

VIRTUAL REALITY EXHIBIT DISPLAY MACHINE FOR INTANGIBLE CULTURAL HERITAGE DIGITAL MUSEUMS

Field of the Invention

5 The present invention relates to the technical field of information display, and in particular to a virtual reality exhibit display machine for intangible cultural heritage digital museums.

Background to the Invention

10 An intangible cultural heritage digital museum is a new type of museum that utilizes digital technology to protect, display, and disseminate intangible cultural heritage. It collects, stores, and processes text, images, audio, video, and other information related to intangible cultural heritage, and presents traditional intangible cultural heritage items in digital form. By means of technologies such as virtual reality (VR), augmented reality (AR), 3D reconstruction, and multimedia interaction, it allows audiences to immerse
15 themselves in the charm of intangible cultural heritage, breaking the limitations of time and space inherent in traditional display methods. Exhibition halls generally use virtual reality exhibit display machines to facilitate the presentation.

20 However, the existing virtual reality exhibit display machines for intangible cultural heritage digital museums have certain shortcomings during use: the device relies solely on a display screen for presentation and interaction with visitors, resulting in a low level of interactivity, which is not intuitive enough and is not conducive to visitors' in-depth experience.

25 To address the above-mentioned problems, technical personnel in the field have proposed a virtual reality exhibit display machine for intangible cultural heritage digital museums.

Statement of Invention

30 This section is intended to provide an overview of certain aspects of the embodiments of the present invention and briefly introduce certain preferred embodiments. Simplifications or omissions may be made in this section, as well as in the abstract and the title of the invention, in order to avoid obscuring the purpose of this section, the abstract, and the title, and such simplifications or omissions shall not be used to limit the scope of the present invention.

In view of the problems existing in the existing technology, such as low interaction intensity, insufficient intuitiveness, and a lack of deep engagement for visitors, the present invention is proposed.

5 Therefore, the object of the present invention is to provide a virtual reality exhibit display machine for intangible cultural heritage digital museums.

To solve the above technical problems, the present invention provides the following technical solution:

A virtual reality exhibit display machine for intangible cultural heritage digital museums, comprising: a display platform;

10 a control mechanism, wherein a mounting groove is formed on the display platform, the control mechanism is installed inside the mounting groove, and the control mechanism simulates the tactile feedback of intangible cultural heritage techniques;

a display mechanism disposed on the display platform;

15 a curtain adjustment mechanism, wherein the curtain adjustment mechanism is installed on the display platform; and

a projection mechanism, wherein the projection mechanism is installed on the display platform and the projection mechanism is configured to perform directional projection onto the curtain adjustment mechanism.

20 As a preferred embodiment of the virtual reality exhibit display machine for intangible cultural heritage digital museums of the present invention, the display mechanism comprises a fixed platform, the fixed platform is installed on the top outer wall of the display platform, and a display screen is mounted on the surface of the fixed platform.

25 As a preferred embodiment of the virtual reality exhibit display machine for intangible cultural heritage digital museums of the present invention, voice recognizers are fixedly installed on both end-adjacent positions of one side outer wall of the fixed platform.

As a preferred embodiment of the virtual reality exhibit display machine for intangible cultural heritage digital museums of the present invention, a depth camera is mounted on one side of the top outer wall of the fixed platform.

30 As a preferred embodiment of the virtual reality exhibit display machine for intangible cultural heritage digital museums of the present invention, the control mechanism comprises a fixed plate and two handles, the fixed plate is fixed on the inner wall of the mounting groove, and the two handles are connected to the display screen.

As a preferred embodiment of the virtual reality exhibit display machine for intangible cultural heritage digital museums of the present invention, the projection mechanism comprises a motor, a rectangular groove is formed on the rear outer wall of the display platform, the motor is mounted on the top inner wall of the rectangular groove, the bottom end of the output shaft of the motor is sleeved with a connecting plate, and a projector is mounted on the surface of the connecting plate.

As a preferred embodiment of the virtual reality exhibit display machine for intangible cultural heritage digital museums of the present invention, the curtain adjustment mechanism comprises a curtain and two electric slide rails, two crossbars are mounted on the rear outer wall of the display platform, an arc-shaped plate is mounted at one end of each of the two crossbars, a plurality of magnetic stickers are arranged on the inner wall of the arc-shaped plate, the two electric slide rails are mounted at both ends of the arc-shaped plates, sliders are slidably disposed on one side outer wall of each electric slide rail, one end of each of the two sliders is fixedly provided with a connecting rod, one end of each of the two connecting rods is respectively fixed at each end of the curtain, and the curtain is fixedly adsorbed by the magnetic stickers.

The beneficial effects of the virtual reality exhibit display machine for intangible cultural heritage digital museums of the present invention are as follows: the device realizes natural interaction between the audience and virtual exhibits through the depth camera, handles, and voice recognizers. The depth camera captures audience gesture movements (such as grabbing and rotating) to achieve contactless interaction and, combined with a skeletal tracking algorithm, accurately identifies audience limb movements and maps them into the virtual scene. The voice recognizer receives audience voice commands (such as "zoom in details", "switch item"), parses them through NLP technology, and triggers corresponding functions. The handles simulate the tactile feedback of intangible cultural heritage techniques (such as pottery throwing and embroidery) and transmit a sense of resistance through the handles. The projection mechanism adjusts the projection angle via the motor, and the curtain adjustment mechanism adjusts the curtain height, thereby facilitating changes in its position to enhance deeper interaction with visitors and improve the virtual reality projection effect.

Brief Description of the Drawings

In order to more clearly illustrate the technical solutions of the embodiments of the present invention, a brief introduction to the drawings required for the description of the embodiments is provided below. It is evident that the drawings described below are merely some embodiments of the present invention. For those of ordinary skill in the field,

other drawings can also be obtained based on these drawings without any creative effort. Among them:

FIG. 1 is a schematic diagram of the overall structure of a virtual reality exhibit display machine for intangible cultural heritage digital museums.

5 FIG. 2 is a schematic diagram of the rear structure of the display platform of a virtual reality exhibit display machine for intangible cultural heritage digital museums.

FIG. 3 is a schematic diagram of a partial three-dimensional structure of a virtual reality exhibit display machine for intangible cultural heritage digital museums.

10 FIG. 4 is a schematic diagram of the structure of the curtain adjustment mechanism of a virtual reality exhibit display machine for intangible cultural heritage digital museums.

Detailed Description

To make the above objectives, features, and advantages of the present invention more apparent and easier to understand, the specific embodiments of the present invention are described in detail below with reference to the accompanying drawings.

15 Many specific details are set forth in the following description to facilitate a full understanding of the present invention. However, the present invention may also be implemented in ways other than those described herein. Those skilled in the field may make similar adaptations without departing from the essence of the present invention. Therefore, the present invention is not limited by the specific embodiments disclosed below.

20 Furthermore, the expressions “an embodiment” or “embodiment” as used herein refer to a specific feature, structure, or characteristic that may be included in at least one implementation of the present invention. The appearance of the phrase “in one embodiment” in different places in this specification does not necessarily refer to the same embodiment, nor are these embodiments mutually exclusive or alternative unless expressly stated.

Embodiment 1

30 Referring to FIGS. 1 and 3, a first embodiment of the present invention provides a virtual reality exhibit display machine for intangible cultural heritage digital museums, which enables deep interaction with visitors. It comprises a display platform 100;

a control mechanism 200, wherein a mounting groove 101 is formed on the display platform 100, the control mechanism 200 is installed inside the mounting groove 101, and

the control mechanism 200 simulates the tactile feedback of intangible cultural heritage techniques;

a display mechanism 300 disposed on the display platform 100;

5 a curtain adjustment mechanism 400, wherein the curtain adjustment mechanism 400 is installed on the display platform 100; and

a projection mechanism 500, wherein the projection mechanism 500 is installed on the display platform 100, and the projection mechanism 500 is used for directional projection onto the curtain adjustment mechanism 400.

10 Specifically, the display mechanism 300 comprises a fixed platform 301, the fixed platform 301 is mounted on the top outer wall of the display platform 100, and a display screen 302 is mounted on the surface of the fixed platform 301.

Further, voice recognizers 303 are fixedly installed on both end-adjacent positions of one side outer wall of the fixed platform 301.

A depth camera 304 is mounted on one side of the top outer wall of the fixed platform 301.

15 It should be noted that the control mechanism 200 comprises a fixed plate 201 and two handles 202, the fixed plate 201 is fixed to the inner wall of the mounting groove 101, and the two handles 202 are connected to the display screen 302.

20 In use, the projection mechanism 500 and the curtain adjustment mechanism 400 are adjusted to suitable positions to act as a second interactive element in addition to the display screen 302, establishing in-depth interaction with visitors. The depth camera 304 captures audience gesture movements such as grabbing and rotating, achieving contactless interaction. Combined with a skeletal tracking algorithm, it accurately identifies audience limb movements and maps them into the virtual scene. The voice recognizer 303 receives audience voice commands such as "zoom in details", "switch item", parses them through NLP technology, and triggers the corresponding functions. The handles 202 simulate the tactile feedback of intangible cultural heritage techniques such as pottery throwing and embroidery and transmit a sense of resistance through the handles 202, allowing visitors to better experience the exhibits and enhancing the virtual reality projection effect.

30 Embodiment 2

Referring to FIGS. 1 to 4, a second embodiment of the present invention is provided.

Unlike the previous embodiment, the projection mechanism 500 comprises a motor 501, a rectangular groove 102 is formed on the rear outer wall of the display platform 100, the motor 501 is mounted on the top inner wall of the rectangular groove 102, the bottom end

of the output shaft of the motor 501 is sleeved with a connecting plate 502, and a projector 503 is mounted on the surface of the connecting plate 502.

Specifically, the curtain adjustment mechanism 400 comprises a curtain 402 and two electric slide rails 401, two crossbars 103 are mounted on the rear outer wall of the display platform 100, an arc-shaped plate 104 is mounted at one end of each of the two crossbars 103, a plurality of magnetic stickers are arranged on the inner wall of each arc-shaped plate 104, the two electric slide rails 401 are mounted at both ends of the arc-shaped plates 104, sliders 403 are slidably arranged on one side outer wall of each electric slide rail 401, one end of each of the two sliders 403 is fixedly provided with a connecting rod 404, one end of each of the two connecting rods 404 is respectively fixed at each end of the curtain 402, and the curtain 402 is fixedly adsorbed by the magnetic stickers.

In use, the motor 501 is activated to drive the connecting plate 502 and the projector 503 to rotate to a suitable angle. The sliders 403 are moved via the electric slide rails 401, thereby moving the curtain 402, the curtain 402 is then fixed in place by the magnetic stickers. This facilitates the adjustment of the projection angle and projection position, making it easier to interact with visitors and enhancing the virtual reality projection effect.

It should be understood that in the development process of any practical embodiment, as in any engineering or design project, numerous implementation-specific decisions may be made. Such development efforts may be complex and time-consuming, but for those skilled in the field benefitting from this disclosure, they would constitute routine tasks of design, manufacturing, and production without requiring excessive experimentation.

It should be noted that the above embodiments are intended only to illustrate the technical solutions of the present invention and not to limit them. Although the present invention has been described in detail with reference to preferred embodiments, those of ordinary skill in the field should understand that modifications or equivalent substitutions can be made to the technical solutions of the present invention without departing from the spirit and scope of the technical solutions of the present invention, and all such modifications or substitutions shall fall within the scope of the claims of the present invention.