PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT8056358

SUBMISSION TYPE:	CORRECTIVE ASSIGNMENT
NATURE OF CONVEYANCE:	Corrective Assignment to correct the ASSIGNEE previously recorded on Reel 062977 Frame 0157. Assignor(s) hereby confirms the ASSIGNMENT OF ASSIGNORS INTEREST.

CONVEYING PARTY DATA

Name	Execution Date
NANOCO TECHNOLOGIES LTD	03/07/2023

RECEIVING PARTY DATA

Name:	SAMSUNG ELECTRONICS CO., LTD.
Street Address:	129, SAMSUNG-RO, YEONGTONG-GU, GYEONGGI-DO
City:	SUWON-SI
State/Country:	KOREA, REPUBLIC OF
Postal Code:	16677

PROPERTY NUMBERS Total: 29

Property Type	Number
Application Number:	17332765
Application Number:	14460008
Application Number:	15618863
Application Number:	15411653
Application Number:	16863116
Application Number:	16026791
Application Number:	14496020
Application Number:	14615243
Application Number:	15496712
Application Number:	15592775
Application Number:	14046512
Application Number:	15061753
Application Number:	14211289
Application Number:	14207084
Application Number:	16290450
Application Number:	14832631
Application Number:	13723418
Application Number:	15831019
Application Number:	16442060

Property Type	Number
Application Number:	16870146
Application Number:	15805880
Application Number:	15435696
Application Number:	14463928
Application Number:	15737158
Application Number:	12612379
Application Number:	15441460
Application Number:	12392719
Application Number:	15492185
Application Number:	13887090

CORRESPONDENCE DATA

Fax Number: (202)293-7860

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Address Line 2: SUITE 9000
Address Line 4: WASHINGTON, D.C. 20006

ATTORNEY DOCKET NUMBER:	015223
NAME OF SUBMITTER:	TEAMS-BORAM
SIGNATURE:	/boram jung/
DATE SIGNED:	07/13/2023

Total Attachments: 28
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PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT7832425

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
NANOCO TECHNOLOGIES LTD	02/03/2023

RECEIVING PARTY DATA SAMSUNG ELECTRONICS CO., LTD.

Name:	~~SAMSUNG ELECTRONICS CO. LTD~~
Street Address:	129, SAMSUNG-RO
City:	YEONGTONG-GU, SUWON-SI, GYEONGGI-DO
State/Country:	KOREA, REPUBLIC OF
Postal Code:	16677

PROPERTY NUMBERS Total: 56

Property Type	Number
Application Number:	61246287
Application Number:	61031218
Application Number:	61111093
Application Number:	12888881
Application Number:	14496020
Application Number:	15400524
Application Number:	12392719
Application Number:	12612379
Application Number:	61579440
Application Number:	13723418
Application Number:	15831019
Application Number:	14832631
Application Number:	16442060
Application Number:	16870146
Application Number:	61937073
Application Number:	14615243
Application Number:	15496712
Application Number:	61783324
Application Number:	14207084
Application Number:	61642934

Property Type	Number
Application Number:	13887090
Application Number:	61788131
Application Number:	14211289
Application Number:	61709452
Application Number:	14046512
Application Number:	61924060
Application Number:	14579339
Application Number:	15805880
Application Number:	61868885
Application Number:	14463928
Application Number:	15435696
Application Number:	61912916
Application Number:	14560797
Application Number:	15998851
Application Number:	61865692
Application Number:	14460008
Application Number:	15618863
Application Number:	17332765
Application Number:	18146869
Application Number:	62128354
Application Number:	15061753
Application Number:	16150946
Application Number:	62249595
Application Number:	15337557
Application Number:	16290450
Application Number:	62281882
Application Number:	15411653
Application Number:	62300484
Application Number:	15441460
Application Number:	62334954
Application Number:	15592775
Application Number:	62325797
Application Number:	15492185
Application Number:	62528823
Application Number:	16026791
Application Number:	16863116

CORRESPONDENCE DATA

Fax Number:	(713)583-5864

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.

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Email:	houstonpatents@blankrome.com, tami.day@blankrome.com
Correspondent Name:	BLANK ROME LLP
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ATTORNEY DOCKET NUMBER:	038-0203US1
NAME OF SUBMITTER:	TAMI DAY
SIGNATURE:	/Tami Day/
DATE SIGNED:	03/07/2023

Total Attachments: 10

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ASSIGNMENT OF PATENT RIGHTS

For good and valuable consideration, the receipt of which is hereby acknowledged, Nanoco Technologies Ltd., a corporation organized and existing under the laws of the United Kingdom and having a principal place of business at The Heath Business & Technical Park, Runcorn, Cheshire, WA7 4QX, United Kingdom ("**Assignor**"), does hereby sell, assign, transfer, and convey unto Samsung Electronics Co. Ltd., a corporation organized under the laws of Korea, having its registered office at 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677, the Republic of Korea (the "**Assignee**"), all right, title, and interest that exist today and may exist in the future in and to any of the following (collectively, the "**Assigned Patent Rights**"):

(a) all patents and patent applications listed in the table below in Schedule 1 (each a "**Listed Patent**", collectively the "**Listed Patents**");

(b) all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of such Listed Patents (whether pending, issued, abandoned or filed prior to, on or after the execution date of this Assignment of Patent Rights);

(c) all patents and patent applications (i) to which any Listed Patent directly or indirectly claims priority to, or the benefit of, the filing date, and/or (ii) for which any Listed Patent directly or indirectly forms a basis for priority or otherwise provides the benefit of an earlier filing date; and all foreign counterparts to any or all of the foregoing;

(d) inventions, invention disclosures, and discoveries claimed in any of the Listed Patents and/or any item in the foregoing categories (b) through (c);

(e) all rights to apply in any or all countries of the world for patents, certificates of invention, utility models, or other governmental grants or issuances of any type related to any item in any of the foregoing categories (a) through (e), including, without limitation, under the Paris Convention for the Protection of Industrial Property, the International Patent Cooperation Treaty, or any other convention, treaty, agreement, or understanding; and

(f) causes of action and enforcement rights of any kind under, or on account of, any of the Listed Patents and/or any of the items described in either of the foregoing categories (b) to (e), including but not limited to, all causes of action, enforcement rights and all other rights to seek and obtain any other remedies of any kind for past, current, and future infringement.

Assignor hereby authorizes the respective patent office or governmental agency in each jurisdiction to issue any and all future patents, certificates of invention, utility models or other governmental grants or issuances that may be granted upon any of the Assigned Patent Rights in the name of Assignee, as the assignee to the entire interest therein.

Assignor will, at the reasonable request of Assignee, take all reasonable steps necessary and proper, to confirm the assignment to Assignee of the Assigned Patent Rights pursuant to this

Assignment of Patent Rights, including but not limited to, the execution, acknowledgement, and recordation of specific assignments, oaths, declarations, and other documents on a country-by-country basis, to assist Assignee in obtaining and perfecting the Assigned Patent Rights.

The terms and conditions of this Assignment will inure to the benefit of Assignee, its successors, assigns, and other legal representatives and will be binding upon Assignor, its successors, assigns, and other legal representatives.

IN WITNESS WHEREOF, each of the parties has caused this Assignment of Patent Rights to be executed by its duly authorized representatives as of 3 FEBRUARY 2023.

ASSIGNOR:

Nanoco Technologies Ltd.

By: Brian Tenner

Name: BRIAN TENNER

Title: CEO

ASSIGNEE:

Samsung Electronics Co., Ltd.

By:

Name: Hamyong Lee

Title: VP

Schedule 1: Assigned Patents[1]

SEMICONDUCTOR NANOPARTICLE-BASED MATERIALS		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
Australia	2010299632	
Canada	2,774,838	2,774,838
China	201080053048.9	ZL201080053048.9
Germany	602010039003.9	EP2481100
European Patent Office	10770857.0	EP2481100
France	10770857.0	EP2481100
United Kingdom	10770857.0	EP2481100
Hong Kong	12107603.0	
Israel	218709	218709
India	2970/CHENP/2012	
Japan	2012-530327	5759995
Republic of Korea	10-2012-7010270	
Republic of Korea	10-2014-7026989	10-1584688
Netherlands	10770857.0	EP2481100
United States of America	61/246,287	
Taiwan	099132284	I462988
United States of America	12/888,881	8,847,197
United States of America	14/496,020	9,543,481
United States of America	15/400,524	10,014,447
PCT	PCT/GB2010/001782	

SEMICONDUCTOR NANOPARTICLE CAPPING AGENTS		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
Australia	2009219983	
Canada	2,716,552	2,716,552
China	200980106289.2	ZL200980106289.2
China	201310400543.8	ZL201310400543.8
European Patent Office	09715099.9	
Hong Kong	11103188.3	
Israel	207721	207721
India	1923/MUMNP/2010	
Japan	2010-547252	5749495
Republic of Korea	10-2010-7020492	10-1690210
Republic of Korea	10-2016-7003916	10-1735575
United States of America	61/031,218	
Taiwan	098106040	I455958

[1] The title of a patent application or issued patent in a given family may differ from the title for that family as identified in Schedule 1.

United States of America	12/392,719	8,337,720
PCT	PCT/GB2009/000510	
SURFACE FUNCTIONALIZED NANOPARTICLES		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
Australia	2009312587	
Canada	2,741,825	2,741,825
China	200980153629.7	ZL200980153629.7
Germany	602009044197.3	EP2350183
European Patent Office	09756543.6	EP2350183
France	09756543.6	EP2350183
United Kingdom	09756543.6	EP2350183
Hong Kong	12100348.5	
Israel	212663	212663
India	3300/CHENP/2011	
Japan	2011-533822	5727936
Republic of Korea	10-2011-7012613	
Netherlands	09756543.6	EP2350183
United States of America	61/111,093	
Taiwan	098137432	I515262
United States of America	12/612,379	8,394,976
PCT	PCT/GB2009/002605	
SURFACE MODIFIED NANOPARTICLES		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
China	201280063722.0	ZL201280063722.0
China	201710878049.0	
European Patent Office	12832767.3	
Hong Kong	15104081.5	
Japan	2014-548244	6111264
Japan	2017-045600	6381713
Japan	2018-143494	6827447
Republic of Korea	10-2014-7019554	10-2086729
Republic of Korea	10-2020-7006264	10-2184715
United States of America	61/579,440	
United States of America	13/723,418	9,115,097
United States of America	15/831,019	10,377,944
United States of America	16/442,060	10,669,475
United States of America	16/870,146	11,053,436
United States of America	14/832,631	9,840,664
PCT	PCT/IB2012/003015	
QUANTUM DOT NANOPARTICLES HAVING ENHANCED STABILITY AND LUMINESCENCE EFFICIENCY		

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201580007042.0	ZL201580007042.0
China	201910042350.7	
Germany	15704090.8	602015017812.2
Germany	602015063426.8	3473692
European Patent Office	15704090.8	3102649
European Patent Office	18189532.7	3473692
France	15704090.8	3102649
France	18189532.7	3473692
United Kingdom	15704090.8	3102649
United Kingdom	18189532.7	3473692
Hong Kong	17101987.4	
Japan	2016-550505	6483716
Japan	2018-172010	
Republic of Korea	10-2016-7020226	10-1819573
Republic of Korea	10-2018-7000924	10-1912782
Netherlands	15704090.8	3102649
Netherlands	18189532.7	3473692
United States of America	61/937,073	
Taiwan	104104132	I580763
Taiwan	105116320	I621692
United States of America	14/615,243	9,666,768
United States of America	15/496,712	10,468,559
PCT	PCT/GB2015/050336	

QUANTUM DOTS MADE USING PHOSPHINE

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201480014543.7	
Germany	602014024888.8	2970763
European Patent Office	14755121.2	2970763
France	14755121.2	2970763
United Kingdom	14755121.2	2970763
Hong Kong	16100627.3	
Japan	2015-562388	
Republic of Korea	10-2015-7025518	
Republic of Korea	10-2017-7031774	10-1884818
Netherlands	14755121.2	2970763
United States of America	61/783,324	
Taiwan	103109238	I537206
United States of America	14/207,084	9,343,301
PCT	PCT/IB2014/001040	

METHOD FOR THE DETECTION OF DEFECTS IN GAS-BARRIER FILMS USING QUANTUM DOTS		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
China	201380023523.1	ZL201380023523.1
Germany	13736953.4	602013005774.5
European Patent Office	13736953.4	2844985
France	13736953.4	2844985
United Kingdom	13736953.4	2844985
Hong Kong	15105132.1	HK1204678
Japan	2015-509515	5805349
Republic of Korea	10-2014-7033099	10-1497631
Netherlands	13736953.4	2844985
United States of America	61/642,934	
United States of America	13/887,090	8,908,164
PCT	PCT/US2013/039558	
MULTI-WAVELENGTH-EMITTING LENS TO REDUCE BLENDING OF LIGHT OVER LONG DISTANCES		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
United Kingdom	1404701.3	2514462
Hong Kong	15104490.0	
United States of America	61/788,131	
United States of America	14/211,289	9,255,671
ILLUMINATED SIGNAGE USING QUANTUM DOTS		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
China	201380063260.7	201380063260.7
Germany	13840166.6	2904604
European Patent Office	13840166.6	2904604
France	13840166.6	2904604
United Kingdom	13840166.6	2904604
Hong Kong	16101514.7	
Japan	2015-535120	
Japan	2018-132149	6553259
Republic of Korea	10-2015-7011306	
Republic of Korea	10-2018-7020342	
Republic of Korea	10-2019-7012850	
Netherlands	13840166.6	2904604
United States of America	61/709,452	
United States of America	14/046,512	9,548,009
PCT	PCT/IB2013/003037	
SURFACE-MODIFIED NANOPARTICLES		

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201480072461.8	ZL201480072461.8
China	201810376947.0	
European Patent Office	14824071.6	3092283
Hong Kong	17102989.0	
Japan	2016-562072	6333408
Japan	2018-082747	6537667
PCT	PCT/GB2014/053775	
Republic of Korea	10-2016-7020144	
Republic of Korea	10-2018-7004392	10-1916288
Taiwan	104100096	I593621
Taiwan	106107441	I656090
United States of America	61/924,060	
United States of America	14/579,339	
United States of America	15/805,880	10,329,479

GAS PHASE ENHANCEMENT OF EMISSION COLOR QUALITY IN SOLID STATE LEDs

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
United Kingdom	1414989.2	2523423
Hong Kong	16102169.3	
United States of America	61/868,885	
United States of America	14/463,928	9,574,135
United States of America	15/435,696	10,233,390

CORE-SHELL NANOPARTICLES FOR PHOTOVOLTAIC ABSORBER FILMS

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201480066247.1	ZL201480066247.1
China	201811338634.2	
Germany	602014072735.2	3078062
European Patent Office	14811955.5	3078062
France	14811955.5	3078062
United Kingdom	14811955.5	3078062
Hong Kong	17102991.6	
Japan	2016-536660	6450386
Japan	2018-198891	6704027
Republic of Korea	10-2016-7013781	10-1888579
Netherlands	14811955.5	3078062
United States of America	61/912,916	
Taiwan	103142488	I687369
Taiwan	108134897	
United States of America	14/560,797	
United States of America	15/998,851	

PCT	PCT/GB2014/053628	
QUANTUM DOT FILMS UTILIZING MULTI-PHASE RESINS		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
China	201480054002.7	ZL201480054002.7
China	201811388274.7	ZL201811388274.7
Germany	602014036967.7	3033404
Germany	602014079150.6	3428244
European Patent Office	14753301.2	3033404
European Patent Office	18186420.8	3428244
France	14753301.2	3033404
France	18186420.8	3428244
United Kingdom	14753301.2	3033404
United Kingdom	18186420.8	3428244
Hong Kong	16107315.5	
Japan	2016-533955	6475722
Japan	2018-160909	6832898
Republic of Korea	10-2016-7006309	10-1977123
Republic of Korea	10-2017-7009836	10-2025346
Republic of Korea	10-2018-7002161	10-1954160
Republic of Korea	10-2019-7005588	10-2086712
Republic of Korea	10-2020-7006256	10-2207171
Netherlands	14753301.2	3033404
Netherlands	18186420.8	3428244
United States of America	61/865,692	
Taiwan	103127819	I557424
Taiwan	105126131	I606252
United States of America	14/460,008	9,680,068
United States of America	15/618,863	11,335,834
United States of America	17/332,765	11,552,223
United States of America	18/146,869	
PCT	PCT/GB2014/052471	
QUANTUM DOTS STABILIZED WITH A METAL THIOL POLYMER		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
China	201680022134.0	
Germany	602016026385.8	3265538
European Patent Office	16724103.3	3265538
France	16724103.3	3265538
United Kingdom	16724103.3	3265538
Hong Kong	18108129.7	
Japan	2017-546132	
Republic of Korea	10-2017-7027278	10-2003827

Netherlands	16724103.3	3265538
United States of America	62/128,354	
Taiwan	105106604	I608076
United States of America	15/061,753	10,196,562
United States of America	16/150,946	
PCT	PCT/IB16/000416	

DISPLAY DEVICES COMPRISING GREEN-EMITTING QUANTUM DOTS AND RED KSF PHOSPHOR

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201680073144.7	ZL201680073144.7
Germany	602016054503.9	3371834
European Patent Office	16794713.4	3371834
France	16794713.4	3371834
United Kingdom	16794713.4	3371834
Japan	2018-541575	6804548
Republic of Korea	10-2018-7014573	10-2163254
Netherlands	16794713.4	3371834
United States of America	62/249,595	
Taiwan	105135389	I635339
United States of America	15/337,557	
United States of America	16/290,450	11,043,618
PCT	PCT/GB2016/053394	

QUANTUM DOT-BASED LIGHTING DEVICES FOR ANIMAL HUSBANDRY AND AQUARIUMS

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201780007368.2	
European Patent Office	17701918.9	
Japan	2018-537786	6704054
Republic of Korea	10-2018-7022903	10-2120303
United States of America	62/281,882	
Taiwan	106102508	I642994
United States of America	15/411,653	10,655,815
PCT	PCT/GB2017/050163	

PHOTOTHERAPY MASK WITH QUANTUM DOT PHOSPHORS

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
United Kingdom	1703059.4	2548012
United States of America	62/300,484	
United States of America	15/441,460	10,765,885

METHOD AND APPARATUS USING A COMBINATION OF QUANTUM DOT-CONTAINING FILMS WITH OPTICAL FILTER FILMS FOR SIGNAGE AND ILLUMINATION APPLICATIONS		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
United Kingdom	1707548.2	2553174
United States of America	62/334,954	
United States of America	15/592,775	10,699,606
INDIUM TIN OXIDE (ITO) THIN FILMS WITH BOTH HIGH NEAR-INFRARED TRANSPARENCY AND EXCELLENT RESISTIVITY		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
United States of America	62/325,797	
United States of America	15/492,185	10,167,545
QUANTUM DOT ARCHITECTURES FOR COLOR FILTER APPLICATIONS		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
China	201880044442.2	
Germany	602018035764.5	3625309
European Patent Office	18742572.3	3625309
European Patent Office	22162086.7	
France	18742572.3	3625309
United Kingdom	18742572.3	3625309
Japan	2019-572522	
Republic of Korea	10-2019-7038846	
Netherlands	18742572.3	3625309
United States of America	62/528,823	
Taiwan	107123256	I675092
United States of America	16/026,791	10,768,485
United States of America	16/863,116	11,043,611
PCT	PCT/GB2018/051911	

ASSIGNMENT OF PATENT RIGHTS

For good and valuable consideration, the receipt of which is hereby acknowledged, Nanoco Technologies Ltd., a corporation organized and existing under the laws of the United Kingdom and having a principal place of business at The Heath Business & Technical Park, Runcorn, Cheshire, WA7 4QX, United Kingdom ("**Assignor**"), does hereby sell, assign, transfer, and convey unto Samsung Electronics Co., Ltd., a corporation organized under the laws of Korea, having its registered office at 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677, the Republic of Korea (the "**Assignee**"), all right, title, and interest that exist today and may exist in the future in and to any of the following (collectively, the "**Assigned Patent Rights**"):

Initial: SH

Date: 24/05/23

(a) all patents and patent applications listed in the table below in Schedule 1 (each a "**Listed Patent**", collectively the "**Listed Patents**");

(b) all reissues, reexaminations, continuations, continuations-in-part, divisionals, renewals and extensions of such Listed Patents (whether pending, issued, abandoned or filed prior to, on or after the execution date of this Assignment of Patent Rights);

(c) all patents and patent applications (i) to which any Listed Patent directly or indirectly claims priority to, or the benefit of, the filing date, and/or (ii) for which any Listed Patent directly or indirectly forms a basis for priority or otherwise provides the benefit of an earlier filing date; and all foreign counterparts to any or all of the foregoing;

(d) inventions, invention disclosures, and discoveries claimed in any of the Listed Patents and/or any item in the foregoing categories (b) through (c);

(e) all rights to apply in any or all countries of the world for patents, certificates of invention, utility models, or other governmental grants or issuances of any type related to any item in any of the foregoing categories (a) through (c), including, without limitation, under the Paris Convention for the Protection of Industrial Property, the International Patent Cooperation Treaty, or any other convention, treaty, agreement, or understanding; and

(f) causes of action and enforcement rights of any kind under, or on account of, any of the Listed Patents and/or any of the items described in either of the foregoing categories (b) to (e), including but not limited to, all causes of action, enforcement rights and all other rights to seek and obtain any other remedies of any kind for past, current, and future infringement.

Assignor hereby authorizes the respective patent office or governmental agency in each jurisdiction to issue any and all future patents, certificates of invention, utility models or other governmental grants or issuances that may be granted upon any of the Assigned Patent Rights in the name of Assignee, as the assignee to the entire interest therein.

Assignor will, at the reasonable request of Assignee, take all reasonable steps necessary and proper, to confirm the assignment to Assignee of the Assigned Patent Rights pursuant to this

Assignment of Patent Rights, including but not limited to, the execution, acknowledgement, and recordation of specific assignments, oaths, declarations, and other documents on a country-by-country basis, to assist Assignee in obtaining and perfecting the Assigned Patent Rights.

The terms and conditions of this Assignment will inure to the benefit of Assignee, its successors, assigns, and other legal representatives and will be binding upon Assignor, its successors, assigns, and other legal representatives.

IN WITNESS WHEREOF, each of the parties has caused this Assignment of Patent Rights to be executed by its duly authorized representatives as of 3 FEBRUARY 2023.

ASSIGNOR:

Nanoco Technologies Ltd.

By: Brian Tenner

Name: BRIAN TENNER

Title: CEO

ASSIGNEE:

Samsung Electronics Co., Ltd.

By:

Name: Hanyong Lee

Title: VP

Schedule 1: Assigned Patents[1]

SEMICONDUCTOR NANOPARTICLE-BASED MATERIALS		
COUNTRY	APPLICATION NUMBER	PATENT NUMBER
Australia	2010299632	
Canada	2,774,838	2,774,838
China	201080053048.9	ZL201080053048.9
Germany	602010039003.9	EP2481100
European Patent Office	10770857.0	EP2481100
France	10770857.0	EP2481100
United Kingdom	10770857.0	EP2481100
Hong Kong	12107603.0	
Israel	218709	218709
India	2970/CHENP/2012	
Japan	2012-530327	5759995
Republic of Korea	10-2012-7010270	
Republic of Korea	10-2014-7026989	10-1584688
Netherlands	10770857.0	EP2481100
United States of America	61/246,287	
Taiwan	099132284	1462988
United States of America	12/888,881	8,847,197
United States of America	14/496,020	9,543,481
United States of America	15/400,524	10,014,447
PCT	PCT/GB2010/001782	

SEMICONDUCTOR NANOPARTICLE CAPPING AGENTS		
COUNTRY	APPLICATION NUMBER	PATENT NUMBER
Australia	2009219983	
Canada	2,716,552	2,716,552
China	200980106289.2	ZL200980106289.2
China	201310400543.8	ZL201310400543.8
European Patent Office	09715099.9	
Hong Kong	11103188.3	
Israel	207721	207721
India	1923/MUMNP/2010	
Japan	2010-547252	5749495
Republic of Korea	10-2010-7020492	10-1690210
Republic of Korea	10-2016-7003916	10-1735575
United States of America	61/031,218	
Taiwan	098106040	1455958

[1] The title of a patent application or issued patent in a given family may differ from the title for that family as identified in Schedule 1.

United States of America	12/392,719	8,337,720
PCT	PCT/GB2009/000510	
SURFACE FUNCTIONALIZED NANOPARTICLES		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
Australia	2009312587	
Canada	2,741,825	2,741,825
China	200980153629.7	ZL200980153629.7
Germany	602009044197.3	EP2350183
European Patent Office	09756543.6	EP2350183
France	09756543.6	EP2350183
United Kingdom	09756543.6	EP2350183
Hong Kong	12100348.5	
Israel	212663	212663
India	3300/CHENP/2011	
Japan	2011-533822	5727936
Republic of Korea	10-2011-7012613	
Netherlands	09756543.6	EP2350183
United States of America	61/111,093	
Taiwan	098137432	I515262
United States of America	12/612,379	8,394,976
PCT	PCT/GB2009/002605	
SURFACE MODIFIED NANOPARTICLES		
COUNTRY	**APPLICATION NUMBER**	**PATENT NUMBER**
China	201280063722.0	ZL201280063722.0
China	201710878049.0	
European Patent Office	12832767.3	
Hong Kong	15104081.5	
Japan	2014-548244	6111264
Japan	2017-045600	6381713
Japan	2018-143494	6827447
Republic of Korea	10-2014-7019554	10-2086729
Republic of Korea	10-2020-7006264	10-2184715
United States of America	61/579,440	
United States of America	13/723,418	9,115,097
United States of America	15/831,019	10,377,944
United States of America	16/442,060	10,669,475
United States of America	16/870,146	11,053,436
United States of America	14/832,631	9,840,664
PCT	PCT/IB2012/003015	
QUANTUM DOT NANOPARTICLES HAVING ENHANCED STABILITY AND LUMINESCENCE EFFICIENCY		

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201580007042.0	ZL201580007042.0
China	201910042350.7	
Germany	15704090.8	602015017812.2
Germany	602015063426.8	3473692
European Patent Office	15704090.8	3102649
European Patent Office	18189532.7	3473692
France	15704090.8	3102649
France	18189532.7	3473692
United Kingdom	15704090.8	3102649
United Kingdom	18189532.7	3473692
Hong Kong	17101987.4	
Japan	2016-550505	6483716
Japan	2018-172010	
Republic of Korea	10-2016-7020226	10-1819573
Republic of Korea	10-2018-7000924	10-1912782
Netherlands	15704090.8	3102649
Netherlands	18189532.7	3473692
United States of America	61/937,073	
Taiwan	104104132	1580763
Taiwan	105116320	1621692
United States of America	14/615,243	9,666,768
United States of America	15/496,712	10,468,559
PCT	PCT/GB2015/050336	

QUANTUM DOTS MADE USING PHOSPHINE

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201480014543.7	
Germany	602014024888.8	2970763
European Patent Office	14755121.2	2970763
France	14755121.2	2970763
United Kingdom	14755121.2	2970763
Hong Kong	16100627.3	
Japan	2015-562388	
Republic of Korea	10-2015-7025518	
Republic of Korea	10-2017-7031774	10-1884818
Netherlands	14755121.2	2970763
United States of America	61/783,324	
Taiwan	103109238	1537206
United States of America	14/207,084	9,343,301
PCT	PCT/IB2014/001040	

METHOD FOR THE DETECTION OF DEFECTS IN GAS-BARRIER FILMS USING QUANTUM DOTS		
COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201380023523.1	ZL201380023523.1
Germany	13736953.4	602013005774.5
European Patent Office	13736953.4	2844985
France	13736953.4	2844985
United Kingdom	13736953.4	2844985
Hong Kong	15105132.1	HK1204678
Japan	2015-509515	5805349
Republic of Korea	10-2014-7033099	10-1497631
Netherlands	13736953.4	2844985
United States of America	61/642,934	
United States of America	13/887,090	8,908,164
PCT	PCT/US2013/039558	
MULTI-WAVELENGTH-EMITTING LENS TO REDUCE BLENDING OF LIGHT OVER LONG DISTANCES		
COUNTRY	APPLICATION NUMBER	PATENT NUMBER
United Kingdom	1404701.3	2514462
Hong Kong	15104490.0	
United States of America	61/788,131	
United States of America	14/211,289	9,255,671
ILLUMINATED SIGNAGE USING QUANTUM DOTS		
COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201380063260.7	201380063260.7
Germany	13840166.6	2904604
European Patent Office	13840166.6	2904604
France	13840166.6	2904604
United Kingdom	13840166.6	2904604
Hong Kong	16101514.7	
Japan	2015-535120	
Japan	2018-132149	6553259
Republic of Korea	10-2015-7011306	
Republic of Korea	10-2018-7020342	
Republic of Korea	10-2019-7012850	
Netherlands	13840166.6	2904604
United States of America	61/709,452	
United States of America	14/046,512	9,548,009
PCT	PCT/IB2013/003037	
SURFACE-MODIFIED NANOPARTICLES		

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201480072461.8	ZL201480072461.8
China	201810376947.0	
European Patent Office	14824071.6	3092283
Hong Kong	17102989.0	
Japan	2016-562072	6333408
Japan	2018-082747	6537667
PCT	PCT/GB2014/053775	
Republic of Korea	10-2016-7020144	
Republic of Korea	10-2018-7004592	10-1916288
Taiwan	104100096	1593621
Taiwan	106107441	I656090
United States of America	61/924,060	
United States of America	14/579,339	
United States of America	15/805,880	10,329,479

GAS PHASE ENHANCEMENT OF EMISSION COLOR QUALITY IN SOLID STATE LEDs

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
United Kingdom	1414989.2	2523423
Hong Kong	16102169.3	
United States of America	61/868,885	
United States of America	14/463,928	9,574,135
United States of America	15/435,696	10,233,390

CORE-SHELL NANOPARTICLES FOR PHOTOVOLTAIC ABSORBER FILMS

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201480066247.1	ZL201480066247.1
China	201811338634.2	
Germany	602014072735.2	3078062
European Patent Office	14811955.5	3078062
France	14811955.5	3078062
United Kingdom	14811955.5	3078062
Hong Kong	17102991.6	
Japan	2016-536660	6450386
Japan	2018-198891	670-4027
Republic of Korea	10-2016-7013781	10-1888579
Netherlands	14811955.5	3078062
United States of America	61/912,916	
Taiwan	103142488	I687369
Taiwan	108134897	
United States of America	14/560,797	
United States of America	15/998,851	

PCT	PCT/GB2014/053628	

QUANTUM DOT FILMS UTILIZING MULTI-PHASE RESINS		
COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201480054002.7	ZL201480054002.7
China	201811388274.7	ZL201811388274.7
Germany	602014036967.7	3033404
Germany	602014079150.6	3428244
European Patent Office	14753301.2	3033404
European Patent Office	18186420.8	3428244
France	14753301.2	3033404
France	18186420.8	3428244
United Kingdom	14753301.2	3033404
United Kingdom	18186420.8	3428244
Hong Kong	16107315.5	
Japan	2016-533955	6475722
Japan	2018-160909	6832898
Republic of Korea	10-2016-7006309	10-1977123
Republic of Korea	10-2017-7009836	10-2025346
Republic of Korea	10-2018-7002161	10-1954160
Republic of Korea	10-2019-7005588	10-2086712
Republic of Korea	10-2020-7006256	10-2207171
Netherlands	14753301.2	3033404
Netherlands	18186420.8	3428244
United States of America	61/865,692	
Taiwan	103127819	1557424
Taiwan	105126131	1606252
United States of America	14/460,008	9,680,068
United States of America	15/618,863	11,335,834
United States of America	17/332,765	11,552,223
United States of America	18/146,869	
PCT	PCT/GB2014/052471	

QUANTUM DOTS STABILIZED WITH A METAL THIOL POLYMER		
COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201680022134.0	
Germany	602016026385.8	3265538
European Patent Office	16724103.3	3265538
France	16724103.3	3265538
United Kingdom	16724103.3	3265538
Hong Kong	18108129.7	
Japan	2017-546132	
Republic of Korea	10-2017-7027278	10-2003827

Netherlands	16724103.3	3265538
United States of America	62/128,354	
Taiwan	105106604	1608076
United States of America	15/061,753	10,196,562
United States of America	16/150,946	
PCT	PCT/IB16/000416	

DISPLAY DEVICES COMPRISING GREEN-EMITTING QUANTUM DOTS AND RED KSF PHOSPHOR

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201680073144.7	ZL201680073144.7
Germany	602016054503.9	3371834
European Patent Office	16794713.4	3371834
France	16794713.4	3371834
United Kingdom	16794713.4	3371834
Japan	2018-541575	6804548
Republic of Korea	10-2018-7014573	10-2163284
Netherlands	16794713.4	3371834
United States of America	62/249,595	
Taiwan	105135389	1635339
United States of America	15/337,557	
United States of America	16/290,450	11,043,618
PCT	PCT/GB2016/053394	

QUANTUM DOT-BASED LIGHTING DEVICES FOR ANIMAL HUSBANDRY AND AQUARIUMS

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
China	201780007368.2	
European Patent Office	17701918.9	
Japan	2018-537786	6704054
Republic of Korea	10-2018-7022903	10-2120303
United States of America	62/281,882	
Taiwan	106102508	1642994
United States of America	15/411,653	10,655,815
PCT	PCT/GB2017/050163	

PHOTOTHERAPY MASK WITH QUANTUM DOT PHOSPHORS

COUNTRY	APPLICATION NUMBER	PATENT NUMBER
United Kingdom	1703059.4	2548012
United States of America	62/300,484	
United States of America	15/441,460	10,765,883