505812932 12/10/2019

PATENT ASSIGNMENT COVER SHEET

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EPAS ID: PAT5859761

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

CONVEYING PARTY DATA

| Name | Execution Date |
|-----------------|----------------|
| MUKERREM CAKMAK | 10/02/2019 |
| ALINA ALEXEENKO | 10/27/2019 |

RECEIVING PARTY DATA

| Name: | PURDUE RESEARCH FOUNDATION | |
|-----------------|----------------------------|--|
| Street Address: | 1801 NEWMAN ROAD | |
| City: | WEST LAFAYETTE | |
| State/Country: | INDIANA | |
| Postal Code: | 47906 | |

PROPERTY NUMBERS Total: 2

| Property Type | Number |
|---------------------|-----------|
| Application Number: | 62406298 |
| PCT Number: | US1755933 |

CORRESPONDENCE DATA

Fax Number:

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.

Email: jjmartin@prf.org

Correspondent Name: PURDUE RESEARCH FOUNDATION

Address Line 1: 1801 NEWMAN ROAD

Address Line 4: WEST LAFAYETTE, INDIANA 47906

| ATTORNEY DOCKET NUMBER: | 67672-01-02 |
|-------------------------|---------------|
| NAME OF SUBMITTER: | JENI MARTIN |
| SIGNATURE: | /Jeni Martin/ |
| DATE SIGNED: | 12/10/2019 |

Total Attachments: 6

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2017-CAKM-67672-01-02-03

ASSIGNMENT

WHEREAS, WE,

Name

Mukerrem Cakmak

Alina Alexeenko

(hereinafter "ASSIGNORs"), have made or developed a technology identified in a disclosure to

Purdue Research Foundation (PRF) and assigned:

PRF reference number: 2017-CAKM-67672

generally known as:

CONTINUOUS LYOPHILIZATION ROLL-TO-ROLL MANUFACTURING AND

METROLOGY SYSTEM

which is further described in a patent application filed in the United States Patent and Trademark

Office on October 10, 2016 and accorded Application No. 62/406,298 ("Technology"); and which

is further described in a patent application filed in the United States Patent and Trademark Office

on October 10, 2017 and accorded Application No. PCT/US17/55933 ("Technology"); and which

is further described in a patent application filed in the United States Patent and Trademark Office

on Apr 1, 2019 and accorded Application No. 16/338,532 ("Technology"); and

WHEREAS, Purdue Research Foundation, a statutory body corporate formed and existing

under the Indiana Foundation or Holding Companies Act of 1921, having a place of business at

1801 Newman Road, West Lafayette, IN 47906 (hereinafter "ASSIGNEE"), is desirous of

accepting and assuming all such right, title, and interests of the ASSIGNOR.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby

acknowledged, the ASSIGNOR(s) do hereby sell, transfer, convey, assign and deliver unto the

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REEL: 051234 FRAME: 0526

ASSIGNEE, its successors, assigns and legal representatives, any and all intellectual property rights, whether domestic or foreign related to the Technology, including but not limited to: all portions, and works in progress with respect thereto and all inventions, works of authorship, masks works, technology, information, know-how, materials and tools relating thereto or to the development, support or maintenance thereof; all copyright, patent rights, trade secret rights, trademark rights, mask works rights, and all other intellectual property rights and all business, contract rights and goodwill in, incorporated or embodied in, used to develop, or related to any of the foregoing and any registrations and applications for registrations of the foregoing throughout the United States of America and the world and any and all other applications arising therefrom, including any and all divisional applications, continuation applications, and continuation-in-part applications (but only and solely to the extent such continuation-in-part applications are described in the priority application to which such continuation-in-part applications claim priority and such priority is not denied), of the Technology, and any and all patents to be issued and obtained therefor and thereon, in the United States and throughout the world, including all reissued Patents, and extensions thereof (collectively, the "Intellectual Property");

AND WE HEREBY agree to communicate to ASSIGNEE or its representative any facts known to us respecting the Technology whether or not patentable, which we may conceive, develop, make, produce or reduce to practice in whole or in part as a result of any employment, research, or activity involving or relating to the use of Purdue University resources; and agree to sign all lawful documents and make all rightful oaths and declarations relating to said Technology and Intellectual Property; authorize ASSIGNEE to insert herein the date of application, serial number, date of registration, and registration number of patents issued once known; and agree to otherwise aid ASSIGNEE as necessary and desirable to:

1. Obtain, enforce, and maintain any issued letters patent in the United States or throughout the world, when reasonably requested to do so by ASSIGNEE, including but not limited to executing, acknowledging, and delivering to ASSIGNEE such written documents and instruments as ASSIGNEE requests and giving testimony in support of ASSIGNEE's inventorship, as may be necessary in ASSIGNEE's opinion to obtain and maintain patents in the United States of America and throughout the world;

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2. Secure or aid in securing and maintaining copyright protection in the Intellectual

Property and assist ASSIGNEE or its nominees in filing applications to register copyright in the

name of ASSIGNEE as owner in such Intellectual Property; and

3. Execute, acknowledge, and deliver to ASSIGNEE at its expense, such written

documents and instruments and do such other acts as may be necessary in the opinion of

ASSIGNEE, to vest the entire rights, title, and interests in and to the Intellectual Property to

ASSIGNEE and to confirm the complete ownership thereof by ASSIGNEE.

AND WE HEREBY authorize ASSIGNEE to take any and all action necessary to

effectuate this Assignment, including but not limited to, the filing of the Assignment with the U.S.

Patent and Trademark Office and U.S. Copyright Office.

AND WE HEREBY authorize and request the Director of the U.S. Patent and Trademark

Office or any other proper officer or agency throughout the world to issue any and all said letters

patent to ASSIGNEE.

AND WE HEREBY warrant and covenant that we have full rights to convey the entire

right, title and interest herein assigned and that we have not executed and will not execute any

instrument or assignment in conflict herewith;

This Assignment shall be binding upon ASSIGNOR(s) and their heirs, successors, and

assigns. Should any term of this Assignment be found invalid or unenforceable, it shall not affect

the validity or enforceability of any other term of this Assignment. The laws of the State of Indiana

will govern the interpretation, validity, and effect of this Assignment, without regard to the place

of making or to the place of performance.

This Assignment is hereby made effective as of the conception date of the Technology.

[SIGNATURES ON NEXT PAGE]

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PATENT

REEL: 051234 FRAME: 0528

| ACCEPTED BY ASSIGNOR: | |
|-----------------------|--|
| 10/2/2019 | Mukerrem Cakmak M. Calima |
| Date | Mukerrem Cakmak |
| | Residence Address: |
| | 801 Emerald Drive, Lafayette, IN 47905 |
| | Address |
| | City, State and Zip |
| | Citizenship |

| ACCEPTED BY ASSIGNOR: | |
|-----------------------|--------------------------|
| 10/27/2019 | CHROCE |
| Date | Alina Alexeenko |
| | |
| | Residence Address: |
| | 615 Carrolton Blvd |
| | Address |
| | West Lafayette, IN 47906 |
| | City, State and Zip |
| | USA |
| | Citizenship |

ACCEPTED BY ASSIGNEE:

October 28,2019

Date

By: /4///////

Printed: Bobak P. Jalaie

Title: Chief Patent Counsel and Director of IP-Legal

Office of Technology Commercialization

Purdue Research Foundation

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