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(54) **LIGHT-EMITTING BALL**

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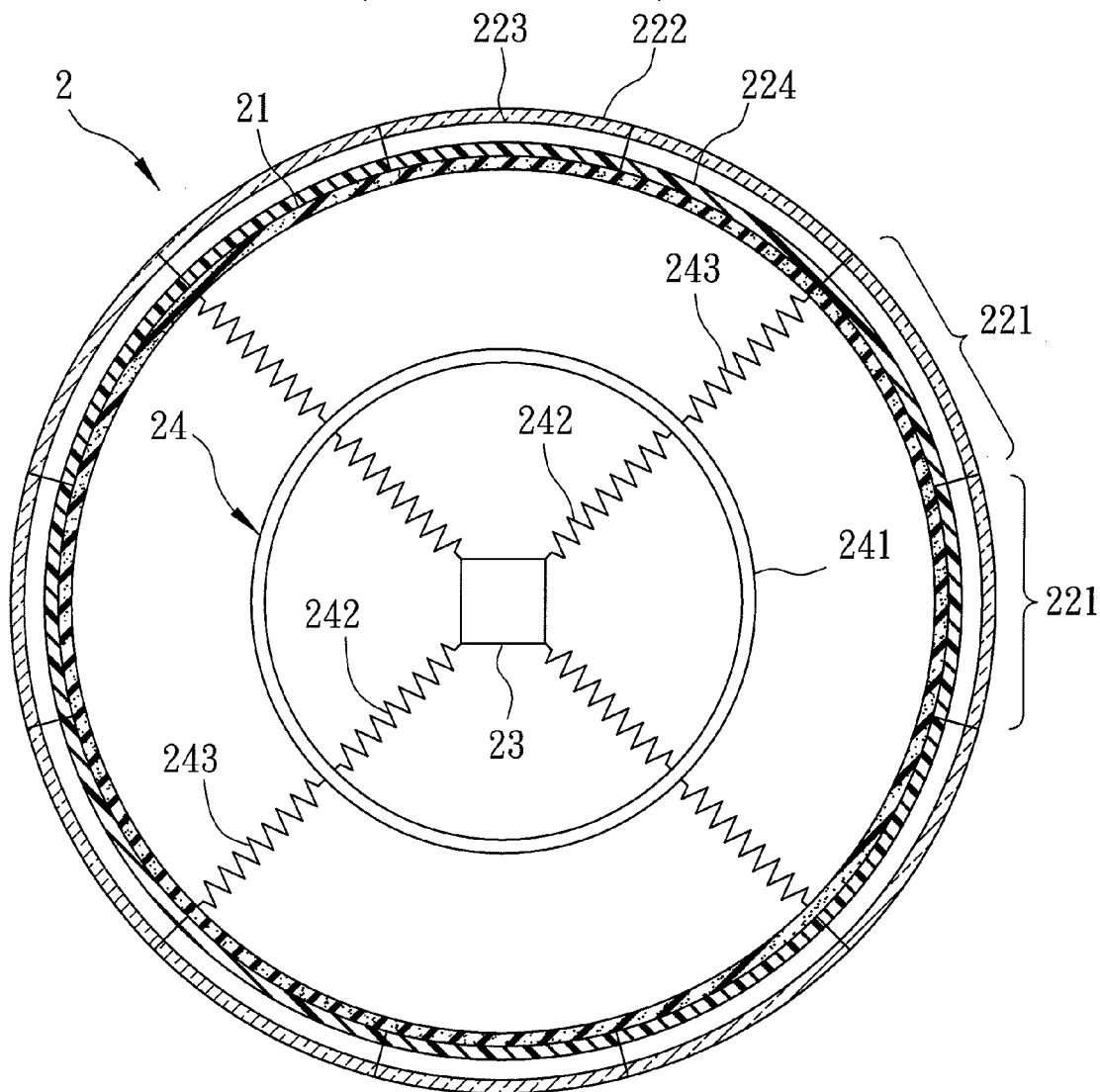
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(57) **ABSTRACT**

A light-emitting ball includes an inflatable ball bladder, a transparent skin layer that encloses the ball bladder, and an electrically operable display module, such as a flexible organic light emitting diode (OLED) display module, that is disposed between the ball bladder and the skin layer and that is operable to generate images visible through the skin layer.

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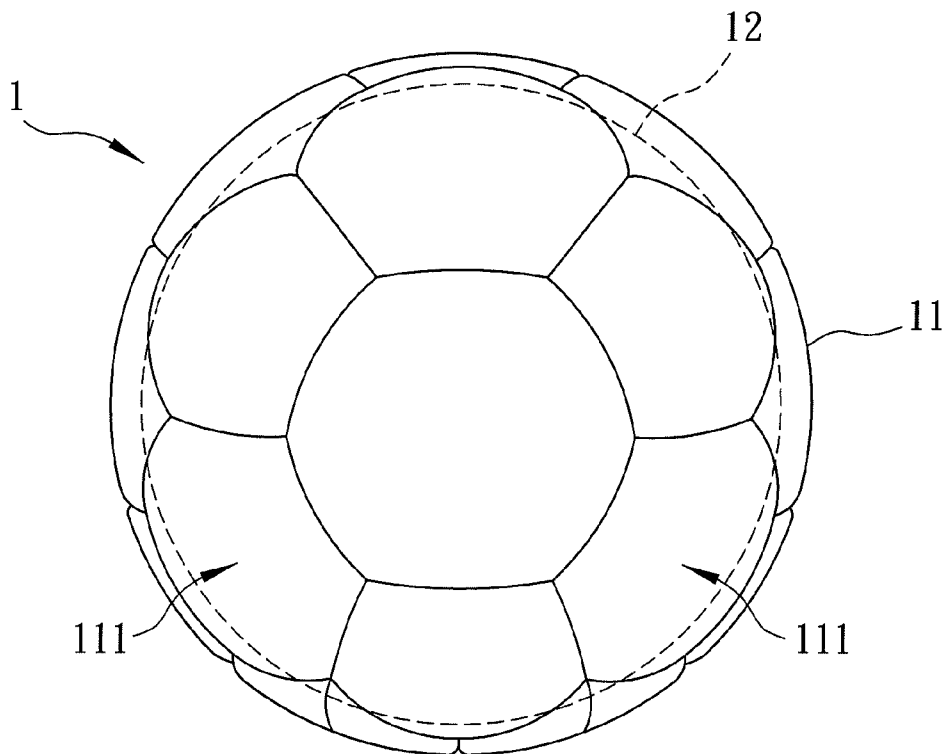


FIG. 1
PRIOR ART

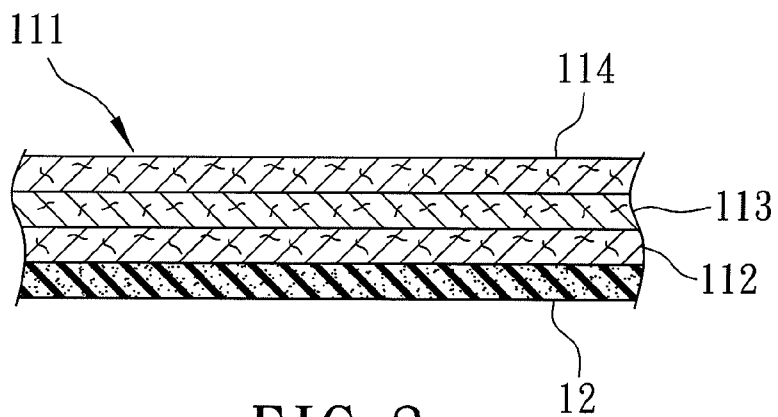


FIG. 2
PRIOR ART

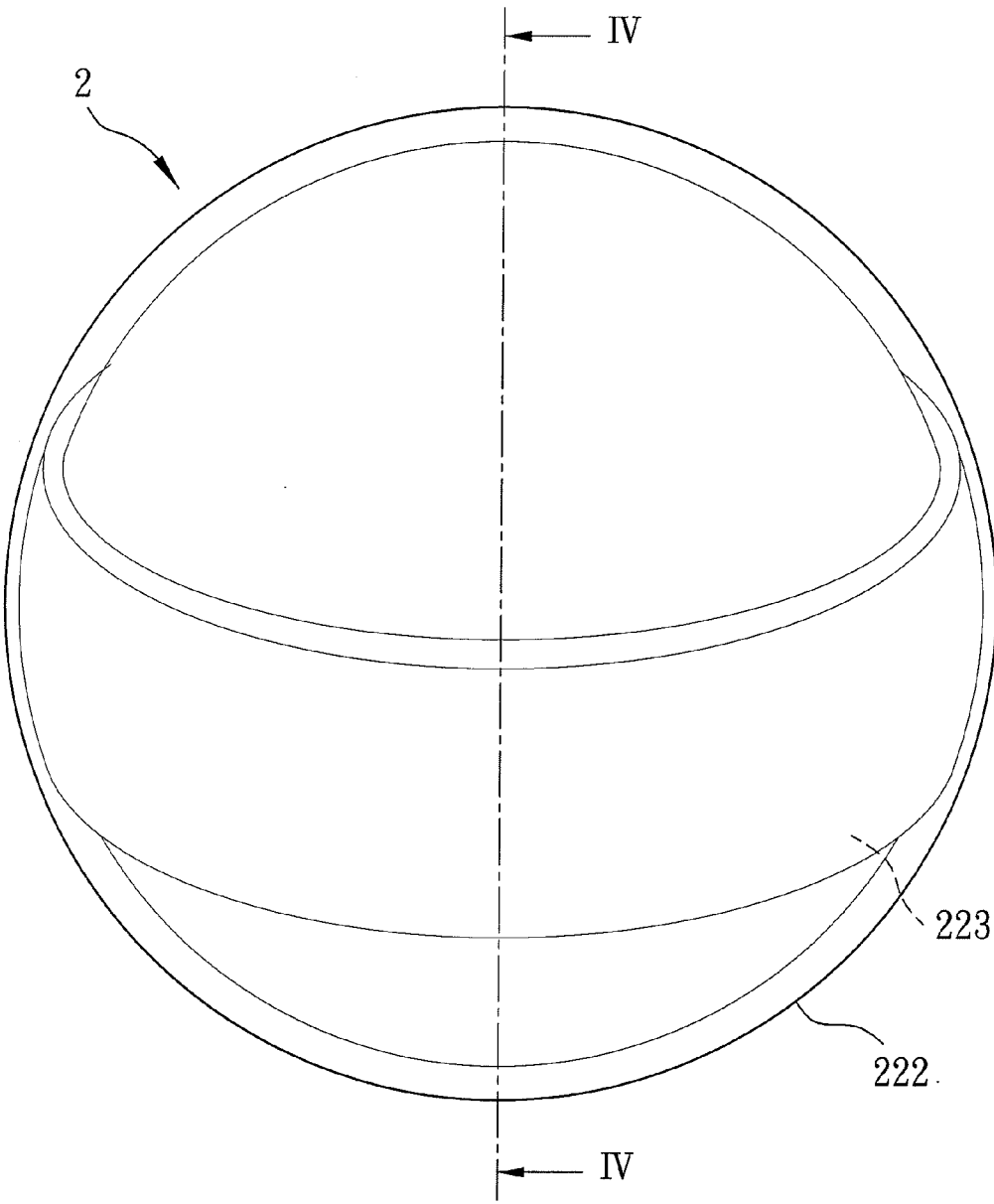


FIG. 3

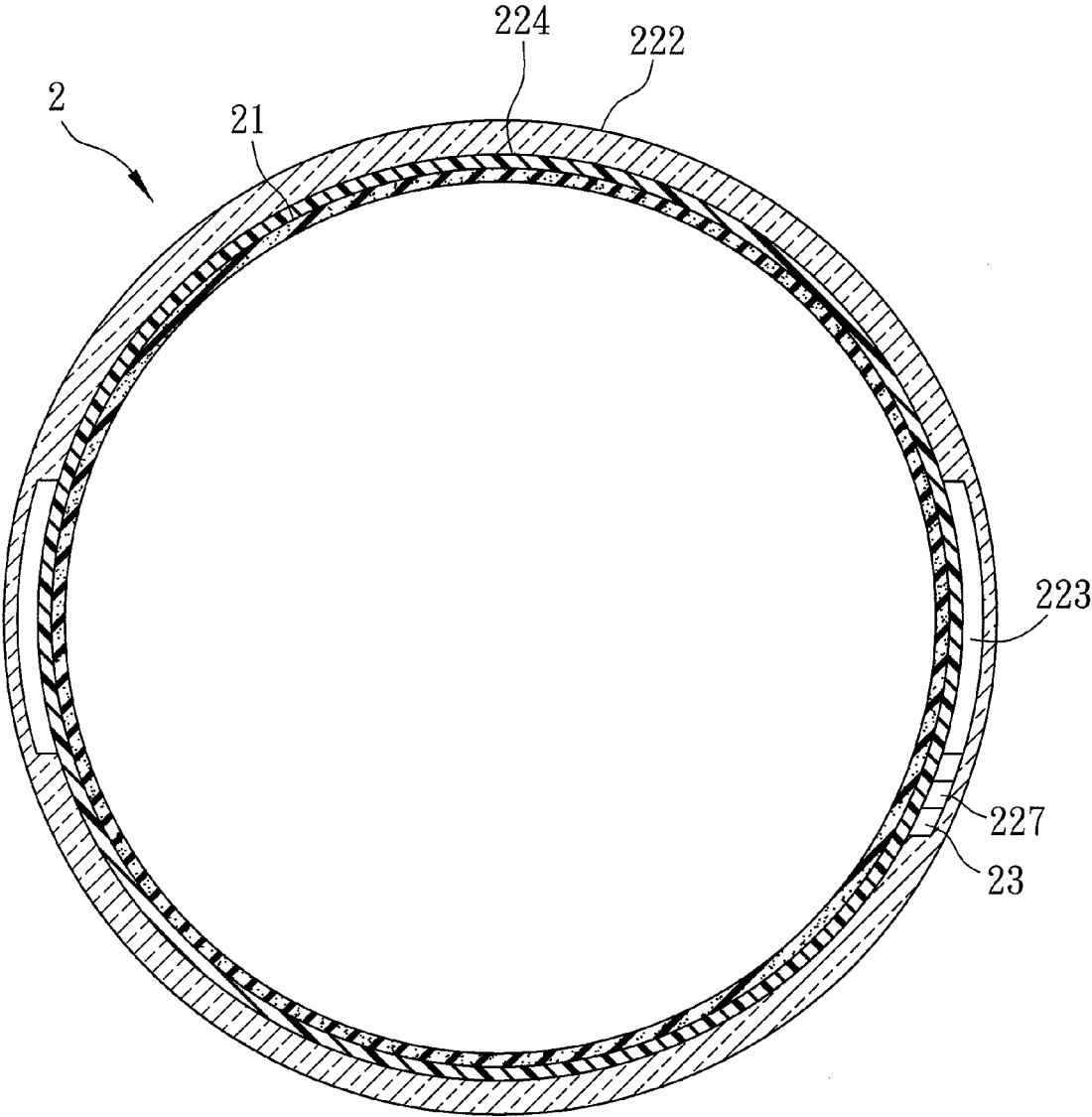


FIG. 4

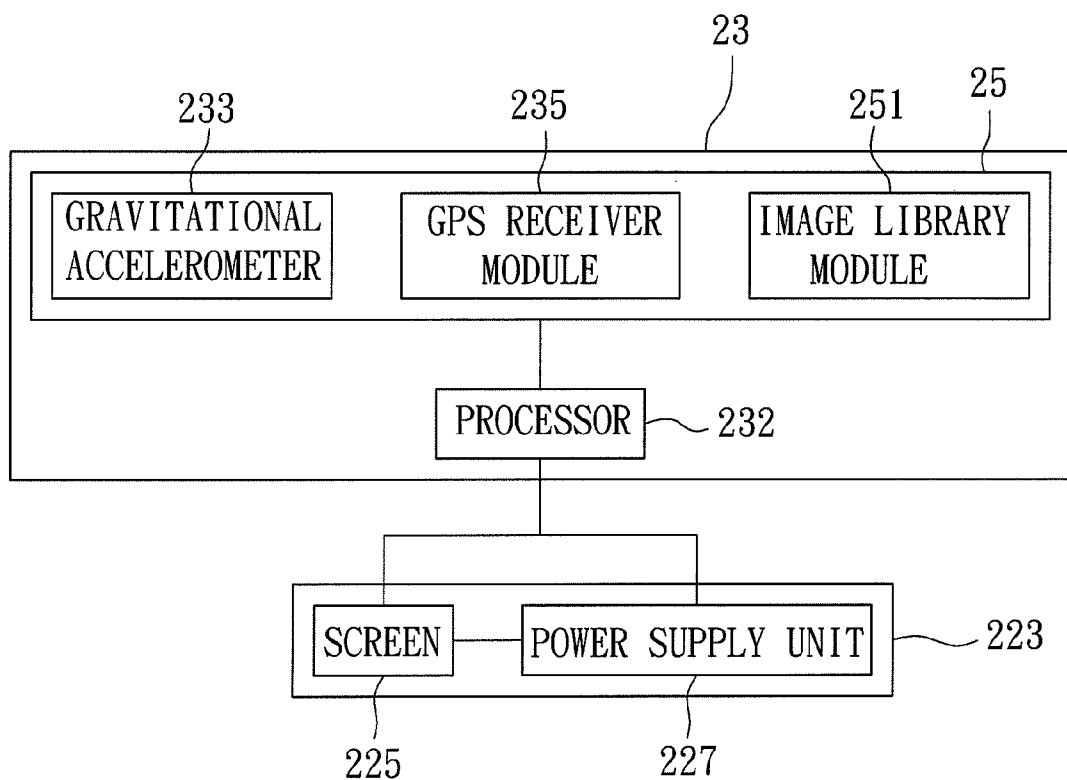


FIG. 5

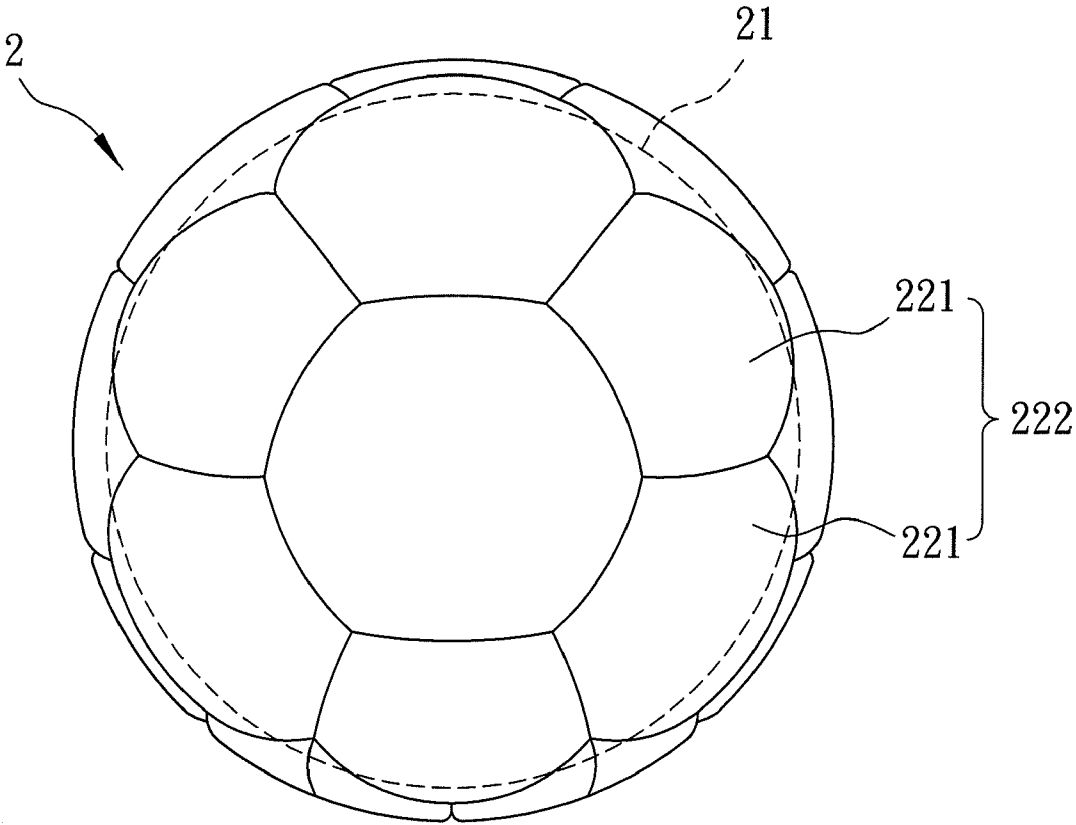


FIG. 6

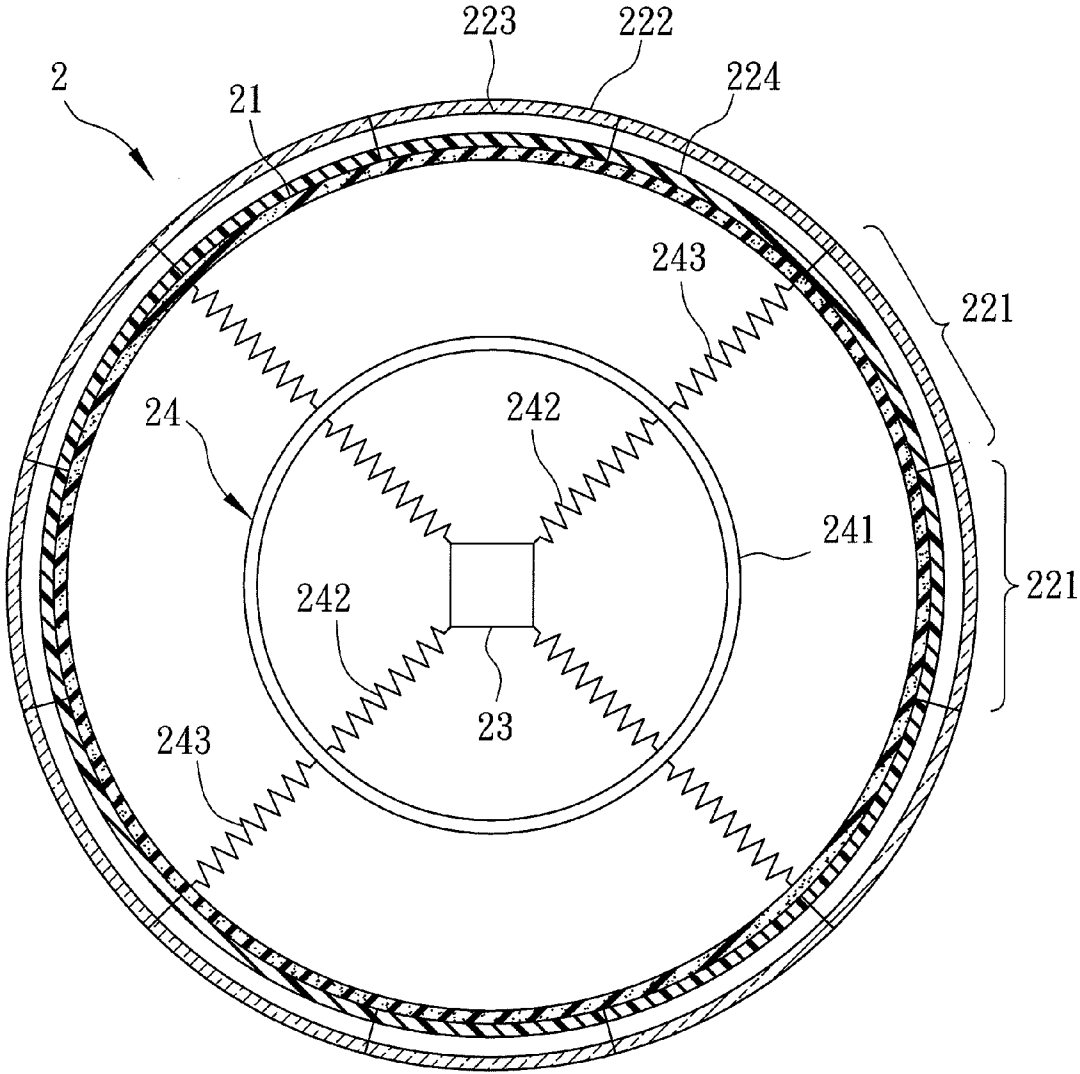


FIG. 7

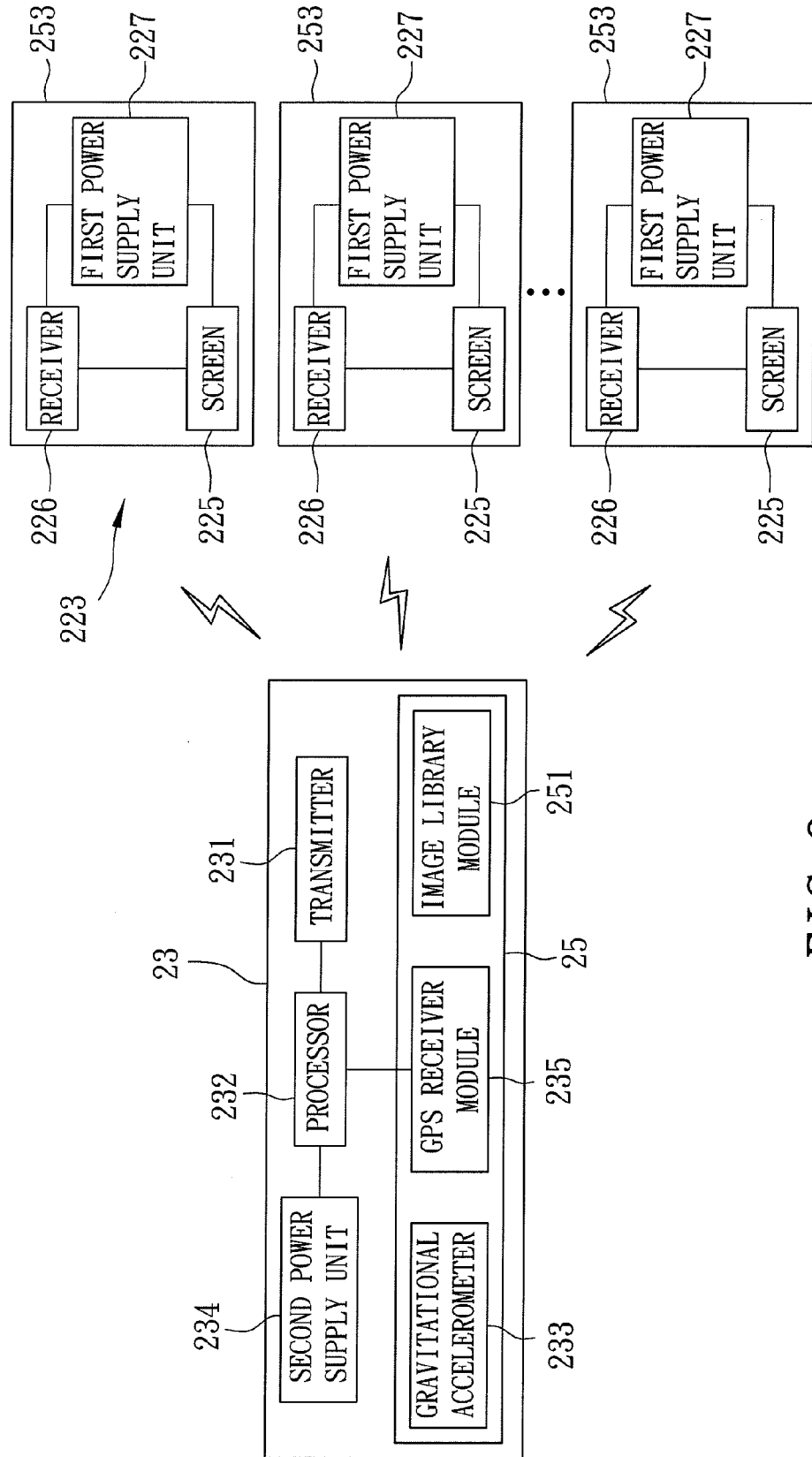


FIG. 8

LIGHT-EMITTING BALL

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority of Taiwanese Application No. 097135320, filed on Sep. 15, 2008.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a ball, more particularly to a light-emitting ball.

[0004] 2. Description of the Related Art

[0005] Sport activities played with a ball are popular. Examples of such sport activities include baseball, basketball, soccer, volleyball, softball, and so on.

[0006] Referring to FIGS. 1 and 2, a conventional sports ball 1 includes an inflatable ball bladder 12 and a skin layer 11 that encloses the ball bladder 12. The skin layer 11 has a plurality of interconnected patch segments 111 enclosing the ball bladder 12. Each of the patch segments 111 has a backing layer 112 attached to an outer surface of the ball bladder 12, an intermediate layer 113 disposed on an outer surface of the backing layer 112, and an outer layer 114 disposed on an outer surface of the intermediate layer 113. In order to improve visual effects, patterns or colors on the sports ball 1 can be changed only via the outer layer 114. However, even if the patterns or the colors can be changed, an appearance of the sports ball 1 remains dull.

SUMMARY OF THE INVENTION

[0007] Therefore, the object of the present invention is to provide a light-emitting ball, which can effectively promote visual effects.

[0008] Accordingly, a light-emitting ball of the present invention comprises an inflatable ball bladder, a transparent skin layer that encloses the ball bladder, and an electrically operable display module that is disposed between the ball bladder and the skin layer and that is operable to generate images visible through the skin layer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with reference to the accompanying drawings, of which:

[0010] FIG. 1 is a perspective view of a conventional sports ball;

[0011] FIG. 2 is a fragmentary sectional view of the conventional sports ball;

[0012] FIG. 3 is a perspective view of a first preferred embodiment of a light-emitting ball according to the present invention;

[0013] FIG. 4 is a sectional view of the light-emitting ball of the first preferred embodiment taken along line IV-IV in FIG. 3;

[0014] FIG. 5 is a circuit block diagram of a second preferred embodiment of a light-emitting ball according to the present invention;

[0015] FIG. 6 is a perspective view of a third preferred embodiment of a light-emitting ball according to the present invention;

[0016] FIG. 7 is a sectional view of the light-emitting ball of the third preferred embodiment; and

[0017] FIG. 8 is a circuit block diagram of the light-emitting ball of the third preferred embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] Before the present invention is described in greater detail, it should be noted that like components are assigned the same reference numerals throughout the following disclosure.

[0019] Referring to FIGS. 3 and 4, a first preferred embodiment of a light-emitting ball 2 according to the present invention is shown to comprise an inflatable ball bladder 21, a transparent skin layer 222, and an electrically operable display module 223.

[0020] The transparent skin layer 222 encloses the ball bladder 21. The electrically operable display module 223 is disposed between the ball bladder 21 and the skin layer 222, is attached to an inner surface of the skin layer 222, and is operable to generate images visible through the skin layer 222. The display module 223 has a shape of an annular band in this embodiment, and includes a remotely controllable battery-operated power supply unit 227 for supplying electric power thereto.

[0021] In this embodiment, the skin layer 222 is made of a thermoplastic resin, such as thermoplastic polyurethane (TPU). The display module 223 is a flexible organic light emitting diode (OLED) display module. The material for the skin layer 222 is not limited to the above example as long as light from the display module 223 can pass therethrough.

[0022] The light-emitting ball 2 further comprises a backing layer 224 that is disposed between the display module 223 and the ball bladder 21, and a controller 23 that is disposed on the display module 223, that is coupled to the display module 223, and that is operable to provide image data thereto. The display module 223 is operable to generate the images based upon the image data received thereby, and can be configured to display predetermined images that may be, for example, stored in the display module 223.

[0023] FIG. 5 illustrates a circuit block diagram of a controller 23 of a second preferred embodiment of a light-emitting ball 2 according to the present invention.

[0024] In the second preferred embodiment, the controller 23 includes a processor 232 that is electrically coupled to the remotely controllable battery-operated power supply unit 227 and a screen 225 of the display module 223, and a data source 25 that is coupled to the processor 232. The processor 232 is operable to provide the image data to the screen 225 of the display module 223 based upon an output of the data source 25. The data source 25 includes at least one of a gravitational accelerometer 233, a global positioning system (GPS) receiver module 235, and an image library module 251. The gravitational accelerometer 233 is used for measuring acceleration of the ball 2 when moving and converting the measured acceleration into speed, and may transmit a speed signal to the processor 232, for subsequent display of the ball speed on the display module 223. The GPS receiver module 235 is used for obtaining coordinates of the ball 2, and may transmit a coordinate signal to the processor 232 for subsequent display of the position of the ball 2 on the display module 223 when the speed of the ball 2 is below a threshold value. The image library module 251 may include the predetermined images, which can be accessed by the processor 232 for subsequent transmission to the display module 223.

[0025] Referring to FIGS. 6, 7, and 8, a third preferred embodiment of a light-emitting ball 2 of the present invention is shown to be similar to the first and second preferred embodiments. The third preferred embodiment differs from the first and second preferred embodiments in the following aspects.

[0026] The display module 223 includes a plurality of display units 253, each of which includes a screen 225 and a remotely controllable battery-operated first power supply unit 227 for supplying electric power thereto. The skin layer 222 includes a plurality of interconnected patch segments 221. Each of the display units 253 is attached to an inner surface of a corresponding one of the patch segments 221. The controller 23 is disposed in the ball bladder 21, and further includes a remotely controllable battery-operated second power supply unit 234 for supplying electric power thereto. The light-emitting ball 2 further comprises a suspension mechanism 24 for suspending the controller 23 in the ball bladder 21. The suspension mechanism 24 includes a frame member 241, a set of first elastic components 242 that interconnect the controller 23 and the frame member 241, and a set of second elastic components 243 that interconnect the frame member 241 and the ball bladder 21. By virtue of the elastic components 242, 243, shock forces that act on the controller 23 when the ball 2 is in use can be reduced.

[0027] The controller 23 is coupled to each of the display units 253, and is operable to provide image data thereto. Each of the display units 253 is operable to generate the images based upon the image data received thereby. The controller 23 further includes a transmitter 231 for transmitting the image data wirelessly to the display units 253, and each of the display units 253 further includes a receiver 226 for receiving the image data from the controller 23 and for providing the received image data to the screen 225. Like the previous embodiment, the controller 23 further includes a processor 232 coupled to the transmitter 231, and a data source 25 coupled to the processor 232. The processor 232 is operable to provide the image data to the display units 253 based upon an output of the data source 25. The remotely controllable battery-operated second power supply unit 234 is for supplying electric power to the processor 232.

[0028] In the third preferred embodiment, the first and second elastic components 242, 243 of the suspension mechanism 24 are not limited to compression springs, and may be other elastic components as long as shock forces that act on the controller 23 can be reduced.

[0029] While the present invention has been described in connection with what are considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

What is claimed is:

1. A light-emitting ball comprising:
an inflatable ball bladder;
a transparent skin layer that encloses said ball bladder; and
an electrically operable display module that is disposed between said ball bladder and said skin layer and that is operable to generate images visible through said skin layer.
2. The light-emitting ball as claimed in claim 1, wherein said skin layer is made of a thermoplastic resin.
3. The light-emitting ball as claimed in claim 1, wherein said display module is attached to an inner surface of said skin layer.
4. The light-emitting ball as claimed in claim 1, wherein said display module is a flexible organic light emitting diode (OLED) display module.

5. The light-emitting ball as claimed in claim 1, wherein said display module includes a remotely controllable battery-operated power supply unit for supplying electric power thereto.

6. The light-emitting ball as claimed in claim 1, further comprising a backing layer disposed between said display module and said ball bladder.

7. The light-emitting ball as claimed in claim 1, further comprising a controller coupled to said display module and operable to provide image data thereto, said display module being operable to generate the images based upon the image data received thereby.

8. The light-emitting ball as claimed in claim 7, wherein said controller includes a processor coupled to said display module and a data source coupled to said processor, said processor being operable to provide the image data to said display module based upon an output of said data source.

9. The light-emitting ball as claimed in claim 8, wherein said data source includes at least one of a gravitational accelerometer, a global positioning system receiver module, and an image library module.

10. The light-emitting ball as claimed in claim 1, wherein said display module includes a plurality of display units, each of which includes a remotely controllable battery-operated power supply unit for supplying electric power thereto.

11. The light-emitting ball as claimed in claim 10, wherein said skin layer includes a plurality of interconnected patch segments, each of said display units being attached to an inner surface of a corresponding one of said patch segments.

12. The light-emitting ball as claimed in claim 10, further comprising a controller coupled to each of said display units and operable to provide image data thereto, each of said display units being operable to generate the images based upon the image data received thereby.

13. The light-emitting ball as claimed in claim 12, wherein said controller includes a transmitter for transmitting the image data wirelessly to said display units, and each of said display units includes a receiver for receiving the image data from said controller.

14. The light-emitting ball as claimed in claim 13, wherein said controller further includes a processor coupled to said transmitter and a data source coupled to said processor, said processor being operable to provide the image data to said display units based upon an output of said data source.

15. The light-emitting ball as claimed in claim 14, wherein said controller further includes a remotely controllable battery-operated power supply unit for supplying electric power to said processor.

16. The light-emitting ball as claimed in claim 13, wherein said controller is disposed in said ball bladder and further includes a remotely controllable battery-operated power supply unit for supplying electric power thereto.

17. The light-emitting ball as claimed in claim 16, further comprising a suspension mechanism for suspending said controller in said ball bladder, said suspension mechanism including a frame member, a set of first elastic components that interconnect said controller and said frame member, and a set of second elastic components that interconnect said frame member and said ball bladder.

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