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(71) Applicant: PHOTRONICS, INC. [US/US]; 15 Secor Road, P.O. Box 5226, Brookfield, CT 06804 (US).

(72) Inventor: DILLON, Brian W.; 1619 Millview Place, Carrollton, TX 75006 (US).

(74) Agents: MACEDO, Charles R. et al.; Amster, Rothstein & Ebenstein LLP, 90 Park Avenue, New York, NY 10016 (US).

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(54) Title: GRAYSCALE LITHOGRAPHY OF PHOTO DEFINABLE GLASS

(57) Abstract: A method for forming a three-dimensional microstructure includes providing a photosensitive glass substrate; exposing the photosensitive glass substrate to energy through a continuous tone, variable transmission photomask so as to form opaque portions in the photosensitive glass substrate, each of the opaque portions having one of a variety of depths extending through the entire thickness of the photosensitive glass substrate; and removing the opaque portions so as to form three-dimensional features in the photosensitive glass substrate.



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INTERNATIONAL SEARCH REPORT		International application No. PCT/US14/29047									
A. CLASSIFICATION OF SUBJECT MATTER IPC: G03F 1/00(2012.01);C03C 17/00(2006.01),21/00(2006.01),23/00(2006.01),25/00(2006.01),10/00(2006.01);C03B 27/012(2006.01),32/00(2006.01) USPC: 430/320;65/31,33.2 According to International Patent Classification (IPC) or to both national classification and IPC											
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 430/320; 65/31, 33.2 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet											
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; padding: 5px;">Category *</th> <th style="width: 70%; padding: 5px;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="width: 20%; padding: 5px;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 5px;">X</td> <td style="padding: 5px;">JP 2003-015275 A (MATSUMOTO) 15 January 2003 (15.01.2003), see entire document.</td> <td style="text-align: center; padding: 5px;">1-15</td> </tr> <tr> <td style="text-align: center; padding: 5px;">X</td> <td style="padding: 5px;">JP 05-097455 A (KONDO et al.) 20 April 1993 (20.04.1993), see entire document.</td> <td style="text-align: center; padding: 5px;">1-15</td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	JP 2003-015275 A (MATSUMOTO) 15 January 2003 (15.01.2003), see entire document.	1-15	X	JP 05-097455 A (KONDO et al.) 20 April 1993 (20.04.1993), see entire document.	1-15
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☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.											
<table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> * Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; vertical-align: top;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> </tr> </table>			* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family							
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer William Krynski Telephone No. 571-272-1700									

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/29047

Continuation of B. FIELDS SEARCHED Item 3:

US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB: photosensitive, photoetch, photodefne, glass, photo, light, radiation, irradiate, greyscale, grayscale, halftone, continuous, mask, photomask, reticle