



- (51) **International Patent Classification:**
A61B 8/00 (2006.01) *A61B 8/13* (2006.01)
- (21) **International Application Number:**
PCT/US2014/060293
- (22) **International Filing Date:**
13 October 2014 (13.10.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/889,585 11 October 2013 (11.10.2013) 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, BN, 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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

(54) **Title:** SYSTEMS AND METHODS FOR COMPONENT SEPARATION IN MEDICAL IMAGING

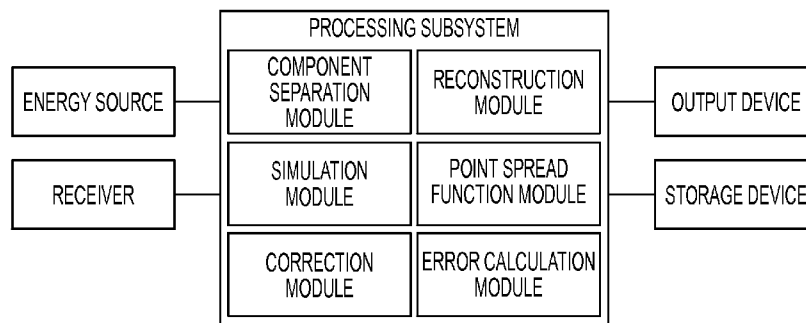


FIG. 1

(57) **Abstract:** A system is provided for component separation. In an embodiment, a light source or other source of electromagnetic energy delivers energy to a volume of tissue. A transducer array or other sensor receives a resulting acoustic signal, and a processing subsystem processes the acoustic signal to separate a direct acoustic return component from a secondary acoustic return component of the acoustic signal. An output and/or storage device presents and/or stores information about the direct acoustic return component, the secondary acoustic return component, or both. Other embodiments include a coded probe, a probe having an isolator that produces a wavefront, a sensor for measuring intensity of an acoustic wave produced by absorbed photons, and a system that receives acoustic signals from surface targets to determine an optical parameter of the volume.

