

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 October 2003 (23.10.2003)

PCT

(10) International Publication Number
WO 03/088723 A1

(51) International Patent Classification⁷: **H05H 3/04**

(21) International Application Number: PCT/US03/10936

(22) International Filing Date: 10 April 2003 (10.04.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/120,748 10 April 2002 (10.04.2002) US

(71) Applicant (for all designated States except US): **ARRAYX, INC.** [US/US]; 316 North Michigan Avenue, Chicago, IL 60601 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GRIER, David** [US/US]; 1960 N. Lincoln Park West, Chicago, IL 60614 (US). **LOPES, Ward** [US/US]; 1519 E. 54th Street, Apt. 4, Chicago, IL 60615 (US).

(74) Agents: **EDWARDS, Jean, C.** et al.; Sonnenschein Nath & Rosenthal, P.O. Box 061080, Wacker Drive Station, Chicago, IL 60606-1080 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

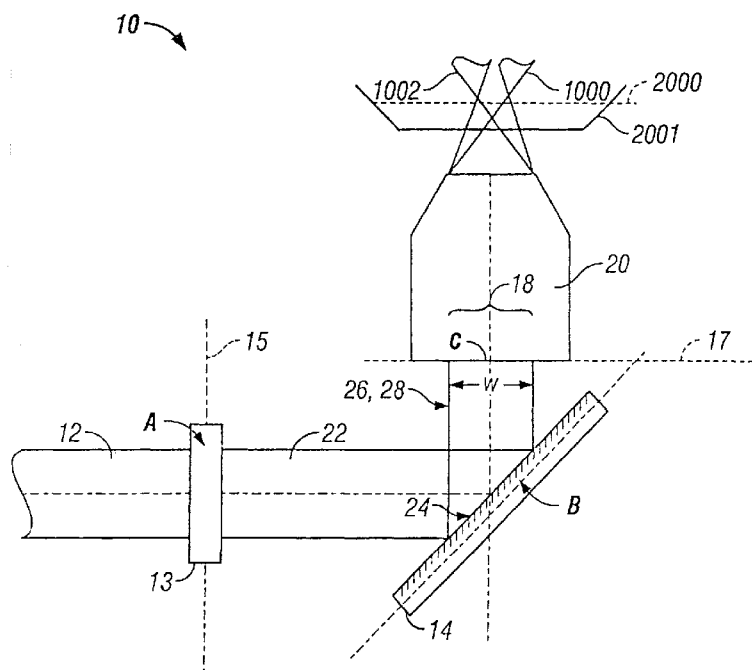
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

[Continued on next page]

(54) Title: APPARATUS AND METHOD TO GENERATE AND CONTROL OPTICAL TRAPS TO MANIPULATE SMALL PARTICLES



(57) Abstract: The present invention relates generally to an apparatus and method to generate and control optical traps (1000, 1002) for manipulation of small particles. An upstream modification of an input laser beam (12, 22) provides a beam with a square or other preselected, cross section of intensity which can be used to form optical traps (1000, 1002) with a corresponding cross section of intensity.



WO 03/088723 A1

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.