

CORRECTED VERSION

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
1 December 2005 (01.12.2005)

PCT

(10) International Publication Number
WO 2005/114801 A1(51) International Patent Classification⁷: **H01S 3/08**, 3/06(21) International Application Number:
PCT/US2005/010196

(22) International Filing Date: 25 March 2005 (25.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/571,443 14 May 2004 (14.05.2004) US
10/893,148 16 July 2004 (16.07.2004) US(71) Applicant (for all designated States except US): **ELECTRO SCIENTIFIC INDUSTRIES, INC.** [US/US];
13900 NW Science Park Drive, Portland, OR 97229-5497 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **SUN, Yunlong** [US/US]; 7679 SW 194th Terrace, Beaverton, OR 97007 (US).(74) Agent: **LEVINE, Michael, L.**; Stoel Rives, LLP, 900 S.W. Fifth Avenue, Suite 2600, Portland, OR 97204-1268 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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

Published:

— with international search report

(48) Date of publication of this corrected version:

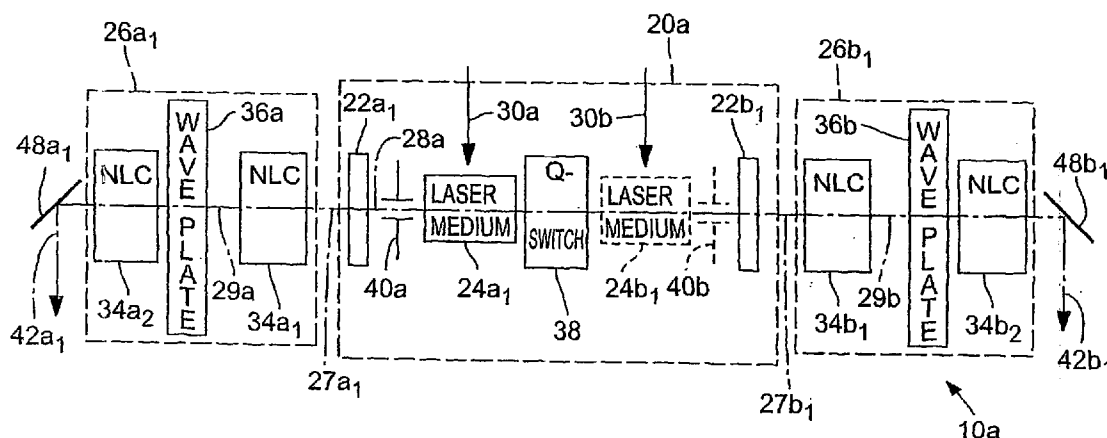
2 February 2006

(15) Information about Correction:

see PCT Gazette No. 05/2006 of 2 February 2006, Section II

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.

(54) Title: MULTI-OUTPUT HARMONIC LASER AND METHODS EMPLOYING SAME



(57) Abstract: A solid-state laser (10a) has a laser resonator (20a) with output ports (22a1, 22b1) at both ends to provide two separate laser micromachining beams (42a1, 42b1). A set of wavelength converters (26a1, 26b1) can be employed to convert the laser micromachining beams to harmonic wavelength outputs, thus reducing the risk of damage to the wavelength converters and enabling higher total average harmonic power to be generated from a single laser. The laser micromachining beams can be different to perform different laser operations independently or can be adapted to have substantially identical parameters to permit simultaneous parallel high-quality laser operations on substantially identical workpieces (54), or the laser micro-machining beams can be combined to provide a single laser system output (42e). The two laser machining beams can be further split or multiplexed to suit particular applications.