

(43) International Publication Date
19 November 2009 (19.11.2009)(10) International Publication Number
WO 2009/140526 A4

(51) International Patent Classification:

B23K 26/06 (2006.01) **G02B 6/26** (2006.01)
G02B 6/42 (2006.01)

(21) International Application Number:

PCT/US2009/043997

(22) International Filing Date:

14 May 2009 (14.05.2009)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/121,559 15 May 2008 (15.05.2008) US

(71) Applicant (for all designated States except US): **LOCKHEED MARTIN CORPORATION** [US/US]; 6801 Rockledge Drive, Bethesda, MD 20817 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DUBOIS, Marc** [CA/US]; 312 Foxcroft Lane, Keller, TX 76248 (US). **DRAKE, Thomas, E., Jr.** [US/US]; 2530 Ryan Place Drive, Fort Worth, TX 76110 (US). **OSTERKAMP, Mark, A.** [US/US]; 3601 Redbud Drive, Weatherford, TX 76087 (US).(74) Agent: **MATTINGLY, Todd, D.**; Bracewell & Giuliani LLP, P.O. Box 61389, Houston, TX 77208-1389 (US).

(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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, 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 (Art. 21(3))
- with amended claims (Art. 19(1))

(88) Date of publication of the international search report:

7 January 2010

Date of publication of the amended claims:

11 March 2010

(54) Title: HOLLOW CORE WAVEGUIDE FOR LASER GENERATION OF ULTRASONIC WAVES

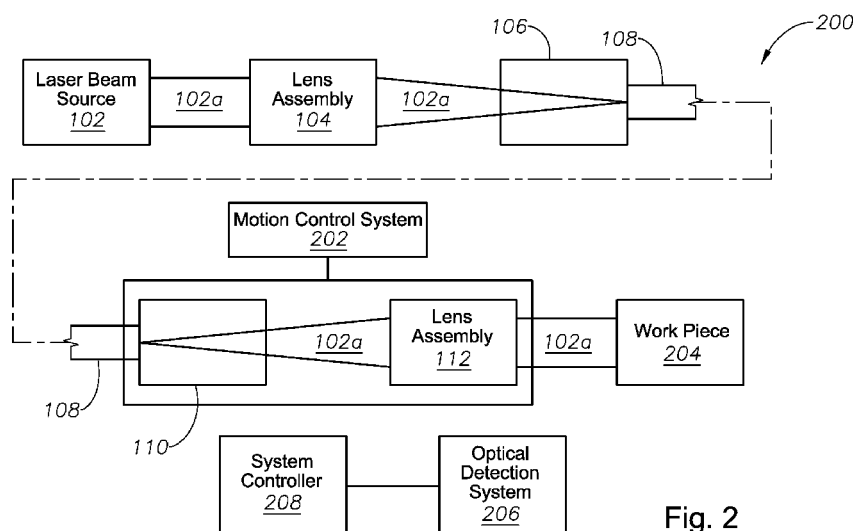


Fig. 2

(57) Abstract: A laser transmission system for an ultrasonic workpiece detection system operating in the wavelength range between 3μm and 5μm. The system comprises a source (102) coupled via a first lens assembly (104) and first hollow core waveguide to an optical fibre (108). The system optical exit comprises a further hollow core waveguide (110) coupling the optical fibre to an exit lens assembly (112).