(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 August 2009 (27.08.2009)

PCT

(10) International Publication Number
WO 2009/105178 A3

(51) International Patent Classification:
*A61F 9/007* (2006.01)

(21) International Application Number:
PCT/US2009/000963

(22) International Filing Date:
17 February 2009 (17.02.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/066,233 18 February 2008 (18.02.2008) US
61/049,347 30 April 2008 (30.04.2008) US

(71) Applicant *(for all designated States except US)*: **QLT PLUG DELIVERY, INC.** [US/US]; 1098 Hamilton Court, Menlo Park, CA 94025 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **JAIN, Rachna** [IN/US]; 294 Jurgens Drive, Milpitas, California 95035 (US). **SHIMIZU, Robert W.** [US/US]; 26 Danforth Avenue, Laguna Niguel, California 92677 (US).

(74) Agents: **FINKEL, Evan** et al.; Pillsbury Winthrop Shaw Pittman LLP, P.O. Box 10500, McLean, VA 22102 (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))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
3 June 2010

(54) Title: LACRIMAL IMPLANTS AND RELATED METHODS

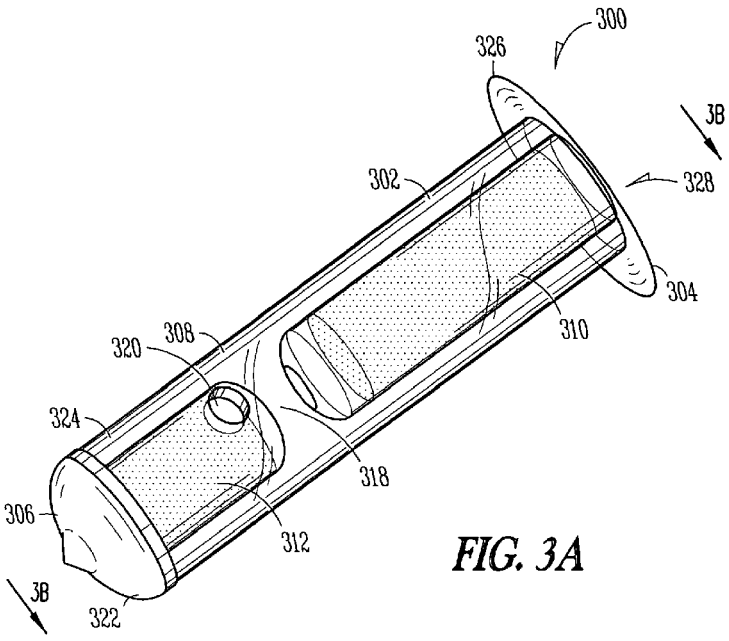



FIG. 3A

(57) Abstract: Lacrimal implants (300) providing secure retention within the lacrimal punctum of an eye are described. The lacrimal implants can comprise a implant body (302) configured for at least partial insertion through the lacrimal punctum and into a lacrimal canaliculus. The implant body can include a deformable retention structure (308) that can be configured to substantially encapsulate an expandable retention element. In some examples, the expandable retention element can include a fluid absorbing material, which can be exposed to fluid such as via a fluid permeable retainer or a fluid permeable aperture (320). As the fluid absorbing material retains fluid (i.e., upon acceptance of fluid into the retention structure), its size increases and its shape can change to urge one or more portions of the retention structure outward, such as against a wall of the lacrimal canaliculus, thereby securely retaining the lacrimal implant within the punctum.

WO 2009/105178 A3