



- (51) **International Patent Classification:**
A61F 2/16 (2006.01) *A61F 9/007* (2006.01)
- (21) **International Application Number:**
PCT/US2014/031589
- (22) **International Filing Date:**
24 March 2014 (24.03.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/808,053 3 April 2013 (03.04.2013) US
- (71) **Applicant (for all designated States except US):** **NO-VARTIS AG** [CH/CH]; Lichtstrasse 35, CH-4056 Basel (CH).
- (72) **Inventors; and**
- (71) **Applicants (for US only):** **DOWNER, David A.** [US/US]; 5217 Spanish River Trail, Fort Worth, TX 76137 (US). **TRAN, Tu C.** [US/US]; 4113 Mapleridge Drive, Grapevine, TX 76051 (US).
- (74) **Agents:** **PREJEAN, Jonathan E.** et al.; Alcon Research, Ltd., Ip Legal, Mail Code Tb4-8, 6201 South Freeway, Fort Worth, TX 76134 (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, 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, LT, 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, 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:

— with international search report (Art. 21(3))

[Continued on next page]

(54) **Title:** AUTOMATED INTRAOCULAR LENS INJECTOR DEVICE

FIGURE 13

BEGIN

Check for user input
[210]

Begin advancing plunger
[220]

At critical point,
retract plunger
[230]

Pause to allow
IOL material to relax
[240]

Advance plunger
back to critical point
[250]

Advance plunger
to implant lens
[260]

END

(57) **Abstract:** An IOL injection device comprises a tubular housing with a plunger longitudinally disposed within the tubular housing. The device is configured so that when the plunger is translated towards the front of the device, its tip engages an intraocular lens insertion cartridge mounted at or near the front end of the housing. The IOL injection device further comprises a control circuit. The control circuit is configured to perform the steps of advancing the plunger to a critical point at which an axial compressive force on the lens suddenly increases, retracting the plunger from the critical point to a sufficient distance for material of the intraocular lens to relax, pausing to allow the material of the intraocular lens to relax, advancing the plunger to the critical point a second time, and continuing to advance the plunger beyond the critical point to implant the intraocular lens.



- *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))*