### 503832418 05/18/2016

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT3879066

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

#### **CONVEYING PARTY DATA**

| Name         | Execution Date |
|--------------|----------------|
| YOHAN KIM    | 05/17/2016     |
| SONG CHONG   | 05/16/2016     |
| EUNYONG KIM  | 05/17/2016     |
| JOSEPH JEON  | 05/17/2016     |
| OKYOUNG CHOI | 05/16/2016     |
| CHANGSIK LEE | 05/16/2016     |

#### **RECEIVING PARTY DATA**

| Name:                    | SAMSUNG ELECTRONICS CO., LTD.  |
|--------------------------|--|
| Street Address:          | 129, SAMSUNG-RO, YEONGTONG-GU  |
| City:                    | SUWON-SI, GYEONGGI-DO  |
| State/Country:           | KOREA, REPUBLIC OF   |
|                          |  |
| Name:                    | KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY                           |
| Name:<br>Street Address: | KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY 291 DAEHAK-RO, YUSEONG-GU |
|                          |  |

#### **PROPERTY NUMBERS Total: 1**

| Property Type       | Number   |
|---------------------|----------|
| Application Number: | 15158098 |

#### **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.

**Phone:** 202-293-0804

Email: usdocketing@jeffersonip.com
Correspondent Name: JEFFERSON IP LAW, LLP

Address Line 1: 1130 CONNECTICUT AVE., NW, SUITE 420

Address Line 4: WASHINGTON, D.C. 20036

ATTORNEY DOCKET NUMBER: 0203-1884

NAME OF SUBMITTER: GEORGE C. ECKERT

PATENT 503832418 REEL: 038637 FRAME: 0368

| SIGNATURE:                                     | /George C. ECKERT/ |
|--|--------------------|
| DATE SIGNED:                                   | 05/18/2016         |
| Total Attachments: 8                           |                    |
| source=0203-1884 Assignment As Filed#page1.tif |                    |
| source=0203-1884 Assignment As Filed#page2.tif |                    |
| source=0203-1884 Assignment As Filed#page3.tif |                    |
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| source=0203-1884 Assignment As Filed#page5.tif |                    |
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| source=0203-1884 Assignment As Filed#page7.tif |                    |
| source=0203-1884 Assignment As Filed#page8.tif |                    |

PATENT REEL: 038637 FRAME: 0369

| RECORDATION FORM COVER SHEET  |  |  |  |  |  |
|---|--|--|--|--|--|
| PATENTS ONLY  |  |  |  |  |  |
| To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below. |  |  |  |  |  |
| 1. Name of conveying party(ies)   | 2. Name and address of receiving party(ies)  |  |  |  |  |
| 1) Yohan KIM; 2) Song CHONG; 3) Eunyong KIM;<br>4) Joseph JEON; 5) Okyoung CHOI; 6) Changsik LEE                            | Name: Samsung Electronics Co., Ltd.  |  |  |  |  |
| , , . , . , . , ,   | Internal Address:  |  |  |  |  |
| Additional name(s) of conveying party(ies) attached? Yes No  3. Nature of conveyance/Execution Date(s):                     | Street Address: 129, Samsung-ro, Yeongtong-gu  |  |  |  |  |
| Execution Date(s) May 16, 2016; May 17, 2016  |  |  |  |  |  |
| Assignment Merger  Security Agreement Change of Name  | City: Suwon-si, Gyeonggi-do  |  |  |  |  |
| Joint Research Agreement  | State:   |  |  |  |  |
| Government Interest Assignment  | State: Zip: Zip: Additional name(s) & address(es) attached? ✓ Yes No   |  |  |  |  |
| Executive Order 9424, Confirmatory License  |  |  |  |  |  |
| Other   |  |  |  |  |  |
| Additional numbers at 5. Name and address to whom correspondence  | ached? Yes No  |  |  |  |  |
| concerning document should be mailed:   | 6. Total number of applications and patents involved: One  |  |  |  |  |
| Name: Jefferson IP Law, LLP   | 7. Total fee (37 CFR 1.21(h) & 3.41) \$  |  |  |  |  |
| Internal Address: George Eckert   | Authorized to be charged by credit card  |  |  |  |  |
| Street Address: 1130 Connecticut Ave., NW, Suite 420  | Authorized to be charged to deposit account Enclosed None required (government interest not affecting title) |  |  |  |  |
| City: Washington  | 8. Payment Information   |  |  |  |  |
| State: DC Zip:20036   | a. Credit Card Last 4 Numbers<br>Expiration Date   |  |  |  |  |
| Phone Number: 202-293-0804  |  |  |  |  |  |
| Fax Number: <u>202-403-3587</u>   | b. Deposit Account Number  |  |  |  |  |
| Email Address: usdocketing@jeffersonip.com  | Authorized User Name   |  |  |  |  |
| 9. Signature:   | 559 900 May 10, 0010   |  |  |  |  |
| /George C. ECKERT/ Reg. No<br>Signature   | o. 58,892 May 18, 2016 Date  |  |  |  |  |
| George C. Eckert Name of Person Signing   | Total number of pages including cover sheet, attachments, and documents:                                     |  |  |  |  |

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1450, Alexandria, V.A. 22313-1450

Additional name and address of receiving parties:

Name: KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY

Address: 291 Daehak-ro, Yuseong-gu, Daejeon, Republic of Korea

> PATENT REEL: 038637 FRAME: 0371

DOCKET NO: 0203-1884

CLIENT REF.: YPF201603-0039/US\_DMC SAMSUNG REF.: GA-201503-001-1-US0

## Assignment

WHEREAS, the following inventors, namely 1) Yohan KIM, a citizen of the Republic of Korea, 2) Song CHONG, a citizen of the United States, 3) Eunyong KIM, a citizen of the Republic of Korea, 4) Joseph JEON, a citizen of the Republic of Korea, 5) Okyoung CHOI, a citizen of the Republic of Korea, and 6) Changsik LEE, a citizen of the Republic of Korea (hereinafter called "Assignors"), having made or discovered certain new, useful and non-obvious improvements in an invention having a working title of:

## SCHEDULING METHOD AND APPARATUS OF WIRELESS COMMUNICATION SYSTEM.

for which a United States Patent Application is being filed concurrently berewith or, if not being concurrently filed, was filed on May 18, 2016 and assigned Serial No. 15/158,098 \_\_\_; and,

WHEREAS, Samsung Electronics Co., Ltd., a corporation duly organized under the laws of the Republic of Korea, located and doing business at 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyconggi-do, Republic of Korea, 16677, and Korea Advanced Institute of Science and Technology, a corporation duly organized under the laws of the Republic of Korea, located and doing business at 291 Daehak-ro, Yuseong-gu, Daejeon, Republic of Korea (hereinafter called "Assignees"), are desirous of acquiring the entire right, title and interest therein;

NOW, THEREFORE, BE IT KNOWN that for and in good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignors do hereby sell, assign and transfer unto said Assignces the entire and exclusive worldwide right, title and interest in and to all said inventions and discoveries disclosed in said application, and in and to said application, any and all substitutions, divisions, provisionals, conversions of provisionals and continuations thereof, and in and to all Letters Patent. United States and foreign, that may be granted for said inventions and discoveries, and in and to all extensions, renewals and ressues thereof; and the right to file any foreign application and/or claim priority under the provisions of any international treaty or convention arising from this application or any divisional, continuing, substitute or reissue application therefrom. The aforesaid assignment includes the right in and to all income, royalties, damages and payments, now or hereafter due or payable with respect to any Letters Patent which may be granted, and in and to all causes of action (either in law or in equity), and the right to sue, counterclaim, and recover for past, present and future infringement of the rights assigned or to be assigned under this Assignment, as fully and entirely as the same would have been held and enjoyed by Assignors if this sale, assignment and transfer had not been made.

Assignors covenant and agree, without further compensation to said Assignors but at Assignees' expense:

- a. to execute:
  - all papers to be used in connection with this application and any divisional. continuing, substitute or reissue application thereof, as the Assignees may deem necessary or expedient, and

PATENT REEL: 038637 FRAME: 0372

DOCKET NO.: 0203-1884

CLIENT REF.: YPF201603-0039/US\_DMC SAMSUNG REF.: GA-201503-001-1-US0

- all papers in connection with any interference, litigation, mediation, arbitration or other proceeding relating to this application or any divisional, continuing, substitute or reissue application thereof, as may be necessary or expedient;
- to cooperate with the Assignees in every way possible in obtaining evidence and going forward in any interference, litigation, mediation, arbitration or other proceeding relating to said invention, said application and any divisional, continuing, substitute or reissue application thereof;
- c. to communicate to the Assignees any facts relating to said invention, said application and any divisional, continuing, substitute or reissue application thereof, including evidence for any interference, litigation, mediation, arbitration or other proceeding relating to said invention, whenever requested;
- d. to testify in any interference, litigation, mediation, arbitration or other proceeding relating to said invention, said application and any divisional, continuing, substitute or reissue application thereof whenever requested; and
- e. to perform all other affirmative acts which may be necessary or desirable to secure full and complete protection of the inventions and discoveries or that may be necessary or desirable to vest in Assignees the complete title to the inventions and discoveries and Letters Patent hereby conveyed and to enable Assignees to record title.

Assignors hereby authorize and request the United States Patent and Trademark Office or any other issuing authority to issue any and all Letters Patent that may be granted upon this invention and/or this application or any divisional, continuing, substitute or reissue application thereof to the Assignees, its legal representatives, successors and assigns.

Assignors each hereby represents, covenants and warrants that he or she has the full right to convey the entire right, title and interest by this instrument, free of any encumbrances and that no other agreement has been or will be executed in conflict herewith.

The provisions of this Assignment are binding upon Assignors' heirs, legal representatives and/or administrators and assigns.

Assignors hereby grant to the law firm of Jefferson IP Law, LLP of Washington, DC and its attorneys and agents as associated with Customer No. 68103 the authority and power to insert on this instrument any further identification which may be necessary or desirable for purposes of recordation in the United States Patent and Trademark Office or a Patent Office of any foreign country.

Okyoung CHOI

Changsik LEE

Date

Date

Signature of Inventor.

DOCKET NO.: 0203-1884

CLIENT REF.: YPF201603-0039/US\_DMC

DOCKET NO: 0203-1884

CLIENT REF.: YPF201603-0039/US\_DMC SAMSUNG REF.: GA-201503-001-1-US0

## <u>Assignment</u>

WHEREAS, the following inventors, namely 1) Yohan KIM, a citizen of the Republic of Korea, 2) Song CHONG, a citizen of the United States, 3) Eunyong KIM, a citizen of the Republic of Korea, 4) Joseph JEON, a citizen of the Republic of Korea, 5) Okyoung CHOI, a citizen of the Republic of Korea, and 6) Changsik LEE, a citizen of the Republic of Korea (hereinafter called "Assignors"), having made or discovered certain new, useful and non-obvious improvements in an invention having a working title of:

# SCHEDULING METHOD AND APPARATUS OF WIRELESS COMMUNICATION SYSTEM,

for which a United States Patent Application is being filed concurrently berewith or, if not being concurrently filed, was filed on May 18, 2016 and assigned Serial No. 15/158,098 and,

WHEREAS, Samsung Electronics Co., Ltd., a corporation duly organized under the laws of the Republic of Korea, located and doing business at 129. Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea, 16677, and Korea Advanced Institute of Science and Technology, a corporation duly organized under the laws of the Republic of Korea, located and doing business at 291 Daehak-ro, Yuseong-gu, Daejeon, Republic of Korea (hereinafter called "Assignees"), are desirous of acquiring the entire right, title and interest therein;

NOW, THEREFORE, BE IT KNOWN that for and in good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignors do hereby sell, assign and transfer unto said Assignces the entire and exclusive worldwide right, title and interest in and to all said inventions and discoveries disclosed in said application, and in and to said application, any and all substitutions, divisions, provisionals, conversions of provisionals and continuations thereof, and in and to all Letters Patent. United States and foreign, that may be granted for said inventions and discoveries, and in and to all extensions, renewals and ressues thereof; and the right to file any foreign application and/or claim priority under the provisions of any international treaty or convention arising from this application or any divisional, continuing, substitute or reissue application therefrom. The aforesaid assignment includes the right in and to all income, royalties, damages and payments, now or hereafter due or payable with respect to any Letters Patent which may be granted, and in and to all causes of action (either in law or in equity), and the right to sue, counterclaim, and recover for past, present and future infringement of the rights assigned or to be assigned under this Assignment, as fully and entirely as the same would have been held and enjoyed by Assignors if this sale, assignment and transfer had not been made.

Assignors covenant and agree, without further compensation to said Assignors but at Assignees' expense:

- a. to execute:
  - all papers to be used in connection with this application and any divisional, continuing, substitute or reissue application thereof, as the Assignees may deem necessary or expedient, and

PATENT

REEL: 038637 FRAME: 0375

DOCKET NO.: 0203-1884

CLIENT REF.: YPF201603-0039/US\_DMC SAMSUNG REF.: GA-201503-001-1-US0

- all papers in connection with any interference, litigation, mediation, arbitration or other proceeding relating to this application or any divisional, continuing, substitute or reissue application thereof, as may be necessary or expedient;
- to cooperate with the Assignees in every way possible in obtaining evidence and going forward in any interference, litigation, mediation, arbitration or other proceeding relating to said invention, said application and any divisional, continuing, substitute or reissue application thereof;
- to communicate to the Assignees any facts relating to said invention, said application and any divisional, continuing, substitute or reissue application thereof, including evidence for any interference, litigation, mediation, arbitration or other proceeding relating to said invention, whenever requested;
- d. to testify in any interference, litigation, mediation, arbitration or other proceeding relating to said invention, said application and any divisional, continuing, substitute or reissue application thereof whenever requested; and
- e. to perform all other affirmative acts which may be necessary or desirable to secure full and complete protection of the inventions and discoveries or that may be necessary or desirable to vest in Assignees the complete title to the inventions and discoveries and Letters Patent hereby conveyed and to enable Assignees to record title.

Assignors hereby authorize and request the United States Patent and Trademark Office or any other issuing authority to issue any and all Letters Patent that may be granted upon this invention and/or this application or any divisional, continuing, substitute or reissue application thereof to the Assignees, its legal representatives, successors and assigns.

Assignors each hereby represents, covenants and warrants that he or she has the full right to convey the entire right, title and interest by this instrument, free of any encumbrances and that no other agreement has been or will be executed in conflict herewith.

The provisions of this Assignment are binding upon Assignors' heirs, legal representatives and/or administrators and assigns.

Assignors hereby grant to the law firm of Jefferson IP Law, LLP of Washington, DC and its attorneys and agents as associated with Customer No. 68103 the authority and power to insert on this instrument any further identification which may be necessary or desirable for purposes of recordation in the United States Patent and Trademark Office or a Patent Office of any foreign country.

DOCKET NO.: 0203-1884

CLIENT REF.: YPF201603-0039/US\_DMC SAMSUNG REF.: GA-201503-001-1-US0

| Signature of Inventor: |              |              |
|------------------------|--------------|--------------|
|                        | Yohan KIM    | Date         |
| Signature of Inventor: |              | 2016 5 . 18  |
|                        | Song CHONG   | Date         |
| Signature of Inventor: |              |              |
|                        | Eunyong KIM  | Date         |
| Signature of Inventor: |              |              |
|                        | Joseph JEON  | Date         |
| Signature of Inventor: | <u> </u>     | 2416 3.16    |
|                        | Okyoung CHOI | Date         |
| Signature of inventor: | 405          | 2016. \$. 16 |
|                        | Changsik LEE | Date         |

**RECORDED: 05/18/2016**