

PATENT ASSIGNMENT

Electronic Version v1.1

Stylesheet Version v1.1

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| SUBMISSION TYPE: | NEW ASSIGNMENT |
| NATURE OF CONVEYANCE: | ASSIGNMENT |
| CONVEYING PARTY DATA | |
| Name | Execution Date |
| Nader ENGHETA | 08/10/2010 |
| Hideo IIZUKA | 08/04/2010 |
| RECEIVING PARTY DATA | |
| Name: | The Trustees of the University of Pennsylvania |
| Street Address: | 3451 Walnut St., Franklin Bldg., Rm. P221 |
| Internal Address: | Office of Research Services |
| City: | Philadelphia |
| State/Country: | PENNSYLVANIA |
| Postal Code: | 19104-6205 |
| Name: | Toyota Motor Engineering & Manufacturing North America, Inc. |
| Street Address: | 25 Atlantic Avenue |
| City: | Erlanger |
| State/Country: | KENTUCKY |
| Postal Code: | 41018 |
| PROPERTY NUMBERS Total: 1 | |
| Property Type | Number |
| Application Number: | 12855844 |
| CORRESPONDENCE DATA | |
| Fax Number: | (248)649-3333 |
| <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i> | |
| Phone: | 248-649-3333 |
| Email: | docketing@youngbasile.com |
| Correspondent Name: | Christopher G. Darrow |
| Address Line 1: | 3001 W. Big Beaver Rd., Ste. 624 |
| Address Line 2: | Young Basile Hanlon & MacFarlane PC |

CH \$40.00 12855844

501276321

**PATENT
REEL: 024908 FRAME: 0424**

Address Line 4: Troy, MICHIGAN 48084

ATTORNEY DOCKET NUMBER:

TRDL-106-A

NAME OF SUBMITTER:

Christopher G. Darrow

Total Attachments: 4

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ASSIGNMENT AND AGREEMENT

WHEREAS, **Nader ENGHETA** of 2077 Fox Creek Road, Berwyn, Pennsylvania 19312 (hereinafter referred to as "ASSIGNOR"), along with a co-inventor Hideo Iizuka, has invented a certain invention entitled OPTICAL DEVICE USING DOUBLE-GROOVE GRATING as set forth in this United States Patent Application,

☐ executed concurrently herewith

☐ executed on

■ Serial No. 12/855,844

Filed 08/13/2010

WHEREAS, The Trustees of the University of Pennsylvania, a non-profit corporation with offices located at Office of Research Services, Franklin Building, Room P221, 3451 Walnut Street, Philadelphia, Pennsylvania 19104-6205, (hereinafter referred to as "ASSIGNEE"), desires to acquire the entire right, title, and interest in and to said invention held by inventor Nader Engheta.

NOW THEREFORE, in consideration of One Dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, ASSIGNOR has sold, assigned, and transferred, and by these presents hereby sells, assigns and transfers, unto ASSIGNEE, its successors and assigns, the full and exclusive right, title, and interest in and to (a) the above-identified invention or inventions and all improvements and modifications thereof, (b) the above-identified application and all other applications for Letters Patent of the United States and countries foreign thereto for the above-identified invention or inventions and all improvements and modifications thereof, (c) all Letters Patent which may issue from said applications in the United States and countries foreign thereto, (d) all divisions, continuations, reissues, and extensions of said applications and Letters Patent, and (e) the right to claim for any of said applications the full benefits and priority rights under the International Convention and any other international agreement to which the United States adheres; such right, title, and interest to be held and enjoyed by ASSIGNEE, its successors and assigns, to the full end of the term or terms for which any and all such Letters Patent may be granted as fully and entirely as would have been held and enjoyed by ASSIGNOR had this Assignment not been made.

ASSIGNOR HEREBY AUTHORIZES AND REQUESTS the Commissioner of Patents and Trademarks to issue said Letters Patent to ASSIGNEE as assignee for the sole use and benefit of ASSIGNEE, and its successors and assigns.

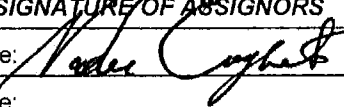

ASSIGNOR HEREBY AGREES (a) to communicate to ASSIGNEE, its successors and assigns, or their representatives or agents, all facts and information known or available to ASSIGNORS respecting said invention or inventions, improvements, and modifications including evidence for interference, reexamination, reissue, opposition, revocation, extension, or infringement purposes or other legal, judicial, or administrative proceedings,

whenever requested by ASSIGNEE; (b) to testify in person or by affidavit as required by ASSIGNEE, its successors and assigns, in any such proceeding in the United States or a country foreign thereto; (c) to execute and deliver, upon request by ASSIGNEE, all lawful papers including, but not limited to, original, divisional, continuation, and reissue applications, renewals, assignments, powers of attorney, oaths, affidavits, declarations, depositions; and (d) to provide all reasonable assistance to ASSIGNEE, its successors and assigns, in obtaining and enforcing proper title in and protection for said invention or inventions, improvements, and modifications under the intellectual property laws of the United States and countries foreign thereto.

ASSIGNOR HEREBY REPRESENTS AND WARRANTS that ASSIGNOR has the full and unencumbered right to sell, assign, and transfer the interests sold, assigned, and transferred herein, and that ASSIGNOR has not executed and will not execute any document or instrument in conflict herewith.

ASSIGNOR HEREBY GRANTS to the law firm of Young Basile Hanlon & MacFarlane, P.C. the power and authority to insert in this Assignment any further identification which may be necessary or desirable to comply with the rules of the U.S. Patent and Trademark Office for recordation of this Assignment.

ASSIGNOR UNDERSTANDS AND AGREES that the attorneys and agents of the law firm of Young Basile Hanlon & MacFarlane, P.C. do not personally represent ASSIGNOR or ASSIGNOR'S legal interests, but instead represent the interests of ASSIGNEE; since said attorneys and agents cannot provide legal advice to ASSIGNOR with respect to this Assignment, ASSIGNOR acknowledges their right to seek their own independent legal counsel.

| NAMES AND SIGNATURE OF ASSIGNORS | | |
|----------------------------------|---|---------------------|
| Name: Nader ENGHETA | Signature:  | Date: Aug. 10, 2010 |
| Name: | Signature: | Date: |
| NAMES AND SIGNATURE OF WITNESS | | |
| Name: JESSICA BRENNAN | Signature:  | Date: 8/10/10 |

Note: *Prima facie* evidence of execution may optionally be obtained by execution of this document before a U.S. Consul or before a local officer authorized to administer oaths whose authority is proved by a certificate from a U.S. Consul.

ASSIGNMENT AND AGREEMENT

WHEREAS, **Hideo IIZUKA** of 4949 Ravine Court, Ann Arbor, Michigan 48105, (hereinafter referred to as "ASSIGNOR") has invented, along with co-inventor Nader ENGHETA, a certain invention entitled OPTICAL DEVICE USING DOUBLE-GROOVE GRATING as set forth in this United States Patent Application,

☐ executed concurrently herewith

☐ executed on

■ Serial No. 12/855,844

Filed 08/13/2010

WHEREAS, Toyota Motor Engineering & Manufacturing North America, Inc., a corporation of the state of Kentucky having its principal place of business at 25 Atlantic Avenue, Erlanger, Kentucky 41018, (hereinafter referred to as "ASSIGNEE"), desires to acquire the entire right, title, and interest in and to said invention held by inventor Hideo Iizuka;

NOW THEREFORE, in consideration of One Dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, ASSIGNOR has sold, assigned, and transferred, and by these presents hereby sells, assigns and transfers, unto ASSIGNEE, its successors and assigns, the full and exclusive right, title, and interest in and to (a) the above-identified invention or inventions and all improvements and modifications thereof, (b) the above-identified application and all other applications for Letters Patent of the United States and countries foreign thereto for the above-identified invention or inventions and all improvements and modifications thereof, (c) all Letters Patent which may issue from said applications in the United States and countries foreign thereto, (d) all divisions, continuations, reissues, and extensions of said applications and Letters Patent, and (e) the right to claim for any of said applications the full benefits and priority rights under the International Convention and any other international agreement to which the United States adheres; such right, title, and interest to be held and enjoyed by ASSIGNEE, its successors and assigns, to the full end of the term or terms for which any and all such Letters Patent may be granted as fully and entirely as would have been held and enjoyed by ASSIGNOR had this Assignment not been made.

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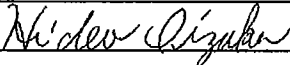
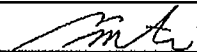
ASSIGNOR HEREBY AGREES (a) to communicate to ASSIGNEE, its successors and assigns, or their representatives or agents, all facts and information known or available to ASSIGNORS respecting said invention or inventions, improvements, and modifications including evidence for interference, reexamination, reissue, opposition, revocation, extension, or infringement purposes or other legal, judicial, or administrative proceedings,

whenever requested by ASSIGNEE; (b) to testify in person or by affidavit as required by ASSIGNEE, its successors and assigns, in any such proceeding in the United States or a country foreign thereto; (c) to execute and deliver, upon request by ASSIGNEE, all lawful papers including, but not limited to, original, divisional, continuation, and reissue applications, renewals, assignments, powers of attorney, oaths, affidavits, declarations, depositions; and (d) to provide all reasonable assistance to ASSIGNEE, its successors and assigns, in obtaining and enforcing proper title in and protection for said invention or inventions, improvements, and modifications under the intellectual property laws of the United States and countries foreign thereto.

ASSIGNOR HEREBY REPRESENTS AND WARRANTS that ASSIGNOR has the full and unencumbered right to sell, assign, and transfer the interests sold, assigned, and transferred herein, and that ASSIGNOR has not executed and will not execute any document or instrument in conflict herewith.

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| NAMES AND SIGNATURE OF ASSIGNORS | | |
|----------------------------------|---|----------------|
| Name: Hideo IIZUKA | Signature:  | Date: 8/4/2010 |
| Name: | Signature: | Date: |
| NAMES AND SIGNATURE OF WITNESS | | |
| Name: Masaki Matsui | Signature:  | Date: 8/4/2010 |

Note: *Prima facie* evidence of execution may optionally be obtained by execution of this document before a U.S. Consul or before a local officer authorized to administer oaths whose authority is proved by a certificate from a U.S. Consul.