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PATENT ASSIGNMENT COVER SHEET

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| NATURE OF CONVEYAN | NCE: | ASSIGNMENT | ASSIGNMENT | | | |
| CONVEYING PARTY DA | ATA | | | | | |
| | | Name | | Execution Date | | |
| PO YAO LI | | | | 10/14/2019 | | |
| SHAO CHANG TU | | | | 10/15/2019 | | |
| TSUNG-YING WU | | | 10/14/2019 | | | |
| WEI CHIH LIN | | | | 10/14/2019 | | |
| RECEIVING PARTY DA | ТА | | | | | |
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| Postal Code: | 300-78 | | | | | |
| Property Type | | Number | | | | |
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| Property Type Application Number: | | Number 17853577 | | | | |
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| Application Number: CORRESPONDENCE D Fax Number: | ΑΤΑ | (703)518-5499 | | | | |
| Application Number: CORRESPONDENCE D. Fax Number: <i>Correspondence will be</i> | ATA e sent to | 17853577 (703)518-5499 the e-mail address first; if that | | | | |
| Application Number: CORRESPONDENCE D. Fax Number: <i>Correspondence will be</i> | ATA e sent to provided | (703)518-5499 | | | | |
| Application Number: CORRESPONDENCE D Fax Number: Correspondence will be using a fax number, if p | ATA e sent to provided | 17853577 (703)518-5499 <i>the e-mail address first; if that</i> <i>; if that is unsuccessful, it will</i> | | | | |
| Application Number: CORRESPONDENCE D Fax Number: Correspondence will be using a fax number, if p Phone: Email: Correspondent Name: | ATA e sent to provided | (703)518-5499 <i>the e-mail address first; if that</i> <i>; if that is unsuccessful, it will i</i> 7036841111 smc@ipfirm.com HAUPTMAN HAM, LLP (TSMC) | | | | |
| Application Number: CORRESPONDENCE D Fax Number: Correspondence will be using a fax number, if p Phone: Email: Correspondent Name: Address Line 1: | ATA e sent to provided | (703)518-5499 <i>the e-mail address first; if that</i> <i>; if that is unsuccessful, it will i</i> 7036841111 rsmc@ipfirm.com HAUPTMAN HAM, LLP (TSMC) 2318 MILL ROAD | | | | |
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| Application Number: CORRESPONDENCE D Fax Number: Correspondence will be using a fax number, if p Phone: Email: Correspondent Name: Address Line 1: | ATA e sent to provided | (703)518-5499 <i>the e-mail address first; if that</i> <i>; if that is unsuccessful, it will i</i> 7036841111 rsmc@ipfirm.com HAUPTMAN HAM, LLP (TSMC) 2318 MILL ROAD | | | | |
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| Application Number: CORRESPONDENCE D. Fax Number: <i>Correspondence will be</i> <i>using a fax number, if p</i> Phone: Email: Correspondent Name: Address Line 1: Address Line 2: Address Line 2: Address Line 4: ATTORNEY DOCKET NUN NAME OF SUBMITTER: SIGNATURE: | ATA e sent to provided | (703)518-5499 the e-mail address first; if that ; if that is unsuccessful, it will is 7036841111 rsmc@ipfirm.com HAUPTMAN HAM, LLP (TSMC) 2318 MILL ROAD SUITE 1400 ALEXANDRIA, VIRGINIA 22314 T5057-1373UA RANDY A. NORANBROCK /Randy A. Noranbrock/ | be sen | | | |

Docket No. T5057-1373U P20181434US00

NP-25685-0-US-BA

ASSIGNMENT

In consideration of the premises and other good and valuable consideration in hand paid, the receipt and sufficiency of which is hereby acknowledged, the undersigned,

| 1) | Po Yao Li | 3) | Tsung-Ving WU |
|----|---------------|----|---------------|
| 2) | Shao Chang TU | 4) | Wei Chih LIN |

who has made a certain new and useful invention, hereby sells, assigns and transfers unto TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD., having a place of business at No. 8, Li-Hsin Rd. VI, Hsinchu Science Park, Hsinchu 300, Taiwan R.O.C.

its successors and assigns (hereinafter designated "ASSIGNEE") the entire right, title and interest for the United States of America as defined in 35 U.S.C. 100 in the invention entitled

SYSTEM FOR REDUCING FRICTION-INDUCED WEAR OF PIPE

for which an application for United States Letters Patent was filed on _____2019-10-07_____, and identified by (a) United States Patent Application No. 16/595,045 ; or

(b) for which an application for United States Letters Patent was executed on

and the undersigned hereby authorizes and requests the United States Commissioner of Patents and Trademarks to issue any and all United States Letters Patent which may be granted therefore and any and all extensions, divisions, reissues, continuations, or continuations-in-part thereof, and the right to all benefits under the International Convention for the Protection of Industrial Property to the said ASSIGNEE, for its interest as ASSIGNEE, its successors, assigns and legal representatives; the undersigned agrees that the attorneys of record in said application shall hereafter act on behalf of said ASSIGNEE;

AND the undersigned hereby agrees to transfer a like interest, and to render all necessary assistance in making application for and obtaining original, divisional, reissued or extended Letters Patent of the United States, upon request of the said ASSIGNEE, its successors, assigns and legal representatives, and without further remuneration, in and to any improvements, and applications for patent based thereon, growing out of or related to the said invention; and to execute any papers by the said ASSIGNEE, its successors, assigns and legal representatives, deemed essential to ASSIGNEE's full protection and title in and to the invention hereby transferred.

SIGNED on the date indicated aside my signature:

1) Po Yau LL Name: Po Yau LL

2) <u>Shap chang</u> TU Name: Shap Chang TU

3) <u>Tsung - Ying WU</u> Name: Tsung-Ving WU

4) Wei Claik LIN

2019.10.14 Date:

<u>~~19, 10, 15</u> me

PATENT REEL: 060359 FRAME: 0097

RECORDED: 06/29/2022