration.

[0138] In an optional embodiment, the sighting telescope picture is a picture of the virtual environment observed in a first perspective direction by using the sighting telescope accessory;

[0139] the receiving module 1520 is further configured to receive a drag operation determined according to the touch operation; and

[0140] the apparatus further includes:

[0141] an adjustment module 1540, configured to adjust the first perspective direction according to the drag operation, to obtain a second perspective direction.

[0142] The display module 1510 is further configured to display a third environment interface, the third environment interface including a picture of the virtual environment observed in the second perspective direction by using the sighting telescope accessory.

[0143] In an optional embodiment, when the virtual environment is not observed by using the sighting telescope accessory, a speed at which a perspective direction is adjusted is a first adjustment speed.

[0144] The adjustment module 1540 is further configured to adjust the first perspective direction at a second adjustment speed according to the drag operation, the second adjustment speed being less than the first adjustment speed.

[0145] In an optional embodiment, the receiving module 1520 is further configured to receive a touch operation on a touchscreen; and

[0146] the apparatus further includes:

[0147] a determining module 1530, configured to determine first coordinates corresponding to the touch operation on the touchscreen; determine second coordinates corresponding to a center point of the sighting telescope control on the touchscreen; and determine, based on a distance between the first coordinates and the second coordinates being less than a required distance, that the touch operation is the touch operation performed on the sighting telescope control.

[0148] Based on the above, in the apparatus for application of a sighting telescope in a virtual environment according to the embodiments of this application, a sighting telescope control is disposed, and a touch signal and touch end signal are determined according to whether a touch operation on the sighting telescope control is continuous. In this way, only a single touch on the sighting telescope accessory is required to switch between a person perspective picture observed without a sighting telescope accessory and a sighting telescope picture observed with the sighting telescope accessory, thereby improving the efficiency for enabling the sighting telescope accessory, and improving the efficiency and accuracy of observing a virtual environment.

[0149] The apparatus for application of a sighting telescope in a virtual environment according to the foregoing embodiment is illustrated only with an example of division of the foregoing functional modules. In actual application, the functions may be allocated to and completed by different functional modules according to requirements, that is, the internal structure

of the device is divided into different functional modules, to implement all or some of the functions described above. In addition, the apparatus for application of a sighting telescope in a virtual environment according to the foregoing embodiment belong to the same conception as the embodiments of the method for application of a sighting telescope in a virtual environment. For the specific implementation process, refer to the method embodiments. Details are not described herein again.

[0150] FIG. 17 is a structural block diagram of a terminal 1700 according to an exemplary embodiment of this application. The terminal 1700 may be a smartphone, a tablet computer, an MP3 player, an MP4 player, a notebook computer, or a desktop computer. The terminal 1700 may also be referred to as user equipment, a portable terminal, a laptop terminal, or a desktop terminal, among other names.

[0151] Generally, the terminal 1700 includes a processor 1701 and a memory 1702.

[0152] The processor 1701 may include one or more processing cores, for example, a 4-core processor or an 8-core processor. The processor 1701 may be implemented in at least one hardware form of a digital signal processor (DSP), a field-programmable gate array (FPGA), and a programmable logic array (PLA). The processor 1701 may also include a main processor and a coprocessor. The main processor is a processor configured to process data in an awake state, and is also referred to as a central processing unit (CPU). The coprocessor is a low power consumption processor configured to process data in a standby state. In some embodiments, the processor 1701 may be integrated with a graphics processing unit (GPU). The GPU is configured to be responsible for rendering and drawing content to be displayed by a display screen. In some embodiments, the processor 1701 may further include an artificial intelligence (AI) processor. The AI processor is configured to process computing operations related to machine learning.

[0153] The memory 1702 may include one or more computer-readable storage media that may be non-transitory. The memory 1702 may further include a high-speed random access memory (RAM) and a nonvolatile memory, for example, one or more disk storage devices or flash storage devices. In some embodiments, the non-transitory computer-readable storage medium in the memory 1702 is configured to store at least one instruction, and the at least one instruction is configured to be executed by the processor 1701 to implement the method for application of a sighting telescope in a virtual environment according to the method embodiments of this application.

[0154] In some embodiments, the terminal 1700 may optionally include a peripheral interface 1703 and at least one peripheral. The processor 1701, the memory 1702, and the peripheral

interface 1703 may be connected through a bus or a signal cable. Each peripheral may be connected to the peripheral interface 1703 through a bus, a signal cable, or a circuit board. Specifically, the peripheral device includes: at least one of a radio frequency (RF) circuit 1704, a touchscreen 1705, a camera component 1706, an audio circuit 1707, a positioning component 1708, and a power supply 1709.

[0155] The peripheral interface 1703 may be configured to connect at least one peripheral related to input/output (I/O) to the processor 1701 and the memory 1702. In some embodiments, the processor 1701, the memory 1702, and the peripheral interface 1703 are integrated on the same chip or the same circuit board. In some other embodiments, any or two of the processor 1701, the memory 1702, and the peripheral interface 1703 may be implemented on an independent chip or circuit board. This is not limited in this embodiment.

[0156] The radio frequency circuit 1704 is configured to receive and transmit a radio frequency (RF) signal, which is also referred to as an electromagnetic signal. The RF circuit 1704 communicates with a communication network and another communication device by using the electromagnetic signal. The RF circuit 1704 converts an electric signal into an electromagnetic signal for transmission, or converts a received electromagnetic signal into an electric signal. Optionally, the radio frequency circuit 1704 includes an antenna system, an RF transceiver, one or more amplifiers, a tuner, an oscillator, a digital signal processor, a codec chip set, a subscriber identity module card, and the like. The RF circuit 1704 may communicate with another terminal by using at least one wireless communication protocol. The wireless communication protocol includes, but is not limited to, a world wide web, a metropolitan area network, an intranet, generations of mobile communication networks (2G, 3G, 4G, and 5G), a wireless local area network and/or a wireless fidelity (Wi-Fi) network. In some embodiments, the RF circuit 1704 may further include a circuit related to near field communication (NFC), which is not limited in this application.

[0157] The display screen 1705 is configured to display a user interface (UI). The UI may include a graph, a text, an icon, a video, and any combination thereof. When the display screen 1705 is a touchscreen, the display screen 1705 is also capable of capturing a touch signal on or above a surface of the display screen 1705. The touch signal may be used as a control signal to be inputted to the processor 1701 for processing. In this case, the display screen 1705 may be further configured to provide a virtual button and/or a virtual keyboard that are/is also referred to as a soft button and/or a soft keyboard. In some embodiments, there may be one display screen 1705, disposed on a front panel of the terminal 1700. In some other embodiments, there may be at least two display screens 1705, respectively disposed on different surfaces of the terminal 1700 or

designed in a foldable shape. In still some other embodiments, the display screen 1705 may be a flexible display screen, disposed on a curved surface or a folded surface of the terminal 1700. Even, the display screen 1705 may be further set in a non-rectangular irregular pattern, namely, a special-shaped screen. The display screen 1705 may be prepared by using materials such as a liquid crystal display (LCD), an organic light-emitting diode (OLED), or the like.

[0158] The camera 1706 is configured to acquire an image or a video. Optionally, the camera 1706 includes a front-facing camera and a rear-facing camera. Generally, the front-facing camera is disposed on the front panel of the terminal, and the rear-facing camera is disposed on a back surface of the terminal. In some embodiments, there are at least two rear-facing cameras, each being any one of a main camera, a depth of field camera, a wide-angle camera, and a telephoto camera, to implement a Bokeh function through fusion of the main camera and the depth of field camera, panoramic photo shooting and VR shooting functions through fusion of the main camera and wide-angle camera, or another fusion shooting function. In some embodiments, the camera 1706 may further include a flash. The flash may be a single-color-temperature flash, or may be a double-color-temperature flash. The double-color-temperature flash refers to a combination of a warm-light flash and a cold-light flash, and may be used for light compensation under different color temperatures.

[0159] The audio circuit 1707 may include a microphone and a speaker. The microphone is configured to acquire sound waves of users and surroundings, and convert the sound waves into electrical signals and input the signals to the processor 1701 for processing, or input the signals to the RF circuit 1704 to implement voice communication. For the purpose of stereo acquisition or noise reduction, there may be a plurality of microphones, respectively disposed at different portions of the terminal 1700. The microphone may further be an array microphone or an omni-directional acquisition type microphone. The speaker is configured to convert electric signals from the processor 1701 or the RF circuit 1704 into sound waves. The speaker may be a conventional thin-film speaker or a piezoelectric ceramic speaker. When the speaker is the piezoelectric ceramic speaker, electric signals not only may be converted into sound waves that can be heard by human, but also may be converted into sound waves that cannot be heard by human for ranging and the like. In some embodiments, the audio circuit 1707 may further include an earphone jack.

[0160] The positioning component 1708 is configured to determine a current geographic location of the terminal 1700, to implement a navigation or a location based service (LBS). The positioning component 1708 may be a positioning component based on the Global Positioning

System (GPS) of the United States, the China's Beidou Navigation Satellite System (BDS), or the Galileo system of Russia.

[0161] The power supply 1709 is configured to supply power to components in the terminal 1700. The power supply 1709 may be an alternating current, a direct current, a primary battery, or a rechargeable battery. When the power supply 1709 includes a rechargeable battery, the rechargeable battery may be a wired rechargeable battery or a wireless rechargeable battery. The wired rechargeable battery is a battery charged through a wired circuit, and the wireless rechargeable battery is a battery charged through a wireless coil. The rechargeable battery may be further configured to support a fast charge technology.

[0162] In some embodiments, the terminal 1700 further includes one or more sensors 1710. The one or more sensors 1710 include, but are not limited to, an acceleration sensor 1711, a gyroscope sensor 1712, a pressure sensor 1713, a fingerprint sensor 1714, an optical sensor 1715, and a proximity sensor 1716.

[0163] The acceleration sensor 1711 may detect a magnitude of acceleration on three coordinate axes of a coordinate system established with the terminal 1700. For example, the acceleration sensor 1711 may be configured to detect components of gravity acceleration on the three coordinate axes. The processor 1701 may control, according to the gravity acceleration signal collected by the acceleration sensor 1711, the touchscreen 1705 to display in a UI using a horizontal view or a longitudinal view. The acceleration sensor 1711 may be further configured to acquire motion data of a game or a user.

[0164] The gyroscope sensor 1712 may detect a body direction and a rotation angle of the terminal 1700. The gyroscope sensor 1712 may cooperate with the acceleration sensor 1711 to acquire a 3D action by the user on the terminal 1700. The processor 1701 may implement the following functions according to the data acquired by the gyroscope sensor 1712: motion sensing (such as changing the UI according to a tilt operation of the user), image stabilization at shooting, game control, and inertial navigation.

[0165] The pressure sensor 1713 may be disposed at a side frame of the terminal 1700 and/or a lower layer of the touchscreen 1705. When the pressure sensor 1713 is disposed at the side frame of the terminal 1700, a holding signal of the user on the terminal 1700 may be detected. The processor 1701 performs left/right hand recognition or a quick operation according to the holding signal collected by the pressure sensor 1713. When the pressure sensor 1713 is disposed on the lower layer of the touchscreen 1705, the processor 1701 controls, according to a pressure operation

of the user on the touchscreen 1705, an operable control in the UI. The operable control includes at least one of a button control, a scroll-bar control, an icon control, and a menu control.

[0166] The fingerprint sensor 1714 is configured to acquire a user's fingerprint, and the processor 1701 identifies a user's identity according to the fingerprint acquired by the fingerprint sensor 1714, or the fingerprint sensor 1714 identifies a user's identity according to the acquired fingerprint. When identifying that the identity of the user is a trusted identity, the processor 1701 authorizes the user to perform related sensitive operations. The sensitive operations include: unlocking a screen, viewing encrypted information, downloading software, paying, changing a setting, and the like. The fingerprint sensor 1714 may be disposed on a front surface, a back surface, or a side surface of the terminal 1700. When a physical button or a vendor logo is disposed on the terminal 1700, the fingerprint sensor 1714 may be integrated with the physical button or the vendor logo.

[0167] The optical sensor 1715 is configured to acquire ambient light intensity. In an embodiment, the processor 1701 may control display brightness of the touchscreen 1705 according to the ambient light intensity acquired by the optical sensor 1715. Specifically, when the ambient light intensity is relatively high, the display luminance of the touchscreen 1705 is increased. When the ambient light intensity is relatively low, the display luminance of the touchscreen 1705 is reduced. In another embodiment, the processor 1701 may further dynamically adjust a camera parameter of the camera 1706 according to the ambient light intensity acquired by the optical sensor 1715.

[0168] The proximity sensor 1716, also referred to as a distance sensor, is usually disposed on the front panel of the terminal 1700. The proximity sensor 1716 is configured to acquire a distance between the user and the front surface of the terminal 1700. In an embodiment, when the proximity sensor 1716 detects that the distance between the user and the front surface of the terminal 1700 gradually becomes smaller, the touchscreen 1705 is controlled by the processor 1701 to switch from a screen-on state to a screen-off state. In a case that the proximity sensor 1716 detects that the distance between the user and the front surface of the terminal 1700 gradually becomes larger, the touchscreen 1705 is controlled by the processor 1701 to switch from the screen-off state to the screen-on state.

[0169] A person skilled in the art may understand that a structure shown in FIG. 17 constitutes no limitation on the terminal 1700, and the terminal may include more or fewer components than those shown in the figure, or combine some components, or use a different component deployment.

[0170] An embodiment of this application further provides a computer device, including a memory and a processor, the memory storing at least one instruction, at least one program, a code set, or an instruction set, and the at least one instruction, the at least one program, the code set, or the instruction set being loaded by the processor to implement the method for application of a sighting telescope in a virtual environment according to the foregoing embodiments of this application.

[0171] An embodiment of this application further provides a storage medium, configured to store a computer program, the computer program being configured to perform the method for application of a sighting telescope in a virtual environment according to the foregoing embodiments of this application.

[0172] This application further provides a computer program product, the computer program product, when run on a computer, causing the computer to perform the method for application of a sighting telescope in a virtual environment according to the foregoing method embodiments.

[0173] A person of ordinary skill in the art may understand that all or some of the steps of the methods in the embodiments may be implemented by a program instructing relevant hardware. The program may be stored in a computer-readable storage medium. The computer-readable storage medium may be the computer-readable storage medium included in the memory in the foregoing embodiment, or may be a computer-readable storage medium that exists independently and that is not disposed in a terminal. The computer-readable storage medium stores at least one instruction, at least one program, a code set or an instruction set, the at least one instruction, the at least one program, the code set or the instruction set being loaded and executed by a processor to implement the method for application of a sighting telescope in a virtual environment according to the embodiments of this application.

[0174] Optionally, the computer-readable storage medium may include: a read-only memory (ROM), a random access memory (RAM), a solid state drive (SSD), an optical disc, or the like. The RAM may include a resistance random access memory (ReRAM) and a dynamic random access memory (DRAM). The sequence numbers of the foregoing embodiments of this application are merely for description purpose, and are not intended to indicate priorities of the embodiments.

[0175] A person of ordinary skill in the art may understand that all or some of the steps in the embodiments may be implemented by hardware or a program instructing relevant hardware. The program may be stored in a computer-readable storage medium. The storage medium may be: a ROM, a magnetic disk, or an optical disc, or the like.

[0176] The foregoing descriptions are merely exemplary embodiments of this application, and are not intended to limit this application. Any modification, equivalent replacement, improvement and the like made within the spirit and principle of this application shall fall within the protection sighting telescope of this application.

CLAIMS

What is claimed is:

1. A method for application of a sighting telescope in a virtual environment, the method being performed by a terminal and comprising:

5 displaying a first environment interface, the first environment interface comprising a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further comprising a sighting telescope control;

 receiving a touch operation on the sighting telescope control and generating a touch signal;

10 displaying a second environment interface according to the touch signal, the second environment interface comprising a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory; and

 resuming displaying the person perspective picture based on a touch end signal of the touch operation being received.

15 2. The method according to claim 1, wherein the resuming displaying the person perspective picture based on a touch end signal of the touch operation being received comprises:

 determining a touch duration of the touch operation based on the touch end signal of the touch operation being received; and

20 disabling the sighting telescope accessory according to the touch end signal based on the touch duration reaching a required duration, and resuming displaying the person perspective picture.

3. The method according to claim 2, further comprising:

 determining, based on the touch duration not reaching the required duration, a tap signal on the sighting telescope control as a signal for controlling the sighting telescope accessory to be disabled; and

25 disabling the sighting telescope accessory based on the tap signal on the sighting telescope control being received, and resuming displaying the person perspective picture.

4. The method according to claim 3, wherein before the receiving a touch operation on the sighting telescope control, the method further comprises:

 receiving a trigger operation on a function setting control;

30 displaying a function setting interface according to the trigger operation, the function setting

interface comprising a sighting telescope setting option, the sighting telescope setting option comprising a hybrid control option; and

receiving an enabling operation on the hybrid control option, the hybrid control option being used for instructing to determine a disabling manner of the sighting telescope accessory by using the required duration as a critical duration.

5 The method according to any one of claims 1 to 4, wherein the sighting telescope picture is a picture of the virtual environment observed in a first perspective direction by using the sighting telescope accessory; and

after the displaying a second environment interface according to the touch operation, the method further comprises:

receiving a drag operation determined according to the touch operation;

adjusting the first perspective direction according to the drag operation, to obtain a second perspective direction; and

displaying a third environment interface, the third environment interface comprising a picture of the virtual environment observed in the second perspective direction by using the sighting telescope accessory.

6. The method according to claim 5, wherein in a case that the virtual environment is not observed by using the sighting telescope accessory, a speed at which a perspective direction is adjusted is a first adjustment speed; and

the adjusting the first perspective direction according to the drag operation comprises:

adjusting the first perspective direction at a second adjustment speed according to the drag operation, the second adjustment speed being less than the first adjustment speed.

7. The method according to any one of claims 1 to 4, wherein the receiving a touch operation on the sighting telescope control comprises:

receiving a touch operation on a touchscreen;

determining first coordinates corresponding to the touch operation on the touchscreen;

determining second coordinates corresponding to a center point of the sighting telescope control on the touchscreen; and

determining, based on a distance between the first coordinates and the second coordinates being less than a required distance, that the touch operation is the touch operation performed on the

sighting telescope control.

8. An apparatus for application of a sighting telescope in a virtual environment, the apparatus comprising:

a display module, configured to display a first environment interface, the first environment interface comprising a person perspective picture of the virtual environment observed from a person perspective of a virtual object, the virtual object holding a virtual item, the virtual item being equipped with a sighting telescope accessory, and the first environment interface further comprising a sighting telescope control; and

a receiving module, configured to receive a touch operation on the sighting telescope control and generate a touch signal;

the display module being further configured to display a second environment interface according to the touch signal, the second environment interface comprising a sighting telescope picture of the virtual environment observed by using the sighting telescope accessory; and

the receiving module being further configured to resuming displaying the person perspective picture based on a touch end signal of the touch operation being received.

9. The apparatus according to claim 8, wherein the receiving module is further configured to determine a touch duration of the touch operation based on the touch end signal of the touch operation being received; and disable the sighting telescope accessory according to the touch end signal based on the touch duration reaching a required duration, and resume displaying the person perspective picture.

10. The apparatus according to claim 9, further comprising:

a determining module, configured to determine, based on the touch duration not reaching the required duration, a tap signal on the sighting telescope control as a signal for controlling the sighting telescope accessory to be disabled;

the receiving module being further configured to disable the sighting telescope accessory based on the tap signal on the sighting telescope control being received; and

the display module being further configured to resume displaying the person perspective picture.

11. The apparatus according to claim 10, wherein the receiving module is further configured to receive a trigger operation on a function setting control;

the display module being further configured to display a function setting interface according to

the trigger operation, the function setting interface comprising a sighting telescope setting option, the sighting telescope setting option comprising a hybrid control option; and

the receiving module being further configured to receive an enabling operation on the hybrid control option, the hybrid control option being used for instructing to determine a disabling manner of the sighting telescope accessory by using the required duration as a critical duration.

12. The apparatus according to any one of claims 8 to 11, wherein the sighting telescope picture is a picture of the virtual environment observed in a first perspective direction by using the sighting telescope accessory;

the receiving module is further configured to receive a drag operation determined according to the touch operation; and

the apparatus further comprises:

an adjustment module, configured to adjust the first perspective direction according to the drag operation, to obtain a second perspective direction;

the display module being further configured to display a third environment interface, the third environment interface comprising a picture of the virtual environment observed in the second perspective direction by using the sighting telescope accessory.

13. The apparatus according to claim 12, wherein in a case that the virtual environment is not observed by using the sighting telescope accessory, a speed at which a perspective direction is adjusted is a first adjustment speed;

the adjustment module being further configured to adjust the first perspective direction at a second adjustment speed according to the drag operation, the second adjustment speed being less than the first adjustment speed.

14. A computer device, comprising a processor and a memory, the memory storing at least one instruction, at least one program, a code set, or an instruction set, the at least one instruction, the at least one program, the code set, or the instruction set being loaded and executed by the processor to implement the method for application of a sighting telescope in a virtual environment according to any one of claims 1 to 7.

15. A storage medium, configured to store a computer program, the computer program being configured to perform the method for application of a sighting telescope in a virtual environment according to any one of claims 1 to 7.

16. A computer program product comprising instructions, the computer program product,

when run on a computer, causing the computer to perform the method for application of a sighting telescope in a virtual environment according to any one of claims 1 to 7.