



- (51) International Patent Classification:  
*B01L 7/00* (2006.01)
- (21) International Application Number:  
PCT/US2015/038525
- (22) International Filing Date:  
30 June 2015 (30.06.2015)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
62/018,893 30 June 2014 (30.06.2014) US
- (71) Applicant: **GNUBIO, INC.** [US/US]; 1 Kendall Square, B14201, Cambridge, MA 02139 (US).
- (72) Inventors: **POSSINGER, Christopher**; 1 Kendall Square, Suite B14201, Cambridge, MA 02139 (US). **KIANI, Sepehr**; 1 Kendall Square, Suite B14201, Cambridge, MA 02139 (US).
- (74) Agents: **CHANG, James, K.** et al.; Kilpatrick Townsend & Stockton LLP, Two Embarcadero Center, 8th Floor, San Francisco, CA 94111 (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, 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:**

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

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

7 April 2016

(54) Title: FLOATING THERMAL CONTACT ENABLED PCR

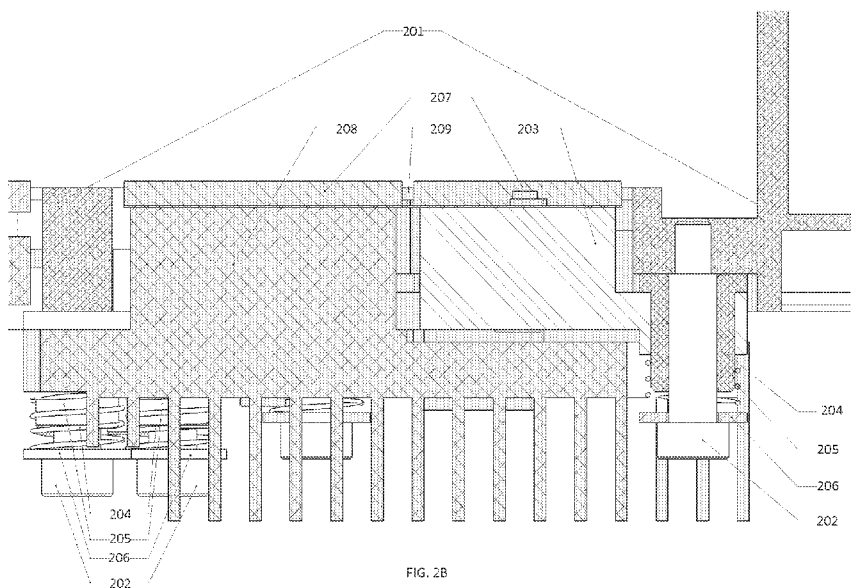


FIG. 2B

(57) Abstract: The present invention generally pertains to a system which utilizes floating thermal contact to enable PCR, in a thermal management device. Comprised of multiple thermal zones attached to a framework, each zone an individually actuated, isolated sub-assembly. The actuation of each zone ensures physical contact with an uneven, yet flat microfluidic chip to achieve effective, conductive heat transfer. The isolation of each zone serves to insulate the thermal zones from each other and minimize undesired heat transfer between adjacent zones, so that each zone is at a proper, uniform temperature.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2015/038525

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B01L 7/00 (2015.01)

CPC - B01L 7/525 (2015.07)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - B01J 19/00; B01L 7/00; C12M1 /38; F16B 35/04 (2015.01)

USPC - 62/259.2; 165/61, 165; 422/82.05, 198; 435/91.1, 91.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

CPC - B01J 19/00, 19/0006, 19/0013, 2219/00049, 2219/00051; B01L 7/52, 7/525, 7/54, 2300/18, 2300/1805, 2300/1827; C12M 1/38 (2015.07) (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase, Google Scholar, Google.

Search terms used: Polymerase Chain Reaction, spreader, heatsink, thermal cycler, bearing, screw, microfluidic, biochip, thermal actuator

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2013/0217103 A1 (BAUER) 22 August 2013 (22.08.2013) entire document	1-5, 7-17, 20
Y	US 2010/0104485 A1 (YUAN) 29 April 2010 (29.04.2010) entire document	1-5, 7-17, 20
Y	US 8,151,589 B2 (LEPSCHI et al) 10 April 2012 (10.04.2012) entire document	2-5, 9-11
Y	US 6,786,691 B2 (ALDEN III) 07 September 2004 (07.09.2004) entire document	4-5
Y	US 2011/0057117 A1 (FAWCETT et al) 10 March 2011 (10.03.2011) entire document	14
A	US 7,741,123 B2 (PEASE et al) 22 June 2010 (22.06.2010) entire document	1-20

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

31 August 2015

Date of mailing of the international search report

23 SEP 2015

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-8300

Authorized officer

Blaine Copenheaver

PCT Helpdesk: 571-272-4300  
PCT OSP: 571-272-7774