



US007664395B2

(12) **United States Patent**  
**Holmes**

(10) **Patent No.:** **US 7,664,395 B2**  
(45) **Date of Patent:** **Feb. 16, 2010**

(54) **OPTICAL PROCESSING**  
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(73) Assignee: **Thomas Swan & Co. Ltd.**, Durham (GB)  
(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 3 days.

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(21) Appl. No.: **11/514,725**  
(22) Filed: **Sep. 1, 2006**

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(65) **Prior Publication Data**  
US 2007/0035803 A1 Feb. 15, 2007

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**Related U.S. Application Data**

(62) Division of application No. 10/487,810, filed as application No. PCT/GB02/04011 on Sep. 2, 2002, now Pat. No. 7,145,710.

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(74) *Attorney, Agent, or Firm*—Hamilton, Brook, Smith & Reynolds, P.C.

(30) **Foreign Application Priority Data**  
Sep. 3, 2001 (GB) ..... 0121308.1

(57) **ABSTRACT**

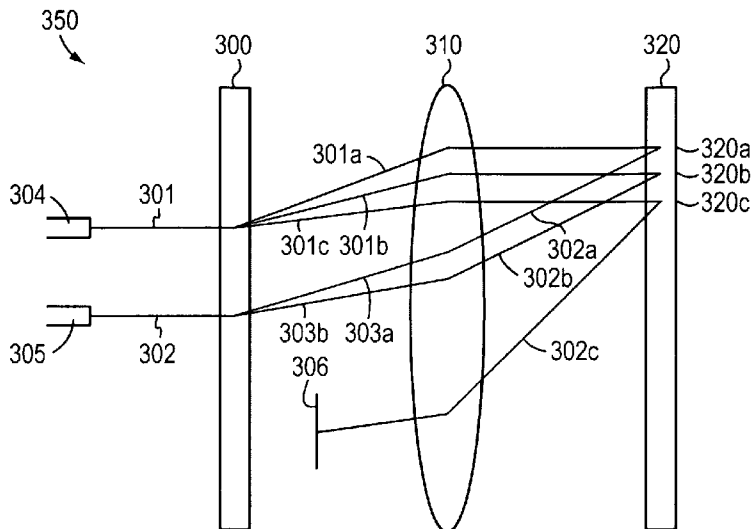
To operate an optical device comprising an SLM with a two-dimensional array of controllable phase-modulating elements groups of individual phase-modulating elements are delineated, and control data selected from a store for each delineated group of phase-modulating elements. The selected control data are used to generate holograms at each group and one or both of the delineation of the groups and the selection of control data is/are varied. In this way upon illumination of the groups by light beams, light beams emergent from the groups are controllable independently of each other.

(51) **Int. Cl.**  
**H04J 14/00** (2006.01)  
(52) **U.S. Cl.** ..... **398/49**  
(58) **Field of Classification Search** ..... 359/15, 359/19, 9, 569, 566, 572, 571, 244; 349/201, 349/202; 398/48, 49, 79, 81, 82, 84, 87  
See application file for complete search history.

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**27 Claims, 36 Drawing Sheets**



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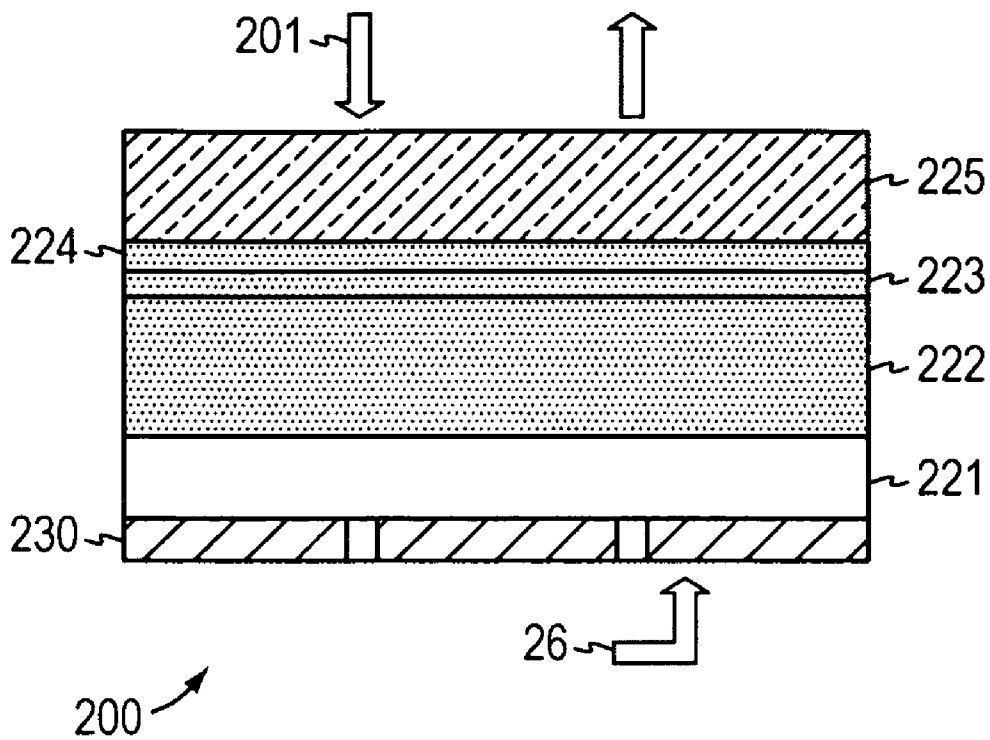


FIG. 1

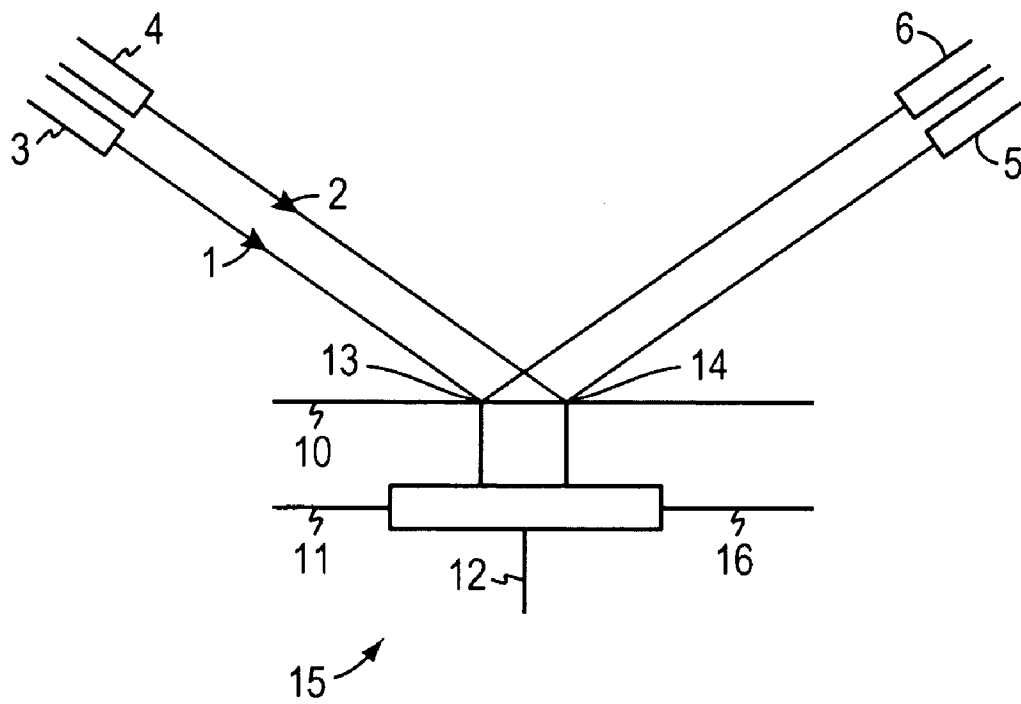


FIG. 2

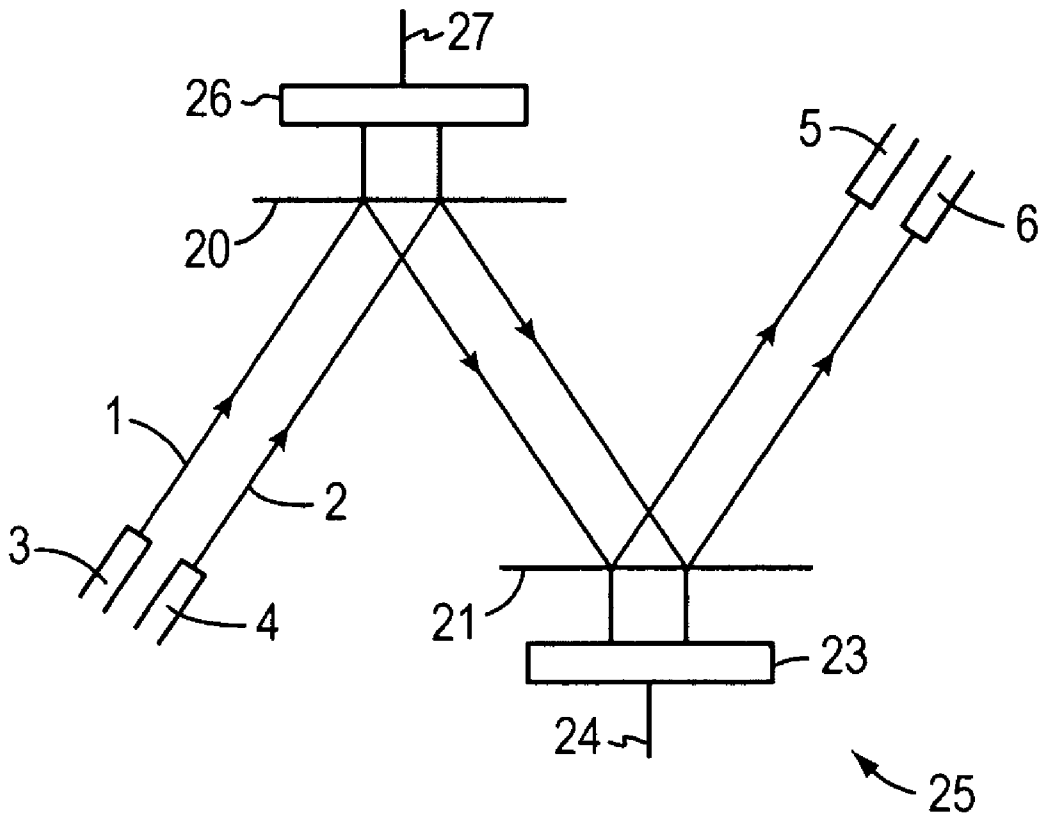


FIG. 3

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