10/13/2015 503520586

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2

EPAS ID: PAT3567212

| SUBMISSION TYPE: | NEW ASSIGNMENT |
|-----------------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|-------------------|----------------|
| THOMAS P. RUSSELL | 08/05/2011 |
| SUNG WOO HONG | 08/04/2011 |
| DONG HYUN LEE | 07/25/2011 |

RECEIVING PARTY DATA

| Name: | THE UNIVERSITY OF MASSACHUSETTS |
|-----------------|---------------------------------|
| Street Address: | 225 FRANKLIN STREET |
| City: | BOSTON |
| State/Country: | MASSACHUSETTS |
| Postal Code: | 02110 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 14845488 |

CORRESPONDENCE DATA

Fax Number: (860)286-0115

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent

using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 8602862929

Email: Inolan@cantorcolburn.com CANTOR COLBURN LLP **Correspondent Name:** Address Line 1: 20 CHURCH STREET

Address Line 2: 22ND FLOOR

Address Line 4: HARTFORD, CONNECTICUT 06103

| ATTORNEY DOCKET NUMBER: | UMA0033USD |
|-------------------------|-----------------------|
| NAME OF SUBMITTER: | J. MICHAEL BUCHANAN |
| SIGNATURE: | /J. Michael Buchanan/ |
| DATE SIGNED: | 10/13/2015 |

Total Attachments: 6

source=7H32035#page1.tif source=7H32035#page2.tif

source=7H32035#page3.tif

source=7H32035#page4.tif source=7H32035#page5.tif source=7H32035#page6.tif

ASSIGNMENT

WHEREAS We, Thomas P. Russell of 25 Greenleaves Drive, Unit #533, Amherst, MA 01002, Sung Woo Hong of 1040 N. Pleasant St., Apt. 242, Amherst, MA 01002, and Dong Hyun Lee of 1040 North Pleasant Street, Apt. 66, Amherst, MA 01002; have invented certain new and useful improvements in:

METHOD OF FORMING ORIENTED BLOCK COPOLYMER LINE PATTERNS, BLOCK COPOLYMER LINE PATTERNS FORMED THEREBY, AND THEIR USE TO FORM PATTERNED ARTICLES

filed on May 25, 2011 as U.S. Provisional Application No. 61/489,894;

AND WHEREAS, THE UNIVERSITY OF MASSACHUSETTS, having a business address at 225 Franklin Street, Boston, MA 02110; is desirous of acquiring an interest in the United States and all foreign countries, in and to the said invention and any Letters Patent to be obtained therefor (hereinafter referred to as ASSIGNEE);

NOW THEREFORE, TO ALL WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, the receipt of which is hereby acknowledged, We, the said ASSIGNORS have assigned and transferred, and hereby assign and transfer unto the said ASSIGNEE, the entire right, title and interest in and to said invention in the United States and in all foreign countries, including priority rights, as fully set forth and described in said application; and We do hereby authorize and request the Commissioner of Patents to issue any Letters Patent, and any and all Letters Patent that may be issued upon any and all utility applications, revivals, refilings, continuations, RCE's, continuations-in-part, divisions and reissues thereof, to the said ASSIGNEE, an assignee of the entire right, title and interest in and to the same, for the sole use and behoof of ASSIGNEE, its successors and assigns; and We do hereby agree that the said ASSIGNEE, may apply for foreign Letters Patent on said invention and that We will execute all papers necessary in connection with the United States and foreign applications when called upon to do so by the said ASSIGNEE, its successors or assigns, and that We will, at the cost and expense of the said ASSIGNEE fully assist and cooperate in all matters in connection with the United States and foreign applications and patents issuing thereon.

1

UMA0033US2

The undersigned declare that all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1

| Date: 8/5/11 | Thomas P. Russell | L.S. |
|--------------|------------------------------|------|
| Date: | | L.S. |
| Date: | Sung Woo Hong Dong Hyun Lee | L.S |

ASSIGNMENT

WHEREAS We, Thomas P. Russell of 25 Greenleaves Drive, Unit #533, Amherst, MA 01002, Sung Woo Hong of 1040 N. Pleasant St., Apt. 242, Amherst, MA 01002, and Dong Hyun Lee of 1040 North Pleasant Street, Apt. 66, Amherst, MA 01002; have invented certain new and useful improvements in:

METHOD OF FORMING ORIENTED BLOCK COPOLYMER LINE PATTERNS, BLOCK COPOLYMER LINE PATTERNS FORMED THEREBY, AND THEIR USE TO FORM PATTERNED ARTICLES

filed on May 25, 2011 as U.S. Provisional Application No. 61/489,894;

AND WHEREAS, THE UNIVERSITY OF MASSACHUSETTS, having a business address at 225 Franklin Street, Boston, MA 02110; is desirous of acquiring an interest in the United States and all foreign countries, in and to the said invention and any Letters Patent to be obtained therefor (hereinafter referred to as ASSIGNEE);

NOW THEREFORE, TO ALL WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, the receipt of which is hereby acknowledged, We, the said ASSIGNORS have assigned and transferred, and hereby assign and transfer unto the said ASSIGNEE, the entire right, title and interest in and to said invention in the United States and in all foreign countries, including priority rights, as fully set forth and described in said application; and We do hereby authorize and request the Commissioner of Patents to issue any Letters Patent, and any and all Letters Patent that may be issued upon any and all utility applications, revivals, refilings, continuations, RCE's, continuations-in-part, divisions and reissues thereof, to the said ASSIGNEE, an assignee of the entire right, title and interest in and to the same, for the sole use and behoof of ASSIGNEE, its successors and assigns; and We do hereby agree that the said ASSIGNEE, may apply for foreign Letters Patent on said invention and that We will execute all papers necessary in connection with the United States and foreign applications when called upon to do so by the said ASSIGNEE, its successors or assigns, and that We will, at the cost and expense of the said ASSIGNEE fully assist and cooperate in all matters in connection with the United States and foreign applications and patents issuing thereon.

The undersigned declare that all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

| Date: | L.S. |
|-------------------|-------------------------|
| Date: 08 / 04 / 1 | Thomas P. Russell L.S. |
| | Sung Woo Hong |
| Date: | L.S. |
| | Dong Hyun Lee |

ASSIGNMENT

WHEREAS We, Thomas P. Russell of 25 Greenleaves Drive, Unit #533, Amherst, MA 01002, Sung Woo Hong of 1040 N. Pleasant St., Apt. 242, Amherst, MA 01002, and Dong Hyun Lee of 1040 North Pleasant Street, Apt. 66, Amherst, MA 01002; have invented certain new and useful improvements in:

METHOD OF FORMING ORIENTED BLOCK COPOLYMER LINE PATTERNS, BLOCK COPOLYMER LINE PATTERNS FORMED THEREBY, AND THEIR USE TO FORM PATTERNED ARTICLES

filed on May 25, 2011 as U.S. Provisional Application No. 61/489,894;

AND WHEREAS, THE UNIVERSITY OF MASSACHUSETTS, having a business address at 225 Franklin Street, Boston, MA 02110; is desirous of acquiring an interest in the United States and all foreign countries, in and to the said invention and any Letters Patent to be obtained therefor (hereinafter referred to as ASSIGNEE);

NOW THEREFORE, TO ALL WHOM IT MAY CONCERN, be it known that, for good and valuable consideration, the receipt of which is hereby acknowledged, We, the said ASSIGNORS have assigned and transferred, and hereby assign and transfer unto the said ASSIGNEE, the entire right, title and interest in and to said invention in the United States and in all foreign countries, including priority rights, as fully set forth and described in said application; and We do hereby authorize and request the Commissioner of Patents to issue any Letters Patent, and any and all Letters Patent that may be issued upon any and all utility applications, revivals, refilings, continuations, RCE's, continuations-in-part, divisions and reissues thereof, to the said ASSIGNEE, an assignee of the entire right, title and interest in and to the same, for the sole use and behoof of ASSIGNEE, its successors and assigns; and We do hereby agree that the said ASSIGNEE, may apply for foreign Letters Patent on said invention and that We will execute all papers necessary in connection with the United States and foreign applications when called upon to do so by the said ASSIGNEE, its successors or assigns, and that We will, at the cost and expense of the said ASSIGNEE fully assist and cooperate in all matters in connection with the United States and foreign applications and patents issuing thereon.

The undersigned declare that all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

| Date: | | L.S. |
|-----------------|-------------------|--|
| | Thomas P. Russell | And the second s |
| Date: | | L.S. |
| | Sung Woo Hong | and a second |
| Date: 07/15/201 | 1 1 h (2) |) L.S. |
| | Dong Hyun Lee | AND THE PROPERTY OF THE PROPER |

2

UMA0033US2

RECORDED: 10/13/2015