504547333 09/14/2017

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 EPAS ID: PAT4594041 Stylesheet Version v1.2

 SUBMISSION TYPE:
 NEW ASSIGNMENT

 NATURE OF CONVEYANCE:
 ASSIGNMENT

CONVEYING PARTY DATA

| Name | Execution Date |
|----------------|----------------|
| Denis G. Chen | 09/06/2017 |
| Hari Vasudevan | 09/06/2017 |

RECEIVING PARTY DATA

| Name: | Apple Inc. |
|-----------------|-----------------|
| Street Address: | 1 Infinite Loop |
| City: | Cupertino |
| State/Country: | CALIFORNIA |
| Postal Code: | 95014-2094 |

PROPERTY NUMBERS Total: 1

| Property Type | Number | |
|---------------------|----------|--|
| Application Number: | 15698477 | |

CORRESPONDENCE DATA

Fax Number: (877)769-7945

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.

Phone: (650) 839-5112

Email: apsi@fr.com,obutler@fr.com

Correspondent Name: KIRK A. GOTTLIEB

Address Line 1: FISH & RICHARDSON P.C.

Address Line 2: P.O.BOX 1022

Address Line 4: MINNEAPOLIS, MINNESOTA 55440-1022

ATTORNEY DOCKET NUMBER: 18962-0980001

NAME OF SUBMITTER: ORTALYAH BUTLER

SIGNATURE: /Ortalyah Butler/

DATE SIGNED: 09/14/2017

Total Attachments: 4

source=Assignments#page1.tif source=Assignments#page2.tif source=Assignments#page3.tif source=Assignments#page4.tif

PATENT 504547333 REEL: 043587 FRAME: 0632

Attorney Docket No.: 18962-0980001 / Client Ref:P33406US1

ASSIGNMENT

For good and valuable consideration, the receipt of which is hereby acknowledged, ASSIGNORS, Denis G. Chen, Hari Vasudevan, hereby sell, assign, and transfer to Apple Inc. (CALIFORNIA corporation), having offices located at 1 Infinite Loop, Cupertino, California 95014-2094, and its successors, assigns and legal representatives (collectively, "ASSIGNEE") all of the right, title and interest of ASSIGNORS throughout the world in and to any and all inventions and improvements which are the subject of a patent document entitled

MASS DISPLACEMENT ESTIMATION USING BACK EMF AND MAGNETIC REFERENCE CROSSING

| | | * | |
|-----|---|--|-----|
| (a) | Ø | U.S. patent application executed on, entitled as above, listing the above named persons as Invento | rs. |
| (b) | | U.S. patent application filed on $9/7/2017$ \boxtimes under Application No. $15/698,477$ \square with Express Mail No. (Application Number not yet known). | |
| (c) | | U.S. Patent No.; issued | |

and which is found in

An attorney of record, or the attorney filing the application, is authorized and requested by the execution of this assignment to insert into this assignment the execution date of the application and/or the filing date and serial number of the application when officially known.

This assignment includes the foregoing patent application or patent; all legal equivalents thereof in any foreign country and all patents issuing therefrom; all United States and foreign patents, utility models, and design registrations granted for any of said inventions and improvements; and the right to claim priority based on the filing date of the foregoing patent application or patent under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes. ASSIGNORS authorize ASSIGNEE to apply in all countries in the name of ASSIGNORS or in the name of ASSIGNEE for patents, utility models, and design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements.

ASSIGNORS hereby covenant that no assignment, sale, agreement or encumbrance has been or will be made or entered into that would conflict with this assignment.

ASSIGNORS further covenant for themselves and their respective heirs, legal representatives and assigns to provide to ASSIGNEE promptly upon the request of ASSIGNEE all pertinent facts and documents relating to said invention and said patents and legal equivalents as may be known and accessible to ASSIGNORS and to testify as to the same in any interference, litigation, or proceeding relating thereto and promptly to execute and deliver to ASSIGNEE or its legal representative any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue or enforce said application, said inventions and improvements and said patents and said equivalents thereof which may be necessary or desirable to carry out the purposes thereof.

ASSIGNORS request the Commissioner of Patents and Trademarks to issue said patents of the United States and any reissue or extension thereof to the ASSIGNEE.

| Executed this | Signature of Inventor |
|----------------------------|-----------------------|
| 6 day of <u>Sept.</u> 2017 | Denis G. Chen |
| Executed this | Signature of Inventor |
| day of20 | Hari Vasudevan |
| | |

61553250 doc

Attorney Docket No.: 18962-0980001 / Client Ref:P33406US1

ASSIGNMENT

For good and valuable consideration, the receipt of which is hereby acknowledged, ASSIGNORS, Denis G. Chen, Hari Vasudevan, hereby sell, assign, and transfer to Apple Inc. (CALIFORNIA corporation), having offices located at 1 Infinite Loop, Cupertino, California 95014-2094, and its successors, assigns and legal representatives (collectively, "ASSIGNEE") all of the right, title and interest of ASSIGNORS throughout the world in and to any and all inventions and improvements which are the subject of a patent document entitled

MASS DISPLACEMENT ESTIMATION USING BACK EMF AND MAGNETIC REFERENCE CROSSING

| (a) | U.S. patent application executed on, entitled as above, listing the above named persons as Inventors. | |
|-----|---|--|
| (b) | U.S. patent application filed on 9/7/2017 ☐ under Application No. 15/698,477 ☐ with Express Mail No. (Application Number not yet known). | |
| (c) | U.S. Patent No.: issued | |

and which is found in

An attorney of record, or the attorney filing the application, is authorized and requested by the execution of this assignment to insert into this assignment the execution date of the application and/or the filing date and serial number of the application when officially known.

This assignment includes the foregoing patent application or patent; all legal equivalents thereof in any foreign country and all patents issuing therefrom; all United States and foreign patents, utility models, and design registrations granted for any of said inventions and improvements; and the right to claim priority based on the filling date of the foregoing patent application or patent under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes. ASSIGNORS authorize ASSIGNEE to apply in all countries in the name of ASSIGNORS or in the name of ASSIGNEE for patents, utility models, and design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements.

ASSIGNORS hereby covenant that no assignment, sale, agreement or encumbrance has been or will be made or entered into that would conflict with this assignment.

ASSIGNORS further covenant for themselves and their respective heirs, legal representatives and assigns to provide to ASSIGNEE promptly upon the request of ASSIGNEE all pertinent facts and documents relating to said invention and said patents and legal equivalents as may be known and accessible to ASSIGNORS and to testify as to the same in any interference, litigation, or proceeding relating thereto and promptly to execute and deliver to ASSIGNEE or its legal representative any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue or enforce said application, said inventions and improvements and said patents and said equivalents thereof which may be necessary or desirable to carry out the purposes thereof.

ASSIGNORS request the Commissioner of Patents and Trademarks to issue said patents of the United States and any reissue or extension thereof to the ASSIGNEE.

Assignment Page 1 of 2

Attorney Docket No.: 18962-0980001 / Client Ref:P33406US1

| Executed this | Signature of Inventor |
|--|-----------------------|
| day of 20 | Denis G. Chen |
| Executed this | Signature of inventor |
| <u>5</u> day of <u>5677</u> ,20 <u>1</u> 7 | Han Vasurdevan |

61553250.doc

Assignment Page 2 of 2