

REMARKS

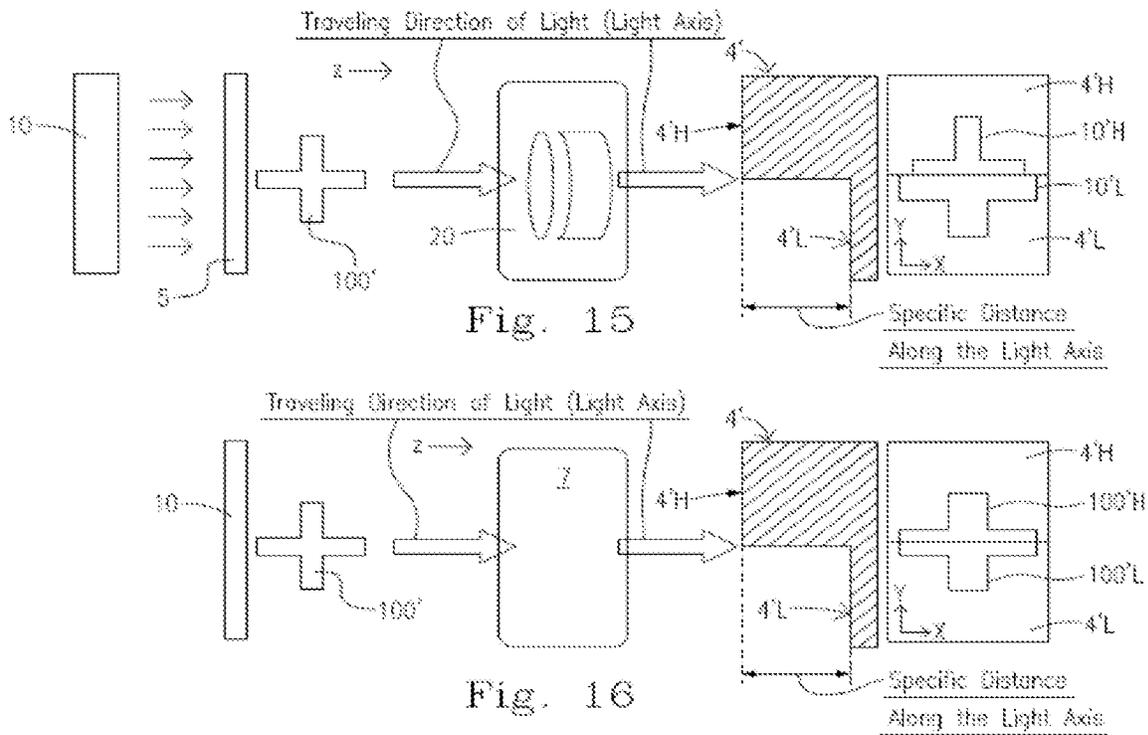
The Applicant has amended Claim 1 and added Claims 27-28 to better distinguish the present technical scheme over those of the cited references. The amended and added claims are supported by the contents disclosed in Figs. 15 and 16 and the corresponding descriptions in Paragraphs [0041] and [0042] of the originally filed disclosure. Specifically, the added technical features in the amended and added claims and their supporting descriptions are shown in the following table.

The added technical features	Supporting descriptions in the originally filed disclosure
Claims 1, 28	
Claim 1: “focusing the light emitted from... <u>and along a light axis</u> ”	Paragraph [0042]: The light shape 100’s is projected on the same object 4’ via a zoom array 7.
Claim 1: “the external object has <u>a first and a second portions which are separated by a specific distance along the light axis</u> ”	Paragraph [0041]: The light with the shape 100’ passes through a zoom module 20 and then is projected on an object 4’ comprising a higher portion 4’H and a lower portion 4’L. It appears the distance from the zoom module 20 to the higher portion 4’H is shorter than that to the lower portion 4’L.... Paragraph [0042]: The light shape 100’s is projected on the same object 4’ via a zoom

	<p>array 7. Fig. 16: The skilled person in the art can directly and unambiguously understand that the higher portion 4'H and the lower portion 4'L are separated by a specific distance along a light axis of the zoom array 7.</p>
<p>Claim 1: “the light passing through the set of zoom elements is projected onto <u>the first portion to form a first sub-shape on the first portion and projected onto the second portion to form a second sub-shape on the second portion, the first and the second sub-shapes form a combined light shape when observed along the light axis</u>” and “<u>the combined light shape has a contour essentially free from a distortion</u>”</p> <p>Claim 28: “<u>the combined light shape is essentially identical to the original light shape</u>”</p>	<p>Paragraph [0042]: Notably, lights emitted from those light-emission units 10a for composing the upper half of the light shape are projected and focused on the higher portion 4'H of the object 4' to form a light shape 100'H, while lights emitted from those light-emission units 10a for composing the lower half of the light shape are projected and focused on the lower portion 4'L of the object 4' to form another light shape 100'L. The light shape 100'H and the light shape 100'L together compose a light shape similar to the light shape 100'.</p> <p>Fig. 16: The skilled person in the art can directly and unambiguously understand that the combined light shape of 100'H and 100'L has a contour essentially free from a distortion and is essentially identical to the light shape 100'.</p>
<p>Claim 27</p>	
<p><u>“the first and the second sub-shapes</u></p>	<p>Paragraph [0042]:</p>

<p><u>have a first and a second illuminations respectively, and the first illumination is essentially identical to the second illumination”</u></p>	<p>The light shape 100'H and the light shape 100'L together compose a light shape similar to the light shape 100'. An optical field with homogeneous illumination and dimension can be obtained by such a method.</p>
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In addition, the added technical features in amended Claim 1 are supported by the illustration in Figs. 15 and 16 of the originally filed disclosure.



According to the illustration in the present Figs. 15 and 16, where the three dimensional directions are expressly shown by x-axis, y-axis and z-axis, one skilled

person can undoubtedly know that the light having the original light shape **100'** is emitted along the light axis, the external object **4'** has the first and the second portions **4'H**, **4'L** which are separated by a specific distance along the light axis, the light having the original light shape **100'** and passing through the set of zoom elements **7** is projected onto the first portion **4'H** to form the first sub-shape **100'H** on the first portion **4'H** and projected onto the second portion **4'L** to form the second sub-shape **100'L** on the second portion **4'L**, the first and the second sub-shapes **100'H**, **100'L** form the combined light shape **100'H**, **100'L** when observed along the light axis, and the combined light shape **100'H**, **100'L** has a contour essentially free from a distortion.

Thus, no new matter is introduced into the amendments. Claims 8-14 and 21-26 are cancelled without prejudice.

In view of the foregoing amendments and the following remarks, reconsideration of the present patent application is respectfully requested.

Drawings and Claims Objections

In order to expedite the examination of the present application, the Applicant has cancelled Claims 8-14 and 21-26, and appropriately amended Claim 1. The Applicant respectfully submits that the objections resulting from these claims are overcome.

Claim Rejections – 35 USC 103

The Examiner rejected Claim 1 of the present application under 35 U.S.C. § 103(a) as being unpatentable over Takeda et al. (US 7,207,677) in view of Kato et al. (US 2008/0100905).

The Applicant respectfully submits that the amended Claim 1 is patentable over the cited references. The reasons are set forth below.

The present invention provides an apparatus and method for controlling a three-dimensional optical field. The amended Claim 1 claims the apparatus for controlling the three-dimensional optical field, comprising:

“a light-emission device emitting a light for projecting an original light shape;
and

a set of zoom elements disposed in front of the light-emission device, and focusing the light emitted from the light-emission device and along a light axis, and passing therethrough to project the light onto an external object, wherein:

the light-emission device has a plurality of portions, and each of which corresponds to a single one of the set of zoom elements;

the set of zoom elements comprise a plurality of first zoom elements, and each of the set of zoom elements includes a liquid lens;

the external object has a first and a second portions which are separated by a specific distance along the light axis; and

the light passing through the set of zoom elements is projected onto the first portion to form a first sub-shape on the first portion and projected onto the second portion to form a second sub-shape on the second portion, the first and the second sub-shapes form a combined light shape when observed along the light axis, and the combined light shape has a contour essentially free from a distortion.”

Takeda et al. disclose an image display device including plural color-ray light-sources for supplying RGB-rays, and a tilt-mirror device having plural movable mirror elements that may be switched to a specific reflection position. The contents in Fig. 9 and lines 34-52 of Col. 17 of Takeda et al.’s disclosure disclose a configuration of a projector **200** having the image display device, where a light source **110** turns on the light-emitting elements for each color-ray **110R**, **110G** and **110B** with a specific timing, and light from the light-emitting elements illuminates a transmissive liquid crystal light valve **210** via a fly-eye lens array **120**, and is then modulated via the transmissive liquid crystal light valve **210** to be projected on a screen **160** via a projection lens system **150**. However, Takeda et al. at least fail to disclose the distinguishing technical features that the screen **160** (corresponding to the present external object as considered by the Examiner) “has a first and a second portions which are separated by a specific distance along the light axis; and the light passing through the set of zoom elements is projected onto the first portion to form a first sub-shape on the first portion and projected onto the second portion to form a second sub-shape on the second portion, the first and the second sub-shapes

form a combined light shape when observed along the light axis, and the combined light shape has a contour essentially free from a distortion” as recited in the amended Claim 1. Therefore, the scheme of the amended Claim 1 is different from that of Takeda et al.

Kato et al.’s invention is directed to an electrowetting device having varifocal lens. Kato et al. further disclose an embodiment of the electrowetting device having varifocal lens in Figs. 7 and 8, and Paragraphs [0118], [0119] and [0122] of the disclosure. However, Kato et al.’s invention is totally irrelevant to the distinguishing technical features that “the external object has a first and a second portions which are separated by a specific distance along the light axis; and the light passing through the set of zoom elements is projected onto the first portion to form a first sub-shape on the first portion and projected onto the second portion to form a second sub-shape on the second portion, the first and the second sub-shapes form a combined light shape when observed along the light axis, and the combined light shape has a contour essentially free from a distortion” as recited in the amended Claim 1. Therefore, the scheme of the amended Claim 1 is different from that of Kato et al.

In addition, because neither Takeda et al. nor Kato et al. disclose any teaching/suggestion/hint regarding the above-mentioned distinguishing technical features recited in the amended Claim 1, the skilled person in the field would find it

impossible to conceive the apparatus disclosed in the amended Claim 1 based on the disclosures of Takeda et al. and Kato et al. separately or jointly.

Moreover, according to the illustrations in Figs. 15 and 16 and the descriptions in Paragraphs [0041] and [0042] of the present disclosure, “[t]he light with the shape 100’ passes through a zoom module 20 and then is projected on an object 4’ comprising a higher portion 4’H and a lower portion 4’L. It appears the distance from the zoom module 20 to the higher portion 4’H is shorter than that to the lower portion 4’L, so the degree of illumination at the higher portion 4’H is higher while the size of the light shape 10’H projected on the higher portion 4’H is smaller than that of the light shape 10’L on the lower portion 4’L. Therefore, a homogeneous light shape at the object 4’ cannot be achieved by using the traditional apparatus for controlling a three-dimensional optical field” and “the present invention makes use of the variation of light emission at a two-dimension surface, which is achieved by control(*ing*) the plurality of light-emission units, to control the light shape and the dark/light distribution, and control the illumination or light intensity by zooming the focal position at the one-dimensional light axis with the aid of the zoom array 7, so as to achieve an efficacy of controlling a three-dimensional optical field”, the skilled person in the art can easily understand that the present invention makes use of the set of zoom elements as recited in the amended Claim 1 to control the illumination or light intensity of different portions of the projected light shape so as to achieve a homogeneous light shape. The above-mentioned technical efficacies

brought by the apparatus recited in the amended Claim 1 are unachievable by the disclosures of the cited references, either alone or in combination.

Based on the above, the Applicant respectfully submits that amended Claim 1 is patentable over the cited references, whether taken alone or in combination with one another.

Because independent Claim 1 of the present application is patentable, dependent Claims 3-6 and 8, which either directly or indirectly depend from the independent Claim 1, are patentable for at least the same reasons as patentable amended independent claim 1.

Based on the above reasons, the Applicant respectfully requests a withdrawal of the rejections of the present application.

Applicants: Jerliang Yeh *et al.*
Application No: 13/071,561

CONCLUSION

In view of the foregoing remarks, the Applicant respectfully requests allowance of all pending claims, and the allowance at an early date would be appreciated.

If the Examiner has any questions or comments, the Examiner is invited to reach the undersigned by telephone so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,

Jerliang Yeh *et al.*

By: /Thomas A. Mattioli/
Thomas A. Mattioli
Registration No. 56,773

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103-4009
Telephone: (215) 568-6400
Facsimile: (215) 568-6499

TAM/aj
Enclosure