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07/16/2012

Form PTO-1595 (Rev. 03-11)
OMB No. 0651-0027 (exp. 03/31/2012)U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office**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):Jin-eun Kim (07/09/2012), Q-han Park
(07/09/2012), Chang-won Lee (07/09/2012),
Yeon-sang Park (07/09/2012),Additional name(s) of conveying party(ies) attached? ☒ Yes ☐ No**2. Name and address of receiving party(ies)**Name: Samsung Electronics Co., Ltd.

Internal Address: _____

Street Address: _____

129, Samsung-ro, Yeongtong-gu

City: Suwon-si, Gyeonggi-do

State: _____

Country: Republic of Korea Zip: 443-742Additional name(s) & address(es) attached? ☒ Yes ☐ No**3. Nature of conveyance/Execution Date(s):**

Execution Date(s): in parentheses after inventor name

☒ Assignment ☐ Merger ☐ Change of Name☐ Security Agreement ☐ Joint Research Agreement☐ Government Interest Assignment☐ Executive Order 9424, Confirmatory License☐ Other _____**4. Application or patent number(s):**☐ This document is being filed together with a new application.

A. Patent Application No.(s)

13/549,808

B. Patent No.(s)

Additional numbers attached?

☐ Yes ☒ No**5. Name and address to whom correspondence concerning document should be mailed:**Name: John A. Castellano
HARNES, DICKEY & PIERCE, P.L.C.Internal Address: Atty. Dkt.: 2557SI-001744/USStreet Address: P.O. Box 8910City: RestonState: VA Zip: 20195Phone Number: (703) 668-8000Fax Number: (703) 668-8200Email Address: dcmalroom@ndp.com**6. Total number of applications and patents involved:**

1

7. Total fee (37 CFR 1.21(h) & 3.41) \$ 40.00☒ Authorized to be charged to deposit account☐ Enclosed☐ None required (government interest not affecting title)**8. Payment Information**Deposit Account Number 08-0750Authorized User Name John A. Castellano**9. Signature:**

Signature

John A. Castellano - 35,094

Name of Person Signing

July 16, 2012

Date

Total number of pages including cover sheet, attachments, and documents:

5

CH \$40.00 080750 13549808

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PATENT
REEL: 028609 FRAME: 0671

RECORDATION FORM COVER SHEET (PTO-1595) (supplemental sheet)	
Additional Conveying Party(ies)/Execution Date(s) (1. Continued): Young-geun Roh (07/09/2012), Hwan-soo Suh (07/09/2012), and Jong-ho Choe (07/09/2012)	
Additional Assignees (2. Continued):	
<div>Assignee Name: <u>Korea University Industrial & Academic Collaboration Foundation</u></div> <div>Internal Address: _____</div> <div>Street Address: <u>Anam-dong 5-ga, Seongbuk-gu</u></div> <div>City: <u>Seoul</u> State: _____ Country: <u>Republic of Korea</u> Zip: _____</div>	
<div>Assignee Name: _____</div> <div>Internal Address: _____</div> <div>Street Address: _____</div> <div>City: _____ State: _____ Country: _____ Zip: _____</div>	
<div>Assignee Name: _____</div> <div>Internal Address: _____</div> <div>Street Address: _____</div> <div>City: _____ State: _____ Country: _____ Zip: _____</div>	
Additional Applications and/or Patents (4. Continued):	
<div>Additional Patent Application Numbers 4A. Continued:</div> <div style="border: 1px solid black; height: 150px; margin-top: 10px;"></div>	<div>Additional Patent Numbers 4B. Continued:</div> <div style="border: 1px solid black; height: 150px; margin-top: 10px;"></div>
<div>Additional numbers attached? <input type="checkbox"/> Yes <input type="checkbox"/> No</div>	

ASSIGNMENT

WHEREAS, the undersigned, hereinafter referred to collectively as Assignor, has invented:

OPTICAL DEVICES AND METHODS OF CONTROLLING

PROPAGATION DIRECTIONS OF LIGHT FROM OPTICAL DEVICES

for which Assignor is about to make or has made United States or International application for patent

- (a) ☒ executed on even date preparatory to filing (each inventor should sign this Assignment on the same day as he/she signs the Declaration and Power of Attorney);
- (b) ☐ executed on _____, _____, _____; or
- (c) ☐ filed on _____, and assigned Serial No. _____ or PCT International Application No. _____; and

WHEREAS, SAMSUNG ELECTRONICS CO., Ltd., 416, Maetan-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do 442-742, Republic of Korea, and Korea University Industrial & Academic Collaboration Foundation, Anam-dong 5-ga, Seongbuk-gu, Seoul, Republic of Korea, hereinafter referred to collectively as Assignee, is desirous of acquiring all right, title, and interest therein:

NOW, THEREFORE, for good and valuable consideration, the receipt and adequacy whereof is hereby acknowledged, Assignor hereby confirms any prior assignment to Assignee, and to the extent that Assignor has not already done so, agrees to assign, and hereby does, sell, assign and transfer unto Assignee and its successors in interest, the full and exclusive right, title and interest in the United States of America and throughout the world, including the right to claim priority under the laws of the United States, the Paris Convention, and any foreign countries, to the inventions as described in the aforesaid application, to the aforesaid application itself, and all divisions, continuations, continuations-in-part, or other applications claiming priority directly or indirectly from the aforesaid application, and any United States or foreign Letters Patent, utility model, or other similar rights which may be granted thereon, including reissues, reexaminations and extensions thereof, and all copyright rights throughout the world in the aforesaid application and the subject matter disclosed therein, these rights, title and interest to be held and enjoyed by Assignee to the full end of the term for which the Letters Patent, utility model, or other similar rights, are granted and any extensions thereof as fully and entirely as the same would have been held by Assignor had this assignment and sale not been made, and the right to sue for, and recover for past infringements of, or liabilities for, any of the rights relating to any of the applications, patents, utility models, or other similar rights, resulting therefrom, and the copyright rights;

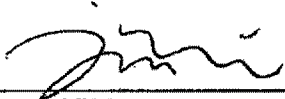
Assignor hereby covenants and agrees to execute all instruments or documents required or requested for the making and prosecution of any applications of any type for patent, utility model, or other similar rights, and for copyright, in the United States and in all foreign countries including, but not limited to, any provisional, continuation, continuation-in-part, divisional, renewal or substitute thereof, and as to letters patent any reissue, re-examination, or extension thereof, and for litigation regarding, or for the purpose of protecting title and to the said invention, the United States application for patent, or Letters Patent therefor, and to testify in support thereof, for the benefit of Assignee without further or other compensation than that above set forth;

Assignor hereby covenants that no assignment, sale, license, agreement or encumbrance has been or will be entered into which would conflict with this Assignment; and

Assignor hereby requests the United States Patent and Trademark Office to issue the Letters Patent of the United States of America to Assignee, and requests that any official of any country or countries foreign to the United States, whose duty it is to issue or grant patents and applications as aforesaid, to issue the Letters Patent, Utility Model Registration or other similar right to Assignee.

The undersigned hereby grant(s) the law firm of Harness, Dickey & Pierce, P.L.C. the power to insert on this Assignment any further identification which may be necessary or desirable in order to comply with the rules of the U.S. Patent and Trademark Office for recordation of this document.

ASSIGNMENT



Jin-eun KIM

July 9, 2012

Dated



Q-han PARK

July 9, 2012

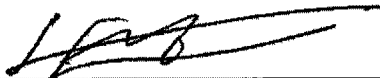
Dated



Chang-won LEE

July 9, 2012

Dated



Yeon-sang PARK

July 9, 2012

Dated



Young-geun ROH

July 9, 2012

Dated



Hwan-soo SUH

July 9, 2012

Dated



Jong-ho CHOE

July 9, 2012

Dated