PATENT ASSIGNMENT

Electronic Version v1.1 Stylesheet Version v1.1

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

CONVEYING PARTY DATA

| Name | Execution Date |
|--------------------------|----------------|
| Chidambaram G. Kallingal | 06/28/2013 |
| YuYang Sun | 06/28/2013 |

RECEIVING PARTY DATA

| Name: | GLOBALFOUNDRIES Inc. |
|-------------------|-----------------------------------|
| Street Address: | Maples Corporate Services Limited |
| Internal Address: | PO Box 309, Ugland House |
| City: | Grand Cayman |
| State/Country: | CAYMAN ISLANDS |
| Postal Code: | KY1-1104 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 13936680 |

CORRESPONDENCE DATA

Fax Number: 7139347011

Correspondence will be sent via US Mail when the fax attempt is unsuccessful.

Phone: 7139344055

Email: mpaul@wmalaw.com
Correspondent Name: J. Mike Amerson

Address Line 1: 10333 Richmond, Suite 1100
Address Line 4: Houston, TEXAS 77042

| ATTORNEY DOCKET NUMBER: | Y DOCKET NUMBER: 2162.229200 | |
|-------------------------|------------------------------|--|
| NAME OF SUBMITTER: | J. Mike Amerson | |
| Signature: | /J. Mike Amerson/ | |
| Date: | 07/08/2013 | |
| | PAIENI | |

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13936680

CH \$40.00

This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 2

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PATENT REEL: 030751 FRAME: 0527

COMBINED DECLARATION and ASSIGNMENT (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

| As the below named inventor, I hereby declare that: This declaration is directed to: United States application or PCT international application number | Title of Invention | METHODS INVOLVING COLOR-AWARE RETARGETING OF INDIVIDUAL DECOMPOSED PATTERNS WHEN DESIGNING MASKS TO BE USED IN MULTIPLE PATTERNING PROCESSES | |
|--|--|--|--|
| The attached application or PCT international application number | | DECLARATION | |
| Interest to the content of the special content of the application of the special content of | As the below | named inventor, I hereby declare that: | |
| The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. I have reviewed and understand the contents of the application and am aware of the duty to disclose to the US Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR § 1.56. ASSIGNMENT For good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, I hereby sell, assign, transfer, to GLOBALFOUNDRIES Inc. having a business address of PO Box 309. Ugland House, Grand Cayman KYI-1104 its successors and assigns, absolutely and forever, my entire right, title and interest in and to the invention listed above, together with the Application, any and all Patents that may issue in the United States and/or any foreign countries, and any reissues, re-examinations, renewals, continuations, continuation—in-parts, divisionals or extensions thereof that may be issued or granted, and all right, title and interest to the inventions contained in said Patents and Applications, for the United States and all foreign countries, and all the rights and privileges relating thereto including but not limited to the priority rights arising from said Applications, the right to recover and take all such proceedings as may be necessary for the recovery of damages or otherwise in respect of past, present and future infringement, and the right to apply for, take and maintain patents on said inventions. If any portion of this Combined Declaration or Assignment is held unenforceable, then remaining portions hereof shall nevertheless remain in full force and effect. | | | |
| I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. I have reviewed and understand the contents of the application and am aware of the duty to disclose to the US Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR § 1.56. ASSIGNMENT For good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, I hereby sell, assign, transfer, to GLOBALFOUNDRIES Inc. having a business address of PO Box 309, Ugland House, Grand Cayman KYI-1104 its successors and assigns, absolutely and forever, my entire right, title and interest in and to the invention listed above, together with the Application, any and all Patents that may issue in the United States and/or any foreign countries, and any reissues, re-examinations, renewals, continuations, continuation-in-parts, divisionals or extensions thereof that may be issued or granted, and all right, title and interest to the inventions contained in said Patents and Applications, for the United States and all foreign countries, and all the rights and privileges relating thereto including but not limited to the priority rights arising from said Applications, the right to recover and take all such proceedings as may be necessary for the recovery of damages or otherwise in respect of past, present and future infringement, and the right to apply for, take and maintain patents on said inventions. If any portion of this Combined Declaration or Assignment is held unenforceable, then remaining portions hereof shall nevertheless remain in full force and effect. LEGAL NAME OF INVENTOR Inventor: CHIDAMBARAM G. KALLINGAL Date: 6 / 2 8 / 1 3 Signature: K. G. U.S. Signature: M. G. | anti Mila. Hayati ka ta | United States application or PCT international application number filed on | |
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| Signature: K. G. Adl | LEGAL NAME OF INVENTOR | | |
| | Inventor: CHIDAMBARAM G. KALLINGAL Date: 6/28/13 | | |
| | Signature: KG Kd. | | |
| Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional form for each additional inventor. | | | |

PATENT REEL: 030751 FRAME: 0528

COMBINED DECLARATION and ASSIGNMENT (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

| Title of Invention | METHODS INVOLVING COLOR-AWARE RETARGETING OF INDIVIDUAL DECOMPOSED PATTERNS WHEN DESIGNING MASKS TO BE USED IN MULTIPLE PATTERNING PROCESSES | |
|---|--|--|
| | DECLARATION | |
| As the below | named inventor, I hereby declare that: | |
| This declarati | This declaration | |
| | United States application or PCT international application number filed on | |
| | | |
| The above-id | entified application was made or authorized to be made by me. | |
| I believe that | I am the original inventor or an original joint inventor of a claimed invention in the application. | |
| I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. | | |
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| | | |
| LEGAL NAME OF INVENTOR | | |
| Inventor: | YUYANG SUN Date: 6/28/2013 | |
| Signature: | | |
| Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional form for each additional inventor. | | |

PATENT REEL: 030751 FRAME: 0529

RECORDED: 07/08/2013