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Method and apparatus to enhance multimedia experience

The present invention provides a method and apparatus for enhancing a multimedia experience, wherein it is possible to store at least one multimedia content in a storage medium, to present selected content of the stored multimedia content on a display, and during presenting to influence displaying based on a user input, wherein the influence affects positioning of the displayed multimedia content on the display. The method and the apparatus can be used in any multimedia entertainment machine as well as in audio and video displays, video games, gaming machines, information kiosks, media players and computing devices suitable for playing multimedia content.

To enhance the multimedia experience, especially at gaming applications, a number of solutions became known recently. U.S. Patent No. 6,788,275, for example, describes a method and apparatus for enhancing the viewing experience of video content, which essentially generates a three-dimensional effect. In the solution, a Fresnel lens is placed in front of the TV screen, preferably at a distance of screen diagonal / 3.386.

U.S. Patent No. 6,337,720 discloses a TV monitor unit integrated into a gaming machine which can be rotated at an angle of 90 degrees by a mechanical mechanism and can be fixed in any position within the rotation range. The aim of the rotation is to set the monitor from vertical position to horizontal position and from horizontal position to vertical position. Correct angular position serves for improvement of visibility.

The object of the present invention is to provide a method and an apparatus for enhancing multimedia experience that enables to shift the displayed content during the multimedia content displaying along one direction to one of two possible directions based on a user input.

The present invention is defined in claim 1 for the method and in claim 13 for the apparatus. Further preferred embodiments are set forth in the dependent claims.

While developing the invention, we started from a method that is suitable for

enhancing of multimedia experience, during which at least one multimedia content is stored in a storage medium, a selected content of the stored multimedia contents is presented on a display, and during presenting displaying is influenced based on user input, wherein the influence affects positioning of the displayed multimedia content on the display. During the method according to the invention, multimedia content is displayed on a wide screen that is masked with a narrowing mask while shifting the display or displayed content along a coordinate from two possible directions by the user input in one or the other direction.

Due to the shifting in a selected direction, multimedia content displayed or visibly shown to the user changes, in the direction corresponding to the direction of the shifting the user may look in into an area that was originally invisible.

In the method according to the invention, the aspect (width to height) ratio of the wide screen is suitably 16:9, and the ratio of width and height of the free area of the narrow mask is preferably 4:3.

In one possible embodiment of the invention, the screen is moved in the direction of the width in one or the other direction such that in one extreme position the displayed multimedia content appears up to one edge of the screen and the displayed multimedia content in the other extreme position appears up to the other end of the screen.

In the method of the present invention, the movement of the display can be effected directly or indirectly using mechanical actuating means connected to the screen.

Movement of the display can be manually, electrically or electronically controlled. For electric or electronic control, an electric motor drive can be used to move the screen.

In a further preferred embodiment of the method according to the invention, user's head movement is perceived and the displayed multimedia content is shifted on the display in response to a software control in one or another direction. The head movement is conveniently detected along the offset direction and the content displayed on the screen is shifted in the same direction as of the head movement.

In a further preferred embodiment of the method according to the invention, user's eye movement is perceived and the displayed multimedia content is shifted on the display in response to a software control in one or another direction. The eye movement is conveniently detected along the offset direction and the content displayed on the screen is shifted in the opposite direction compared to the eye movement.

In a still further embodiment, the multimedia content displayed on the screen is rotated in two or more directions, preferably left and right, upon user input. The user input in this case may be effected by a gyroscopic device comprised in connection with the user input device.

In one aspect of the method of the invention, at least a part of the multimedia content displayed on the display is magnified by optical means, preferably by a Fresnel lens.

In this case, when using a distortive lens, depending on the viewing direction, the displayed content is pre-distorted by a computer program in an inverted sense compared to the distortion of the lens in order to compensate for distortion of the lens.

In connection with the multimedia experience enhancement apparatus, we started from a device comprising at least one multimedia storage medium, a means of selecting a multimedia content from the stored multimedia content, a display for presenting multimedia content, and a means for receiving user input upon which the display of multimedia content can be influenced, where influence affects the positioning of the displayed multimedia content on the display. In the apparatus of the present invention, the display used for displaying multimedia content is a wide screen display, in front of which a narrowing mask covering the edges of the wide screen display is placed, and the display or displayed content is arranged along a coordinate enabling being shifted by user input in one or the other direction.

In one aspect of the apparatus according to the invention, the aspect (width to height) ratio of the wide screen is suitably 16:9, and the ratio of width and height of the free area of the narrow mask is preferably 4:3.

In the apparatus of the present invention, the screen is movable in the direction of

the width, where in one extreme position the mask covers the edge of the screen on one side of the screen, and at the other extreme position the screen edge is covered by the mask on the other side of the screen.

In the apparatus of the present invention, for moving the display, the display is directly or indirectly coupled to a mechanical actuator.

In the apparatus according to the invention, the actuator for moving the display is a manually, electrically or electrically operated actuator. In the case of electrically or electrically actuated actuators, an electrically operated drive is preferably connected to the actuator for moving the screen.

In another preferred embodiment of the apparatus according to the invention, the apparatus has also a user head movement sensor element, its output signal being coupled to a head movement evaluation unit which effects shifting of the multimedia content displayed on the screen in response to software control in one or another direction.

In another preferred embodiment of the apparatus according to the invention, the apparatus has also a user eye movement sensor element, its output signal being coupled to an eye movement evaluation unit which effects shifting of the multimedia content displayed on the screen in response to software control in one or another direction.

In a still further embodiment, in addition to or in replacement of the motion detector a gyroscopic device may be used in connection with the user input device, that is the position or movement of the user input device can be used as a control for moving the multimedia content displayed on the screen. In addition to or instead of the translational movement, the multimedia content displayed on the screen may also be moved rotationally in two or more directions, preferably left and right, upon user input.

In the apparatus of the present invention, preferably an optical device, advantageously a Fresnel lens is positioned in front of the display.

When a lens is used with a distortion depending on the viewing direction, the displayed content is led to a pre-distortion unit with opposite effect with respect to

the distortion of the lens and its output is connected to the display in order to compensate for the distortion of the lens.

The invention will now be described in more details with reference to the accompanying drawings, where

Figure 1 is a schematic side view of an exemplary apparatus according to the invention,

Figure 2 is a schematic front view of an exemplary apparatus according to the invention,

Figure 3 is a schematic illustration of the lateral displacement of the content displayed on the display or of the display used in an exemplary apparatus of the present invention ,

Figure 4 is a schematic diagram illustrating one possible embodiment of the arrangement for laterally displacing the display device used in the exemplary apparatus of the present invention,

Figure 5 is a schematic diagram illustrating a second possible embodiment of the arrangement for laterally displacing the display device used in the exemplary apparatus of the present invention,

Figure 6 is a schematic diagram illustrating a third possible embodiment of the arrangement for laterally displacing the display device used in the exemplary apparatus of the present invention, in the middle position,

Figure 7 is the arrangement shown in Figure 6 in the left-most position of the display,

Figure 8 is the arrangement shown in Figure 6 in the right-most position of the display,

Figure 9 is a schematic diagram illustrating the embodiment of Figure 6 of the arrangement for laterally displacing the display device used in the exemplary apparatus of the present invention, in side view, and

Figure 10 is a schematic diagram illustrating the embodiment of Figure 6 of the arrangement for laterally displacing the display device used in the exemplary apparatus of the present invention, in the installed position.

Figure 1 is a schematic side view of an exemplary apparatus according to the invention. In the embodiment shown in the drawing, the apparatus 10 of the present invention is a gaming machine having a multipart, dismountable and assembled housing. The housing is supported by base and mounting brackets 13. Base 13 includes a rear panel 11, a front panel 12, a control panel 14 and a display

frame. An actuator 15, which is formed as a rod, extends from the control panel 14, the protruding end of which is provided by a user input means 16.

Figure 2 is a schematic front view of an exemplary apparatus according to the invention. As it can be seen well in Figure 2, on the front panel 12 which is fixed on the base plate 13 and the mounting stand, an opening door 17 is arranged which can be locked by a lock 21. The multimedia storage and playback unit and all electrical and electronic components that are necessary for operating the equipment including power supplies and/or batteries, computer hardware, control units, data processing units, audio amplifiers, loudspeakers, cooling fans etc. can be installed in a space behind the door 17. The control panel 14 has a tilting angle (preferably 45 degrees) with respect to a horizontal plane and comprises a display window 20. The display window 20 is surrounded by the display frame 18 in three directions to ensure lateral light shielding for better visibility of the display. The display frame 18 surrounds a recess 19 having three substantially flat boundary surfaces. The upper boundary surface and the control panel 14 meet at the rear in a line and the two lateral boundary surfaces are essentially parallel to each other. The actuator 15, which is formed as a rod, extends from the control panel 14, at the protruding end of which a user input means 16, e.g. a game controller is fixed. On the door 17 a recess or handle that enables or facilitates gripping can be found. The elements of the multimedia system installed in the equipment are interconnected within the housing. Only the cable that supplies mains voltage needed to operate the system and the connecting cable of the game controller (unless wireless transmission is used) are output from the housing.

Figure 3 is a schematic illustration of the lateral displacement of the content displayed on the display or the display used in an exemplary apparatus of the present invention without the structural elements necessary for the implementation. In the drawing illustrating the principle of operation of the method and apparatus according to the invention, a wide screen display 30 can be seen, which is covered by a narrow mask 31, 32 on both sides. At the wide screen display 30, the aspect (width to height) ratio is suitably 16: 9, and at the narrowing mask 31, 32 the ratio of width and height of the freely left area is preferably 4:3. The above ratios are not mandatory, important is however that the total display 30 is wider than the screen covered by the mask 31, 32. The mask 31, 32 is positioned in front of the display 30 in the immediate vicinity but not touching the display 30 and not preventing its lateral displacement. As can be seen in Figure 3, mask 31,

32 is slightly, e.g. 10-20% higher than the height of the display 30 (smaller length) and its weight is essentially the same and is chosen so that while one, e.g. mask 30 completely covers one edge (in this case the left) of the display 30, the free display surface 30 corresponds to the narrow screen size while the other mask (in this case, 32) does not cover the other edge of the display (in this case, the right edge). The widths of the masks 31, 32 should be slightly wider than the minimum required for covering, e.g. 10 to 20% wider and positioned so that the fully-covering mask extends slightly over the width direction, preferably 10% of its width, on the display 30. In Figure 3, the display 30 or the multimedia content displayed on the display 30 can be shifted in the direction of the arrow 33 in either direction, in this case, horizontally to the right or to the left. Movement is possible manually, e.g. mechanically, electromechanically, electronically or automatically, e.g. using software control. In the case of the former, to move the display, a mechanical actuator is directly or indirectly connected to the display. In the case of electrically or electronically operated actuators, an electrically operated drive not shown on the drawing can be connected to the actuator for moving the screen.

In the case of automatic (software) control, the apparatus has also a user head or eye movement sensor element (e.g. camera), its output signal being coupled to a head or eye movement evaluation unit (e.g. system control computer) which shifts the multimedia content displayed on the screen in response to software control in one or another direction. For this purpose, head movement or eye movement is conveniently detected in the offset (in this case horizontal) direction and the content displayed on the screen is displaced in the same direction as of the head movement or in the opposite direction with respect to the eye movement. This means that when the user moves the head to the right, the head motion sensor transmits the video signal of the right-hand motion to the head movement evaluation unit (preferably in the computer controlling the system, but it may also be independent), which directs the head movement (preferably in a computer that controls the system, but it may also be independent), as a result of which it will cause the display 30 to move the stationary or moving 2D or 3D image to the right. Reverse (left) head movement results in an opposite (left) image shifting. In case of eye movement detection, the image shifting on the display is opposite to the eye movement. This means that if the user turns his eye, for example from the centre of the image to the right edge of the screen, the content displayed on the screen must be shifted to the left to achieve the desired effect. This means that if the user turns his eye, for example from the centre of the image to the left edge of the

screen, the content displayed on the screen must be shifted to the right to achieve the desired effect.

With the wide display 30 in case of 16:9 aspect ratio, if the height of display 30 is 22,5 cm the width is 40 cm. Full size of the wide display therefore may be 22,5 cm x 40 cm. Free surface on the screen covered by the mask in case of 4:3 aspect ratio may be 22,5 cm x 30 cm. The width covered on the right and left sides would be 10 cm in total. Based on the above dimensioning data, the size of the mask 31, 32 can be between 22,5 cm x 10 cm and 26,5 cm x 12 cm. Within the specified range, the choice of a larger size is appropriate because the mask 31, 32 provides a sufficient coverage for the display 30 in the full range of manufacturing, assembling or adjusting tolerances.

Figure 4 is a schematic diagram illustrating one possible embodiment of the arrangement for laterally displacing the display device used in the exemplary apparatus of the present invention. In this embodiment, the two-way (horizontal) displacement of the display 30 is provided by an upper guide rail 41 and a lower guide rail 42. Since the total weight of the display 30 rests on the lower guide rail 42, at least the lower guide rail 42 must provide for reducing friction, such as by guide rollers. With the upper guide rail 41 friction reducing guiding rollers may also be used, but here they can be omitted and the upper guide rail 41 can also be formed as a simple sliding rail, e.g. of low friction plastic or with such plastic coating. In the example above, for the 16:9 and 4:3 and 12:9 aspect ratio ratios, limitation of the 16-12 = 4 width size unit, in the actual dimensioning example, the 10 cm lateral displacement can be delimited for example by stoppers 43, 44 shown in the drawing. In drawing the stoppers 43, 44 are located at the top, but this is not necessary. The stoppers 43, 44 may be located in the middle or even at the bottom as well. Using the above dimensioning data, the distance between the stopping surfaces of the stoppers may be 40 cm + 10 cm = 50 cm. To move the display manually, a mechanical actuator can be fixed directly on the display to move the display 30 in the same direction as the user's head movement between the extreme positions defined by the stoppers 43, 44. If the user moves the head to the right then the manual actuator and thereby the display 30 must also be drawn to the right. Thereby the detail covered by the left mask 31 (Figure 3) becomes more and more free, creating an illusion for the user as if he looked in to the left behind a door opening. Otherwise, if the user moves his head to the left, the manual actuator and thereby the display 30 must also be drawn to the left. Thereby the

detail covered by the right mask 32 (Figure 3) becomes more and more free, creating an illusion for the user as if he looked in to the right behind a door opening. In extreme positions of head movement, extreme positions of the display 30 must be reached and, in intermediate positions of head movement, the proportional position of extreme positions of the display 30 must be adjusted to achieve the optimum effect. As by this direct manual displacement, displacement proportional to the head movement cannot be provided in any case, later we will give a more preferred embodiment, too.

Figure 5 is a schematic diagram illustrating a second possible embodiment of a lateral displacement of the display device used in the exemplary apparatus of the present invention, wherein the movement of the display 30 is delimited by two lower side stoppers 36. In this embodiment, the display 30 stands on a foot 34 and on a base 35. In this case, horizontal displacement is provided by two lower guide rails (not shown in the drawings) and by a mechanical drive mechanism. Direct manual or automatic (software) offset can also be used here. In case of automatic (software offset), the display 30 is fixed, the display 30 will not move, only the stationary or moving image displayed on the 30 display will be shifted. The design of the mechanical actuator is explained in more details referring to Figures 6 and 9.

Figure 6 is a schematic diagram illustrating the third possible embodiment of the arrangement for laterally displacing the display device used in the exemplary apparatus of the present invention. In this embodiment, the display 30 shown in Fig. 5, stands on the foot 34 and on the base 35, and can be shifted between two lower guide rails (not shown) in two (horizontal) directions between two extreme positions. To move the display 30, an indirectly coupled mechanical or electromechanical actuator is used. The drive mechanism is a pulley mechanism with four pulleys 63 fixed to vertical support rods 62 connected to the two ends of a horizontal support rod 61. The pulleys 63 are connected by an endless drive belt 64, which on the top side is fixed to the display 30 and on the bottom side at an operating point 65 it is fixed to an actuator or moving element. The display 30 is preferably connected to the drive belt 64 by means of the foot 34 or the base 35, optionally through another connecting element. The display 30, for example, a rectangular flat LCD or LED, OLED or similar monitor, has two edges covered by a mask 31, 32. The display is shown in Figure 6 in the middle position between the masks 31, 32. The width of the free area between the masks 31, 32 is 30 cm in the above calculation example. As the total width of the display 30 is 40 cm, the width

of the screen covered by masks 31, 32 is 10 cm in total, that is a coverage on both sides of 5 cm respectively. In this position, the actuating point 65 is in the middle position.

In Figure 7, in the arrangement according to Fig. 6, the display 30 is shown in its left-most position. In this case, the actuating point 65 is moved to the right-most position. In this position, the left edge of the display 30 is completely covered by the left side mask 31 with a width of 10 cm, as shown in the calculation example above. The right mask 32 does not cover the display 30 on the right side, at most its frame not shown in the drawing. In Figure 8, in the arrangement according to Fig. 6, the display 30 is shown in its right-most position. In this case, the actuating point 65 is moved to the left-most position. In this position, the right edge of the display 30 is completely covered by the right side mask 32 with a width of 10 cm, as shown in the calculation example above. The left mask 31 does not cover the display 30 on the left side, at most its frame not shown in the drawing.

As already mentioned above, the screen must be shifted or moved in the same direction as of the user's head movement. Figures 6 to 8 clearly show that the movement of the operating point 65 is opposite to the displacement of the display 30. In the case of direct manual control of the operating point 65, the user should be forced to move in the direction opposite to the head movement, which is uncomfortable, so a further movement direction reversal element is required, as shown in Figure 9. This movement direction reversal element is the actuator 15, which is mounted rotatable about pivoting point 66. The length of the actuator 15 is preferably the same on both sides of the pivot point 66, as a result of which the displacement of the free end causes the same displacement at the operating point 65, and results in the same degree of displacement at the display 30. If necessary, the pivot point 66 can be shifted in the direction of the arrow and the dividing ratio of the two arms of the actuator 15 can be varied. In Figure 9, the arrangement shown in Figures 6 to 8 is shown in side view with additional auxiliary elements. The display 30 here is connected by a support 45 to a base 46 which is fixed on a movable plate 47. The movable plate 47 is guided between front and the rear guide rails 54, 52 so that to the bottom of the movable plate 47, front and rear rails 53, 51 are connected, the rollers of which run in the front and rear guide rails 54, 52. In the embodiment shown in Figure 9, the drive belt 64 led through the pulleys 63 of the pulley assembly is attached to the movable plate 47 and at the bottom at the operating point 65 to the inner end of the actuator 15. In front of the display 30, an

optical magnifying lens 40, such as an optical purity PMMA material Fresnel lens is placed. In a practical embodiment, the Fresnel lens is 40 cm x 30 cm with a focal length of 33 cm. The thickness of the Fresnel lens used is 2 mm and the distance between adjacent grooves is 0.5 mm. Based on the experiments, the distance between the lens and the display was determined to be equal to one third of the lens focal length. In this case F / 3 = 33 cm / 3 = 11 cm.

Figure 10 is a schematic diagram illustrating the Figure 6 embodiment of the arrangement for laterally displacing the display device used in the exemplary apparatus 10 of the present invention, in the installed position. The display 30 equipped with moving mechanism of the multimedia system according to the present invention is fixed to the mounting stand of the base plate of the apparatus 10 such that the surface of the display 30 is substantially at an angle of 45 degrees to both the horizontal and vertical directions. In front of the display 30, a magnifying lens 40, preferably a Fresnel lens is located in the plane of the control panel of the apparatus 10. The actuator 15 of the drive mechanism described in detail in connection with Figure 9 is led through the housing of the apparatus. At the end of the actuator 15, a user input device 16, such as a game controller, is detachably fixed. The pivot point 66 of the actuator 15 is formed within the housing by dividing the actuator 15 substantially into two equal parts. The user of the device can move the head in the horizontal plane and move the top end of the actuator 15 with the head movement simultaneously in the same direction along with the input means 16 placed thereon. As a result, the display 30 will move in the same direction as of the head movement, which gives the users an experience as if they were able to access the multimedia content previously covered. This insight into the covered multimedia content is possible in both directions by two-way moving the head and, in turn, the actuator 15.

The invention has been described in detail on the basis of the exemplary embodiments shown in the drawing, but this does not mean that the invention is limited to these embodiments. As it will be apparent to those skilled in the art, a number of modifications and further combinations are possible within the scope of the invention as defined by the claims.

For example, by processing a signal from the head movement sensor camera, a control signal can be generated in the system control unit which controls the electric motor operating the drive mechanism. Instead of stoppers in such cases, limit position sensors can also be used. In addition, in case of manual and

mechanical movement, the stopper may also be implemented, for example, in the guide rail itself beside the features presented.

List of references

10 apparatus
11 rear panel
12 front panel
13 base plate (and mounting bracket)
14 control panel
15 (mechanic) actuator
16 user input device
17 door
18 display frame
19 recess
20 display window
21 lock
30 display
31, 32 mask
33 arrow (movement direction)
34 foot
35 base
36 stopper
40 (magnifying/Fresnel lens)
41 (upper) guide rail
42 (lower) guide rail
43, 44 stopper
45 support
46 base
47 movable plate
51, 53 guide rail
52, 54 roller rail
61 (horizontal) support rod
62 (vertical) support rod
63 pulley
64 drive belt
65 (actuator connection) point
66 pivot point

CLAIMS

1. A method for enhancing a multimedia experience, wherein at least one multimedia content is stored in a storage, a selected content of the stored multimedia content is presented on the display (30) , and during presentation, the display is influenced by user input where the influence affects the positioning of the displayed multimedia content on the display (30), characterized in that the multimedia content is displayed on a wide screen display (30), which is masked by a narrowing mask (31, 32), while the display (30) or displayed content is moved along a coordinate in two possible directions by user inputs in one or another direction.

2. The method according to claim 1, characterised in that the aspect ratio of the wide screen display (30) is 16:9, and the ratio of width and height of the area left free by the narrowing mask (31, 32) is 4:3.

3. The method according to claim 1 or 2, characterized in that the screen (30) is moved in the direction of the width in one or the other direction such that in one extreme position the displayed multimedia content appears up to one edge of the screen (30) and in the other extreme position, the displayed multimedia content is displayed up to the other end of the screen (30).

4. The method according to any one of claims 1 to 3, characterized in that the display (30) is moved directly by a mechanical actuator connected to the screen.

5. The method according to any one of claims 1 to 3, characterized in that the display (30) is moved indirectly by a mechanical actuator (15) connected to the screen.

6. The method according to claim 4 or 5, characterized in that the movement of the display (30) is manually controlled.

7. The method according to claim 4 or 5, characterized in that the movement of the display (30) is electrically or electronically controlled.

8. The method of claim 7, characterized in that an electric motor drive is used to move the screen (30).

9. The method of claim 1, characterized in that the user's head movement is detected and, accordingly, the displayed multimedia content on the display (30) is displaced in response to software control in one direction or another, where the head movement is detected preferably along the offset direction and the content displayed on the screen is displaced in the same direction as of the head movement.

10. The method of claim 1, characterized in that the user's eye movement is detected and, accordingly, the displayed multimedia content on the display (30) is displaced in response to software control in one direction or another, where the eye movement is detected preferably along the offset direction and the content displayed on the screen is displaced in the opposite direction with respect to the eye movement.

11. The method according to any one of claims 1 to 10, characterized in that at least a portion of the multimedia content displayed on the display (30) is magnified by an optical means, preferably by a Fresnel lens.

12. The method of claim 11, characterised in that in case of using a lens (40) with a distortion depending on the viewing direction, the displayed content is pre-distorted by a computer program in an inverted sense compared to the distortion of the lens (40) in order to compensate for distortion of the lens (40).

13. An apparatus for enhancing a multimedia experience, comprising at least one storage medium for storing multimedia content, a means for selecting a multimedia content from the stored multimedia content, a display (30) for presenting multimedia content, and a means (16) for receiving user input, based on which during presenting the displaying of the multimedia content can be influenced, where influencing concerns positioning the multimedia content on the display (30), characterized in that the display (30) for presenting multimedia content is a wide screen display, in front of which a narrowing mask (31, 32) covering the edges of the wide screen display (30) is located, and the display (30) or the displayed content is arranged along two directions of a coordinate to be moved in one or the other direction by way of user input.

14. The apparatus according to claim 13, characterised in that the aspect ratio of the wide screen display (30) is 16:9, and the ratio of width and height of the area

left free by the narrow mask (31, 32) is 4:3.

15. The apparatus in claim 13 or 14, characterised in that the screen (30) is movable in the direction of the width, where in one extreme position the mask (31, 32) covers the edge of the screen on one side of the screen (30), and at the other extreme position the mask (31, 32) covers the edge of the screen on the other side of the screen (30).

16. The apparatus according to any one of claims 13 to 15, characterized in that, in order to move the display, the display (30) is directly connected to a mechanical actuator.

17. The apparatus according to any one of claims 13 to 15, characterized in that, in order to move the display, the display (30) is indirectly connected to a mechanical actuator (15).

18. The apparatus according to claim 16 or 17, characterized in that the actuator (15) for moving the display (30) is a manually operated actuator.

19. The apparatus according to claim 16 or 17, characterized in that the actuator for moving the display (30) is an electrically or electronically operated actuator.

20. The apparatus of claim 19, characterized in that an electric motor drive is connected to the actuator for moving the screen (30).

21. The apparatus of claim 13, characterised in that it has also a user head movement sensing element, its output signal being coupled to a head movement evaluation unit, shifting the multimedia content displayed on the display (30) in response to software control in one or another direction, where the head movement is preferably detected along the offset direction and the content displayed on the screen is shifted in the same direction as of the head movement.

22. The apparatus of claim 13, characterised in that it has also a user eye movement sensing element, its output signal being coupled to an eye movement evaluation unit, shifting the multimedia content displayed on the display (30) in response to software control in one or another direction, where the eye movement is preferably detected along the offset direction and the content displayed on the

screen is shifted in the opposite direction with respect to the eye movement.

23. The apparatus according to any one of claims 13 to 22, characterized in that in front of the display (30) a magnifying optical device, preferably a Fresnel lens (40) is located.

24. The apparatus according to claim 23, characterized in that, in case using a lens (40) with distortion depending on the viewing direction, the displayed content is led to a pre-distortion unit with opposite effect with respect to the distortion of the lens (40) and its output connects to the display (30) in order to compensate for distortion of the lens (40).

25. The method of claim 1 or 7, characterized in that the multimedia content displayed on the screen is rotated in two or more directions, preferably left and right upon user input.

26. The apparatus according to claim 13 or 19, characterized in that a gyroscopic device is used in connection with the user input device (16) in order to provide control for the translational and/or rotational movement of the multimedia content displayed on the screen (30).

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Method and apparatus to enhance multimedia experience

Abstract

The invention refers to a method for enhancing multimedia experience, during which at least one multimedia content is stored in a storage medium, a selected content of the stored multimedia contents is presented on a display (30), and during presentation displaying is influenced based on user input, where the influence affects positioning of the displayed multimedia content on the display (30). During the method according to the invention, multimedia content is displayed on a wide screen display (30) that is masked with a narrowing mask (31, 32), while moving the display (30) or displayed content along a coordinate from two possible directions by user input in one or the other direction. The invention further provides an apparatus for carrying out the process according to the invention.

(Figure 3)

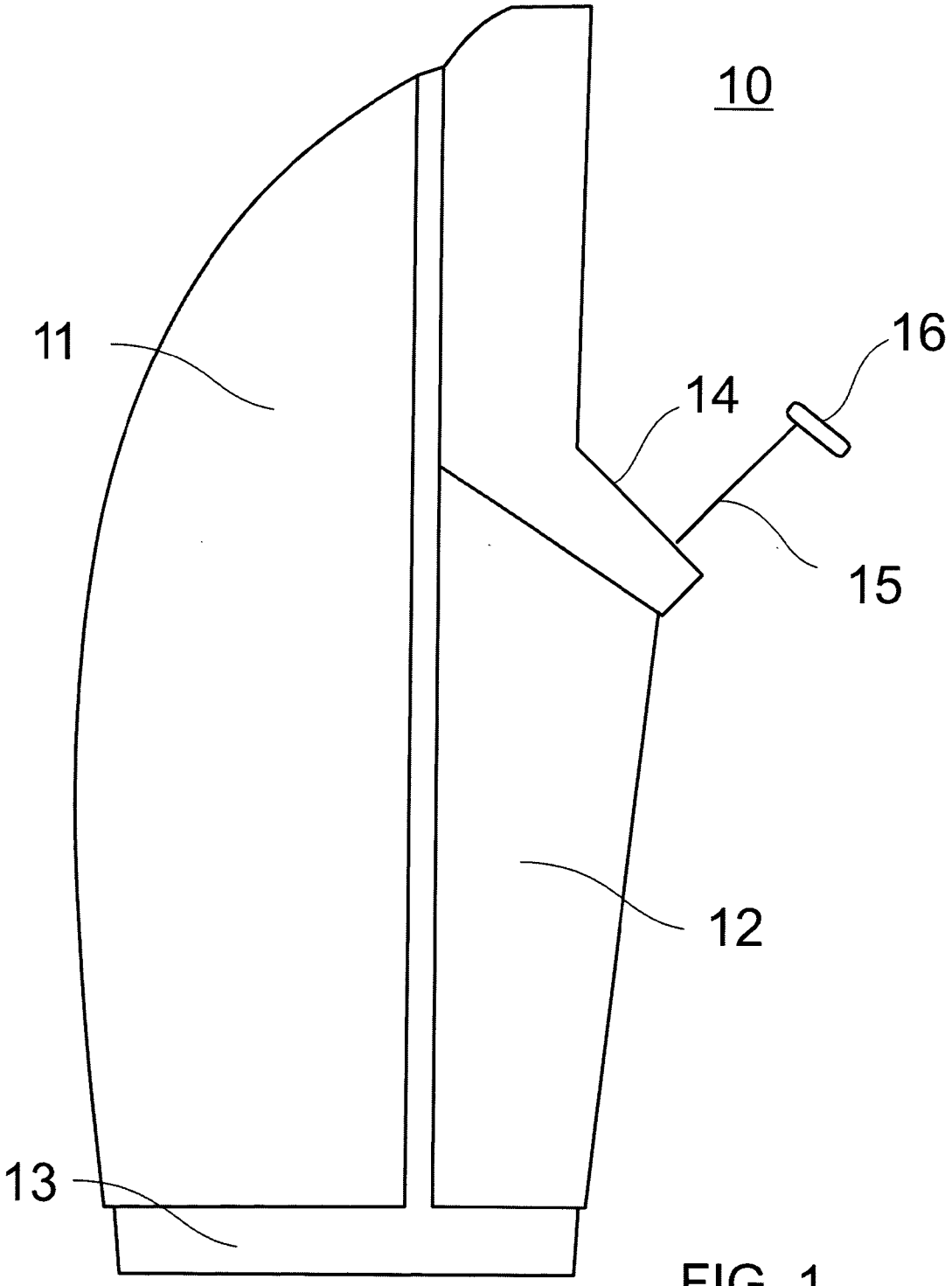

FIG. 1

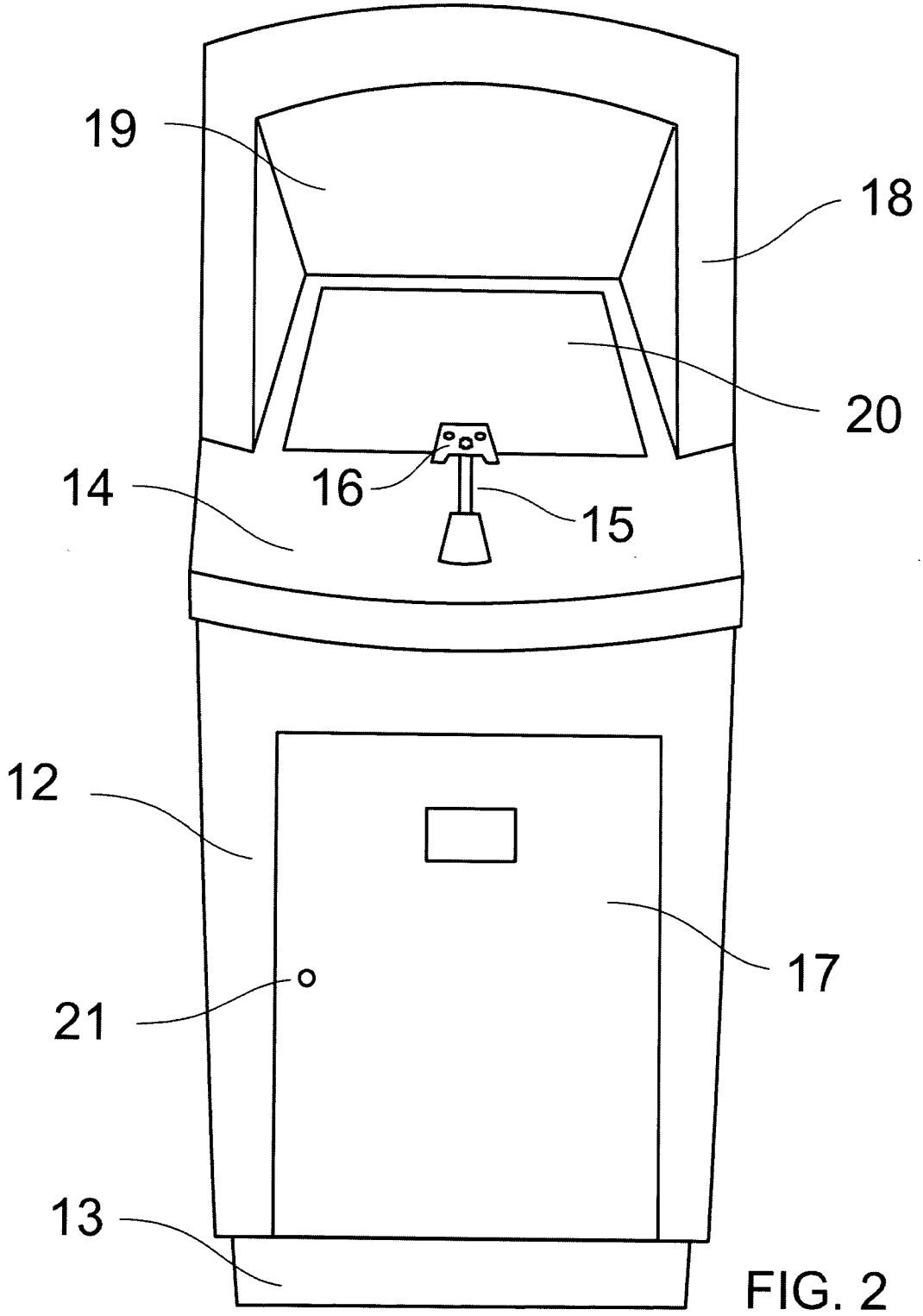

FIG. 2

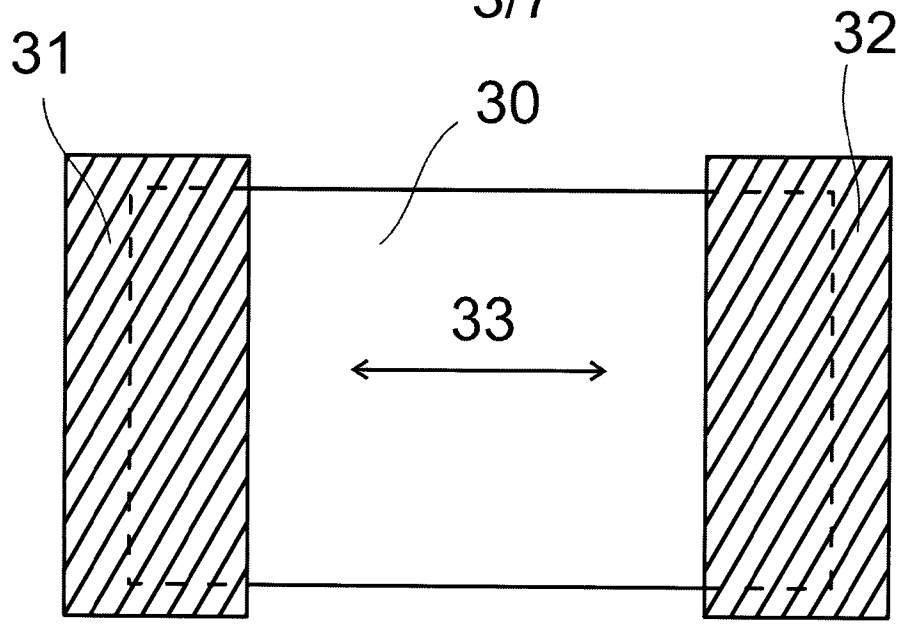

FIG. 3

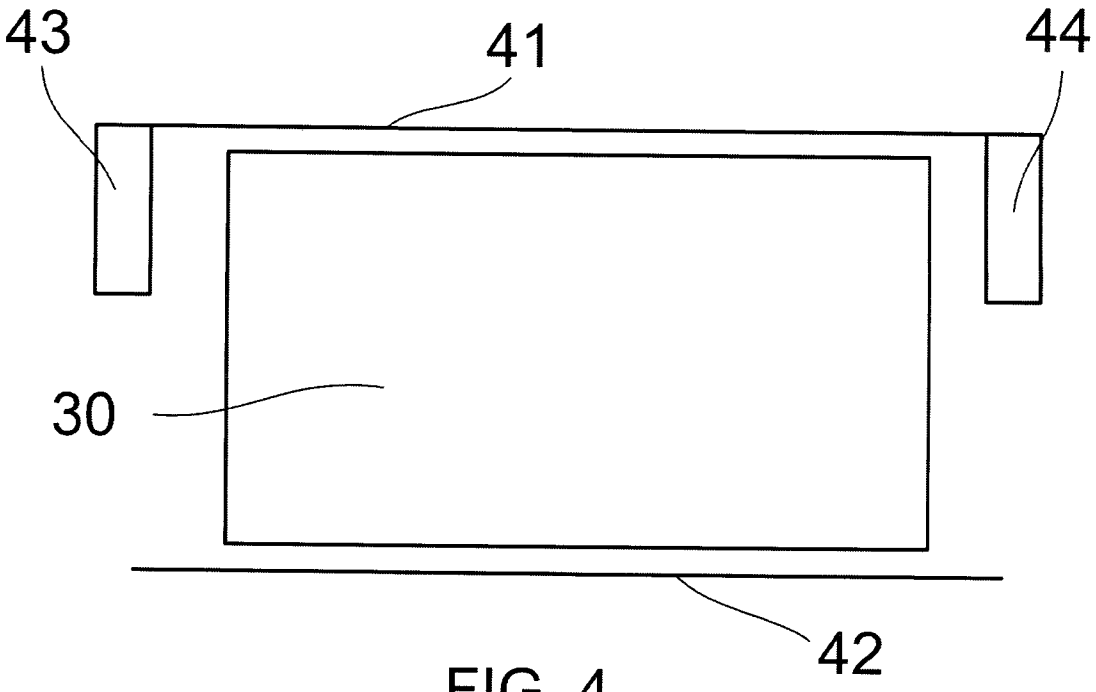

FIG. 4

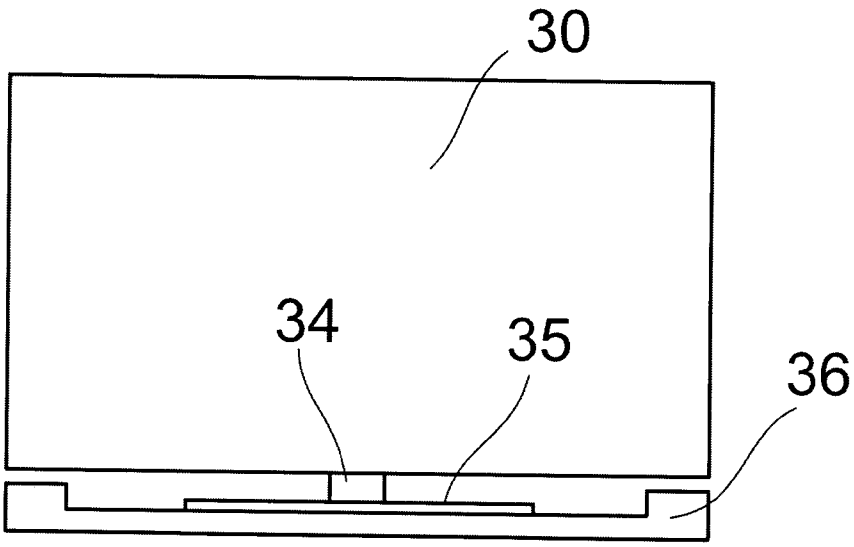

FIG. 5

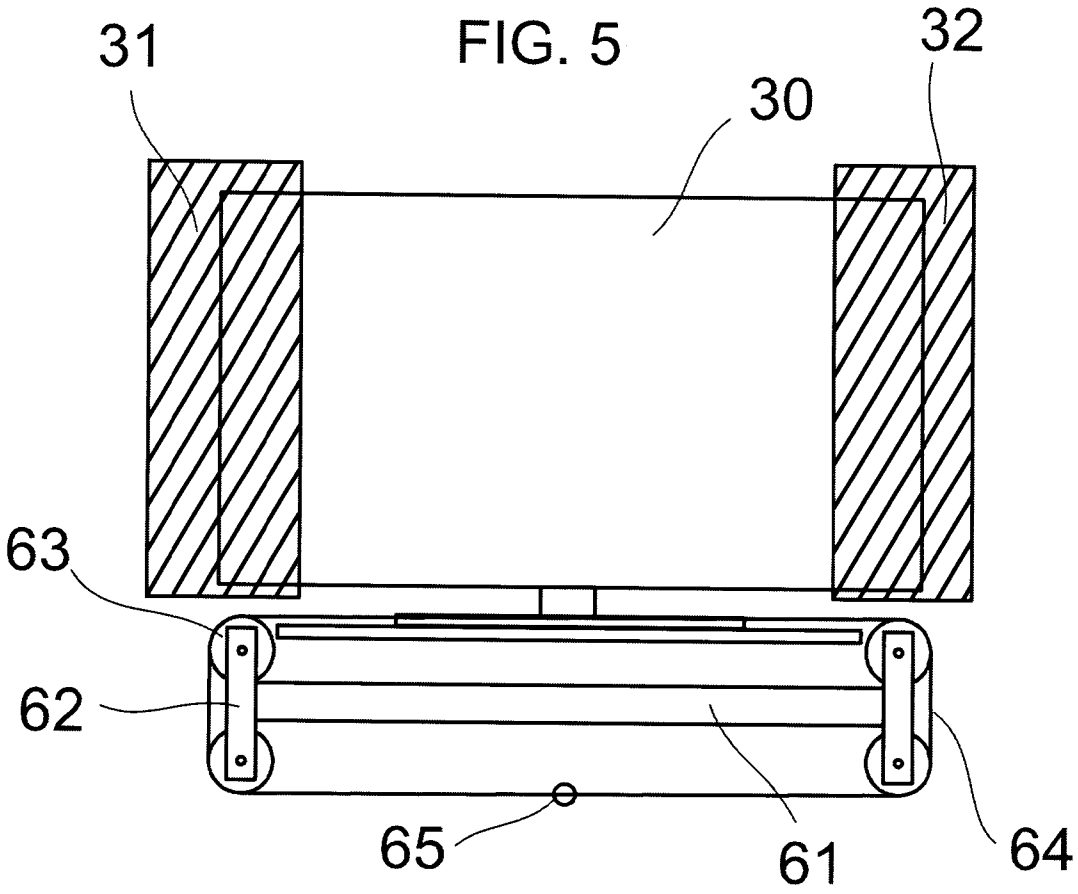

FIG. 6

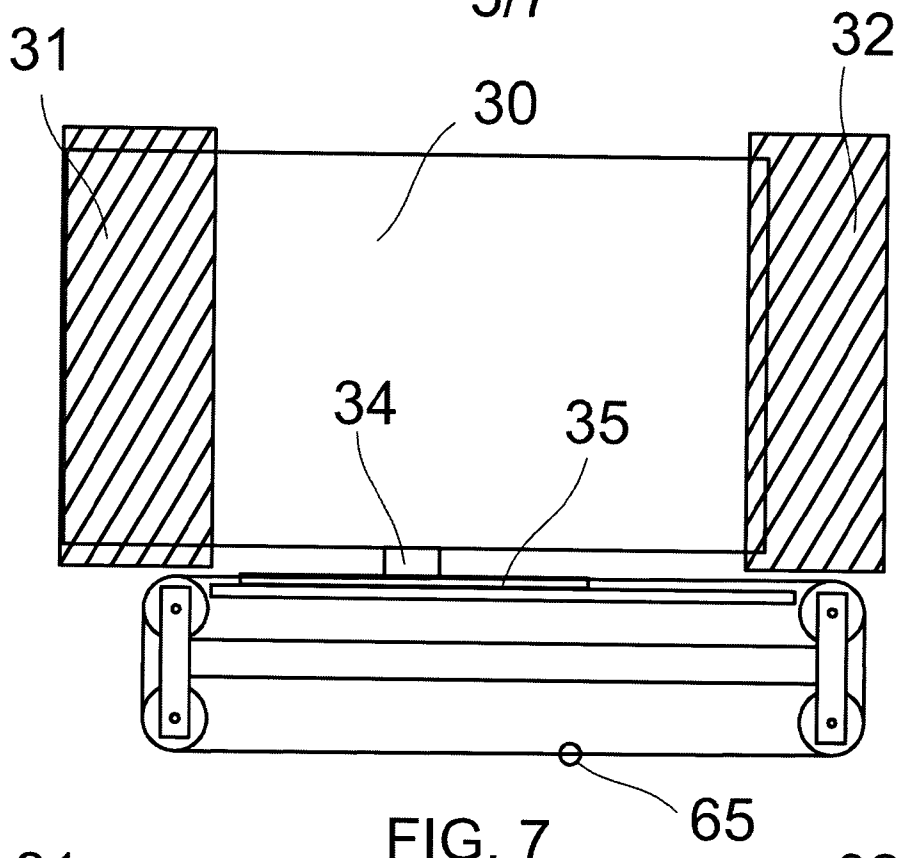

FIG. 7

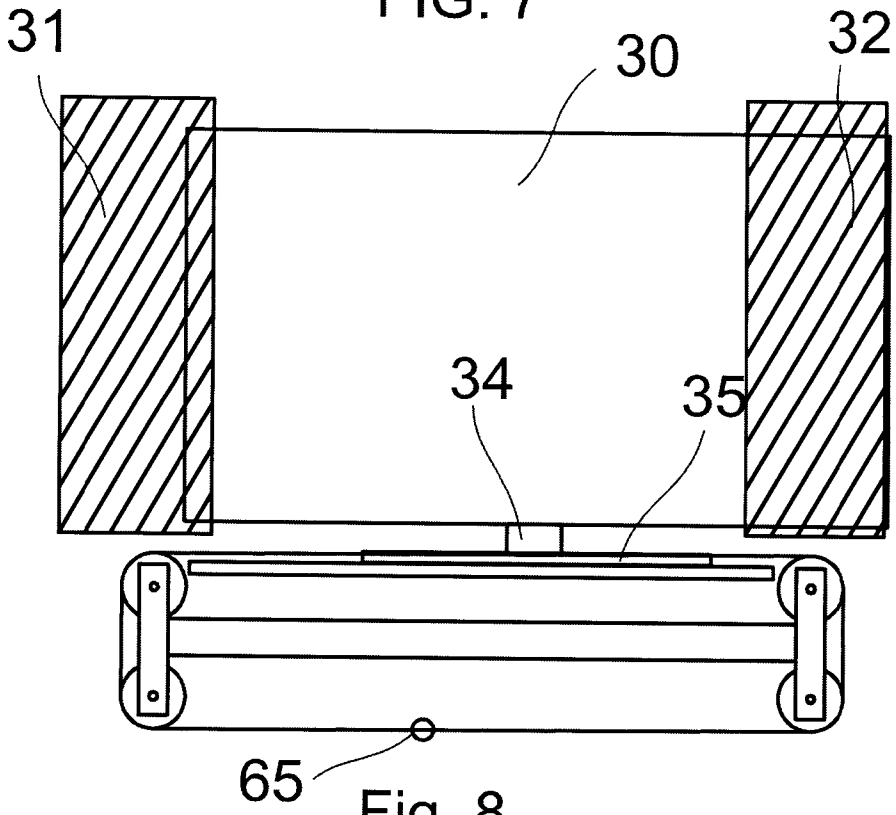

Fig. 8

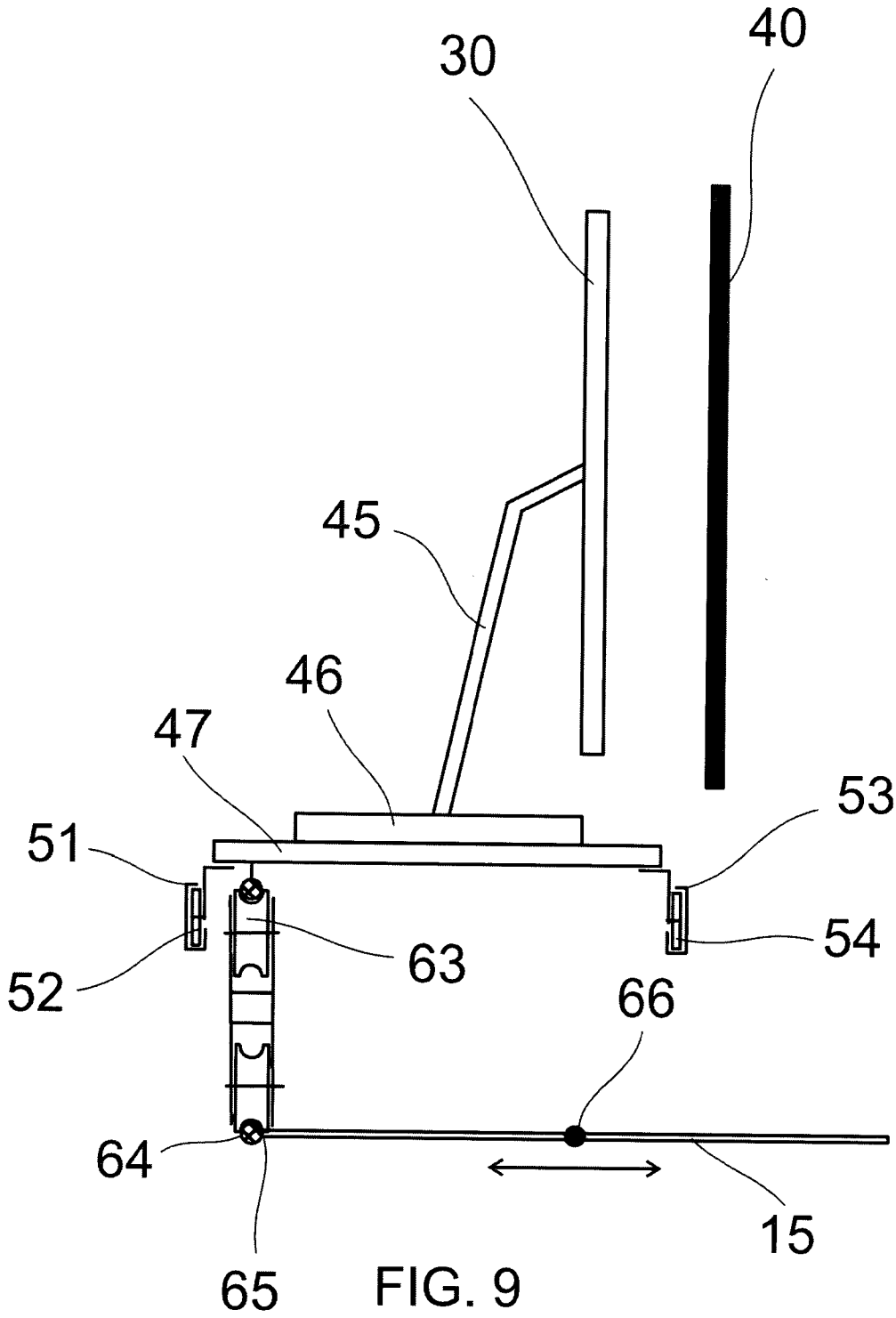

FIG. 9

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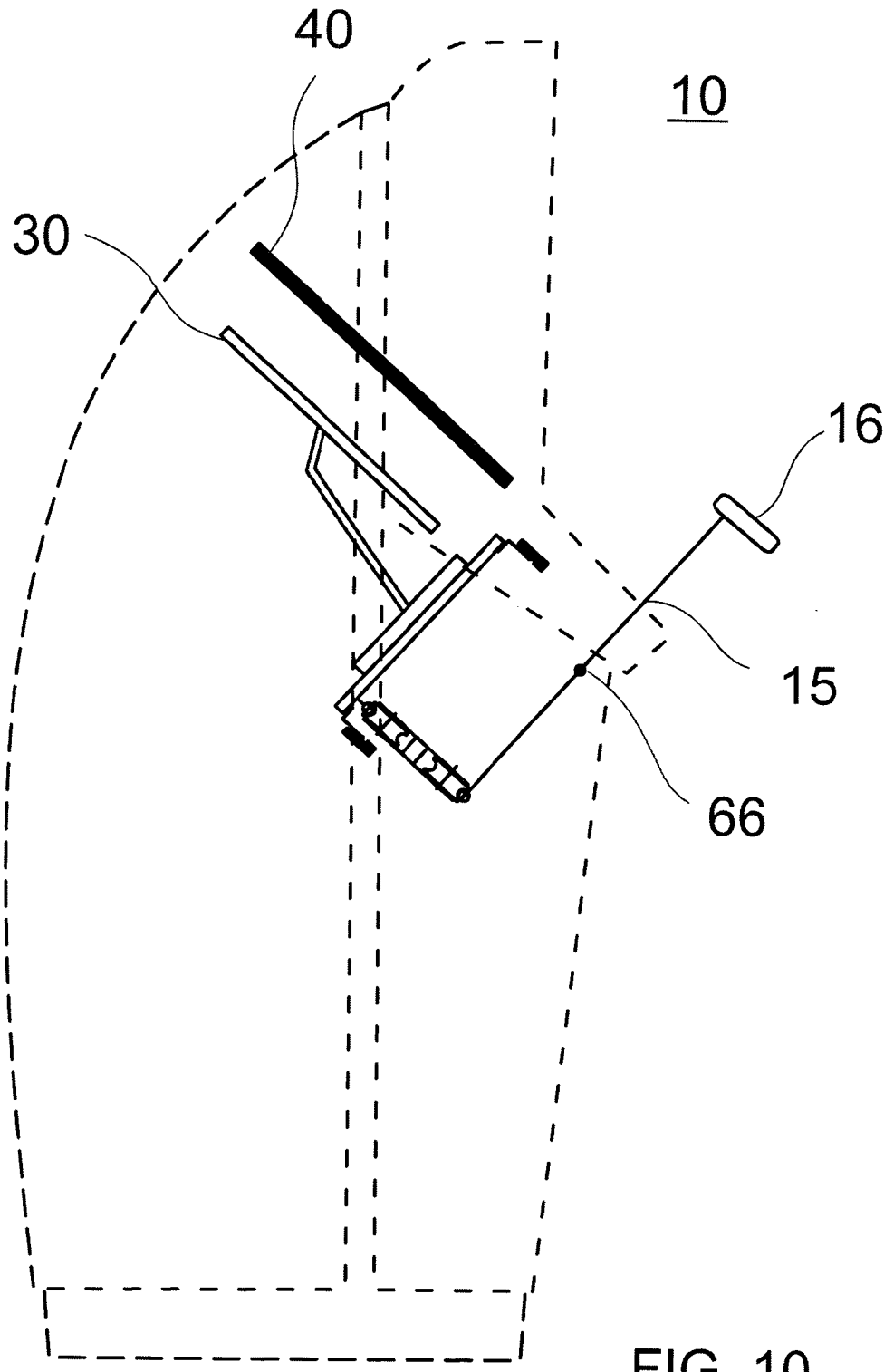

FIG. 10