

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT4312800

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	SECURITY INTEREST	
CONVEYING PARTY DATA		
Name		Execution Date
ZENA TECHNOLOGIES, INC.		12/30/2016
RECEIVING PARTY DATA		
Name:	FAWWAZ HABBAL	
Street Address:	33 LEXINGTON AVENUE	
Internal Address:	APT. #4	
City:	CAMBRIDGE	
State/Country:	MASSACHUSETTS	
Postal Code:	02138	
PROPERTY NUMBERS Total: 68		
Property Type	Number	
Patent Number:	8269985	
Patent Number:	8546742	
Patent Number:	8274039	
Patent Number:	8791470	
Patent Number:	7646943	
Patent Number:	8384007	
Patent Number:	8735797	
Patent Number:	8519379	
Patent Number:	8299472	
Patent Number:	8889455	
Patent Number:	8229255	
Patent Number:	9299866	
Patent Number:	8866065	
Patent Number:	8748799	
Patent Number:	8507840	
Patent Number:	9000353	
Patent Number:	9515218	
Patent Number:	9406709	
Patent Number:	8890271	

PATENT

Property Type	Number
Patent Number:	8835831
Patent Number:	8835905
Patent Number:	9082673
Patent Number:	8471190
Patent Number:	8754359
Patent Number:	8766272
Patent Number:	9429723
Patent Number:	8514411
Patent Number:	9343490
Patent Number:	9263613
Patent Number:	9304035
Patent Number:	8810808
Patent Number:	8710488
Patent Number:	9177985
Patent Number:	9478685
Patent Number:	9543458
Patent Number:	9123841
Patent Number:	9490283
Patent Number:	9410843
Patent Number:	9054008
Patent Number:	9337220
Application Number:	12633313
Application Number:	13288131
Application Number:	14334848
Application Number:	14032166
Application Number:	13543307
Application Number:	13693207
Application Number:	14322503
Application Number:	14563781
Application Number:	14274448
Application Number:	14516402
Application Number:	14501983
Application Number:	14516162
Application Number:	14450812
Application Number:	14459398
Application Number:	14632739
Application Number:	14704143
Application Number:	14929890

Property Type	Number
Application Number:	15225264
Application Number:	15042922
Application Number:	15057153
Application Number:	15082514
Application Number:	15090155
Application Number:	62307018
Application Number:	15149252
Application Number:	15093928
PCT Number:	US2015055710
PCT Number:	US2015055728
PCT Number:	US2016032774

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: request@slwip.com

Correspondent Name: SCHWEGMAN LUNDBERG & WOESSNER, P.A.

Address Line 1: PO BOX 2938

Address Line 4: MINNEAPOLIS, MINNESOTA 55402-0938

ATTORNEY DOCKET NUMBER: 4776.000001

NAME OF SUBMITTER: KRISTEN DAME

SIGNATURE: /Kristen Dame/

DATE SIGNED: 03/10/2017

Total Attachments: 13

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RECORDATION FORM COVER SHEET
PATENTS ONLY

Atty Ref/Docket No.: 4776.000001

Patent and Trademark Office

To the Director of the U.S. Patent and Trademark Office: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

Zena Technologies, Inc.

Additional name(s) of conveying party(ies) attached?

☐ Yes ☒ No

3. Nature of conveyance:

☐ Assignment

☐ Merger

☒ Security Agreement

☐ Change of Name

☐ Other

Execution Date: December 30, 2016

2. Name and address of receiving party(ies):

Name: Fawwaz Habbal

Street Address: 33 Lexington Avenue, Apt. #4

City/State/Zip: Cambridge, MA 02138

Country: United States of America

Additional name(s) & address(es) attached?

☐ Yes ☒ No

4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is:

A. Patent Application No.(s)

B. Patent No.(s)

Serial No. See Schedule A (attached)

Additional numbers attached? ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Stephen C. Durant

Address:

Schwegman Lundberg & Woessner, P.A.

P.O. Box 2938

Minneapolis, MN 55402--0938

6. Total number of applications and patents involved: 1

7. Total fee (37 CFR 3.41): \$ 0.00

☐ Enclosed

☐ Authorized to be charged to deposit account
19-0743

8. Please charge any additional fees or credit any over payments to our Deposit Account No.: 19-0743

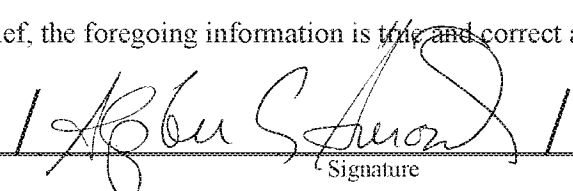
DO NOT USE THIS SPACE

9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Stephen C. Durant/Reg. No. 31,506

Name of Person Signing


Signature

March 9, 2017

Date

Total number of pages including cover sheet: 13

Mail documents to be recorded with required cover sheet information to:

Commissioner of Patents and Trademarks

Mail Stop Assignment Recordation Services

P.O. Box 1450

Alexandria, VA 22313-1450

PATENT
REEL: 041941 FRAME: 0898

INTELLECTUAL PROPERTY SECURITY AGREEMENT

This Intellectual Property Security Agreement is entered into as December 30, 2016 by and between Fawwaz Habbal ("Creditor") and ZENA TECHNOLOGIES, INC., a Delaware corporation ("Grantor"), with its principal place of business located at 174 Haverhill Road, Topsfield, MA 01983.

RECITALS

A. Creditor has made certain advances of money totaling in the sum of \$698,563.00 to Grantor (the "Loan") as set forth in the Promissory Notes executed by Grantor of even date herewith. Grantor agrees to grant to Creditor a security interest in certain Patents (the "Intellectual Property Collateral") to secure the obligations of Grantor under the Promissory Notes.

B. Pursuant to the terms of the Promissory Notes, Grantor has granted to Creditor a security interest in all of Grantor's right, title and interest, whether presently existing or hereafter acquired, in, to and under all of the Intellectual Property Collateral.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, and intending to be legally bound, as collateral security for the prompt and complete payment when due of its obligations under the Promissory Note, Grantor hereby represents, warrants, covenants and agrees as follows:

AGREEMENT

1. Security Interest. To secure its obligations under the Promissory Note, Grantor grants to Creditor a security interest in all of Grantor's right, title and interest in, to and under its Intellectual Property Collateral as listed on Schedule A and attached hereto and made a part hereof, and including without limitation all proceeds thereof (such as by way of example but not by way of limitation, license royalties and proceeds of infringement suits), the right to sue for past, present and future infringements, all rights corresponding thereto throughout the world and all re-issues, divisions, continuations, renewals, extensions and continuations-in-part thereof.

2. Rights Cumulative. This security interest is granted in conjunction with the security interest granted to Creditor under the Promissory Note. The rights and remedies of Creditor with respect to the security interest granted hereby are in addition to those set forth in the Promissory Note, and those which are now or hereafter available to Creditor as a matter of law or equity. Each right, power and remedy of Creditor provided for herein or in the Promissory Note or any of the other documents signed by the parties, or now or hereafter existing at law or in equity shall be cumulative and concurrent and shall be in addition to every right, power or remedy provided for herein and the exercise by Creditor of any one or more of the rights, powers or remedies provided for in this Intellectual Property Security Agreement, the Promissory Notes or any of the other

documents signed by the parties, or now or hereafter existing at law or in equity, shall not preclude the simultaneous or later exercise by any person, including Creditor, of any or all other rights, powers or remedies.

3. Patents. As used herein, the Patents include patents, patent applications and like protections, including improvements, divisions, continuations, renewals, reissues, extensions and continuation in part of the same.

4. Maturity Date. Grantor shall repay the Loan on the Maturity Date set forth in the Promissory Notes concurrently executed by the parties. This Agreement shall terminate and all obligations outstanding hereunder shall be immediately due and payable on the Maturity Date.

5. Power of Attorney. Grantor irrevocably appoints Creditor and its successors and assigns as attorney-in-fact and authorizes Creditor, regardless of whether there has been an event of default as provided in the Promissory Notes, to execute on Grantor's behalf any instruments, documents, financing statements to perfect Creditor's interest in the Intellectual Property Collateral and do all acts and things necessary or expedient, as determined solely and exclusively by Creditor, to protect, preserve, and otherwise enforce Creditor's rights and remedies under this Agreement, as directed by Creditor.

6. Financing Statements. Grantor hereby authorizes Creditor to file financing statements, without notice to Grantor, with all appropriate jurisdictions in order to perfect or protect Creditor's interest or rights hereunder, which financing statements may indicate the Intellectual Property Collateral as "all assets of the Debtor" or words of similar effect, or as being of an equal or lesser scope, or with greater detail, all in Creditor's discretion.

7. Representations and Warranties. Grantor represents and warrants as follows:

7.1. Due Organization and Authorization. Grantor is duly existing and in good standing in its jurisdiction of formation and is qualified and licensed to do business and is in good standing in any jurisdiction in which the conduct of its business or ownership of property requires that it be qualified except where the failure to do so could not reasonably be expected to have a material adverse effect on Grantor's business. The execution, delivery and performance by Grantor of this Agreement and the Promissory Notes have been duly authorized, and do not (i) conflict with any of Grantor's organizational documents, (ii) contravene, conflict with, constitute a default under or violate any material requirement of law, (iii) contravene, conflict or violate any applicable order, writ, judgment, injunction, decree, determination or award of any governmental authority by which Grantor or any of its property or assets may be bound or affected, (iv) require any action by, filing with or governmental approval from any governmental authority (except such governmental approvals which have already been obtained and are in full force and effect) or (v) constitute an event of default under any

material agreement by which Grantor is bound. Grantor is not in default under any agreement to which it is a party or by which it is bound in which the default could have a material adverse effect on Grantor's business.

7.2. Intellectual Property Collateral. Grantor has good title, has rights in, and the power to transfer each item of the Intellectual Property Collateral upon which it purports to grant a security interest hereunder, free and clear of any and all liens except disclosed by Grantor and permitted by Creditor. Grantor is the sole owner of its intellectual property, except for non-exclusive licenses granted to its customers in the ordinary course of business. Each Patent is valid and enforceable, and no part of the intellectual property has been judged invalid or unenforceable, in whole or in part, and to the best of Grantor's knowledge, no claim has been made that any part of the intellectual property violates the rights of any third party except to the extent such claim could not reasonably be expected to have a material adverse effect on Grantor's business. Grantor is not a party to, nor is bound by, any license or other agreement with respect to which Grantor is licensee that prohibits or otherwise restricts Grantor from granting a security interest in Grantor's interest in such license or agreement or any other property.

7.3. Litigation. There are no actions or proceedings pending or, to the knowledge of Grantor's responsible officers or legal counsel, threatened by or against Grantor in which an adverse decision could reasonably be expected to cause a material adverse change to Grantor.

8. Default. Any default under the promissory Note shall constitute an event of default under this Agreement.

9. Rights and Remedies. When an event of default occurs and continues, Creditor may, without notice or demand, do any or all of the following: (a) declare all obligations immediately due and payable, (b) reclaim, recover, prepare for sale, advertise for sale and sell the Intellectual Property Collateral. Creditor is hereby granted a non-exclusive, royalty-free license or other right to use, without charge, Grantor's labels, patents, copyrights, mask works, rights of use of any name, trade secrets, trade names, trademarks, service marks, and advertising matter, or any similar property as it pertains to the Intellectual Property Collateral, in completing advertising for sale, and selling any Intellectual Property Collateral and, in connection with Creditor's exercise of its rights under this section, Grantor's rights under all licenses agreements inure to Creditor's benefit, and/or (c) exercise all rights and remedies and dispose of the Intellectual Property Collateral according to the applicable Uniform Commercial Code.

10. Demand Waiver. Grantor waives demand, notice of default or dishonor, notice of payment and nonpayment, notice of nay default, nonpayment at maturity, release, compromise, settlement, extension, documents, instruments, and chattel paper held by Creditor on which Grantor is liable.

11. Notices. Notices or demands by either party about this Agreement must be in writing and personally delivered or sent by overnight delivery serve, by

certified mail postage prepaid return receipt requested, or by fax to the addresses listed at the beginning of this Agreement. A party may change notice address by written notice to the other party.

12. Choice of Law, Venue and Attorney's Fees. This Agreement shall be governed and construed in accordance with the laws of the Commonwealth of Massachusetts regardless to any conflict of law principles. Grantor and Creditor each submit to the exclusive jurisdiction of the state and federal courts in Boston, Massachusetts; provided, however, that nothing in this Agreement shall be deemed to operate to preclude Creditor from bringing suit or taking other legal action in any other jurisdiction to realize on the Intellectual Property Collateral or any other security for the obligations of Grantor, or to enforce a judgment or other court order in favor of Creditor. Grantor expressly submits and consents in advance to such jurisdiction in any action or suit commenced in any such court, and Grantor hereby waives any objection that it may have based on lack of personal jurisdiction, improper venue, or forum non conveniens and hereby consents to the granting of such legal or equitable relief as is deemed appropriate by such court. The prevailing party in any such legal proceeding shall be entitled to reasonable attorney's fees and costs so incurred.

13. Severability. Each provision of this Agreement is severable from every other provision in determining the enforceability of any provision.

14. Counterparts. This Agreement may be executed in any number of counterparts and by different parties on separate counterparts, each of which, when executed and delivered, are an original, and all taken together, constitute on Agreement.

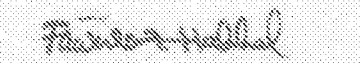
[The rest of this page intentionally left blank. Signatures on the next page.]

IN WITNESS WHEREOF, the parties have caused this Intellectual Property Security Agreement to be duly executed by its officers thereunto duly authorized as of the first date written above.

ZENA TECHNOLOGIES, INC.


By: _____

Jeff Liao
President



Fawwaz Habbal

SCHEDULE A: INTELLECTUAL PROPERTY COLLATERAL
ZENA TECHNOLOGIES, INC.
Patents and Applications

Official No.	Title	Case Status	Case Type	Country
8269985	DETERMINATION OF OPTIMAL DIAMETERS FOR NANOWIRES	Registered	Properties	United States of America
8546742	ARRAY OF NANOWIRES IN A SINGLE CAVITY WITH ANTI-REFLECTIVE COATING ON SUBSTRATE	Registered	Properties	United States of America
8274039	VERTICAL WAVEGUIDES WITH VARIOUS FUNCTIONALITY ON INTEGRATED CIRCUITS	Registered	Properties	United States of America
8791470	NANO STRUCTURED LEDS	Registered	Properties	United States of America
7646943	OPTICAL WAVEGUIDES IN IMAGE SENSOR	Registered	Properties	United States of America
8384007	NANO WIRE BASED PASSIVE PIXEL IMAGING SENSOR	Registered	Properties	United States of America
8735797	NANOWIRE PHOTO-DETECTOR GROWN ON A BACK-SIDE ILLUMINATED IMAGE SENSOR	Registered	Properties	United States of America
8519379	NANOWIRE STRUCTURED PHOTODIODE WITH A SURROUNDING EPITAXIALLY GROWN P OR N LAYER	Registered	Properties	United States of America
12/633313	VERTICAL PHOTOGATE (VPG) PIXEL STRUCTURE WITH NANOWIRES	Published	Properties	United States of America
8299472	ACTIVE PIXEL SENSOR WITH NANOWIRE STRUCTURED PHOTODETECTORS	Registered	Properties	United States of America
8889455	MANUFACTURING NANOWIRE PHOTO-DETECTOR GROWN ON A BACK-SIDE ILLUMINATED	Registered	Properties	United States of America
8229255	OPTICAL WAVEGUIDES IN IMAGE SENSOR	Registered	Properties	United States of America

9298866	NANOWIRE ARRAY BASED SOLAR ENERGY HARVESTING DEVICE	Registered	Properties	United States of America
8866065	NANOWIRE ARRAYS COMPRISING FLUORESCENT NANOWIRES	Registered	Properties	United States of America
8748799	FULL COLOR SINGLE PIXEL INCLUDING DOUBLET OR QUADRUPLET SI	Registered	Properties	United States of America
8507840	VERTICALLY STRUCTURED PASSIVE PIXEL ARRAYS AND METHODS FOR FABRICATING THE	Registered	Properties	United States of America
9000353	LIGHT ABSORPTION AND FILTERING PROPERTIES OF VERTICALLY ORIENTED	Registered	Properties	United States of America
9515218	VERTICAL PILLAR STRUCTURED PHOTOVOLTAIC DEVICES WITH MIRRORS AND	Registered	Properties	United States of America
9406709	METHODS FOR FABRICATING AND USING NANOWIRES	Registered	Properties	United States of America
8890271	SILICON NITRIDE LIGHT PIPES FOR IMAGE SENSORS	Registered	Properties	United States of America
8835831	POLARIZED LIGHT DETECTING DEVICE AND FABRICATION METHODS OF THE SAME	Registered	Properties	United States of America
8835905	SOLAR BLIND ULTRA VIOLET (UV) DETECTOR AND FABRICATION METHODS OF THE SAME	Registered	Properties	United States of America
9082673	PASSIVATED UPSTANDING NANOSTRUCTURE S AND METHODS OF MAKING THE SAME	Registered	Properties	United States of America

13/288131	VERTICAL PILLAR STRUCTURED PHOTOVOLTAIC DEVICES WITH WAVELENGTH-	Published	Properties	United States of America
14/334848	BIFACIAL PHOTOVOLTAIC DEVICES	Published	Properties	United States of America
14/032166	PILLAR STRUCTURED MULTIJUNCTION PHOTOVOLTAIC DEVICES	Published	Properties	United States of America
13/543307	MULTI-JUNCTION PHOTOVOLTAIC DEVICES	Published	Properties	United States of America
8471190	VERTICAL WAVEGUIDES WITH VARIOUS FUNCTIONALITY ON INTEGRATED CIRCUITS	Registered	Properties	United States of America
8754359	NANOWIRE PHOTO- DETECTOR GROWN ON A BACK-SIDE ILLUMINATED IMAGE SENSOR	Registered	Properties	United States of America
8766272	ACTIVE PIXEL SENSOR WITH NANOWIRE STRUCTURED PHOTODETECTOR	Registered	Properties	United States of America
9429723	OPTICAL WAVEGUIDES IN IMAGE SENSORS	Registered	Properties	United States of America
8514411	DETERMINATION OF OPTIMAL DIAMETERS FOR NANOWIRES	Registered	Properties	United States of America
9343490	NANOWIRE STRUCTURED COLOR FILTER ARRAYS AND FABRICATION	Registered	Properties	United States of America
13/693207	MULTI-JUNCTION MULTI-TAB PHOTOVOLTAIC DEVICES	Published	Properties	United States of America

9263613	NANOWIRE PHOTO-DETECTOR GROWN ON A BACK-SIDE ILLUMINATED IMAGE SENSOR	Registered	Properties	United States of America
9304035	VERTICAL WAVEGUIDES WITH VARIOUS FUNCTIONALITY ON INTEGRATED CIRCUITS	Registered	Properties	United States of America
8810808	DETERMINATION OF OPTIMAL DIAMETERS FOR NANOWIRES	Registered	Properties	United States of America
8710488	NANO WIRE STRUCTURED PHOTODIODE WITH A SURROUNDING EPITAXIALLY	Registered	Properties	United States of America
9177985	ARRAY OF NANOWIRES IN A SINGLE CAVITY WITH ANTI-REFLECTIVE	Registered	Properties	United States of America
14/322503	VERTICAL PILLAR STRUCTURED PHOTOVOLTAIC DEVICES WITH THIN MONO-	Published	Properties	United States of America
9478665	VERTICAL PILLAR STRUCTURED INFRARED DETECTOR AND FABRICATION	Registered	Properties	United States of America
14/563781	Pillar Based Amorphous and Polycrystalline Photoconductors for X- ray Image Sensors	Published	Properties	United States of America
14/274448	NANO STRUCTURED LEDS	Published	Properties	United States of America
9543458	FULL COLOR SINGLE PIXEL INCLUDING DOUBLET OR QUADRUPLLET SI	Registered	Properties	United States of America
9123841	NANOWIRE PHOTO-DETECTOR GROWN ON A BACK-SIDE ILLUMINATED IMAGE SENSOR	Registered	Properties	United States of America

9490283	ACTIVE PIXEL SENSOR WITH NANOWIRE STRUCTURED PHOTODETECTOR	Registered	Properties	United States of America
14/516402	BACK-LIT PHOTODETECTOR	Published	Properties	United States of America
14/501983	MANUFACTURING NANOWIRE PHOTO- DETECTOR GROWN ON A BACK-SIDE ILLUMINATED	Published	Properties	United States of America
14/516162	MULTISPECTRAL AND POLARIZATION- SELECTIVE DETECTOR	Published	Properties	United States of America
14/450812	POLARIZED LIGHT DETECTING DEVICE AND FABRICATION METHODS OF THE SAME	Application allowed	Properties	United States of America
9410843	NANOWIRE ARRAYS COMPRISING FLUORESCENT NANOWIRES AND SUBSTRATE	Registered	Properties	United States of America
14/459398	DETERMINATION OF OPTIMAL DIAMETERS FOR NANOWIRES	Application allowed	Properties	United States of America
9054008	SOLAR BLIND ULTRA VIOLET (UV) DETECTOR AND FABRICATION METHODS OF THE SAME	Registered	Properties	United States of America
14/632739	LIGHT ABSORPTION AND FILTERING PROPERTIES OF VERTICALLY ORIENTED	Application allowed	Properties	United States of America
14/704143	PASSIVATED UPSTANDING NANOSTRUCTURE S AND METHODS OF MAKING THE SAME	Pending	Properties	United States of America
9337220	SOLAR BLIND ULTRA VIOLET (UV) DETECTOR AND FABRICATION METHODS OF THE SAME	Registered	Properties	United States of America

14/929890	ARRAY OF NANOWIRES IN A SINGLE CAVITY WITH ANTI-REFLECTIVE	Published	Properties	United States of America
PCT/US2015/055710	BACK-LIT PHOTODETECTOR	Published	Properties	Patent Cooperation Treaty
PCT/US2015/055728	MULTISPECTRAL AND POLARIZATION-SELECTIVE DETECTOR	Published	Properties	Patent Cooperation Treaty
15/225264	METHODS FOR FABRICATING AND USING NANOWIRES	Published	Properties	United States of America
15/042922	NANOWIRE PHOTO-DETECTOR GROWN ON A BACK-SIDE ILLUMINATED IMAGE SENSOR	Published	Properties	United States of America
15/057153	OPTICAL WAVEGUIDES IN IMAGE SENSORS	Published	Properties	United States of America
15/082514	NANOWIRE ARRAY BASED SOLAR ENERGY HARVESTING DEVICE	Published	Properties	United States of America
15/090155	VERTICAL WAVEGUIDES WITH VARIOUS FUNCTIONALITY ON INTEGRATED CIRCUITS	Published	Properties	United States of America
62/307018	NOVEL TECHNOLOGIES IN NANOWIRE DEVICES	Pending	Properties	United States of America
15/149252	SOLAR BLIND ULTRA VIOLET (UV) DETECTOR AND FABRICATION METHODS OF THE SAME	Published	Properties	United States of America
15/093928	NANOWIRE STRUCTURED COLOR FILTER ARRAYS AND FABRICATION	Published	Properties	United States of America

PCT/US2016/032774	METAL MICRO- GRID ELECTRODE FOR HIGHLY EFFICIENT SI MICROWIRE SOLAR	Published	Properties	Patent Cooperation Treaty
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