PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT3348911

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

CONVEYING PARTY DATA

| Name | Execution Date |
|-------------------|----------------|
| GRAZIANO ARCHETTI | 03/25/2015 |
| IZUMI SAITO | 03/25/2015 |
| ROCCO FORTTE | 03/30/2015 |
| THORSTEN KODEK | 04/07/2015 |

RECEIVING PARTY DATA

| Name: | MERCK PATENT GMBH |
|-----------------|-------------------------|
| Street Address: | FRANKFURTER STRASSE 250 |
| City: | DARMSTADT |
| State/Country: | GERMANY |
| Postal Code: | 64293 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 14643147 |

CORRESPONDENCE DATA

Fax Number: (703)243-6410

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: 703-243-6333 Email: mail@mwzb.com

Correspondent Name: MILLEN, WHITE, ZELANO & BRANIGAN - AMB

Address Line 1: 2200 CLARENDON BLVD.

Address Line 2: SUITE 1400

Address Line 4: ARLINGTON, VIRGINIA 22201

| ATTORNEY DOCKET NUMBER: | MERCK-4302 |
|-------------------------|------------------------------------------------------------|
| NAME OF SUBMITTER: | AUBREY M. BROOKS |
| SIGNATURE: | /Aubrey M. Brooks/ |
| DATE SIGNED: | 05/12/2015 |
| | This document serves as an Oath/Declaration (37 CFR 1.63). |

Total Attachments: 4

PATENT REEL: 035615 FRAME: 0876

503302293

source=ARCHETTI#page1.tif
source=SAITO#page1.tif
source=FORTTE#page1.tif
source=KODEK#page1.tif

PATENT REEL: 035615 FRAME: 0877

| Title of Invention | LIQUID-CRYSTALLINE MEDIA HAVING HOMEOTROPIC ALIGNMENT |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As the below nan | ned inventor, I hereby declare that: |
| This declaration | The attached application, or |
| is directed to: | United States Application or PCT International Application number 14/643 147 filed on 03/10/2015 |
| | fied application was made or authorized to be made by me. |
| I believe that I an | the original inventor or an original joint inventor of a claimed invention in the application. |
| AND WHEREAS | Merck Patent GmbH |
| all patent(s) lister | ed to as the ASSIGNEE, is desirous of acquiring the entire right, title, and interest in and to said invention and above, including any and all earlier priority rights (U.S. and foreign), divisions and continuations thereof, all renewals, reissues, reexaminations and extensions thereof. |
| ASSIGNOR here right, title and int and all Letters Pa thereof, and in an to accrue with resinvention, SAID including any and which may be gright to sue for dearising from or agreewals, reissue representatives, it | WITNESSETH that for good and valuable consideration, the receipt whereof is hereby acknowledged, by assigns, sells, and transfers to ASSIGNEE, its assigns and legal representatives, the entire and exclusive crest in and to said invention and patent(s), including any and all divisions and continuations thereof, and any tent which may be granted therefor, including any and all renewals, reissues, reexaminations and extensions of to any and all U.S. (including provisional) or foreign priority and/or convention rights or benefits accruing or spect to the filing or securing of patents in the United States and/or any countries foreign thereto concerning said ASSIGNEE, its assigns and legal representatives to have, hold, exercise, and enjoy said invention and patent, it all earlier priority rights (U.S. and foreign), divisions and continuations thereof, any and all Letters Patent anted therefor, including any and all renewals, reissues, reexaminations thereof, including the amages occurring before the assignment, with all the rights, powers, privileges and advantages in anywise repertaining thereto, for and during the term or terms of any and all such Letters Patent, including any and all s, reexaminations and extensions thereof, for the use and benefit of ASSIGNEE and its assigns and legal in as ample and beneficial a manner to all intents and purposes as the ASSIGNOR might or could have held and if the assignment had not been made. |
| and foreign count | ASSIGNOR hereby agrees to execute all papers that may be necessary to file applications in the United States tries for said invention and to assign the same to said ASSIGNEE, its assigns and legal representatives and to r papers that may be needed in connection with securing Letters Patents thereon. |
| AND And any and all divisi | ASSIGNOR authorizes and requests the Commissioner of Patents and Trademarks to issue a Letters Patent on ons and continuations thereof, to ASSIGNEE, its assigns and legal representatives, in accordance herewith. |
| The un assignment infor properly record t | dersigned hereby grant(s) the law firm of Millen, White, Zelano & Branigan, P.C. the power to insert on this mation which may be necessary or desirable in order for the United States Patent and Trademark Office to his document. |
| | IN TESTIMONY WHEREOF this assignment is executed by ASSIGNOR |
| I hereb fine or imprisonr | y acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by nent of not more than five (5) years, or both. |
| LEGAL NAME | |
| Inventor: | Graziano ARCHETTI Date: 23 0 3 CBAS Graziano ARCHETTI |
| Signature: | Graning Valleton |

Millen, White, Zelano & Branigan, P.C.
Attorneys at Law
Arlington Counthouse Plaza
2200 Clarendon Boblevard (Suite 1400) Arlington VA 22201
Telephone: 703,243,6333 (Fax. 703,243,6410
Email: mail.@mwzb.com

DOCKET NO.: MERCK-4302

| Title of Invention | LIQUID-CRYSTALLINE MEDIA HAVIN | G HOMEOT | FROPIC ALIGNMENT |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As the below nan | ned inventor, I hereby declare that: | | |
| This declaration | The attached application, or | | |
| is directed to: | United States Application or PCT Internation | | number <u>14/643,147</u> filed on <u>03/10/2015</u> |
| The above identif | fied application was made or authorized to be made by | me. | |
| I believe that I an | n the original inventor or an original joint inventor of a | claimed inventi | on in the application. |
| AND WHEREAS | | | |
| | Merck Patent GmbH | | |
| all patent(s) lister | ed to as the ASSIGNEE, is desirous of acquiring the end above, including any and all earlier priority rights (U. d all renewals, reissues, reexaminations and extensions | S, and foreign), | ind interest in and to said invention and divisions and continuations thereof, |
| ASSIGNOR here right, title and int and all Letters Pathercof, and in an to accrue with reinvention, SAID including any and which may be gright to sue for duarising from or at renewals, reissue representatives, it enjoyed the same | WITNESSETH that for good and valuable consideration of the assigns, sells, and transfers to ASSIGNEE, its assign terest in and to said invention and patent(s), including at a tent which may be granted therefor, including any and all to any and all U.S. (including provisional) or foreign espect to the filing or securing of patents in the United St. ASSIGNEE, its assigns and legal representatives to have all earlier priority rights (U.S. and foreign), divisions a santed therefor, including any and all renewals, reissues, lamages occurring before the assignment, with all the right ppertaining thereto, for and during the term or terms of es, reexaminations and extensions thereof, for the use an in as ample and beneficial a manner to all intents and pute, if the assignment had not been made. | ns and legal rep ny and all divisi all renewals, rei priority and/or lates and/or any re, hold, exercis and continuation reexaminations this, powers, pri any and all such discrete of AS reposes as the A | resentatives, the entire and exclusive ions and continuations thereof, and any issues, reexaminations and extensions convention rights or benefits accruing or countries foreign thereto concerning said e, and enjoy said invention and patent, is thereof, any and all Letters Patent and extensions thereof, including the ivileges and advantages in anywise a Letters Patent, including any and all SIONEE and its assigns and legal SSIGNOR might or could have held and |
| and foreign coun | ASSIGNOR hereby agrees to execute all papers that ma atries for said invention and to assign the same to said A or papers that may be needed in connection with securing | SSIGNEE, its a | ssigns and legal representatives and to |
| AND A any and all divisi | ASSIGNOR authorizes and requests the Commissioner of ions and continuations thereof, to ASSIGNEE, its assignment of the continuation of the contin | of Patents and T is and legal rep | Trademarks to issue a Letters Patent on resentatives, in accordance herewith. |
| The un assignment infor properly record t | ndersigned hereby grant(s) the law firm of Millen, White mustion which may be necessary or desirable in order to this document. | , Zelano & Bra r the United Sta | nigan, P.C. the power to insert on this ues Patent and Trademark Office to |
| | IN TESTIMONY WHEREOF this assignme | nt is executed b | y ASSIGNOR |
| I hereb fine or imprisona | by acknowledge that any willful false statement made in ment of not more than five (5) years, or both. | this declaration | is punishable under 18 U.S.C. 1001 by |
| | OF INVENTOR | (Niber | 25,83,2015 |
| Inventor: | Izumi SAITO | Date: | Marie Lance Lance Line |
| Signature: | D. Haira | | |

MILLEN, WHITE, ZELANO & BRANIGAN, P.C.
ATTORNEYS AT LAW
ARLINGTON COURTHOUSE PLAZA
2200 CLARENDON BOULEVARD | SUITE 1400 | ARLINGTON VA 22201
TELEPHONE: 703.243.6333 | FAX: 703.243.6410
EMAIL: MAIL@MWZB.COM

DOCKET NO.: MERCK-4302

PATENT REEL: 035615 FRAME: 0879

| Title of LIQUID-CRYSTALLINE MEDIA HAVING HOMEOTROPIC ALIGNMENT Invention | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| As the below named inventor, I hereby declare that: | |
| This declaration | |
| is directed to: United States Application or PCT International Application number 14/643.147 filed on 03/10/2015 | |
| 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. | |
| AND WHEREAS | |
| Merck Patent GmbH | |
| hereinafter referred to as the ASSIGNEE, is desirous of acquiring the entire right, title, and interest in and to said invention and all patent(s) listed above, including any and all earlier priority rights (U.S. and foreign), divisions and continuations thereof, including any and all renewals, reissues, reexaminations and extensions thereof. | |
| NOW, WITNESSETH that for good and valuable consideration, the receipt whereof is hereby acknowledged, ASSIGNOR hereby assigns, sells, and transfers to ASSIGNEE, its assigns and legal representatives, the entire and exclusive right, title and interest in and to said invention and patent(s), including any and all divisions and continuations thereof, and any and all Letters Patent which may be granted therefor, including any and all renewals, reissues, reexaminations and extensions thereof, and in and to any and all U.S. (including provisional) or foreign priority and/or convention rights or benefits accruing or to accrue with respect to the filing or securing of patents in the United States and/or any countries foreign thereto concerning said invention, SAID ASSIGNEE, its assigns and legal representatives to have, hold, exercise, and enjoy said invention and patent, including any and all earlier priority rights (U.S. and foreign),divisions and continuations thereof, any and all Letters Patent which may be granted therefor, including any and all renewals, reissues, reexaminations and extensions thereof, including the right to sue for damages occurring before the assignment, with all the rights, powers, privileges and advantages in anywise arising from or appertaining thereto, for and during the term or terms of any and all such Letters Patent, including any and all renewals, reissues, reexaminations and extensions thereof, for the use and benefit of ASSIGNEE and its assigns and legal representatives, in as ample and beneficial a manner to all intents and purposes as the ASSIGNOR might or could have held and enjoyed the same, if the assignment had not been made, | |
| AND ASSIGNOR hereby agrees to execute all papers that may be necessary to file applications in the United States and foreign countries for said invention and to assign the same to said ASSIGNEE, its assigns and legal representatives and to execute any other papers that may be needed in connection with securing Letters Patents thereon. | |
| AND ASSIGNOR authorizes and requests the Commissioner of Patents and Trademarks to issue a Letters Patent on any and all divisions and continuations thereof, to ASSIGNEE, its assigns and legal representatives, in accordance herewith. | |
| The undersigned hereby grant(s) the law firm of Millen, White, Zelano & Branigan, P.C. the power to insert on this assignment information which may be necessary or desirable in order for the United States Patent and Trademark Office to properly record this document. | |
| IN TESTIMONY WHEREOF this assignment is executed by ASSIGNOR | |
| 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. | |
| LEGAL NAME OF INVENTOR Inventor: Rocco-FORTTE A# Date: 70.07.20.75 | |
| And the second of the second o | |

MILLEN, WHITE, ZELANO & BRANIGAN, P.C.
ATTORNEYS AT LAW
ARLINGTON COURTHOUSE PLAZA
2200 CLARENDON BOULEVARD | SUITE 1400 | ARLINGTON VA 2220 |
TELEPHONE: 703.243.6333 | FAX: 703.243.6410
EMAIL: MAIL@MWZB.COM

DOCKET NO.: MERCK-4302

PATENT REEL: 035615 FRAME: 0880

| Title of Invention | LIQUID-CRYSTALLINE MEDIA HAVING HOMEOTROPIC ALIGNMENT |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| As the below nan | red inventor, Thereby declare that: |
| This declaration | The attached application, or |
| is directed to: | United States Application or PCT International Application number 14/643 147 filed on 03/10/2015 |
| | fied application was made or authorized to be made by me. |
| I believe that I an | n the original inventor or an original joint inventor of a claimed invention in the application. |
| AND WHEREAS | |
| | Merck Patent GmbH |
| | |
| all materit(e) lister | ed to as the ASSIGNEE, is desirous of acquiring the entire right, title, and interest in and to said invention and I above, including any and all earlier priority rights (U.S. and foreign), divisions and continuations thereof, I all renewals, reissues, reexaminations and extensions thereof. |
| ASSIGNOR here right, title and im and all Letters Pathereof, and in an to accrue with resinvention, SAID including any and which may be goright to sue for diarising from or a renewals, reissue representatives, i enjoyed the same | WITNESSETH that for good and valuable consideration, the receipt whereof is hereby acknowledged, by assigns, sells, and transfers to ASSIGNEE, its assigns and legal representatives, the entire and exclusive terest in and to said invention and patent(s), including any and all divisions and continuations thereof, and any stent which may be granted therefor, including any and all renewals, reissues, reexaminations and extensions at to any and all U.S. (including provisional) or foreign priority and/or convention rights or benefits accruing or spect to the filling or securing of patents in the United States and/or any countries foreign thereto concerning said ASSIGNEE, its assigns and legal representatives to have, hold, exercise, and enjoy said invention and patent, d all carlier priority rights (U.S. and foreign), divisions and entinuations thereof, any and all Letters Patent anted therefor, including any and all renewals, reissues, reexaminations and extensions thereof, including the amages occurring before the assignment, with all the rights, powers, privileges and advantages in anywise popertaining thereto, for and during the term or terms of any and all such Letters Patent, including any and all s, reexaminations and extensions thereof, for the use and benefit of ASSIGNEE and its assigns and legal in as ample and beneficial a manner to all intents and purposes as the ASSIGNOR might or could have held and e, if the assignment had not been made. |
| and foreign coun | ASSIGNOR hereby agrees to execute all papers that may be necessary to file applications in the United States tries for said invention and to assign the same to said ASSIGNEE, its assigns and legal representatives and to repapers that may be needed in connection with securing Letters Patents thereon. |
| AND any and all divisi | ASSIGNOR authorizes and requests the Commissioner of Patents and Trademarks to issue a Letters Patent on ions and continuations thereof, to ASSIGNEE, its assigns and legal representatives, in accordance herewith. |
| The un assignment infor properly record t | dersigned hereby grant(s) the law firm of Millen, White. Zelano & Branigan, P.C. the power to insert on this mation which may be necessary or desirable in order for the United States Patent and Trademark Office to his document. |
| | IN TESTIMONY WHEREOF this assignment is executed by ASSIGNOR |
| I hereb | by acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by ment of not more than five (5) years, or both. |
| LEGAL NAME | OF INVENTOR |
| Inventor: | Thorsten KODEK Date: SAN AND AND AND AND AND AND AND AND AND A |
| Signature: | <u>Il Kad U</u> |

Millen, White, Zelano & Branigan, P.C.
Attorneys at Law
Arlington Courthouse Plaza
2200 Clarendon Boulevard (Suite 1400 | Arlington VA 22201
Telephone: 703.243.63331Fax: 703.243.6410
Email: mail@mwzb.com

DOCKET NO.: MERCK-4302

PATENT REEL: 035615 FRAME: 0881

RECORDED: 05/12/2015