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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 January 2009 (29.01.2009)

PCT

(10) International Publication Number
WO 2009/014985 A3

(51) International Patent Classification:
H01L 23/36 (2006.01)

(21) International Application Number:
PCT/US2008/070309

(22) International Filing Date: 17 July 2008 (17.07.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/961,395 20 July 2007 (20.07.2007) 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, 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, 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).

[Continued on next page]

(54) Title: METHODS AND DEVICES FOR CONTROLLING THERMAL CONDUCTIVITY AND THERMOELECTRIC POWER OF SEMICONDUCTOR NANOWIRES

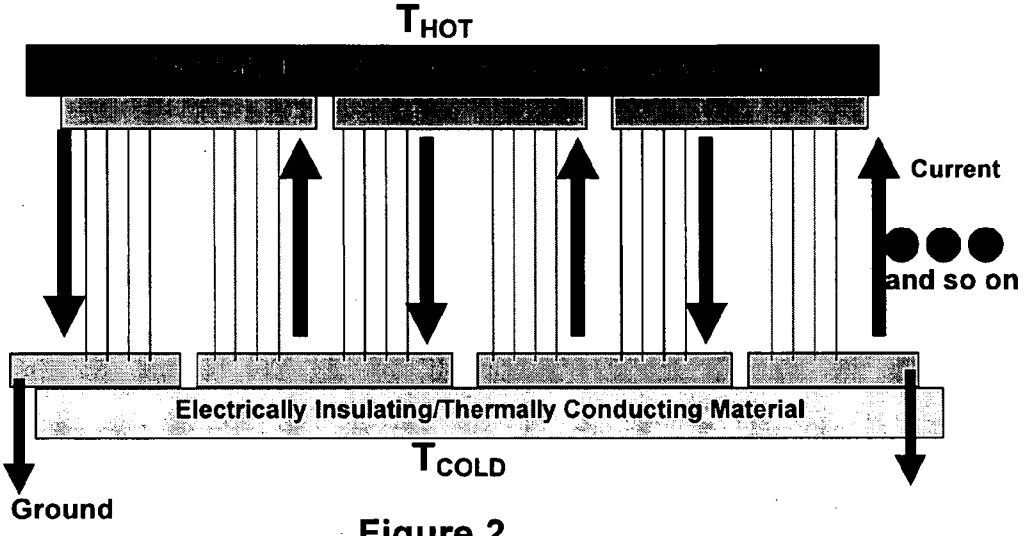

Figure 2

(57) Abstract: Methods and devices for controlling thermal conductivity and thermoelectric power of semiconductor nanowires are described. The thermal conductivity and the thermoelectric power are controlled substantially independently of the electrical conductivity of the nanowires by controlling dimensions and doping, respectively, of the nanowires. A thermoelectric device comprising p-doped and n-doped semiconductor nanowire thermocouples is also shown, together with a method to fabricate alternately p-doped and n-doped arrays of silicon nanowires.

WO 2009/014985 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*

(88) Date of publication of the international search report:
2 April 2009

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/070309

A. CLASSIFICATION OF SUBJECT MATTER

H01L 23/36(2006.01)i

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 23/36

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975.
Japanese Utility models and applications for Utility models since 1975.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
e-KIPASS (KIPO internal); semiconductor, nanowire, conductivity, thermocouples, Peltier

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005-253138 A1 (Choi et al.) 17 Nov. 2005 see abstract, Claims 1~13, Figs. 1~6	1 ~ 24
A	US 2004-152240 A1 (Dangelo) 05 Aug. 2004 see abstract, Claims 1~32, Figs. 1~11	1 ~ 24
A	US 6,882,051 B2 (Majumdar et al.) 19 Apr. 2005 see abstract, Claims 1~21, Figs. 1~21	1 ~ 24
A	US 7,115,971 B2 (Stumbo et al.) 03 Oct. 2006 see abstract, Claims 1~40, Figs. 1~3	1 ~ 24
A	US 2005-176264 A1 (Lai et al.) 11 Aug. 2005 see abstract, Claims 1~10, Figs. 1~9	1 ~ 24
A	US 6,313,015 B1 (Lee et al.) 06 Nov. 2001 see abstract, Claims 1~11, Figs. 1~6	1 ~ 24

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 FEBRUARY 2009 (09.02.2009)	**09 FEBRUARY 2009 (09.02.2009)**

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Facsimile No. 82-42-472-7140	Telephone No. 82-42-481-5729

Form PCT/ISA/210 (second sheet) (July 2008)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/070309

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 2005-176264 A1	11.08.2005	None	
US 6313015 B1	06.11.2001	None	