

(19) World Intellectual Property Organization
International Bureau



G00002



(43) International Publication Date
8 August 2002 (08.08.2002)

PCT

(10) International Publication Number
WO 02/062112 A3

(51) International Patent Classification⁷: **H05H 1/12**,
G21B 1/00

(21) International Application Number: PCT/US02/02854

(22) International Filing Date: 1 February 2002 (01.02.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/266,074 1 February 2001 (01.02.2001) US
60/297,086 8 June 2001 (08.06.2001) US
Not furnished 31 January 2002 (31.01.2002) US

(71) Applicant: **THE REGENTS OF THE UNIVERSITY OF CALIFORNIA** [US/US]; 1111 Franklin Street, 12th Floor, Oakland, CA 94607 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ROSTOKER, Norman** [US/US]; 10 Perkins Court, Irvine, CA 92612 (US). **BINDERBAUER, Michl** [AT/US]; 27 San Leon, Irvine, CA 92606 (US). **QERUSHI, Artan** [AL/US];

4901 Flagstar Circle, Irvine, CA 92604 (US). **TAHSIRI, Hooshang** [US/US]; 3 Lassen, Irvine, CA 92612 (US). **GARATE, Eusebio** [US/US]; 56 Whiteman Court, Irvine, California 92612 (US). **BYSTRITSKII, Vitaly** [US/US]; 91 Schubert Court, Irvine, California 92612 (US).

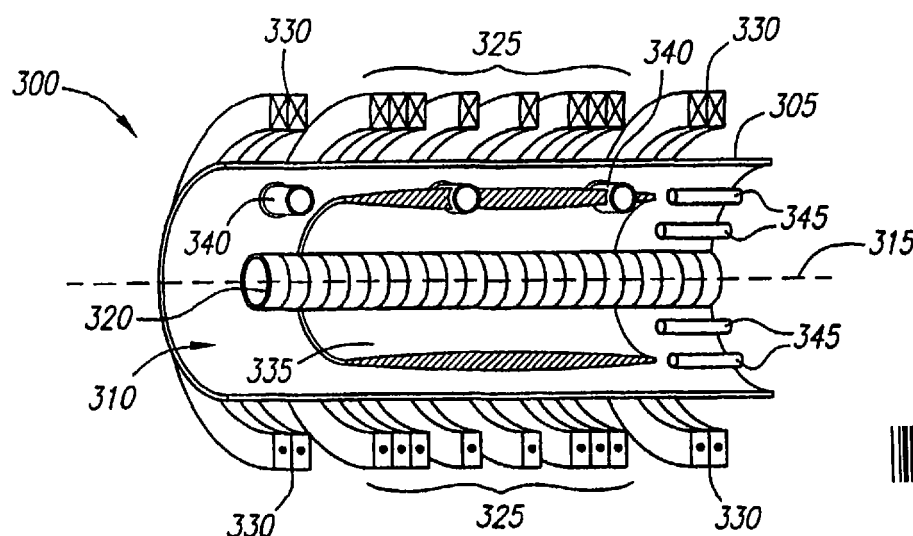
(74) Agent: **LYON & LYON LLP**; Kenneth S. Roberts, 633 West Fifth Street, Suite 4700, Los Angeles, CA 90071-2066 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, 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, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: MAGNETIC AND ELECTROSTATIC CONFINEMENT OF PLASMA IN A FIELD REVERSED CONFIGURATION



162162

(57) Abstract: A system and method for containing plasma and forming a Field Reversed Configuration (FRC) magnetic topology are described in which plasma ions are contained magnetically in stable, non-adiabatic orbits in the FRC. Further, the electrons are contained electrostatically in a deep energy well, created by tuning an externally applied magnetic field. The simultaneous electrostatic confinement of electrons and magnetic confinement of ions avoids anomalous transport and facilitates classical containment of both electrons and ions. In this configuration, ions and electrons may have adequate density and temperature so that upon collisions they are fused together by nuclear force, thus releasing fusion energy. Moreover, the fusion fuel plasmas that can be used with the present confinement system and method are not limited to neutronic fuels only, but also advantageously include advanced fuels.

WO 02/062112 A3

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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.

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

14 November 2002