



(43) International Publication Date  
11 October 2012 (11.10.2012)

(51) International Patent Classification:  
G03F 7/20 (2006.01)

(21) International Application Number:  
PCT/US20 12/029 162

(22) International Filing Date:  
15 March 2012 (15.03.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
61/471,828 5 April 2011 (05.04.2011) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

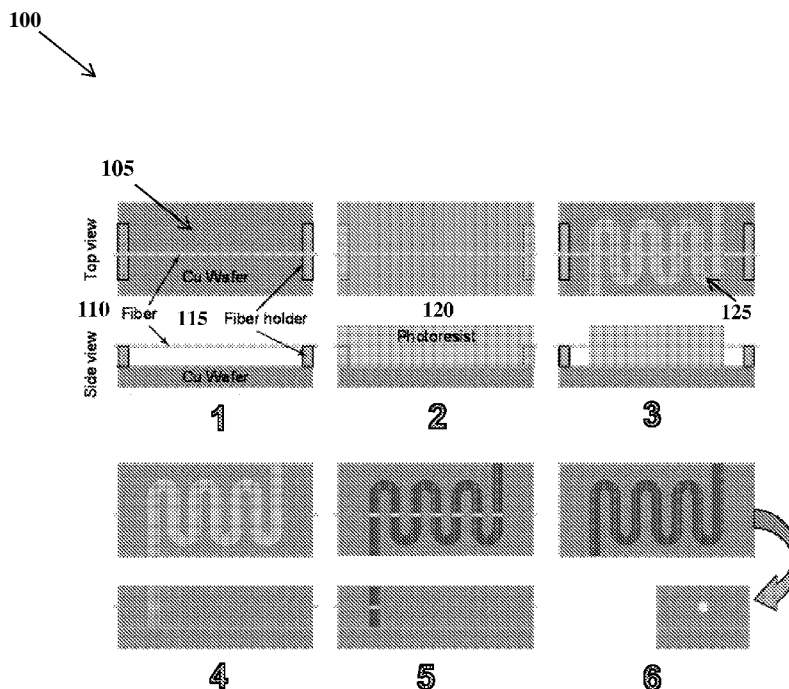
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:  
1 May 2014

(54) Title: MICROFRABICATION OF TUNNELS



(57) Abstract: A system and method to form beam tunnels in interaction circuits. Forms, such as fibers or sheets can be located and secured above a substrate at a desired size and desired shape to form the final shape of the beam tunnels. Fiber holders can be utilized to position the forms above the substrate. A photoresist can then be applied over the substrate embedding the forms. A single exposure LIGA process can be performed on the photoresist, including the steps of ultraviolet photolithography, molding, and electroforming. After the process, the forms can be removed to leave the beam tunnels in the interaction circuits.



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US20 12/029 162

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G03F 7/20 (201 2.01 )

USPC - 430/31 3

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)

IPC(8) - G03F 7/00, 7/20, H01L 21/027 (2012.01)

USPC - 250/396R, 492.1, 335/210, 430/5, 269, 311, 312, 313, 320, 322, 324, 396

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)

Minesoft PatBase

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,919,046 B2 (O'CONNOR et al) 19 July 2005 (19.07.2005) entire document	1-6, 13-14, 16, 21-24
Y		7-12, 15, 17-20, 25
Y	US 6,847,036 B1 (DARLING et al) 25 January 2005 (25.01.2005) entire document	8-12, 17, 20, and 25
Y	US 7,745,077 B2 (THIYAGARAJAN et al) 29 June 2010 (29.06.2010) entire document	15
Y	US 2009/0057839 A1 (LEWIS et al) 05 March 2009 (05.03.2009) entire document	7, 18
Y	US 6,696,305 B2 (KUNG et al) 24 February 2004 (24.02.2004) entire document	19
A	US 7,323,143 B2 (ANDERSON et al) 29 January 2008 (29.01.2008) entire document	1-25
A	US 7,204,139 B2 (TAKAYAMA) 17 April 2007 (17.04.2007) entire document	1-25



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"G" document member of the same patent family

Date of the actual completion of the international search

01 June 2012

Date of mailing of the international search report

20 JUN 2012

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Facsimile No. 571-273-3201

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PCT OSP: 571-272-7774