WHAT IS CLAIMED IS:

1. A hologram reproducing apparatus comprising:

a display configured to display a hologram pattern and emit a write beam corresponding to the hologram pattern;

a first lens unit disposed at a front surface of the display and comprising at least one lens array including a plurality of first microlenses for respectively firstly focusing the write beam emitted from the display;

a second lens unit comprising at least one lens array including a plurality of second microlenses for secondarily focusing the write beam diffused after being firstly focused;

a spatial light modulator (SLM) disposed at a front surface of the second lens unit, configured to write the hologram pattern according to the secondly focused write beam and modulate a reproduction beam into a plurality of diffraction beams corresponding to the hologram pattern if the reproduction beam is incident;

a light guide plate configured to guide the reproduction beam toward the SLM;

a filter disposed at a front surface of the SLM and configured to filter the plurality of diffraction beams and the write beam; and

a lens configured to focus the plurality of diffraction beams filtered through the filter.

2. The hologram reproducing apparatus as claimed in claim 1,

wherein the first lens unit comprises:

a first lens array disposed at the front surface of the display at a first interval from the display; and

a second lens array disposed at a front surface of the first lens array at a second interval from the first lens array,

wherein the second lens unit comprises:

a third lens array disposed at a front surface of the second lens array; and

a fourth lens array disposed at a front surface of the third lens array at the second interval from the third lens array,

wherein the fourth lens array is arranged at the first interval from the SLM, and

wherein the first interval is greater than the second interval.

3. The hologram reproducing apparatus as claimed in claim 2,

wherein microlenses included in each of the first and fourth lens arrays have a first focal distance,

wherein microlenses included in each of the second and third lens arrays have a second focal distance, and

wherein the first focal distance is greater than twice the second focal distance.

4. The hologram reproducing apparatus as claimed in claim 3,

wherein the first interval has an interval greater than twice the first focal distance, and

wherein the second interval has an interval less than twice the first focal distance.

5. The hologram reproducing apparatus as claimed in claim 1, wherein the SLM comprises:

a photosensitive layer configured to write a hologram pattern according to the write beam; and

a liquid crystal display (LCD) panel disposed at a front surface of the photosensitive layer to modulate the incident reproduction beam into a plurality of diffraction beams corresponding to the hologram pattern.

6. The hologram reproducing apparatus as claimed in claim 1, wherein the light guide plate is disposed between the second lens unit and the SLM.

7. The hologram reproducing apparatus as claimed in claim 6,

wherein the light guide plate comprises:

an expander configured to collimate the reproduction beam to make the reproduction beam uniformly incident on a rear surface of the SLM; and

an in-coupling element disposed at one side of the expander to allow an incidence angle of the reproduction beam incident on the expander to fall within a predetermined angle range, and

wherein the in-coupling element is implemented as a Bragg grating element or a prism.

8. The hologram reproducing apparatus as claimed in claim 6,

wherein the light guide plate comprises:

an expander configured to collimate the reproduction beam to make the reproduction beam uniformly incident on a rear surface of the SLM; and

an out-coupling element disposed at a front surface of the expander to refract the reproduction beam incident on the expander at a predetermined angle and emit the reproduction beam outside of the expander, and

wherein the out-coupling element is implemented as a Bragg grating element.

9. The hologram reproducing apparatus as claimed in claim 8, wherein the out-coupling element refracts and emits the reproduction beam incident on the expander at the predetermined angle based on an equation,

$$n\lambda = 2dSin(\theta)$$

where n denotes a refractive index of the Bragg grating, λ denotes a wavelength of a reproduction beam, and d denotes a distance between the Bragg grating.

10. The hologram reproducing apparatus as claimed in claim 1, wherein the filter comprises a Bragg grating filter,

wherein, if the plurality of diffraction beams are incident, the Bragg grating filter allows a diffraction beam incident within a predetermined angle range to pass

through based on a zero order diffraction beam among the plurality of diffraction beams, and

wherein the zero order diffraction beam is a beam in which the reproduction beam is not modulated to a diffraction beam in the SLM.

11. The hologram reproducing apparatus as claimed in claim 10, wherein the filter further comprises a louver film disposed at a front surface of the Bragg grating filter to secondarily filter the diffraction beam firstly filtered through the Bragg grating filter.

12. The hologram reproducing apparatus as claimed in claim 10, further comprising a first polarizing filter disposed between the display and the first lens unit to filter a first polarizing component of the write beam,

wherein the filter further comprises a second polarizing filter configured to filter a second polarizing component of the write beam.

13. The hologram reproducing apparatus as claimed in claim 1, wherein the display is implemented as a self-luminous element that emits the write beam corresponding to the hologram pattern.

14. A control method of a hologram reproducing apparatus comprising a display configured to display a hologram pattern and emit a write beam corresponding to the hologram pattern, a first lens unit disposed at a front surface of the display and comprising at least one lens array including a plurality of first microlenses for firstly focusing the write beam emitted from the display, and a second lens unit comprising at least one lens array including a plurality of second microlenses for secondarily focusing the write beam diffused after being firstly focused, the control method comprising:

transmitting the write beam emitted from the display to a spatial light modulator (SLM) through the first lens unit and the second lens unit;

writing a hologram pattern corresponding to the write beam by the SLM;

modulating a reproduction beam incident on the SLM into a plurality of diffraction beams corresponding to the hologram pattern;

filtering the plurality of diffraction beams and the write beam by a filter disposed at a front surface of the SLM; and

focusing the filtered plurality of diffraction beams and write beam by the lens disposed at a front surface of the filter.

15. The control method as claimed in claim 14,

wherein the first lens unit comprises:

a first lens array disposed at the front surface of the display at a first interval from the display; and

a second lens array disposed at a front surface of the first lens array at a second interval from the first lens array,

wherein the second lens unit comprises:

a third lens array disposed at a front surface of the second lens array; and

a fourth lens array disposed at a front surface of the third lens array at the second interval from the third lens array,

wherein the fourth lens array is arranged at the first interval from the SLM, and

wherein the first interval is greater than the second interval.

16. The control method as claimed in claim 15,

wherein microlenses included in each of the first and fourth lens arrays have a first focal distance,

wherein microlenses included in each of the second and third lens arrays have a second focal distance, and

wherein the first focal distance is greater than twice the second focal distance.

17. The control method as claimed in claim 16,

wherein the first interval has an interval greater than twice the first focal distance, and

wherein the second interval has an interval less than twice the first focal distance.

18. The control method as claimed in claim 14, wherein the SLM comprises:

a photosensitive layer configured to write a hologram pattern according to the write beam; and

a liquid crystal display (LCD) panel disposed at a front surface of the photosensitive layer to modulate the incident reproduction beam into a plurality of diffraction beams corresponding to the hologram pattern.

19. The control method as claimed in claim 14, wherein the reproduction beam is guided toward the SLM by the light guide plate and is disposed between the second lens unit and the SLM.

20. The control method as claimed in claim 19,

wherein the light guide plate comprises an expander and an out-coupling element, and

wherein the control method further comprises:

collimating the reproduction beam by the expander to make the reproduction beam uniformly incident on a rear surface of the SLM; and

refracting the reproduction beam incident on the expander by the out-coupling element disposed at the rear surface of the expander at a predetermined angle and emitting the reproduction beam outside of the expander.