UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

22428 7590 07/11/2023

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

EXAMINER	
MARLEN, TAMMIE K	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
07/11/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.
17/942,353	11-Jul-2023	11697028

FOLEY & LARDNER LLP
3000 K STREET N.W.
WASHINGTON, DC 20007-5109

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at https://patentcenter.uspto.gov

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit https://www.uspto.gov/electronicgrants

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	07/11/2023	11697028	067286-0483	3138

22428 7590 06/21/2023

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site http://pair.uspto.gov for additional inventors):

Thomas BOYAJIAN, Wilmington, MA;
Mark CAROTA, Chelmsford, MA;
Brian MAZEJKA, Salem, NH;

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

DUSA Pharmaceuticals, Inc., Billerica, MA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22428 7590 03/01/2023

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

TITLE OF INVENTION: ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	06/01/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
MARLEN, TAMMIE K	3792	604-020000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Foley & Lardner LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: DUSA PHARMACEUTICALS, INC.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): BILLERICA, MA

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ☒ Corporation or other private group entity ❑ Government

4a. Fees submitted: ☒ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 19-0741

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Kiri Lee Sharon/ Date 31 May 2023

Typed or printed name Kiri Lee Sharon Registration No. 71,828

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/942,353	05/31/2023 04:52:55 PM ET	067286-0483

Title of Invention

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3138	FILED BY	Janet Lee
PATENT CENTER #	62185969	AUTHORIZED BY	Kiri Sharon
CUSTOMER #	22428	FILING DATE	09/12/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Thomas BOYAJIAN

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 7145	E20235UG55336048	Janet Lee

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
190741	37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1501	UTILITY ISSUE FEE	1200.00	1	1200.00
			TOTAL AMOUNT:	$1,200.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement

Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/942,353	**05/31/2023 04:52:55 PM ET**	**067286-0483**

Title of Invention

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3138	FILED BY	Janet Lee
PATENT CENTER #	62185969	FILING DATE	09/12/2022
CUSTOMER #	22428	FIRST NAMED INVENTOR	Thomas BOYAJIAN
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Kiri Sharon

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
067286-0483_PTOL-85.pdf	1	Issue Fee Payment (PTO-85B)	332 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
067286-0483_PTOL-85.pdf	0C8230DF1AFC3F30881245C8192C153405D093BEE92D2C1E4638BAAD702711B114C6788A49D2500249A816D0C0B7CE22F96C7BF5DD42656D2AE8A1A4C530DDC

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as

described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

22428 7590 04/19/2023

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

EXAMINER	
MARLEN, TAMMIE K	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
04/19/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

Corrected ***Notice of Allowability***	**Application No.** 17/942,353	**Applicant(s)** BOYAJIAN et al.	
	Examiner TAMMIE K MARLEN	**Art Unit** 3792	**AIA (FITF) Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the IDS filed on 4/6/2023.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are See Continuation Sheet . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

Continuation of 3. The allowed claim(s) is/are: 1-2,4-5,7-18 and 20-24

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

2. The information disclosure statement(s) (IDS) submitted on 4/6/2023 has/have been acknowledged and is/are being considered by the Examiner.

Allowable Subject Matter

3. Claims 1, 2, 4, 5, 7-18, and 20-24 are allowed.

4. The following is an examiner's statement of reasons for allowance: It is in the opinion of the examiner that the art of record neither anticipates nor renders obvious "wherein each of the five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges" in combination with the rest of the claimed limitations set forth in the independent claim.

Searching by the Examiner yielded prior art as cited in the previous Office Actions. Based on Applicant's arguments and the Examiner's review of the Office Action mailed on November 18, 2022, the subject matter is deemed to be allowable. Further explanation can be reviewed in the Applicant's arguments filed on February 16, 2023. Therefore, it is concluded by the examiner that claims 1, 2, 4, 5, 7-18, and 20-24 of the present invention are allowable..

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAMMIE K MARLEN whose telephone number is (571)272-1986. The examiner can normally be reached Monday through Friday from 8 am until 4 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno can be reached on 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	**Art Unit**
	TAMMIE K MARLEN	3792

CPC						
Symbol					**Type**	**Version**
A61N	/	5	/	062	F	2013-01-01
A61B	/	5	/	0064	I	2013-01-01
A61B	/	5	/	0082	I	2013-01-01
A61N	/	2005	/	0633	A	2013-01-01
A61N	/	2005	/	0626	A	2013-01-01
A61N	/	2005	/	0642	A	2013-01-01
A61N	/	2005	/	0652	A	2013-01-01
A61N	/	2005	/	0663	A	2013-01-01
A61N	/	2005	/	0662	A	2013-01-01
A61N	/	2005	/	0651	A	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	21	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	17 April 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office — Part of Paper No.: 20230417

BIOFRONTERA EXHIBIT 1002
Page 15 of 482

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	**Art Unit**
	TAMMIE K MARLEN	3792

INTERNATIONAL CLASSIFICATION					
CLAIMED					
A61N5/06	/	5	/	06	

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	17 April 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office

Part of Paper No.: 20230417

BIOFRONTERA EXHIBIT 1002
Page 16 of 482

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	8	10		19										
2	2	9	11	17	20										
	3	10	12	18	21										
3	4	13	13	19	22										
4	5	11	14	20	23										
	6	12	15	21	24										
5	7	14	16												
6	8	15	17												
7	9	16	18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	17 April 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office

Part of Paper No.: 20230417

BIOFRONTERA EXHIBIT 1002
Page 17 of 482

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61N 5/06,062,0616	11/10/2022	TKM
A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662	11/10/2022	TKM
A61B5/0064,0082	11/10/2022	TKM
Updated above	02/21/2023	TKM

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
Inventor name and assignee search	11/10/2022	TKM
Text-limited and related application search -- see search history printout	11/10/2022	TKM
Consulted Alyssa Alter	10/20/2021	TKM
Similarity and More Like This search	11/10/2022	TKM
Updated above	02/21/2023	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	PGPUB text search -- see interference search printout	02/21/2023	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	17/942,353
Date Submitted: April 6, 2023				**Filing Date**	9/12/2022
				First Named Inventor	Thomas BOYAJIAN
				Art Unit	3792
(use as many sheets as necessary)				Examiner Name	Tammie K. MARLEN
Sheet	1	of	1	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	D1	2010/0179469-A1	07-15-2010	HAMMOND ET AL.	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	D2	KR-20120100861-A	09-12-2012	WANG		Abs.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	D3	Champeau et al. "Photodynamic therapy for skin cancer: How to enhance drug penetration?", Journal of Photochemistry and Photobiology B: Biology, vol. 197, 2 Jul. 2019	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	04/17/2023

4864-1676-1691.1

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	31	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2019/03/25 10:32 AM
L2	30	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 10:32 AM
L3	6	("0000002"|"0000003"|"0000004"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L6	4	("0000001"|"0000002"|"0000003"|"0000004").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L7	14	("0000001"|"0000002"|"0000003"|"0000004"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045"|"20050075703"|"20060241726"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L8	8	(US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 10:37 AM
L9	3	("0000002"|"20050075703"|"20060241726").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 01:09 PM
L10	9	(("20030088296") or ("20050090877") or ("20060253175") or ("20070283655") or ("20100010591") or ("20110106222") or ("20140067024") or ("9533170")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:12 PM
L11	6	("0000002"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 01:13 PM
L12	14	(US-0162109-$ | US-0287671-$ | US-0287696-$ | US-	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 01:16 PM

		20060287696-$ | US-20120287671-$ | US-20150162109-$ | US-7156865-$).DID.					
L13	3	(("20080031924") or ("20100174223") or ("20150238776")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:18 PM
L14	2	(("20160166846") or ("20130190845")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:19 PM
L15	12	"2007112427"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 02:58 PM
L16	5	"38541884".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 02:58 PM
L17	8	"2011124912"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 02:59 PM
L18	4	"42228866".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 03:00 PM
L19	6	("0000002"|"0000003"|"0000004"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L20	4	("0000001"|"0000002"|"0000003"|"0000004").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L21	14	("0000001"|"0000002"|"0000003"|"0000004"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045"|"20050075703"|"20060241726"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L22	8	(US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L23	3	("0000002"|"20050075703"|"20060241726").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L24	9	(("20030088296") or ("20050090877") or ("20060253175") or ("20070283655") or ("20100010591") or ("20110106222") or ("20140067024") or ("9533170")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L25	6	("0000002"|"20040162596"|"20040260365"|"58	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM

		14008"|"5849027"|"9108045").PN.					
L26	14	(US-0162109-$ | US-0287671-$ | US-0287696-$ | US-20060287696-$ | US-20120287671-$ | US-20150162109-$ | US-7156865-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L27	3	(("20080031924") or ("20100174223") or ("20150238776")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L28	2	(("20160166846") or ("20130190845")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L29	2008929	L19 a4 "s5" L20 L21 L22 L23 L24 L25 L26 L27 L28	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L30	50	L19 L20 L21 L22 L23 L24 L25 L26 L27 L28	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:02 PM
L31	6784	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L32	5	L16	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L33	11523	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L34	8633	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L35	2743	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L36	6725	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L37	572	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L38	1341	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L39	4107	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L40	1289	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L41	285	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM

L42	282	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM
L43	30801	L31 L33 L34 L35 L36 L37 L38 L39 L40 L41 L42	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM
L44	3652	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L45	31604	L43 L44	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L46	8642	L45 and (diode led)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L47	280	(L41 L37) and (L36 L39 L44 (diode led))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:18 PM
L48	280	(L41 L37) and (L36 L39 L44 (diode led))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:18 PM
L49	1828	L46 and (panel$4 hing$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:19 PM
L50	21	(US-20180236259-$ or US-20170007844-$ or US-20150134032-$ or US-20120265275-$ or US-20140350644-$ or US-20120150265-$ or US-20180015297-$ or US-20180193660-$ or US-20180280718-$ or US-20070016269-$ or US-20180345034-$ or US-20110054573-$ or US-20100017953-$ or US-20160129279-$ or US-20170231058-$ or US-20170238401-$ or US-20160235980-$ or US-20180133497-$ or US-20180008839-$).did. or (US-9950136-$).did. or (WO-2018067411-$).did.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 03:35 PM
L51	21	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2019/03/25 04:11 PM

		US-20180345034-$ or US-20180015297-$).did. or (US-9533170-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.					
L52	17	L51 and (@ad<="20151015" @rlad<="20151015" @prad<="20151015")	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 04:12 PM
L53	4	L51 not L52	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 04:12 PM
L54	3	"39774377".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 04:18 PM
L55	4	(("20050090877") or ("20060253175") or ("20140067024") or ("20060253175") or ("20150162109")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/29 08:51 AM
L56	6786	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L57	11526	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L58	8637	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L59	2747	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L60	6728	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L61	572	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L62	1341	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L63	4110	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L64	1289	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L65	285	A61N2005/064.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2019/03/29

			USOCR; FPRS; EPO; JPO; DERWENT)				08:56 AM
L66	282	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L67	30814	L56 L57 L58 L59 L60 L61 L62 L63 L64 L65 L66	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L68	3653	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L69	31617	L67 L68	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L70	2785	L69 and (panel$4 hing$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L71	45	L69 and ((five fifth) with (panel$4 hing$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:58 AM
L72	1	("8021501").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/29 10:10 AM
L73	6919	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L74	11077	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L75	8626	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L76	2800	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L77	6742	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L78	578	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L79	1351	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L80	4117	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L81	1294	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L82	285	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM

L83	283	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L84	30469	L73 L74 L75 L76 L77 L78 L79 L80 L81 L82 L83	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L85	3612	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L86	31266	L84 L85	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L87	10	L86 and ((nest$6 near3 hing$6) (optical$6 near3 dead))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L88	618	L86 and ((sens$6 determin$6 detect$6) near3 (size shape))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:29 AM
L89	6941	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L90	11104	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L91	8674	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L92	2822	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L93	6752	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L94	581	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L95	1355	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L96	4132	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L97	1295	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L98	287	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L99	285	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L100	30552	L89 L90 L91 L92 L93	(US-PGPUB; USPAT;	OR	ON	ON	2019/10/31

		L94 L95 L96 L97 L98 L99	USOCR; FPRS; EPO; JPO; DERWENT)				01:34 PM
L101	3643	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L102	31352	L100 L101	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L103	242	L102 and ((measur$6) near3 (size shape))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L104	6943	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L105	11105	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L106	8678	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L107	2825	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L108	6754	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L109	583	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L110	1356	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L111	4135	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L112	1295	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L113	287	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L114	285	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L115	30563	L104 L105 L106 L107 L108 L109 L110 L111 L112 L113 L114	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L116	3643	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L117	31363	L115 L116	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2019/11/04 11:37 AM

			JPO; DERWENT)				
L118	10	L117 and ((nest$6 near3 hing$6) (optical$6 near3 dead))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L124	1	("20120283328").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2020/01/31 08:26 AM
L125	22	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$).did. or (US-9533170-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2020/11/23 01:14 PM
L126	0	L125 and aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 01:15 PM
L127	0	L125 and ala	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 01:15 PM
L128	13320	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L129	4618	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L130	2839	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L131	4119	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L132	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L133	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L134	5449	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM

L135	8056	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L136	4864	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L137	5508	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L138	8097	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L139	13320	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L140	10819	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L141	4119	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L142	8056	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L143	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L144	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L145	5508	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L146	1413	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L147	365	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L148	441	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L149	36840	L138 L139 L140 L141 L142 L143 L144 L145 L146 L147 L148	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L150	4864	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L151	37870	L149 L150	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L152	46164	L128 L129 L130 L131	(US-PGPUB; USPAT;	OR	ON	ON	2020/11/23

		L132 L133 L134 L135 L136 L137 L151	USOCR; FPRS; EPO; JPO; DERWENT)				03:05 PM
L153	845	L152 and $2aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:07 PM
L154	13321	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L155	4619	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L156	2842	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L157	4120	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L158	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L159	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L160	5449	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L161	8057	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L162	4865	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L163	5509	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L164	8098	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L165	13321	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L166	10819	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L167	4120	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L168	8057	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L169	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2020/11/24 06:15 AM

			JPO; DERWENT)				
L170	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L171	5509	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L172	1413	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L173	365	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L174	441	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L175	36843	L164 L165 L166 L167 L168 L169 L170 L171 L172 L173 L174	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L176	4865	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L177	37873	L175 L176	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L178	46171	L154 L155 L156 L157 L158 L159 L160 L161 L162 L163 L177	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L179	845	L178 and $2aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L180	1	(10/466734).APP.	(USPAT; USOCR)	OR	ON	ON	2020/11/24 01:51 PM
L181	12	"19912039".FMID.	(US-PGPUB; USPAT; FPRS; JPO)	OR	ON	ON	2020/11/24 01:58 PM
L182	39	("0000001"|"0000002"|"20040010299"|"20090324727"|"20110053965"|"20140010761"|"20030088296"|"20040162596"|"20040260365"|"20050075703"|"20050090877"|"20060241726"|"20060253175"|"20060287696"|"20070283655"|"20080031924"|"20100010591"|"20100174223"|"20110106222"|"20120283328"|"20120287671"|"20130066405"|"20130190845"|"20140067024"|"20150162109"|"20150238776"|"20160166846"|"20160175609"|"5849	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 02:10 PM

		027"|"6223071"|"6709446"|"7156865"|"7190109"|"7723910"|"8030836"|"8216289"|"8758418"|"9108045"|"9533170").PN.					
L183	25	(US-20070283655-$ or US-20130066405-$ or US-20160175609-$ or US-20160175610-$ or US-20120287671-$ or US-20060241726-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or US-20050075703-$).did. or (US-9227082-$ or US-9017391-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2020/11/27 01:52 PM
L184	56	(US-0010591-$ | US-0031924-$ | US-0066405-$ | US-0067024-$ | US-0075703-$ | US-0088296-$ | US-0090877-$ | US-0106222-$ | US-0162109-$ | US-0162596-$ | US-0166846-$ | US-0174223-$ | US-0175609-$ | US-0175610-$ | US-0190845-$ | US-0238776-$ | US-0241726-$ | US-0253175-$ | US-0260365-$ | US-0283328-$ | US-0283655-$ | US-0287671-$ | US-0287696-$ | US-16787667-$ | US-20030088296-$ | US-20040162596-$ | US-20040260365-$ | US-	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/27 01:55 PM

		20050075703-$ | US-20050090877-$ | US-20060241726-$ | US-20060253175-$ | US-20060287696-$ | US-20070283655-$ | US-20080031924-$ | US-20100010591-$ | US-20100174223-$ | US-20110106222-$ | US-20120283328-$ | US-20120287671-$ | US-20130066405-$ | US-20130190845-$ | US-20140067024-$ | US-20150162109-$ | US-20150238776-$ | US-20160166846-$ | US-20160175609-$ | US-20160175610-$ | US-5814008-$ | US-5849027-$ | US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$ | US-9533170-$).DID.					
L185	6	("0000001"|"0000002"|"20040010299"|"20090324727"|"20110053965"|"20140010761").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/27 01:59 PM
L186	1	("10357567").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2020/11/27 01:59 PM
L187	18	L183 not (L184 L185 L186)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/27 01:59 PM
L188	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L189	4832	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L190	3002	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L191	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L192	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L193	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/03/16

			USOCR; FPRS; EPO; JPO; DERWENT)				12:49 PM
L194	5775	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L195	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L196	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L197	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L198	8407	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L199	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L200	11191	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L201	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L202	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L203	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L204	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L205	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L206	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L207	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L208	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L209	38191	L198 L199 L200 L201 L202 L203 L204 L205 L206 L207 L208	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L210	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/03/16 12:49 PM

			JPO; DERWENT)				
L211	39273	L209 L210	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L212	47948	L188 L189 L190 L191 L192 L193 L194 L195 L196 L197 L211	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L213	987	L212 and hinge	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L214	23	L212 and (((wide$4 and narrow$6) or (first and second)) adj width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:50 PM
L215	117	L212 and (((wide$4 and narrow$6) or (first and second)) near3 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:51 PM
L216	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L217	4832	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L218	3002	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L219	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L220	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L221	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L222	5775	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L223	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L224	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L225	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L226	8407	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L227	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM

L228	11191	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L229	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L230	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L231	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L232	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L233	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L234	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L235	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L236	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L237	38191	L226 L227 L228 L229 L230 L231 L232 L233 L234 L235 L236	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L238	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L239	39273	L237 L238	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L240	47948	L216 L217 L218 L219 L220 L221 L222 L223 L224 L225 L239	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L241	199	L240 and (((wide$4 and narrow$6) or (first and second)) near6 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L242	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L243	4833	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L244	3005	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L245	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/03/18

			USOCR; FPRS; EPO; JPO; DERWENT)				09:35 AM
L246	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L247	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L248	5776	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L249	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L250	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L251	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L252	8408	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L253	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L254	11195	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L255	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L256	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L257	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L258	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L259	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L260	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L261	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L262	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/03/18 09:35 AM

			JPO; DERWENT)				
L263	38197	L252 L253 L254 L255 L256 L257 L258 L259 L260 L261 L262	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L264	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L265	39279	L263 L264	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L266	47959	L242 L243 L244 L245 L246 L247 L248 L249 L250 L251 L265	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L267	199	L266 and (((wide$4 and narrow$6) or (first and second)) near6 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L268	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L269	4833	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L270	3005	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L271	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L272	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L273	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L274	5776	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L275	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L276	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L277	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L278	8408	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L279	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM

L280	11195	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L281	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L282	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L283	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L284	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L285	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L286	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L287	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L288	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L289	38197	L278 L279 L280 L281 L282 L283 L284 L285 L286 L287 L288	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L290	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L291	39279	L289 L290	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L292	47959	L268 L269 L270 L271 L272 L273 L274 L275 L276 L277 L291	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L293	0	2007/112427	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:22 PM
L294	582470	(stephen tobin).in.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:23 PM
L295	242	(stephen and tobin).in.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:23 PM
L296	10	("0000001"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20160045757"|"5601838	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM

		"|"5686065"|"6897238"). PN.					
L297	2	("0000002"|"D000001"). PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM
L298	3	("0000001"|"0000002"|" 7730893").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM
L299	10	("5032400"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20160045757"|"5601838"|"5686065"|"6897238"). PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:14 PM
L300	1	("20110224598").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2021/07/07 03:15 PM
L301	3	("0000001"|"7033381"|" 7730893").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:16 PM
L302	14	L299 L300 L301	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:16 PM
L303	9	L302 and (wid$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:18 PM
L304	13949	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L305	4963	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L306	3093	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L307	4694	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L308	785	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L309	1739	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L310	5920	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L311	8474	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L312	5338	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L313	6023	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/07/07 03:19 PM

			JPO; DERWENT)				
L314	8498	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L315	13949	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L316	11425	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L317	4694	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L318	8474	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L319	785	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L320	1739	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L321	6023	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L322	1468	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L323	399	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L324	469	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L325	38854	L314 L315 L316 L317 L318 L319 L320 L321 L322 L323 L324	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L326	5338	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L327	39953	L325 L326	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L328	48853	L304 L305 L306 L307 L308 L309 L310 L311 L312 L313 L327	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L329	217	L328 and ((((wide$4 and narrow$6) or (first and second)) near6 width) or ((wide$6 and narrow$6) near6 panel))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:21 PM
L331	3	("0000001"|"0000002"|"	(US-PGPUB; USPAT)	OR	ON	ON	2021/08/26

		20200100997").PN.					12:36 PM
L332	2	(("20160346392") or ("20200100997")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2021/08/26 12:37 PM
L333	14216	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L334	5141	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L335	3204	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L336	4914	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L337	808	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L338	1778	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L339	6128	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L340	8649	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L341	5526	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L342	6224	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L343	8694	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L344	14216	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L345	11742	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L346	4914	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L347	8649	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L348	808	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L349	1778	A61N2005/0642.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/08/26

			USOCR; FPRS; EPO; JPO; DERWENT)				12:42 PM
L350	6224	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L351	1481	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L352	408	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L353	492	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L354	39744	L343 L344 L345 L346 L347 L348 L349 L350 L351 L352 L353	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L355	5526	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L356	40873	L354 L355	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L357	50063	L333 L334 L335 L336 L337 L338 L339 L340 L341 L342 L356	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L358	222	L357 and ((((wide$4 and narrow$6) or (first and second)) near6 width) or ((wide$6 and narrow$6) near6 panel))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L360	37	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2021/10/18 03:52 PM
L361	38	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:52 PM
L362	64	("0000002"|"0000011"|"20200100997"|"0000001"|"20190290763"|"20200269063"|"20200398071"|"7730893"|"20090247932"|"20110224598"|"20130274834"|"20130289089"|"20150290028"|"20160008623"|"20200261580"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20	(US-PGPUB; USPAT)	OR	ON	ON	2021/10/18 03:52 PM

		160045757"|"5601838"|"5686065"|"6897238"|"0017109"|"20010021812"|"D000001"|"20040010299"|"20090324727"|"20110053965"|"20140010761"|"20030088296"|"20040162596"|"20040260365"|"20050075703"|"20050090877"|"20060241726"|"20060253175"|"20060287696"|"20070283655"|"20080031924"|"20100010591"|"20100174223"|"20110106222"|"20120283328"|"20120287671"|"20130066405"|"20130190845"|"20140067024"|"20150162109"|"20150238776"|"20160166846"|"20160175609"|"5849027"|"6223071"|"6709446"|"7156865"|"7190109"|"7723910"|"8030836"|"8216289"|"8758418"|"9108045"|"9533170").PN.				
L363	14281	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L364	5189	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L365	3246	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L366	4993	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L367	815	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L368	1794	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L369	6171	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L370	8713	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L371	5588	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L372	6285	A61N2005/0663.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/18

			USOCR; FPRS; EPO; JPO; DERWENT)				03:53 PM
L373	8738	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L374	14281	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L375	11844	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L376	4993	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L377	8713	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L378	815	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L379	1794	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L380	6285	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L381	1484	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L382	413	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L383	498	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L384	39984	L373 L374 L375 L376 L377 L378 L379 L380 L381 L382 L383	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L385	5588	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L386	41124	L384 L385	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L387	50408	L363 L364 L365 L366 L367 L368 L369 L370 L371 L372 L386	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L388	3097	L387 and (uniform$6 with (light illuminat$8))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L389	29	(US-20070283655-$ or US-20130066405-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2021/10/18 03:54 PM

		US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or US-20050075703-$ or US-20160310756-$ or US-20130190845-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.					
L390	10	L389 and (uniform$6 with (light illuminat$8))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:54 PM
L391	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L392	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L393	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L394	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L395	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L396	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L397	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L398	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L399	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM

L400	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L401	8783	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L402	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L403	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L404	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L405	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L406	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L407	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L408	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L409	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L410	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L411	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L412	40271	L401 L402 L403 L404 L405 L406 L407 L408 L409 L410 L411	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L413	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L414	41417	L412 L413	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L415	50819	L391 L392 L393 L394 L395 L396 L397 L398 L399 L400 L414	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L416	15	L415 and (nest$6 near3 hing$9)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L417	7	L415 and (recess$6	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/19

		near3 hing$9)	USOCR; FPRS; EPO; JPO; DERWENT)				10:30 AM
L418	0	L415 and (hidden near3 hing$9)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:30 AM
L419	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L420	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L421	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L422	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L423	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L424	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L425	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L426	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L427	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L428	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L429	8783	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L430	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L431	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L432	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L433	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L434	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/10/19 03:50 PM

			JPO; DERWENT)				
L435	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L436	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L437	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L438	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L439	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L440	40271	L429 L430 L431 L432 L433 L434 L435 L436 L437 L438 L439	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L441	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L442	41417	L440 L441	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L443	50819	L419 L420 L421 L422 L423 L424 L425 L426 L427 L428 L442	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L444	59	L443 and (dead near3 space)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L445	61	L443 and (hing$6 with (reduce reduced reducing reduction minim$9))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:51 PM
L446	66	L443 and (hing$6 with (reduce reduced reducing reduction minim$9 decreas$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:52 PM
L447	112	L444 L445 L446	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:52 PM
L448	30	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2021/10/20 01:42 PM

		US-20180093107-$ or US-20010021812-$ or US-20050075703-$ or US-20160310756-$ or US-20130190845-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$ or US-20160310756-$).did.					
L449	17	L448 and output	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:42 PM
L450	19	L448 and (shape size measur$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:45 PM
L451	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L452	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L453	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L454	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L455	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L456	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L457	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L458	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L459	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L460	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L461	8783	A61N5/06.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/20

			USOCR; FPRS; EPO; JPO; DERWENT)				01:49 PM
L462	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L463	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L464	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L465	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L466	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L467	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L468	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L469	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L470	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L471	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L472	40271	L461 L462 L463 L464 L465 L466 L467 L468 L469 L470 L471	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L473	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L474	41417	L472 L473	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L475	50819	L451 L452 L453 L454 L455 L456 L457 L458 L459 L460 L474	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L476	1292	L475 and ((sens$6 detect$6) near5 (shape size))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L477	45	L475 and ((sens$6 detect$6) with (shape size) with (treatment adj (surface area)))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:51 PM
L478	54	L475 and ((sens$6	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/20

		detect$6 measur$6) with (shape size) with (treatment adj (surface area)))	USOCR; FPRS; EPO; JPO; DERWENT)				01:54 PM
L479	162	L475 and ((sens$6 detect$6 measur$6 adjust adjusting adjusted adjustable "based on") with (shape size) with (treatment adj (surface area)))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:58 PM
L480	88	L479 and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:59 PM
L481	17	L448 and ("j/cm" "mw/cm" nm nanometer)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:47 PM
L482	0	L448 and ("j/cm" "mw/cm")	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:47 PM
L483	7	L475 and ("j/cm" "mw/cm" nm nanometer)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	AND	ON	ON	2021/10/20 03:47 PM
L484	46	L475 and ("j/cm" "mw/cm" (nm or nanometer))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	AND	ON	ON	2021/10/20 03:48 PM
L485	34	L484 and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:48 PM
L486	629	L475 and (intensity with red) and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:52 PM
L487	442	L475 and (intensity with red with light) and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:52 PM
L488	0	L475 and (intensity with red with "j/cm") and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:53 PM
L489	7	L475 and (intensity with "j/cm") and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:53 PM
L490	32	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2022/01/24 10:45 AM

		US-20050075703-$ or US-20160310756-$ or US-20130190845-$ or US-20130066404-$ or US-20030216795-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$ or US-20160310756-$).did.					
L491	20	L490 and intensity	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2022/01/24 10:45 AM
L492	3	("0000002" OR "0017487" OR "0017506").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L493	2	("0000001" OR "0000002").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L494	3	("0000001" OR "0000002" OR "20150290470").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L495	3	("11135293" "20100174222" "20150290470").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:17 AM
L496	53969	A61N5/062,06,0616.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:37 PM
L497	40946	A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2022/03/23 03:38 PM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L498	13206	A61B5/0064,0082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:38 PM
L499	85960	496 497 498	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:38 PM
L500	20151	499 AND (intensity WITH light)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:39 PM
L501	7575	499 AND (intensity WITH light WITH (more	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	OR	ON	ON	2022/03/23 03:40 PM

		less higher lower highest lowest greater))	AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L502	2876	499 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/03/23 03:47 PM
L503	4680	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:48 PM
L504	1777	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/03/23 03:48 PM
L505	4689	501 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/05/06 02:25 PM
L508	408	L505 AND hing$6	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY,	OR	ON	ON	2022/05/06 02:47 PM

			CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L509	116	((US-20130190845-A1 OR US-20120148975-A1 OR US-20130196284-A1 OR US-20120148976-A1 OR US-20100179622-A1 OR US-20130280671-A1 OR US-20140072932-A1 OR US-20050004632-A1 OR US-20070248930-A1 OR US-20150140502-A1 OR US-20110176326-A1 OR US-20070129776-A1 OR US-20020035386-A1 OR US-20020120312-A1 OR US-20070283655-A1 OR US-20120150265-A1 OR US-20160129279-A1 OR US-20140277291-A1 OR US-20130303972-A1 OR US-20020029071-A1 OR US-20070150031-A1 OR US-20130079759-A1 OR US-20130178919-A1 OR US-20160158485-A1 OR US-20160175609-A1 OR US-20100030013-A1 OR US-20090054953-A1 OR US-20040249423-A1 OR US-20160101295-A1 OR US-20030004499-A1 OR US-20120330386-A1 OR US-20090005839-A1 OR US-20140187998-A1 OR US-20160325109-A1	(US-PGPUB; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); USPAT; DERWENT)	OR	ON	ON	2022/05/06 02:53 PM

		OR US-20060241726-A1 OR US-20140100455-A1 OR US-20050075703-A1 OR US-20050234383-A1 OR US-20100100160-A1 OR US-20050237423-A1 OR US-20110178582-A1 OR US-20060064144-A1 OR US-20010021812-A1 OR US-20140315142-A1 OR US-20050131500-A1 OR US-20060007390-A1 OR US-20080269730-A1 OR US-20120203310-A1 OR US-20120215291-A1 OR US-20160096042-A1 OR US-20110290005-A1 OR US-20060047329-A1 OR US-20090005837-A1 OR US-20160066791-A1 OR US-20140060546-A1 OR US-20080027317-A1 OR US-20170238401-A1 OR US-20170105265-A1 OR US-20100211136-A1 OR US-20170231058-A1 OR US-20080245371-A1 OR US-20140350395-A1 OR US-20150265366-A1).did. AND PGPB.dbnm.) OR ((DE-102015107669-A1 OR KR-20150126087-A OR CN-88102683-A OR KR-20140058327-A OR KR-101350503-B1 OR WO-2015041919-A1 OR WO-2006028465-A1 OR DE-202012004264-U1 OR FR-2931685-A1 OR CN-102300605-A OR WO-2012086991-A2 OR DE-202006017153-U1 OR DK-201500153-A1 OR CN-102300606-A OR CN-102481456-A OR WO-9614792-A1 OR KR-20160041129-A					

		OR KR-20150124016-A OR CA-2638508-A1 OR RU-2483764-C2 OR KR-20120036564-A OR KR-20020088833-A OR EP-2502647-A1 OR CN-103930162-A OR EP-1839703-A1 OR FR-2601784-A1 OR CN-104640602-A OR DE-4015406-A1 OR WO-2014102791-A2 OR CA-2771517-A1 OR KR-20080094715-A OR EP-2749317-A1 OR CN-1039119-A OR CN-1602172-A OR CN-102883776-A OR WO-2014080103-A2 OR CN-105380745-B OR DE-102007018863-A1 OR CA-2551311-A1 OR DE-10326522-A1 OR GB-2415387-A OR CN-101646924-A OR DE-202007005751-U1 OR CN-1708261-A OR CN-104602638-A).did. AND FTDB.dbnm.) OR ((US-4612604-A OR US-4848323-A OR US-7033381-B1 OR US-8170657-B1 OR US-9808644-B2 OR US-10052393-B2 OR US-10194808-B1).did. AND USPT.dbnm.) OR ((WO-2012075584-A1).did. AND DWPI.dbnm.)					
L510	408	((US-20130190845-A1 OR US-20120148975-A1 OR US-20130196284-A1 OR US-20120148976-A1 OR US-20100179622-A1 OR US-20130280671-A1 OR US-20140072932-A1 OR US-20050004632-A1 OR US-20070248930-A1 OR US-20100318161-A1 OR US-20130253620-A1 OR US-20140121731-A1 OR US-20150079536-A1 OR US-20150140502-	(US-PGPUB; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); USPAT; DERWENT)	OR	ON	ON	2022/05/06 02:55 PM

		A1 OR US-20110176326-A1 OR US-20070129776-A1 OR US-20020035386-A1 OR US-20020120312-A1 OR US-20070283655-A1 OR US-20120150265-A1 OR US-20160129279-A1 OR US-20140277291-A1 OR US-20130303972-A1 OR US-20020029071-A1 OR US-20040127961-A1 OR US-20070233209-A1 OR US-20070150031-A1 OR US-20130079759-A1 OR US-20130178919-A1 OR US-20160158485-A1 OR US-20160175609-A1 OR US-20100030013-A1 OR US-20090054953-A1 OR US-20040249423-A1 OR US-20060009822-A1 OR US-20160101295-A1 OR US-20030004499-A1 OR US-20120330386-A1 OR US-20090005839-A1 OR US-20140187998-A1 OR US-20160325109-A1 OR US-20060241726-A1 OR US-20070038269-A1 OR US-20140100455-A1 OR US-20170035299-A9 OR US-20050075703-A1 OR US-20050234383-A1 OR US-20070129778-A1 OR US-20100100160-A1 OR US-20050237423-A1 OR US-20080079802-A1 OR US-20110178582-A1 OR US-20060064144-A1 OR US-20010021812-A1 OR US-20040143308-A1 OR US-20140315142-A1 OR US-20050131500-A1 OR					

		US-20060007390-A1 OR US-20080269730-A1 OR US-20120203310-A1 OR US-20130253619-A1 OR US-20120215291-A1 OR US-20160096042-A1 OR US-20110290005-A1 OR US-20130152670-A1 OR US-20130179120-A1 OR US-20130184846-A1 OR US-20130182882-A1 OR US-20130191084-A1 OR US-20130197888-A1 OR US-20060047329-A1 OR US-20100076526-A1 OR US-20090005837-A1 OR US-20160066791-A1 OR US-20140060546-A1 OR US-20080027317-A1 OR US-20080045841-A1 OR US-20080287806-A1 OR US-20130123640-A1 OR US-20140194751-A1 OR US-20150080745-A1 OR US-20170238401-A1 OR US-20170105265-A1 OR US-20100211136-A1 OR US-20170231058-A1 OR US-20080245371-A1 OR US-20140107404-A1 OR US-20140350395-A1 OR US-20150265366-A1 OR US-20150265353-A1).did. AND PGPB.dbnm.) OR ((WO-2010142031-A1 OR WO-2010142013-A1 OR KR-20120047227-A OR JP-2012529299-A OR CN-102802726-A OR JP-5705838-B2 OR KR-101670537-B1 OR CN-102802726-B OR WO-2012048423-A1 OR EP-2627283-B1 OR DE-102015107669-A1 OR WO-2012075584-					

		A1 OR EP-2648651-B1 OR WO-2009004412-A1 OR CN-101687099-A OR EP-2164566-B1 OR CN-101687099-B OR KR-20150126087-A OR CN-88102683-A OR DE-3814611-A1 OR NL-8801071-A OR IT-1217200-B OR WO-2013155632-A1 OR CN-104379087-A OR JP-2015515333-A OR JP-6007313-B2 OR CN-104379087-B OR CN-106621060-A OR EP-2838468-B1 OR EP-3263066-A1 OR CN-106621060-B OR EP-3626206-A1 OR KR-20140058327-A OR KR-101350503-B1 OR WO-2015041919-A1 OR WO-2015058284-A1 OR CN-105682603-A OR JP-2016538028-A OR JP-6484235-B2 OR CN-111330163-A OR EP-3845200-A1 OR WO-2011082420-A1 OR WO-2006028465-A1 OR CA-2579639-A1 OR DE-202012004264-U1 OR FR-2931685-A1 OR CN-102300605-A OR WO-2007047892-A1 OR CA-2343843-A1 OR GB-2361430-A OR EP-1147785-A2 OR JP-2002102364-A OR WO-2012086991-A2 OR KR-20120069588-A OR KR-20140072854-A OR KR-101845073-B1 OR DE-202006017153-U1 OR DE-102006008774-A1 OR WO-2007098883-A2 OR CA-2373594-C OR CA-2706642-C OR WO-2007112427-A2 OR CA-2664898-A1 OR WO-2012082739-A2 OR EP-0148144-A2 OR HU-189454-B OR SE-455837-B OR FI-79470-B OR FI-79470-C OR WO-2016007798-A2					

		OR DK-201500153-A1 OR DK-178588-B1 OR CN-102300606-A OR CA-2846344-A1 OR EP-2778752-A2 OR KR-20140113561-A OR JP-2014180565-A OR AU-2014201546-A1 OR SG-10201400483T-A OR BR-102014006370-A2 OR EP-2778752-B1 OR TW-I576092-B OR RU-2661020-C2 OR JP-6362885-B2 OR WO-2012176071-A2 OR CN-102481456-A OR JP-2012532643-A OR WO-9614792-A1 OR CN-1164180-A OR CN-1124822-C OR CA-2672092-A1 OR CA-2341951-A1 OR GB-2360461-A OR GB-2360460-A OR EP-1138349-A2 OR JP-2002065875-A OR EP-1457234-A2 OR JP-2005334670-A OR EP-1457234-B1 OR JP-4889247-B2 OR WO-2007000059-A1 OR CA-2613973-A1 OR CN-101242871-A OR KR-20160041129-A OR KR-101642839-B1 OR NL-8700329-A OR EP-0283062-A2 OR EP-0283062-B1 OR WO-2012010861-A1 OR CA-2842275-A1 OR NZ-607470-A OR KR-20150124016-A OR WO-2012040854-A1 OR CA-2812302-A1 OR CN-103237574-A OR JP-2013541977-A OR CA-2638508-A1 OR WO-2010015080-A1 OR CN-102143731-A OR RU-2483764-C2 OR WO-2006013390-A1 OR GB-2425481-A OR JP-2008508918-A OR EP-1824561-B1 OR WO-2004110305-A2 OR JP-2007526003-A OR WO-03001984-A2 OR KR-20040048881-A					

		OR CN-1578688-A OR JP-2005521432-A OR AU-2002320215-B2 OR CA-2452408-C OR CN-1578688-B OR KR-20120036564-A OR KR-101181054-B1 OR KR-20020088833-A OR KR-100848391-B1 OR WO-2011067603-A1 OR CA-2782496-A1 OR AU-2010326393-A1 OR CN-102711912-A OR WO-2007040691-A1 OR CA-2624668-A1 OR WO-2012174245-A1 OR WO-2015006872-A1 OR WO-2004075985-A2 OR WO-2004075984-A1 OR JP-2006519047-A OR JP-2011098207-A OR WO-02062420-A1 OR EP-1359977-B1 OR DE-60207202-T2 OR NO-331280-B1 OR WO-9919024-A1 OR EP-1021223-B1 OR DE-69827286-T2 OR JP-4257718-B2 OR CA-2304774-C OR WO-2010044879-A2 OR CA-2777481-A1 OR JP-2012505706-A OR WO-2006122229-A2 OR CA-2605346-A1 OR AU-2006243966-A1 OR JP-2008541092-A OR EP-1889470-B1 OR EP-2975834-A1 OR GB-2461806-A OR WO-2010007419-A1 OR EP-2339999-B1 OR WO-2006012123-A2 OR EP-2502647-A1 OR WO-2005049127-A1 OR AU-2004291100-A1 OR JP-2007511286-A OR CN-103930162-A OR EP-1839703-A1 OR WO-2012106541-A1 OR CA-2826245-A1 OR CN-103338818-A OR KR-20140044302-A OR EP-2670481-B1 OR DK-2670481-T3 OR RU-2600223-C2 OR CN-103338818-B OR					

		TW-I603754-B OR KR-101842423-B1 OR FR-2601784-A1 OR EP-0255426-A1 OR WO-2012106542-A1 OR CA-2826247-A1 OR KR-20140044300-A OR EP-2670482-B1 OR RU-2580983-C2 OR TW-I598127-B OR KR-101834155-B1 OR CN-104640602-A OR CN-104640602-B OR DE-4015406-A1 OR WO-2014102791-A2 OR WO-2016057729-A1 OR JP-2017534373-A OR CN-107427407-A OR JP-6608440-B2 OR CN-107427407-B OR CA-2771517-A1 OR KR-20080094715-A OR CN-101495182-A OR KR-101370160-B1 OR WO-2013002935-A1 OR CA-2840434-A1 OR JP-2014526166-A OR CA-2840434-C OR EP-2749317-A1 OR CN-1039119-A OR CN-1602172-A OR CA-2465906-C OR CN-102883776-A OR WO-2014080103-A2 OR EP-2922518-B1 OR ES-2828000-T3 OR CN-105380745-B OR DE-102007018863-A1 OR DE-102007018863-B4 OR CA-2551311-A1 OR DE-10326522-A1 OR EP-1486186-B1 OR WO-2008094252-A2 OR CA-2677217-A1 OR CA-2677217-C OR GB-2415387-A OR CA-2570919-A1 OR AU-2005256804-A1 OR KR-20070052742-A OR CN-1988932-A OR EP-1771225-B1 OR ES-2385991-T3 OR CN-101646924-A OR WO-2013112856-A2 OR EP-2807111-B1 OR WO-2015113003-A1 OR WO-2015184019-A1 OR DE-					

		202007005751-U1 OR EP-2489402-A2 OR EP-2489401-A2 OR EP-2489400-A2 OR WO-2016022612-A1 OR CN-1708261-A OR WO-2008124641-A2 OR CA-2858610-A1 OR CN-104080400-A OR EP-3466335-A1 OR BR-112014014781-A2 OR WO-2015143026-A1 OR CN-104602638-A OR CN-104602638-B OR CN-108113762-A).did. AND FTDB.dbnm.) OR ((US-9242118-B2 OR US-9463333-B2 OR US-8900282-B2 OR US-9308389-B2 OR US-9730780-B2 OR US-8702291-B2 OR US-6626932-B2 OR US-6796994-B2 OR US-7517101-B2 OR US-8425577-B2 OR US-4612604-A OR US-9289623-B2 OR US-8980174-B2 OR US-6645230-B2 OR US-4848323-A OR US-9533170-B2 OR US-8070669-B2 OR US-7033381-B1 OR US-9138595-B2 OR US-10252079-B2 OR US-10342991-B2 OR US-8170657-B1 OR US-9808644-B2 OR US-6663659-B2 OR US-9854977-B2 OR US-7311722-B2 OR US-7730893-B2 OR US-7298415-B2 OR US-8279334-B2 OR US-9079021-B2 OR US-6223071-B1 OR US-9320580-B2 OR US-7449026-B2 OR US-7147319-B2 OR US-10384070-B2 OR US-9248309-B2 OR US-10667990-B2 OR US-8384916-B2 OR US-8493574-B2 OR US-8743377-B2 OR US-8874404-B2 OR US-					

		9013701-B2 OR US-9175945-B2 OR US-9448061-B2 OR US-7544204-B2 OR US-10238294-B2 OR US-9907688-B2 OR US-8380291-B2 OR US-8391960-B2 OR US-8706200-B2 OR US-8838210-B2 OR US-9186063-B2 OR US-9226664-B2 OR US-10052393-B2 OR US-10357662-B2 OR US-10194808-B1 OR US-8528563-B2 OR US-9301770-B2 OR US-10165976-B2 OR US-9700342-B2).did. AND USPT.dbnm.) OR ((WO-2012075584-A1).did. AND DWPI.dbnm.)					
L511	408	L510 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/05/06 02:55 PM
L512	5	("0000001" OR "0000002" OR "20160030565" OR "5211938" OR "6559183").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:04 PM
L513	1	kennedy.in. AND @pd="19970708"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:05 PM
L514	1	("5211938").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:07 PM
L515	1	("5211938").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/19 12:07 PM
L516	5	("5211938").pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/08/19 12:07 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L517	1	5211938b1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/19 12:07 PM
L518	0	"5211938-b1"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/19 12:08 PM
L519	1	"5211938 b1"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/08/19 12:08 PM

			IBM_TDB)				
L520	2545	@pd="19970708"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:09 PM
L521	16	@pd="19970708" AND kennedy	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:09 PM
L522	0	kennedy.in. AND @pd="19970807"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:11 PM
L523	20	kennedy.in. AND malignant.ti.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/30 02:23 PM
L524	39	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/11/07 09:16 AM
L525	41	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/07 09:17 AM
L526	103	524 525	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/07 09:17 AM
L527	82	("0000002" OR "0000081" OR "0017854" OR "0017876" OR "0017889" OR "9597150" OR "10357567" OR "11135293" OR "20010021812" OR "20030088296" OR "20030216795" OR "20040010299" OR "20040162596" OR "20040260365" OR "20050075703" OR "20050090877" OR "20060241726" OR "20060253175" OR "20060287696" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/07 11:33 AM

		"20070283655" OR "20080031924" OR "20080188558" OR "20090247932" OR "20090324727" OR "20100010591" OR "20100174222" OR "20100174223" OR "20100298758" OR "20110020441" OR "20110053965" OR "20110106222" OR "20110224598" OR "20110293528" OR "20120283328" OR "20120287671" OR "20130066404" OR "20130190845" OR "20130274834" OR "20130289089" OR "20130304019" OR "20130315999" OR "20140010761" OR "20140067024" OR "20150162109" OR "20150238776" OR "20150290028" OR "20150290470" OR "20160008623" OR "20160030565" OR "20160045757" OR "20160166846" OR "20160175609" OR "20160175610" OR "20160346392" OR "20190290763" OR "20200100997" OR "20200261580" OR "20200269063" OR "20200398071" OR "20220008538" OR "20220040494" OR "5211938" OR "5601838" OR "5686065" OR "5814008" OR "5849027" OR "6223071" OR "6559183" OR "6709446" OR "6897238" OR "7033381" OR "7156865" OR "7190109" OR "7723910" OR "7730893" OR "8030836" OR "8216289" OR					

		"8226289" OR "8758418" OR "9108045" OR "9227082" OR "9533170").pn.					
L528	43	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 0 Text Selections Text: (US-20170216616-A1 OR US-11446512-B2 OR US-7723910-B2 OR US-10603508-B2 OR CA-3057840-A1 OR AU-2018250595-A1 OR WO-2018191356-A2 OR US-20170106205-A1 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-10589122-B2 OR EP-3851161-A1 OR US-20200246630-A1 OR US-11179574-B2 OR EP-3362145-B1 OR US-20200398071-A1 OR ES-2860807-T3 OR US-20200269063-A1 OR US-20220040494-A1 OR EA-201590362-A1 OR BR-112015004114-A2 OR CA-2881614-A1 OR WO-2014033254-A1 OR EP-2890458-A1 OR US-20140067024-A1 OR ES-2685326-T3 OR US-20160367832-A1 OR EP-2890458-B1 OR JP-2015528338-A OR US-20160008623-A1 OR US-9399146-B2 OR US-20210353148-A1 OR US-20210046326-A1 OR WO-2022050963-A1 OR CN-114010954-A OR CN-114010955-A OR CN-110876836-B OR US-20210402211-A1 OR TW-202200233-A OR US-20220288411-A1 OR US-20180117355-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2022/11/10 09:04 AM

		CA-2984963-A1 OR EP-3294413-A1 OR WO-2016179705-A1 OR WO-2022078955-A1 OR US-11452883-B1 OR US-20120165716-A1 OR US-8372128-B2 OR WO-2018191356-A3).did.					
L529	39	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 1 Text Selection Text: (US-20170216616-A1 OR US-7723910-B2 OR US-11446512-B2 OR WO-2018191356-A2 OR AU-2018250595-A1 OR CA-3057840-A1 OR US-10603508-B2 OR US-8372128-B2 OR US-20120165716-A1 OR US-20210353148-A1 OR WO-2011109628-A1 OR US-20200246630-A1 OR US-10589122-B2 OR US-10231942-B2 OR ES-2860807-T3 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-20170106205-A1 OR US-8758418-B2 OR EP-3362145-B1 OR EP-3851161-A1 OR US-20220249042-A1 OR JP-2013540554-A OR US-20200269063-A1 OR EP-4033980-A1 OR US-11118172-B2 OR US-11179574-B2 OR US-20160074669-A1 OR US-20200398071-A1 OR BR-PI0818453-A2 OR US-6709446-B2 OR US-20130211482-A1 OR WO-2012056397-A1 OR EP-2632549-A1 OR CN-114423481-A OR US-20210085386-A1 OR WO-2021053482-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2022/11/10 09:04 AM

		EP-4031007-A1 OR IL-139397-A OR IL-291143-A OR BR-112013009899-A2 OR CN-103180015-A OR RU-2013124017-A OR ES-2323073-T3 OR US-20220040494-A1 OR JP-2010540163-A OR MX-2010003658-A OR AU-2020103365-A4 OR AU-2021102111-A4).did.					
L530	1810	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L531	58003	A61N5/062,06,0616.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L532	45364	A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L533	14582	A61B5/0064,0082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2022/11/10 09:06 AM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L534	93358	531 532 533	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L535	8176	534 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L536	3118	534 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L537	1810	536 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:07 AM
L538	3415	534 AND ((uniform$6 consistan$8) WITH (light illuminat$6 irradiat$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:09 AM
L539	3680	534 AND ((uniform$6 consistan$8) WITH (light illuminat$6 irradiat$6 radiat$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:09 AM
L540	2294	539 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2022/11/10 09:09 AM

			JPO; IBM_TDB)				
L541	82	("0000002" OR "0000081" OR "0017854" OR "0017876" OR "0017889" OR "9597150" OR "10357567" OR "11135293" OR "20010021812" OR "20030088296" OR "20030216795" OR "20040010299" OR "20040162596" OR "20040260365" OR "20050075703" OR "20050090877" OR "20060241726" OR "20060253175" OR "20060287696" OR "20070283655" OR "20080031924" OR "20080188558" OR "20090247932" OR "20090324727" OR "20100010591" OR "20100174222" OR "20100174223" OR "20100298758" OR "20110020441" OR "20110053965" OR "20110106222" OR "20110224598" OR "20110293528" OR "20120283328" OR "20120287671" OR "20130066404" OR "20130190845" OR "20130274834" OR "20130289089" OR "20130304019" OR "20130315999" OR "20140010761" OR "20140067024" OR "20150162109" OR "20150238776" OR "20150290028" OR "20150290470" OR "20160008623" OR "20160030565" OR "20160045757" OR "20160166846" OR "20160175609" OR "20160175610" OR "20160346392" OR "20190290763" OR "20200100997" OR "20200261580" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/10 09:27 AM

		"20200269063" OR "20200398071" OR "20220008538" OR "20220040494" OR "5211938" OR "5601838" OR "5686065" OR "5814008" OR "5849027" OR "6223071" OR "6559183" OR "6709446" OR "6897238" OR "7033381" OR "7156865" OR "7190109" OR "7723910" OR "7730893" OR "8030836" OR "8216289" OR "8226289" OR "8758418" OR "9108045" OR "9227082" OR "9533170").pn.					
L542	32	((US-20030216795-A1 OR US-20130066405-A1 OR US-20120287671-A1 OR US-20060241726-A1 OR US-20160175609-A1 OR US-20160175610-A1 OR US-20140157511-A1 OR US-20170131693-A1 OR US-20170007844-A1 OR US-20130066404-A1 OR US-20160310756-A1 OR US-20050075703-A1 OR US-20010021812-A1 OR US-20180093107-A1 OR US-20180015297-A1 OR US-20180345034-A1 OR US-20070283655-A1 OR US-20040068305-A1 OR US-20130190845-A1 OR US-20040093043-A1).did. AND PGPB.dbnm.) OR ((US-9533170-B2 OR US-9017391-B2 OR US-9227082-B2 OR US-4100415-A).did. AND USPT.dbnm.) OR ((US-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:49 PM

		20160175609-A1 OR US-20160175608-A1 OR GB-2501670-A OR US-20160175610-A1 OR US-20140157511-A1 OR US-20160310756-A1).did. AND DWPI.dbnm.) OR ((EP-2016977-A1 OR WO-2018191356-A2).did. AND FPRS.dbnm.)					
L543	41	(542 541) AND fan	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:50 PM
L544	35	543 AND (uniform$6 constant$6 consisten$6)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:52 PM
L545	39	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/11/14 04:04 PM
L546	41	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/14 04:04 PM
L547	19	(545 546) AND intensity.clm.	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	ON	ON	2022/11/14 04:05 PM

			DERWENT)				
L548	43	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 0 Text Selections Text: (US-20170216616-A1 OR US-11446512-B2 OR US-20220387816-A1 OR US-7723910-B2 OR US-10603508-B2 OR JP-20200516393-A5 OR CA-3057840-A1 OR AU-2018250595-A1 OR WO-2018191356-A2 OR US-20170106205-A1 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-20230001227-A1 OR US-10589122-B2 OR EP-3851161-A1 OR US-11179574-B2 OR US-20200246630-A1 OR US-20200398071-A1 OR EP-3362145-B1 OR ES-2860807-T3 OR US-20200269063-A1 OR US-20220040494-A1 OR CA-2881614-A1 OR EP-2890458-A1 OR WO-2014033254-A1 OR ES-2685326-T3 OR US-20140067024-A1 OR US-20160367832-A1 OR EP-2890458-B1 OR US-20160008623-A1 OR JP-2015528338-A OR US-9399146-B2 OR US-20210353148-A1 OR WO-2021231913-A1 OR US-20210046326-A1 OR US-11452883-B1 OR US-20120165716-A1 OR US-8372128-B2 OR CN-114010954-A OR CN-114010955-A OR WO-2022078955-A1 OR WO-2023285921-A1 OR US-20180117355-A1 OR CN-110876836-B OR CA-2984963-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/02/21 03:13 PM

		EP-3294413-A1 OR WO-2016179705-A1 OR US-11033752-B2 OR US-20200121944-A1).did.					
L549	44	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 1 Text Selection Text: (US-20170216616-A1 OR US-7723910-B2 OR JP-20200516393-A5 OR US-11446512-B2 OR US-20220387816-A1 OR WO-2018191356-A2 OR CA-3057840-A1 OR AU-2018250595-A1 OR US-10603508-B2 OR US-20120165716-A1 OR US-8372128-B2 OR WO-2021231913-A1 OR US-20210353148-A1 OR US-20230001227-A1 OR WO-2011109628-A1 OR US-20200246630-A1 OR US-10589122-B2 OR CN-102164542-A OR US-11179574-B2 OR US-20130274598-A1 OR EP-3362145-A1 OR WO-2017066270-A1 OR WO-2017066270-A9 OR US-20170106205-A1 OR ES-2860807-T3 OR US-20200398071-A1 OR EP-3851161-A1 OR US-8758418-B2 OR EP-3362145-B1 OR IL-139397-A OR US-20200269063-A1 OR AU-2021102111-B4 OR AU-2021102111-A4 OR AU-2020103365-A4 OR US-6709446-B2 OR US-20220040494-A1 OR CZ-284897-A3 OR US-20030158258-A1 OR US-7190109-B2 OR CA-2331090-C OR JP-2002512205-A OR JP-2020516393-A OR CA-2327393-C OR JP-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/02/21 03:14 PM

		2017079940-A OR ES-2323073-T3 OR GB-2525432-A OR KR-101638664-B1 OR US-9723991-B2 OR US-7335684-B2 OR US-5079262-A).did.					
L550	6	("0000001" OR "0000002" OR "10786571" OR "10814114" OR "11235169" OR "20190216927").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/02/21 03:29 PM
L551	1	("20100179469").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/04/17 11:38 AM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N119	882	(panel AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:19 AM
N120	882	(panel AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:20 AM
N121	189	(panel AND width AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:23 AM
N122	213	(panel AND (width wide wider) AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:23 AM
N123	3	(panel AND (width wide wider) AND (light illuminat$6 led) AND ((nest$6 near3 hing$6) (optical$6 near3 dead))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:38 AM
N330	15	(panel AND (width wide wider) AND (light illuminat$6 led) AND (ala aminolevul$8)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 07:14 PM

N359	15	(panel AND (width wide wider) AND (light illuminat$6 led) AND (ala aminolevul$8)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2021/08/26 12:42 PM
N361	3	(panel AND (width wide wider longer long short shorter bigger) AND ((light illuminat$6 led) WITH intens$6) AND (nest$6 WITH hing$6)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/05/06 02:49 PM
N362	1471	(panel AND (width wide wider longer long short shorter bigger) AND ((light illuminat$6 led) WITH intens$6)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/02/21 03:21 PM
N363	46	(panel AND (width wide wider longer long short shorter bigger) AND ((light illuminat$6 led) WITH intens$6) AND hing$6).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/02/21 03:21 PM

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	17/942,353
Date Submitted: April 6, 2023				**Filing Date**	9/12/2022
				First Named Inventor	Thomas BOYAJIAN
				Art Unit	3792
(use as many sheets as necessary)				Examiner Name	Tammie K. MARLEN
Sheet	1	of	1	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	D1	2010/0179469-A1	07-15-2010	HAMMOND ET AL.	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	D2	KR-20120100861-A	09-12-2012	WANG		Abs.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	D3	Champeau et al. "Photodynamic therapy for skin cancer: How to enhance drug penetration?", Journal of Photochemistry and Photobiology B: Biology, vol. 197, 2 Jul. 2019	

Examiner Signature		Date Considered	

(19) 대한민국특허청(KR)
(12) 공개특허공보(A)

(11) 공개번호 10-2012-0100861
(43) 공개일자 2012년09월12일

(51) 국제특허분류(Int. Cl.)
A61N 5/06 (2006.01) *A61N 5/067* (2006.01)
(21) 출원번호 10-2012-0082345(분할)
(22) 출원일자 2012년07월27일
심사청구일자 2012년07월27일
(62) 원출원 특허 10-2010-0058070
원출원일자 2010년06월18일
심사청구일자 2010년06월18일

(71) 출원인
김진왕
서울특별시 강남구 압구정로 201, 87동 202호 (압구정동, 현대아파트)
(72) 발명자
김진왕
서울특별시 강남구 압구정로 201, 87동 202호 (압구정동, 현대아파트)
(74) 대리인
백승남

전체 청구항 수 : 총 6 항

(54) 발명의 명칭 **피부 병변, 피부 신생물 및 피부암, 피부혈관, 통증완화, 다모증완화, 두피모발재생, 피부재생, 피부미백, 피부회춘, 노화방지, 국소지방세포감소, 지방조직감소, 줄기세포 병행치료, 안면 및 전신에 관한 단순치료 혹은 복합광선치료, 공기압 맛사지치료, 공기압 광선역학치료, 고주파, 초음파기기 복합치료, 성형외과, 피부과, 스파병행 시술등에 있어 앨이디, 오앨이디, 레이저 ,레이저 다이오드, 광선, 광선역학 치료방법 및 광선역학 치료기**

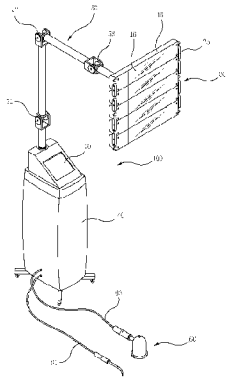
(57) 요 약

본 발명은 신체 지방에 포함된 광감작화제를 피부 흡착 흡인 방식으로 지방을 분쇄하여 광감작화제의 농도를 피부 쪽의 지방 쪽으로 유도한 후 LED(발광다이오드) 광선이나, 레이저 광선을 조사하여 피부 병변, 국소지방세포 감소 등의 치료를 할 수 있는 광선역학 치료기를 제공한다.

본 발명의 광선역학 치료기(100)는 다수의 램프가 격자상으로 배열되게 배치되는 복수의 램프 패널(15) 및 상기 각 램프 패널의 각도 및 위치를 조정할 수 있도록 구성되는 램프 패널 지지체(25)로 이루어진 램프 유닛(30)과,

아암을 개재하여 상기 램프 유닛과 연결되는 램프 유닛의 구동장치(40)와, 상기 램프 유닛의 구동장치에 설치되는 석선 유닛(60)을 구비한다.

대 표 도 - 도1



3/5/2023 15:09:17
BIOFRONTERA EXHIBIT 1002
Page 83 of 482
Page 1 of 12

특허청구의 범위

청구항 1

램프가 격자상으로 배열되게 배치된 기판을 보호케이스에 내장하고, 그 보호케이스의 전면은 투명 글라스로 덮이게 구성되는 동일 형상의 5개의 램프 패널과, 격자핀과 결합핀을 이용하여 상기 각 램프 패널의 이웃하는 보호케이스의 양 측면을 힌지 결합하는 패널 지지체와, 상기 5개의 램프 패널 중 중앙에 위치하는 램프 패널의 보호케이스 후면에 구성되는 접속 커넥터를 포함하여 이루어지는 램프 유닛과;

아암을 개재하여 상기 램프 유닛의 접속 커넥터와 연결되는 램프 유닛의 구동장치와;

상기 램프 유닛의 구동장치에 설치되는 복수의 석션 유닛으로 이루어지되,

상기 5개의 램프 패널 중 어느 하나의 패널에는 적외선 램프와 적색 LED 램프가 설치되고, 상기 5개의 램프 패널 중 다른 패널에는 각각 청색 LED 램프, 녹색 LED 램프, 노란색 LED 램프가 설치되고,

상기 램프의 광원은 레이저 다이오드, 발광다이오드, 적외선 광원, 백열 광원, 냉음극형광 광원, 유기 중합체 광원, 무기 중합체 광원 중 선택되는 어느 하나 이상의 광원으로 이루어지는 것을 특징으로 하는 광선역학 치료기.

청구항 2

제1항에 있어서,

상기 아암과 접속 커넥터는 착탈식으로 체결가능하도록 구성되고, 상기 아암과 접속 커넥터의 체결에 의하여 상기 램프 유닛은 상기 램프 유닛 구동장치와 전기 회로적으로 접속되도록 구성되는 것을 특징으로 하는 광선역학 치료기.

청구항 3

제1항에 있어서,

상기 아암은 적어도 3개의 관절부가 구성되는 것을 특징으로 하는 광선역학 치료기.

청구항 4

제1항에 있어서,

상기 5개의 램프 패널은 중앙에 위치하는 램프 패널을 중심으로 대칭되게 배치되는 것을 특징으로 하는 광선역학 치료기.

청구항 5

제4항에 있어서,

상기 5개의 램프 패널은 중앙에 위치하는 램프 패널을 기준으로 평탄형 또는 호형으로 위치 변경할 수 있도록 구성되는 것을 특징으로 하는 광선역학 치료기.

청구항 6

제1항에 있어서,

상기 복수의 석션 유닛은 "ㄱ"자형, 컵형을 포함하고, 상기 램프 유닛의 구동장치에 착탈할 수 있도록 구성되는 것을 특징으로 하는 광선역학 치료기.

명 세 서

기 술 분 야

3/5/2023 15:09:17 BIOFRONTERA EXHIBIT 1002 Page 84 of 482 Page 2 of 12

[0001] 피부병변, 피부신생물 및 피부암, 피부혈관, 통증완화, 다모증완화, 두피모발재생, 피부재생, 피부미백, 피부회춘, 노화방지, 국소지방세포감소, 지방조직감소, 줄기세포 병행치료, 안면 및 전신에 관한 단순치료 혹은 광선치료, 공기압 광선역학치료, 고주파, 초음파기기 복합치료, 성형외과, 피부과, 스파병행 시술등에 이용되는 광선 역학치료기 및 광선역학 치료방법을 제공하는 것에 관한 것이다.

배 경 기 술

[0002] 피부와 비만을 동시에 치료하는 광선역학 치료기로 치료가 가능한 배경을 보면 일반적으로 당뇨 질환, 신장 질환, 암 질환 등의 한 원인으로 작용하는 비만은 지방세포 용적의 증가 및 지방세포 증가를 초래한다.

[0003] 이와 같은 비만은 통상 식이요법, 운동, 성형수술, 지방흡입, 초음파 및 레이저 치료에 의하여 경피 지방층을 감소시킴으로써 치료되거나 개선될 수 있다.

[0004] 상기 치료방법 중 성형수술, 지방 흡입등의 치료방법을 적용하는 경우 회복에 상당한 기간이 필요하고, 마취로 인한 위험, 감염 위험, 출혈, 기타 합병증 유발 등의 위험이 수반된다.

[0005] 상기와 같이 수술에 의한 비만 또는 성형 수술의 문제점을 개선하기 위하여

[0006] 국제공개번호 WO2005/037372호에는 광감작화제와 레이저 광선역학 치료기를 이용하여 국소지방세포를 제거하는 치료방법이 개시되어 있다.

[0007] 상기 종래 국소지방세포제거 치료방법은 지방조직 또는 지방세포를 선택적으로 괴사시키는 광감작화제를 치료학적 유효량으로 투여하는 단계, 광감작화제가 흡수된 피부 지방조직에 광선역학 치료기를 이용하여 광을 조사하는 단계 등의 과정을 거쳐 치료가 이루어진다.

[0008] 상기 종래 광선역학 치료기를 이용한 치료방법은 광 조사 전에 광감작화제를 환자에게 투여해야 하므로 치료 과정을 거친 후 환자의 신체에 남아있는 산량의 광감작화제를 제거하는 과정을 거쳐야 되고, 일정 시간 빛을 피해야 하는 단점이 있다.

[0009] 또, 광선역학 치료기의 효율이 떨어져 만족하는 치료 효과를 얻을 수 없는 단점이 있다.

발명의 내용

해결하려는 과제

[0010] 본 발명은 상기와 같은 문제점을 해결하기 위하여 안출된 것으로서, 신체 지방에 포함된 광감작화제를 피부 흡착 흡인 방식으로 지방을 분쇄하여 광감작화제의 농도를 피부 쪽의 지방 쪽으로 유도한 후 LED(발광다이오드) 광선이나, 레이저 광선을 조사하여 피부병변, 피부신생물 및 피부암, 피부혈관, 통증완화, 다모증완화, 두피모발재생, 피부재생, 피부미백, 피부회춘, 노화방지, 국소지방세포감소, 지방조직감소, 줄기세포 병행치료, 안면 및 전신에 관한 단순치료),복합광선치료, 공기역학 광역동치료(Pneumatic PDT), 고주파, 초음파기기 복합치료, 성형외과, 피부과, 스파병행 시술등을 제공하는 광선역학 치료방법을 제공하는 것에 관한 것이다.

[0011] 본 발명의 다른 목적은 기능을 개선하여 피부병변, 피부신생물 및 피부암, 피부혈관, 통증완화, 다모증완화, 두피모발재생, 피부재생, 피부미백, 피부회춘, 노화방지, 국소지방세포감소, 지방조직감소, 줄기세포병행치료, 안면 및 전신에 관한 단순치료 혹은 복합광선치료, 공기역학 마사지, 공기역학 광역동치료(Pneumatic PDT), 고주파, 초음파기기 복합치료, 성형외과, 피부과, 스파병행 시술 효과를 극대화 할 수 있는 광선역학 치료기를 제공하는데 있다.

[0012] 본 발명의 다른 목적은 광감작화제의 별도 투여에 의존하지 않고도 치료 효과를 향상시킬 수 있는 광선역학 치료기를 제공하는데 있다.

과제의 해결 수단

[0013] 상기 목적 달성을 위하여 본 발명의 광선역학 치료방법은 포유동물체의 지방 조직 또는 지방세포에 포함된 광감작화제를 피부 흡착 흡인 방식으로 지방을 분쇄하여 광감작화제의 농도를 피부 쪽의 지방 쪽으로 유도시키는 단계,

[0014] 상기 피부의 지방 쪽으로 유도된 광감작화제 또는 이의 프로드럭 생성물에 의해 흡수된 파장에서 광선역학 치료기를 이용하여 상기 광감작화제가 유도된 지방 부위에 광원을 조사하여 피부 및 피하조직으로부터 지방조직 또

3/5/2023 15:09:17 BIOFRONTERA EXHIBIT 1002 Page 85 of 482 Page 3 of 12

는 지방세포를 제기하는 단계를 포함하는 것을 특징으로 한다.

[0015] 또, 상기 광원은 레이저 다이오드, 발광다이오드, 적외선 광원, 백열 광원, 냉음극형광 광원, 유기 중합체 광원, 무기 중합체 광원 중 선택되는 어느 하나 이상의 광원으로 이루어지는 것을 특징으로 한다.

[0016] 또, 광역학시술은 광감작제를 필요로 하기 때문에 상기 광감작화제는 먹는 알라(ALA), 바르는 알라유도체(ALA derivative), 분무형 알라 (ALA spray), 주사용 레이지피린(Laserphyrin NPe6), 안과용 형광감작시약(Visudyne), (델타-아미노레불린산, 프로토포르피린, 박테리오클로린, 프탈로시아닌, 포르피린, 텍사피린, 메로시아닌, 소랄렌, 피로페오포르비드, 클로린, 푸르푸린, 포토셈, 포토산, 라다클로린, 포토디아진, 포토룬, 포토피린, 기타 광감작 중합체 (Conjugated photosensitizer and dimer photosensitizer),알콜, 스테로이등 500-1000㎚의 광을 흡수하는 제제 중 어느 하나의 제제가 투여되는 것을 특징으로 한다. 국소피부치료에서 광감작제를 사용하지 않고 광선만 조사하는것을 쿨 광선역학치료 (Cool PDT) 라한다면 7.5% 의 알라유도체를 사용할 경우 미일드 광선 역학치료 (Mild PDT) 20% 의 알리를 사용할 경우에는 오리지널 광선역학 치료(Original PDT) 치료로 세분화 되기도하고 초음파나, 고주파 그리고 공기압의 가감에 따라서도 한가지 파장을 조사하는가 혹은 두가지파장을 동시에 조사하는가에 따라서도 원하는 치료효과에 변화가 나타나기도 한다.

[0017] 또, 본 발명의 광선역학 치료기는 다수의 램프가 격자상으로 배열되게 배치되는 복수의 램프 패널 및 상기 각 램프 패널의 각도 및 위치를 조정할 수 있도록 구성되는 램프 패널 지지체로 이루어진 램프 유닛과,

[0018] 아암을 개재하여 상기 램프 유닛과 연결되는 램프 유닛의 구동장치와, 상기 램프 유닛의 구동장치에 설치되는 석션 유닛으로 이루어지는 것을 특징으로 한다.

[0019] 또, 상기 복수의 램프 패널 중 적어도 어느 하나의 패널에는 적외선 램프와 LED 램프가 매트릭스 상으로 배치되게 설치되는 것을 특징으로 한다.

[0020] 또, 상기 복수의 램프 패널은 형상기억 금속을 개재하여 상기 램프 패널 지지체에 고정되는 것을 특징으로 한다.

발명의 효과

[0021] 본 발명은 석션 유닛을 이용하여 신체 지방에 포함된 광감작화제를 피부 흡착 흡인 방식으로 지방을 분쇄하여 광감작화제의 농도를 피부 쪽의 지방 쪽으로 유도한 후 광선역학 치료를 실시함으로써 국소지방조직 또는 국소지방세포의 제거에 대한 치료효과를 개선할 수 있다.

[0022] 또, 각도 및 위치 조절이 가능한 램프 패널을 구비함으로써, 광선역학 치료기의 조작 및 치료 기능을 개선하는 효과를 얻을 수 있다.

[0023] 또, 광감작화제의 별도 투여에 의존하지 않는 광선역학 치료기를 제공하는 효과를 얻을 수 있다.

도면의 간단한 설명

[0024] 도 1은 본 발명의 광선역학 치료기의 한 예를 나타내는 입체도이고,

도 2는 본 발명의 램프 유닛의 펼쳐진 상태의 배면 구조를 나타내는 평면도이고,

도 3a는 본 발명의 램프 유닛의 측면도이고,

도 3b는 본 발명의 램프 유닛이 호형으로 굴곡된 상태를 나타내는 측면도이고,

도 4a는 본 발명의 램프 패널에 내장되는 LED 기판의 평면도 이고,

도 4b는 본 발명의 램프 패널에 내장되는 LED 기판의 입체도 이고,

도 5는 본 발명의 광선역학 치료기의 조작부를 나타내는 도면 이고,

도 6은 본 발명의 광선역학 치료기의 다른 구조 예를 나타내는 입체도이고,

도 7은 본 발명의 광선역학 치료기의 동작 과정을 설명하기 위한 도면이고,

도 8은 지방세포가 제거되는 과정을 설명하기 위한 도면이다.

발명을 실시하기 위한 구체적인 내용

3/5/2023 15:09:17 BIOFRONTERA EXHIBIT 1002 Page 86 of 482 Page 4 of 12

[0025] 이하, 도 1내지 도 8을 참고하여 본 발명의 광선역학 치료기 및 광선역학 치료방법의 기술구성 및 작용에 대하여 구체적으로 설명한다.

[0026] 본 발명의 광선역학 치료기(100)는 도 1과 같이 램프 패널(15)과 램프 패널 지지체(25)로 이루어진 램프 유닛(30)과, 램프 유닛 구동장치(40)를 구비한다. 상기 램프 구동장치(40)와 램프 유닛(30) 사이에는 복수의 관절보(51,52,53)를 갖는 아암(50)이 구성된다.

[0027] 특히, 상기 램프 유닛 구동장치(40)에는 복수의 투명 흡착구(61,62)를 구비한 석션 유닛(60)이 설치된다. 본 발명에서는 석션 유닛의 투명 흡착구를 2개만 구성한 구조를 예시하여 도시하였으나 다양한 종류의 투명 흡착구를 착탈 결합하여 사용할 수 있도록 2개 이상 구성하여도 된다.

[0028] 상기 각 투명 흡착구는 배기장치(도시 생략)의 동작에 의하여 제어된다.

[0029] 또, 상기 램프 유닛(30)은 도 2내지 도 5에서 알 수 있는 바와 같이 복수의 램프 패널(15)과 그 각각의 램프 패널을 서로 인접하여 램프 패널 등을 평탄형, 호형으로 자유로이 위치 변경하거나 배치할 수 있도록 하는 램프 패널 지지체(25)로 이루어진다.

[0030] 상기 각각의 램프 패널(15)은 도 4a, 도 4b와 같이 복수의 LED가 격자상으로 배치된 기판(18)을 각각의 보호케이스(15a) 내장하고, 보호케이스의 전면은 투명 글라스(16)로 덮여 있다.

[0031] 상기 각각의 램프 패널은 한 예로 적외선 램프(28) 또는 LED 램프(29)들을 단독 또는 혼합하여 구성할 수 있고, LED 램프 외에 필요에 따라 다른 램프를 적용 설치할 수도 있다. 상기 램프의 광원은 전기발광 광원, 냉음극 형광 광원, 유기 중합체 광원, 무기 광원 등을 이용하여도 된다.

[0032] 한편, 상기 패널 지지체(25)는 다수의 격자편(26)과 결합편(27)을 이용하여 보호케이스(15a)와 힌지 결합되어 체결되도록 구성함으로써, 각 램프 패널의 위치 및 각도를 조정할 수 있도록 구성된다. 상기 패널 지지체(25)는 격자편(26)과 결합편(27) 대신에 도시되지 않은 공지의 형상기억 합금으로 이루어진 금속편을 이용하여 각각의 램프 패널들이 인접되는 형태로 구성하여도 된다.

[0033] 또, 격자편(26)과 결합편(27) 및 형상기억 합금으로 이루어진 금속편을 함께 이용하여 램프 패널들을 연결 고정하여도 된다. 램프 패널(15)들은 전속 커넥터(33)에 의하여 아암(50)에 착탈식으로 체결 가능하도록 구성되고, 램프 유닛 구동장치(40)와 전기 회로적으로 연결된다.

[0034] 상기와 같이 구성되는 본 발명의 광선역학 치료기(100)는 한 예로 아래 표1과 같이 램프 패널에 광원을 배치하고 램프 패널의 입출력 용량 및 사이즈를 구성할 수 있다.

[0035] 표 1

NO	램프	RED	BLUE	IR (적외선)	GREEN	YELLOW	혼용
입력	전압	110-240V					
	주파수	50/60Hz					
	전력	1.0KW					

3/5/2023 15:09:17 BIOFRONTERA EXHIBIT 1002 Page 87 of 482 Page 5 of 12

출력	램프 수	2400개	1500개	800개	1000개	1040개	RED 700개 IR 500개
	전체 출력	80W±8W	46W±4W	46W±8W	8W±2W	8W±2W	19.5W±2W 15.5W±2W
	밀도(최대)	110mW/㎠	60mW/㎠	60mW/㎠	10mW/㎠	10mW/㎠	25mW 20mW
	파장길이 (nm)	635±6nm	420±5nm	830±5nm	530±5nm	585±5nm	635±6nm 830±5nm
	파장폭 (nm)	20±3nm	20±3nm	30±5nm	20±5nm	20±5nm	20±3nm 30±5nm
	표준도스 (J/㎠)	132J/㎠	72J/㎠	72J/㎠	12J/㎠	12J/㎠	30J/㎠ 24J/㎠
	적용시간	20분	20분	20분	20분	20분	20분
	도스 영역	1-264J/㎠	1-144J/㎠	1-144J/㎠	1-24J/㎠	1-24J/㎠	1-60J/㎠ 1-48J/㎠
램프 패널	전체 (L x W)	320-410mm					
	유효 (L x W)	190-410mm					
	1개 영역	190-82nm					

[0036] 상기와 같이 구성되는 본 발명의 광선역학 치료기(100)의 구동은 도 5와 같이 램프 유닛 구동장치에 구성되는 조작부(70)의 스위치 컨트롤에 의하여 이루어진다.

[0037] 예를 들어 도면 부호 A의 1,2,3,4,5는 5개의 각각 램프 패널(15)을 나타내는 것으로써, 해당 위치의 스위치 푸시에 의하여 그 해당하는 위치의 램프 패널이 구동된다. 도면 부호 B의 R은 적색(Red) LED를 표시하는 것으로써, 이 스위치를 푸시하면 램프 패널의 적색 램프 광이 조사되고, IR은 적외선 램프 광, R+IR은 적색 램프 광 및 적외선 램프 광이 함께 조사된다.

[0038] 부호 C는 석션 유닛을 표시하는 것으로써, 선택되는 투명 흡착구 구동 스위치를 선택 푸시하여 투명 흡착구를 구동한다.

[0039] 이어서, 상기와 같이 구성되는 본 발명의 광선역학 치료기(100)를 이용하여 피부병변, 피부신생물 및 피부암, 피부혈관, 통증완화, 다모증완화, 두피모발새생, 피부새생, 피부미백, 피부회춘, 노화방지, 국소지방세포감소, 지방조직감소, 줄기세포병행치료, 안면 및 전신에 관한 단순치료 혹은 복합광선치료, 공기역학 맛사지 , 공기역학 광역동치료(Pneumatic PDT), 고주파, 초음파기기 복합치료, 성형외과, 피부과, 스파병행 시술하는 과정을 설명한다.

[0040] 본 발명의 광선역학 치료기를 이용한 지방 분해 메카니즘을 설명하면 도 7 및 도 8과 같이 포유동물의 세포(88) 내, 외부에는 천연 광감작화제로 작용하는 ALA 프로드럭 포르포빌리노겐(PBG: porphobilinogen)이 분포되어 있고, 세포 내에는 미토콘드리아(mitochondria)분포 되어 있는데 포르포빌리노겐와 미토콘드리아는 소정 주파수의 광선을 조사해 줌으로써 활성산소의 반응 대사가 활발하게 일이나 증식이 빨리 일이나는 지방세포(암세포)를 분해하여 파괴하도록 작용한다.

[0041] 일반적으로 세포막부위에서의 포르포빌리노겐은 830nm, 세포내 반응 미토콘드리아에서는 633nm~635nm의 파장에서 효과적으로 활성화 반응이 일어나는 것으로 알려져 있다. 상기와 같은 내용을 감안하면 광의 파장 길이는 표 1에 예시된 바와 같이 530±5nm에서 830±5nm으로 설정되는 것이 바람직하나 이 파장 길이에 한정되지 않고 필요에 따라 500nm-1000nm의 범위 내에서 설정할 수 있다.

[0042] 상기 포르포빌리노겐, 미토콘드리아가 분포된 지방 세포가 광선을 흡수하여 그 표적 지방 세포의 손상 또는 파괴를 일으키는 과정에서 포르포빌리노겐, 미토콘드리아의 활성화를 극대화하기 위하여 본 발명은 램프가 조사되는 피부(90)에 도 7과 같이 투명 흡착구(62)를 구동하여 투명 흡착구 내부에 위치하는 피부가 부풀어 오르면 혈액의 집중으로 지방 세포 내의 알라(ALA) 프로드럭인 포르포빌리노겐의 미토콘드리아와 세포외의 분포 밀도가 높아지므로 지방 세포(암세포)의 파괴가 더 활발하게 일어난다.

3/5/2023 15:09:17 BIOFRONTERA EXHIBIT 1002 Page 88 of 482 Page 6 of 12

[0043] 따라서, 투명 흡착구(62)는 램프 패널의 광원으로부터 발산되는 광이 투과할 수 있는 재질로 구성되어야 한다.

[0044] 상기와 같이 본 발명은 광감작화제를 투여하지 않고도 지방 세포를 효과적으로 제거할 수 있으나, 치료 효과를 더 극대화하기 위하여 상기 광감작화제는 인도시아닌 그린, 메틸렌블루, 톨루이딘 블루, 마르는 알라유도체(ALA derivative), 분무형 알라 (ALA spray), 주사용 레이저피린(Laserphyrin NPe6), (델타-아미노레불린산, 프로토포르피린, 박테리오클로린, 프탈로시아닌, 포르피린, 텍사피린, 메로시아닌, 소랄렌, 피로페오포르비드, 클로린, 푸르푸린, 포토겜, 포토산, 라다클로린, 포토디아진, 포토돈, 포토피린, 스테로이드, 알코, 포스파티딜콜린(PPC),기타 광감작 중합체 (Conjugated photosensitizer and dimer photosensitizer) 벤조포르피린 유도체(BPD) 및 포르피머 나트륨 및 프로드럭, 예를 들면, δ-아미노레불린산(이는 프로토포르피린 등의 약물을 생성할 수 있음) 등의 광감작화제를 추가로 투여할 수 있다.

[0045] 또한, 클로린 화합물, 푸르푸린, 알콜, 스테로이드,포스파티딜콜린 (PPC) 및 500 내지 1100㎚범위의 광을 흡수하는 임의의 기타 제제를 투여하여도 된다.

[0046] 상기와 같이 석션 유닛(60)을 구동하여 환자의 피부를 흡착한 후, 진단 결과에 따라 표1에 기재된 램프 패널 및 광원 종류를 선택하여 환자의 피부에 소정 시간 동안 지속적 혹은 단발적으로 광원을 조사하여 지방 세포를 분해하는 치료과정을 거친다.

[0047] 본 발명의 특징은 석션 유닛(60)이 구성된 광선역학 치료기(100)를 이용함으로써 광감작화제를 투여하지 않고도 지방 세포를 효과적으로 제거할 수 있다.

[0048] 본 발명의 치료 방법을 적용하는 경우 환자의 장기 입원이 불필요하고, 치료시 환자의 고통이나 통증이 없고 반복 시술이 가능하며, 치료 효과가 매우 양호 한 것을 확인하였다.

[0049] 특히, 본 발명의 광선역학 치료기를 이용한 치료 방법은 초기암이나 말기암환자로서 외과적 수술이나 화학적 치료 또는 방사선 치료를 받기 어려운 경우, 후두암, 자궁암, 유방암 등 외과적 수술시 기능 상실이 되므로 기능 보전을 위해서 선택적으로 시술하는 경우, 완치가 어려운 환자의 통증 완화와 삶의 질을 개선하고자 하는 경우, 수술이 불가능한 담도암 피부암 건선등의 경우, 수술 혹은 고식적 치료를 하여 재발이 된 경우, 노약자 임산부 어린이 등 환자의 상태가 수술이 불가능한 경우, 수술 후의 암의 재발을 줄이고, 수술 대상이 되지 않는 환자를 수술할 수 있는 상태로 전환하기 위한 경우(예: 직장암의 경우 항문 근육 보존 위해) 등에 유용하게 적용할 수 있다.

[0050] 본 발명은 상기 예시된 도면 및 설명 내용에 한정되는 것은 아니고 본 발명의 청구범위 및 목적의 범주 내에서 다양하게 변형 실시할 수 있다. 한 예로 지방 분해의 촉진을 위하여 설치되는 석션 유닛(60)은 이 구조에 한정되지 않고 전기장, 초음파 발생 장치등을 설치하여 이용할 수 있다.

부호의 설명

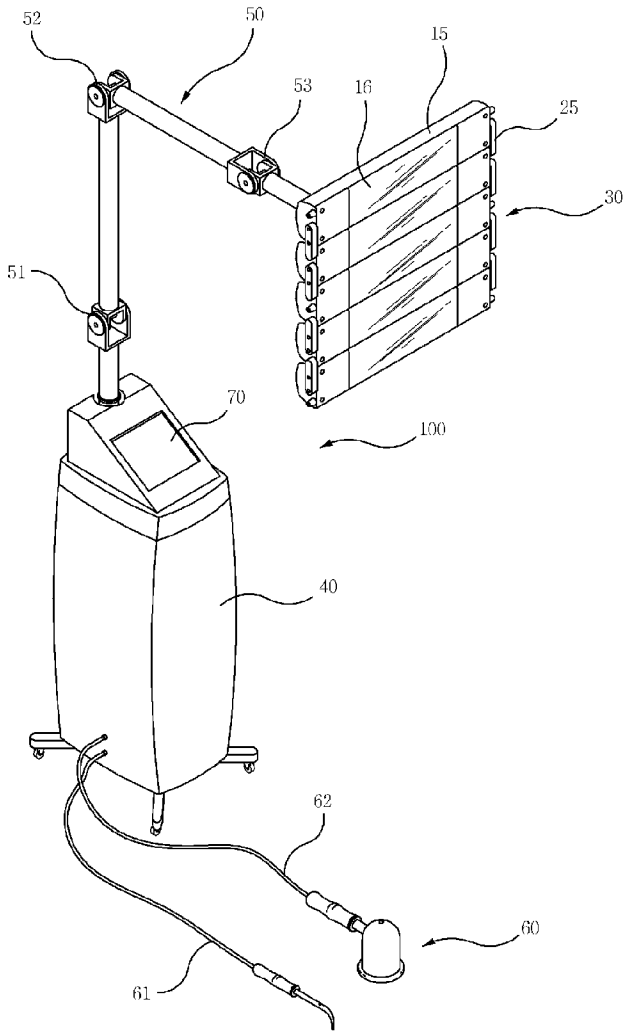
[0051]

15 - 램프 패널	15a - 보호케이스
16 - 투명 글라스	18 - 기판
25 - 램프 패널 지지체	26 - 격자판
27 결합핀	28 적외선 램프
29 - LED 램프	30 - 램프 유닛
33 - 접속 커넥터	40 - 램프 유닛 구동장치
50 - 아암	51,52,53 - 관절보
60 - 석션 유닛	61,62 - 투명 흡착구
70 - 조작부	88 - 세포
90 - 피부	100 - 광선역학 치료기

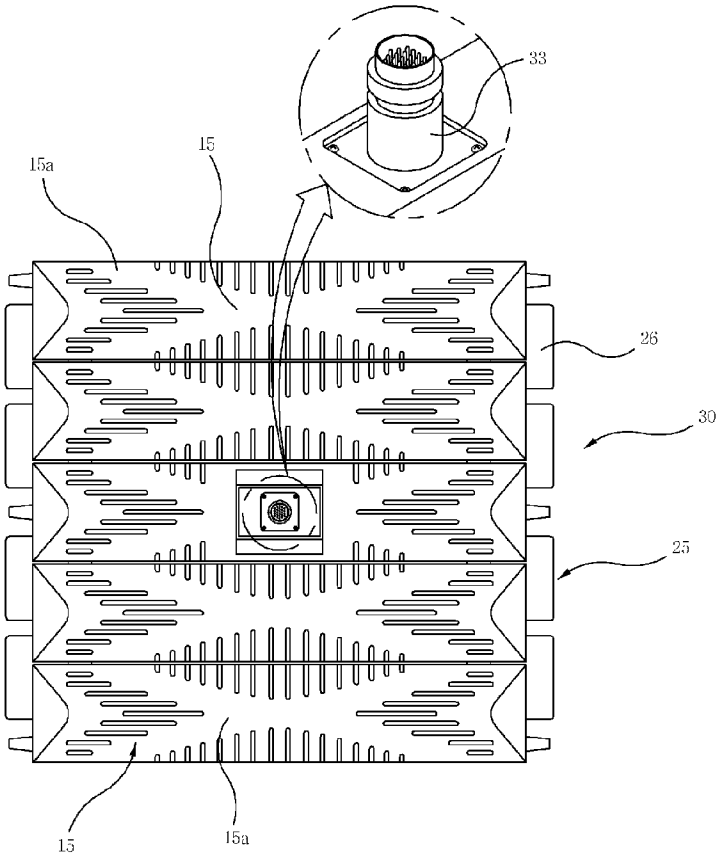
3/5/2023 15:09:17 BIOFRONTERA EXHIBIT 1002 Page 89 of 482 Page 7 of 12

도면

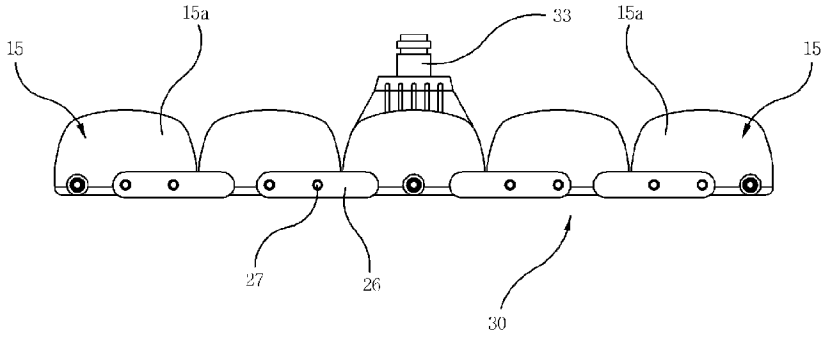
도면1



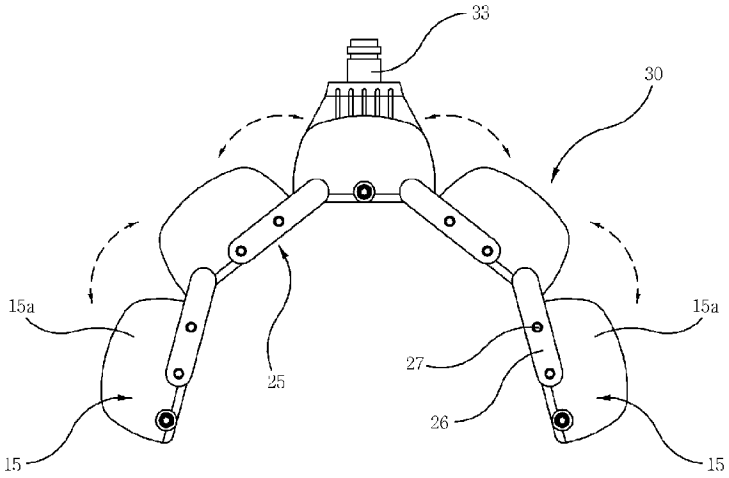
도면2



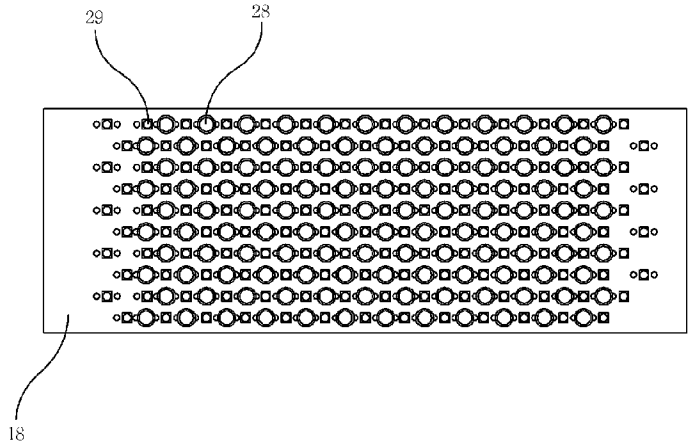
도면3a



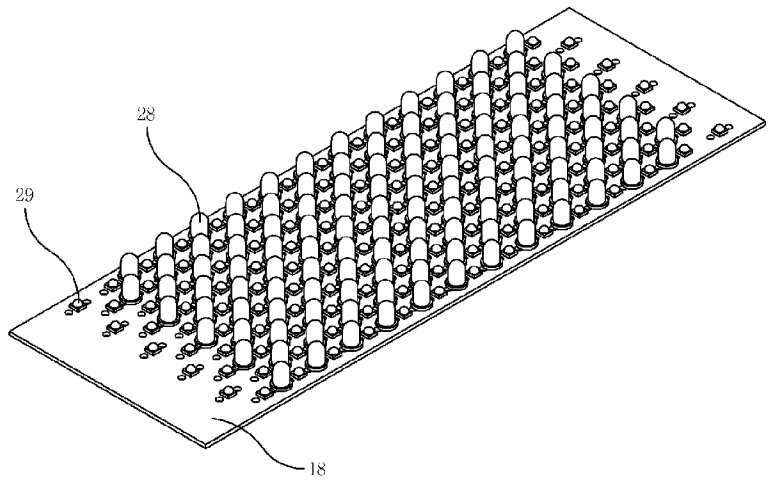
도면3b



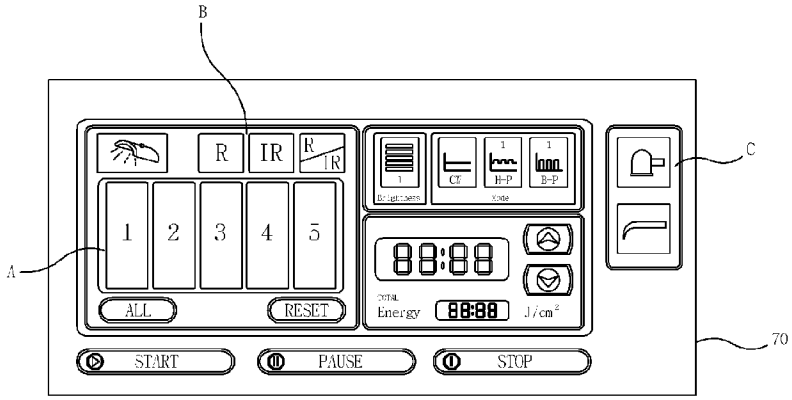
도면4a



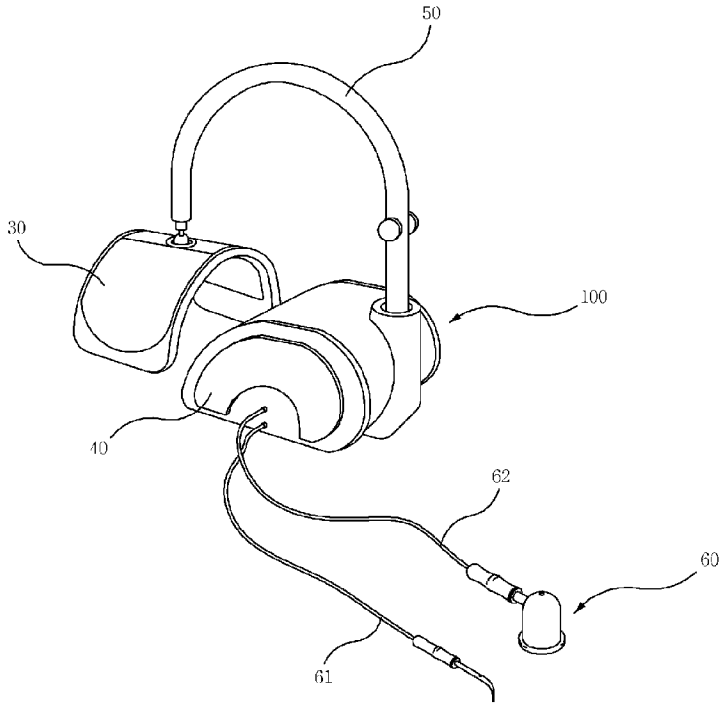
도면4b



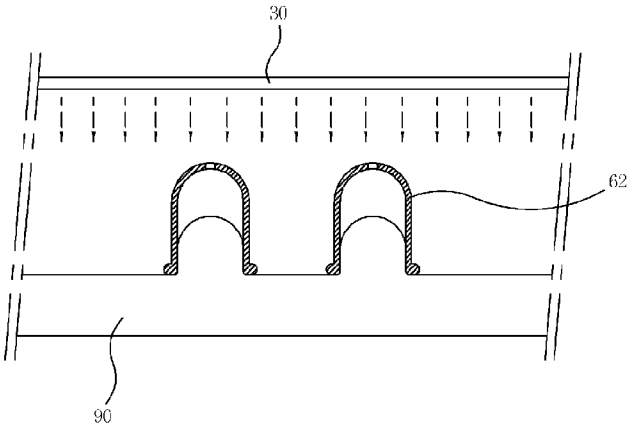
도면5


B
A
C
70
R
IR
1
2
3
4
5
ALL
RESET
START
PAUSE
STOP
Energy
J/cm²

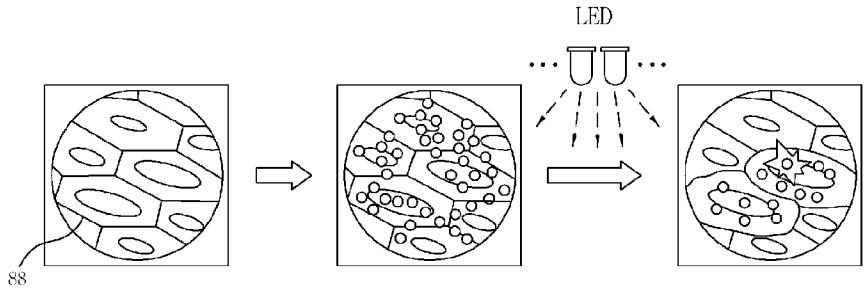
도면6


50
30
100
40
62
60
61

도면7



도면8



3/5/2023 15:09:17
BIOFRONTERA EXHIBIT 1002
Page 94 of 482
Page 12 of 12

Patent Translate
Powered by EPO and Google

Notice

This translation is machine- generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

DESCRIPTION KR101244434B1

11 Skin lesions, skin neoplasia and skin cancer, skin blood vessels, pain relief, hirsutism relief, scalp hair regeneration, skin regeneration, skin whitening, skin rejuvenation, anti- aging, local adipocyte reduction, adipose tissue reduction, stem cell parallel treatment, facial and LED, ORD, laser, laser diode, light beam, light beam in simple treatment or complex light treatment for the whole body, pneumatic massage treatment, pneumatic photodynamic treatment, high frequency, combined ultrasonic device treatment, plastic surgery, dermatology, spa treatment, etc. Dynamic treatment method and photodynamic treatment {Laser, laser diode, LED, flexible OLED, with photodynamic, pneumodynamic, sonodynamic, RF alone or synergistic combination therapy for face and body, skin rejuvenation, skin whitening ,photobleaching, control of scar, acne, vascular lesion, precancerous skin lesion, local skin lesion, cellulite, fat reduction, stem cell therapy, hair removal, hair restoration, anti- aging, pain, wound healing in field of spa therapy, dermatology and plastic surgery}

[0001]

27 Skin lesions, skin neoplasia and skin cancer, skin blood vessels, pain relief, hirsutism relief, scalp hair regeneration, skin regeneration, skin whitening, skin rejuvenation, anti- aging, local adipocyte reduction, adipose tissue reduction, stem cell parallel treatment, facial and It relates to providing a photodynamic therapy device and photodynamic treatment method used for simple treatment or phototherapy for the whole body, pneumatic photodynamic therapy, high frequency, ultrasound device complex treatment, plastic surgery, dermatology, spa treatment, etc.

[0002]

37 Looking at the background that can be treated with a photodynamic therapy device

BIOFRONTERA EXHIBIT 1002
Page 95 of 482

that treats both skin and obesity at the same time, obesity, which is generally one of the causes of diabetes, heart disease, and cancer, causes an increase in the volume of fat cells and an increase in fat cells.

[0003]

44 Such obesity can usually be treated or improved by reducing the percutaneous fat layer through diet, exercise, plastic surgery, liposuction, ultrasound and laser treatment.

[0004]

50 Among the above treatment methods, when a treatment method such as plastic surgery or liposuction is applied, a considerable period of recovery is required, and risks such as risk of anesthesia, risk of infection, bleeding, and other complications are accompanied.

[0005]

57 In order to improve the problem of obesity or plastic surgery by surgery as described above

[0006]

62 International Publication No. WO2005/037372 discloses a treatment method for removing local adipocytes using a photosensitizer and a laser photodynamic therapy device.

[0007]

68 The conventional local fat cell removal treatment method includes the steps of administering a therapeutically effective amount of a photosensitizing agent that selectively localizes fat tissue or fat cells, irradiating light to the skin adipose tissue where the photosensitizing agent has been absorbed using a photodynamic therapy device. Treatment proceeds through a series of steps.

[0008]

76 In the treatment method using the conventional photodynamic therapy device, since the photosensitizer must be administered to the patient before light irradiation, the remaining amount of the photosensitizer remaining in the patient's body must be removed after the treatment process, and light is not applied for a certain period of

BIOFRONTERA EXHIBIT 1002
Page 96 of 482

time. There are downsides to avoid.

[0009]

84 In addition, there is a disadvantage in that a satisfactory treatment effect cannot be obtained due to the low efficiency of the photodynamic therapy device.

[]

89 The present invention has been made to solve the above problems, and the photosensitizer contained in body fat is pulverized in a skin adsorption and suction method to induce the concentration of the photosensitizer to the fat side of the skin, and then LED (light emission) Diode) or laser beam is irradiated to treat skin lesions, skin neoplasia and skin cancer, skin blood vessels, pain relief, hirsutism relief, scalp hair regeneration, skin regeneration, skin whitening, skin rejuvenation, anti- aging, local fat cell reduction, fat loss Tissue reduction, stem cell treatment, simple treatment for the face and body), complex light therapy, pneumatic PDT, high frequency, ultrasound equipment complex treatment, plastic surgery, dermatology, and spa treatment It relates to providing a photodynamic therapy method. Another object of the present invention is to improve the function of skin lesions, skin neoplasia and skin cancer, skin blood vessels, pain relief, hirsutism relief, scalp hair regeneration, skin regeneration, skin whitening, skin rejuvenation, anti- aging, local adipocyte reduction, fat Tissue reduction, combined stem cell treatment, simple or complex light treatment for the face and body, aerodynamic massage, pneumatic photodynamic therapy (Pneumatic PDT), high frequency, combined ultrasound device treatment, plastic surgery, dermatology, and spa combined treatment effect It is to provide a photodynamic therapy device that can maximize Another object of the present invention is to provide a photodynamic therapy device capable of enhancing a therapeutic effect without resorting to separate administration of a photosensitizing agent.

110 In order to achieve the above object, the photodynamic treatment method of the present invention is to pulverize the fat by adsorbing and suctioning the photosensitizer contained in the adipose tissue or fat cells of the mammal body to induce the concentration of the photosensitizer to the fat side of the skin. Step, Using a photodynamic therapy device at a wavelength absorbed by the photosensitizer or its prodrug product induced toward the fat of the skin, the photosensitizer is induced by using a photodynamic therapy device to irradiate a light source from the skin and subcutaneous tissue to the adipose tissue. or removing fat cells. In addition, the light source is characterized in that it consists of at least one light source selected from a laser diode, a light emitting diode, an infrared light source, an incandescent light source, a cold cathode fluorescence light source, an organic polymer light source, and an inorganic polymer light source. In

BIOFRONTERA EXHIBIT 1002
Page 97 of 482

addition, since the photodynamic procedure requires a photosensitizer, the photosensitizer is edible ALA (ALA), topical ALA derivative (ALA derivative), spray- type ALA (ALA spray), injectable laser pyrin (Laserphyrin NPe6), Ophthalmic fluorescent sensitizer (Visudyne), (delta- aminolevulinic acid, protoporphyrin, bacteriochlorin, phthalocyanine, porphyrin, texaphyrin, merocyanine, psoralen, pyropheophorbide, chlorine, purpurin, photogem, Photoacid, radaclorine, photodiazine, photolon, photopyrin, other photosensitizer polymers (Conjugated photosensitizer and dimer photosensitizer), alcohol, steroid, etc. Any one of the agents absorbing 500- 1000nm light is administered characterized by Cool photodynamic therapy (Cool PDT) is a topical skin treatment that irradiates only light rays without using a photosensitizer. In case of using 7.5% ala derivative, Mild photodynamic therapy (Mild PDT) In case of using 20% ala derivative, It is subdivided into original photodynamic therapy (Original PDT) treatment, and depending on the addition and subtraction of ultrasound, high frequency, and air pressure, the desired treatment effect may change depending on whether one wavelength is irradiated or two wavelengths are irradiated at the same time.

138 In addition, the photodynamic therapy device of the present invention includes a lamp unit composed of a plurality of lamp panels in which a plurality of lamps are arranged in a grid pattern and a lamp panel support configured to adjust the angle and position of each lamp panel, and an arm. It is characterized in that it consists of a driving device of the lamp unit connected to the lamp unit through an intervening, and a suction unit installed in the driving device of the lamp unit. In addition, it is characterized in that infrared lamps and LED lamps are installed to be arranged in a matrix on at least one of the plurality of lamp panels. In addition, the plurality of lamp panels are characterized in that they are fixed to the lamp panel support body through a shape memory metal.

148 The present invention uses a suction unit to pulverize the fat by adsorbing and suctioning the photosensitizer contained in body fat to induce the concentration of the photosensitizer to the fat side of the skin, and then conduct photodynamic therapy to treat local adipose tissue or It can improve the therapeutic effect on the removal of local adipocytes. In addition, by providing a lamp panel capable of adjusting the angle and position, the effect of improving the operation and treatment function of the photodynamic therapy device can be obtained. In addition, an effect of providing a photodynamic therapy device not dependent on separate administration of a photosensitizing agent can be obtained.

[0024]

160 1 is a three- dimensional view showing an example of the photodynamic therapy device of the present invention, Figure 2 is a plan view showing the rear structure of the lamp unit in an unfolded state of the present invention, Figure 3a is a side view of the lamp unit of the present invention, 3b is a side view showing a state in which

BIOFRONTERA EXHIBIT 1002
Page 98 of 482

the lamp unit of the present invention is curved in an arc shape, Figure 4a is a plan view of the LED substrate embedded in the lamp panel of the present invention, Figure 4b is a three- dimensional view of the LED substrate embedded in the lamp panel of the present invention FIG. 5 is a view showing the control unit of the photodynamic therapy device of the present invention, FIG. 6 is a three- dimensional view showing another structural example of the photodynamic therapy device of the present invention, and FIG. 7 is an operation process of the photodynamic therapy device of the present invention. , and FIG. 8 is a diagram for explaining the process of removing fat cells.

[0025]

176 Hereinafter, the technical configuration and operation of the photodynamic therapy device and photodynamic therapy method of the present invention will be described in detail with reference to FIGS. 1 to 8 .

[0026]

182 As shown in FIG. 1 , the photodynamic therapy device 100 of the present invention includes a lamp unit 30 composed of a lamp panel 15 and a lamp panel support 25 and a lamp unit driving device 40 .

185 An arm 50 having a plurality of joint beams 51 , 52 , and 53 is configured between the lamp driving device 40 and the lamp unit 30 .

[0027]

190 In particular, a suction unit 60 having a plurality of transparent suction ports 61 and 62 is installed in the lamp unit driving device 40 .

192 In the present invention, a structure in which only two transparent suction ports of the suction unit are illustrated is illustrated, but two or more transparent suction ports of various types may be detachably coupled and used.

[0028]

198 Each of the transparent suction ports is controlled by the operation of an exhaust device (not shown).

[0029]

203 In addition, as can be seen in FIGS. 2 to 5, the lamp unit 30 connects a plurality of lamp panels 15 and each lamp panel to each other to freely change the position of the lamp panel or the like into a flat shape or an arc shape. It consists of a lamp

BIOFRONTERA EXHIBIT 1002
Page 99 of 482

panel support 25 that allows placement.

[0030]

210 As shown in FIGS. 4A and 4B, each of the lamp panels 15 includes a substrate 18 on which a plurality of LEDs are arranged in a lattice shape in each protective case 15a, and the front surface of the protective case is transparent glass 16 covered with

[0031]

216 Each of the lamp panels may be composed of, for example, infrared lamps 28 or LED lamps 29 alone or in combination, and other lamps may be applied and installed as needed in addition to the LED lamps.

219 As the light source of the lamp, an electroluminescent light source, a cold cathode fluorescent light source, an organic polymer light source, an inorganic light source, or the like may be used.

[0032]

225 On the other hand, the panel support 25 is configured to be hinged and fastened to the protective case 15a using a plurality of grid pieces 26 and coupling pins 27, so that the position and angle of each lamp panel can be adjusted It consists of

228 The panel support 25 may be configured in a form in which each lamp panel is connected by using a metal piece made of a known shape memory alloy (not shown) instead of the lattice piece 26 and the coupling pin 27.

[0033]

234 In addition, the lamp panels may be connected and fixed by using the grating piece 26, the coupling pin 27, and a metal piece made of a shape memory alloy together.

236 The lamp panels 15 are configured to be detachably fastened to the arm 50 by the connection connector 33 and connected to the lamp unit driving device 40 in an electrical circuit.

[0034]

242 In the photodynamic therapy device 100 of the present invention configured as described above, as an example, as shown in Table 1 below, a light source may be disposed on a lamp panel, and the input/output capacity and size of the lamp panel may be configured.

BIOFRONTERA EXHIBIT 1002
Page 100 of 482

[0035]

249 NO lampREDBLUEIR (infrared)GREENYELOW mixed Input voltage 110- 240V Frequency 50/60Hz Power 1.0KW Number of output lamps 2400 1500 800 1000 1040 RED700 IR500 _Total output 80W± 8W46W± 4W46W± 8W8W± 2W8W± 2W19.5W± 2W15.5W± 2W Density (maximum) 110mW/cm260mW/cm260mW/cm210mW/cm210mW/cm225mW20mW Wavelength (nm) 635± 6nm420± 5nm830± 5nm530± 5nm585± 5nm635± 6nm830± 5nm Wavelength Width (nm) 20± 3nm20± 3nm30± 5nm20± 5nm20± 5nm20± 3nm30± 5nmStandard dose (J/cm2) 132J/cm272J/cm272J/cm212J/cm212J/cm230J/cm224J/cm2 Application time 20 Minute 20min 20min 20min 20min 20min Dose area1- 264J/cm21- 144J/cm21- 144J/cm21- 24J/cm21- 24J/cm21- 60J/cm21- 48J/cm2 Lamp panel Overall (L x W) 320- 410mm Effective (L x W) 190- 410mm 1 area 190- 82nm

[0036]

265 The operation of the photodynamic therapy device 100 of the present invention configured as described above is performed by the switch control of the manipulation unit 70 configured in the lamp unit driving device as shown in FIG. 5 .

[0037]

271 For example, reference numerals 1, 2, 3, 4, and 5 denote five lamp panels 15, respectively, and the lamp panel at the corresponding position is driven by pushing a switch at the corresponding position.

274 R in reference numeral B indicates a red LED. When this switch is pushed, the red lamp light of the lamp panel is irradiated, IR is the infrared lamp light, and R+IR is the red lamp light and the infrared lamp light. investigated together.

[0038]

280 Symbol C denotes a suction unit, and a selected transparent suction port driving switch is selected and pushed to drive the transparent suction port.

[0039]

285 Subsequently, skin lesions, skin neoplasia and skin cancer, skin blood vessels, pain relief, hirsutism relief, scalp hair regeneration, skin regeneration, skin whitening, skin rejuvenation, Anti- aging, local fat cell reduction, fat tissue reduction, stem cell concurrent treatment, face and body simple treatment or complex light treatment, pneumatic massage, pneumatic PDT, high frequency, ultrasonic device complex

BIOFRONTERA EXHIBIT 1002
Page 101 of 482

treatment, It explains the process of plastic surgery, dermatology, and spa treatment.

[0040]

295 7 and 8, ALA prodrug porphobilinogen (PBG) acting as a natural photosensitizer inside and outside mammalian cells 88, as shown in FIGS.) is distributed, and mitochondria are distributed in the cells. Porphobilinogen and mitochondria are irradiated with light of a certain frequency, thereby actively reacting with active oxygen and decomposing fat cells (cancer cells) that proliferate quickly. and act to destroy it.

[0041]

304 In general, it is known that porphobilinogen in the cell membrane region effectively activates at a wavelength of 830 nm and in the intracellular reaction mitochondria at a wavelength of 633 nm to 635 nm.

307 Considering the above, the wavelength length of light is preferably set from 530± 5nm to 830± 5nm as shown in T able 1, but is not limited to this wavelength length and can be set within the range of 500nm- 1000nm if necessary. there is.

[0042]

313 In order to maximize the activation of porphobilinogen and mitochondria in the process in which the fat cells in which the porphobilinogen and mitochondria are distributed absorb light and cause damage or destruction of the target fat cells, the present invention is directed to skin irradiated with a lamp (90), as shown in FIG. 7, when the transparent adsorbent 62 is driven and the skin located inside the transparent adsorber swells, the concentration of blood causes the mitochondrial and extracellular transport of porphobilinogen, a prodrug of ALA in fat cells. As the distribution density increases, destruction of fat cells (cancer cells) occurs more actively.

[0043]

325 T herefore, the transparent adsorption port 62 must be made of a material through which light emitted from the light source of the lamp panel can pass.

[0044]

330 As described above, the present invention can effectively remove fat cells without the administration of a photosensitizer. However, in order to further maximize the

BIOFRONTERA EXHIBIT 1002
Page 102 of 482

therapeutic effect, the photosensitizer is indocyanine green, methylene blue, toluidine blue, and a topical ala derivative (ALA). derivative), ALA spray, Laserphyrin NPe6 for injection, (delta- aminolevulinic acid, protoporphyrin, bacteriochlorin, phthalocyanine, porphyrin, texaphyrin, merocyanin, psoralen, pyropheo Forbid, chlorine, purpurin, photogem, photoacid, radaclorine, photodiazine, photolon, photophyrin, steroid, alcohol, phosphatidylcholine (PPC), other photosensitizer polymers (Conjugated photosensitizer and dimer photosensitizer) Benzoporphyrin derivatives (BPD) and photosensitizers such as porfimer sodium and prodrugs such as δ - aminolevulinic acid, which can yield drugs such as protoporphyrin, can additionally be administered.

[0045]

345 In addition, a chlorine compound, purpurine, alcohol, steroid, phosphatidylcholine (PPC), and any other agent that absorbs light in the range of 500 to 1100 nm may be administered.

[0046]

351 After driving the suction unit 60 as described above to adsorb the patient's skin, select the type of lamp panel and light source listed in Table 1 according to the diagnosis result, and continuously or intermittently irradiate the light source to the patient's skin for a predetermined time. It undergoes a treatment process that breaks down fat cells.

[0047]

359 A feature of the present invention is that by using the photodynamic therapy device 100 configured with the suction unit 60, fat cells can be effectively removed without administering a photosensitizer.

[0048]

365 In the case of applying the treatment method of the present invention, it was confirmed that long- term hospitalization of the patient was unnecessary, the patient did not have pain or pain during treatment, repeated procedures were possible, and the treatment effect was very good.

[0049]

372 In particular, the treatment method using the photodynamic therapy device of the present invention preserves function when it is difficult to receive surgical

BIOFRONTERA EXHIBIT 1002
Page 103 of 482

operation, chemical treatment, or radiation treatment as an early or terminal cancer patient, and function is lost during surgical operations such as laryngeal cancer, uterine cancer, or breast cancer. In case of selective treatment for the purpose of treatment, pain relief and improvement of quality of life for patients who are difficult to cure, in case of inoperable biliary tract cancer, skin cancer, psoriasis, etc., case of recurrence due to surgery or palliative treatment, the elderly, pregnant women, children It is useful when the condition of a back patient is inoperable, to reduce the recurrence of cancer after surgery, and to convert a patient who is not a target for surgery into a condition that can be operated (e.g., to preserve anal muscles in the case of rectal cancer) can do.

[0050]

387 The present invention is not limited to the above illustrated drawings and descriptions, and various modifications can be made within the scope of the claims and objects of the present invention.

390 For example, the suction unit 60 installed to promote fat decomposition is not limited to this structure, and an electric field, an ultrasonic generator, and the like can be installed and used.

[0051]

396 15 - Lamp panel 15a - Protection case 16 - Transparent glass 18 - Substrate 25 - Lamp panel support 26 - Grid piece 27 - Coupling pin 28 - Infrared lamp 29 - LED lamp 30 - Lamp unit 33 - Connection connector 40 - Lamp unit driving unit 50 - Arm 51,52,53 - Joint beam 60 - Suction unit 61,62 - Transparent suction port 70 - Control panel 88 - Cell 90 - Skin 100 - Photodynamic therapy device

BIOFRONTERA EXHIBIT 1002
Page 104 of 482

Patent Translate
Powered by EPO and Google

Notice

This translation is machine- generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

CLAIMS KR101244434B1

1.

14 A substrate on which the lamps are arranged in a lattice form is embedded in a protective case, and the front surface of the protective case is covered with transparent glass. Using five lamp panels of the same shape, grid pieces and coupling pins, each lamp A lamp unit including a panel support body hinge- coupled to both side surfaces of a protective case adjacent to the panel and a connection connector formed on the rear surface of the protective case of the lamp panel located in the center of the five lamp panels; A driving device of a lamp unit connected to the connecting connector of the lamp unit; A plurality of suction units provided with transparent suction ports having different sizes and shapes installed in the driving device of the lamp unit, among the five lamp panels. An infrared lamp with a wavelength of 830 ± 5 nm and a red LED lamp with a wavelength of 635 ± 6 nm are installed on one panel, and a blue LED lamp with a wavelength of 420 ± 5 nm and a green LED lamp with a wavelength of 530 ± 5 nm are installed on the other panel among the five lamp panels. An LED lamp, a yellow LED lamp with a wavelength of 585 ± 5 nm is installed, and the light source of the lamp is at least one selected from among a laser diode, a light emitting diode, an infrared light source, an incandescent light source, a cold cathode fluorescence light source, an organic polymer light source, and an inorganic polymer light source. Photodynamic therapy device, characterized in that consisting of a light source.

2.

36 The method of claim 1, wherein the arm and the connection connector are configured to be detachably coupled, and the lamp unit is configured to be electrically connected

BIOFRONTERA EXHIBIT 1002
Page 105 of 482

to the lamp unit driving device by fastening the arm and the connection connector. photodynamic therapy.

3.

43 The photodynamic therapy device according to claim 1, wherein the arm is composed of at least three joint beams.

4.

48 The photodynamic therapy apparatus according to claim 1, wherein the five lamp panels are arranged symmetrically around a central lamp panel.

5.

53 The photodynamic therapy apparatus according to claim 4, wherein the five lamp panels are configured to change positions in a flat or arc shape with respect to a central lamp panel.

6.

59 The photodynamic therapy device according to claim 1, wherein the plurality of suction units include an "L" shape and a cup shape, and are detachable from the driving device of the lamp unit.

BIOFRONTERA EXHIBIT 1002
Page 106 of 482

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/942,353	04/06/2023 03:13:15 PM ET	067286-0483

Title of Invention

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3138	FILED BY	Janet Lee
PATENT CENTER #	61880226	AUTHORIZED BY	Kiri Sharon
CUSTOMER #	22428	FILING DATE	09/12/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Thomas BOYAJIAN

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 7145	E202346F14526228	Janet Lee

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
190741	37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	$260.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Thomas BOYAJIAN
Title:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
Application No.:	17/942,353
Filing Date:	9/12/2022
Examiner:	Tammie K. MARLEN
Art Unit:	3792
Confirmation No.:	3138

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicant respectfully requests that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

In accordance with MPEP 609.02, Applicant understands the Examiner will consider all information considered in the following applications to which this application claims benefit under 35 U.S.C. § 120: U.S. Application No. 15/292,731, filed 10/13/2016 and Application No. 16/791,004, filed 2/14/2020.

In accordance with 37 CFR §1.98(d), copies of listed non-U.S. patent/application items previously submitted to, or cited by, the Office in the foregoing applications relied upon for an earlier effective filing date under 35 U.S.C. § 120, are not provided herewith. Nevertheless, Applicant would be pleased to provide copies of any such documents at the Examiner's request.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicant does not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

CONCISE EXPLANATION OF RELEVANCE

The cited documents are in English and were cited in co-pending applications.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(d), on or before payment of the issue fee.

STATEMENT UNDER 37 CFR §1.97(e)

The undersigned hereby states in accordance with 37 CFR §1.97(e)(2) that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in § 1.56(c) more than three months prior to the filing of the information disclosure statement.

FEE

Fees in the amount of $260.00 to cover the fee associated with an information disclosure statement are being paid by credit card via EFS-Web.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application to Deposit Account Number 19-0741.

Respectfully submitted,

Date 6 Apr 2023

By /Kiri Lee Sharon/

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4092
Facsimile: (202) 672-5399

Kiri Lee Sharon
Attorney for Applicant
Registration No. 71,828

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/942,353	**04/06/2023 03:13:15 PM ET**	**067286-0483**

Title of Invention

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3138	FILED BY	Janet Lee
PATENT CENTER #	61880226	FILING DATE	09/12/2022
CUSTOMER #	22428	FIRST NAMED INVENTOR	Thomas BOYAJIAN
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Kiri Sharon

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
067286-0483_SB08.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	102 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
FOR_D2--KR_20120100861A.pdf	24	Foreign Reference	1497 KB
NPL_D3--Champeau_et_al____Photodynamic_therapy_.pdf	17	Non Patent Literature	2321 KB
067286-	3	Transmittal Letter	114 KB

0483_IDSTransmittal.pdf

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
067286-0483_SB08.pdf	49D8FF46E1DCB0B7E985C25EB79F73DBB25486AAFCC1822B5FC61FDFF68F3C260AB5DE7FADDC93DC60DE38CFDD623E45C9BFFBFBBC0022494F4E622DB3467193
FOR_D2--KR_20120100861A.pdf	4BA25BEF622519E9BFC9D15E3C864E1D6B48A43A06130CCCEA139CF6FE37095B128463AE87C3DA591ABFF001E0162EB370F0DE858A165A24B6127FF64A2D4A1A
NPL_D3--Champeau_et_al____Photodynamic_therapy_.pdf	0B50998B5257E51842D87B02AAB9BA0371DE01F960CA411090F50A0D87F8A900E174FF8196F4BA80C30578B8FD17018F8032F334FC7A42B6AE1D5CEF5BBEAC2A
067286-0483_IDSTransmittal.pdf	47DA0D8E55251E87E580126DBB557888A5BA865A49B7D8B4B4C0DFD3282D633FCB8EC272DE3AF7A6784462ACEF9EA4BB53672F939F4E2145E9A0A62548A6538B

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

22428 7590 03/01/2023

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

EXAMINER
MARLEN, TAMMIE K

ART UNIT	PAPER NUMBER
3792	

DATE MAILED: 03/01/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

TITLE OF INVENTION: ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	06/01/2023

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22428 7590 03/01/2023

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

TITLE OF INVENTION: ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	06/01/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
MARLEN, TAMMIE K	3792	604-020000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

BIOFRONTERA EXHIBIT 1002
Page 115 of 482

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

22428 7590 03/01/2023

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

EXAMINER	
MARLEN, TAMMIE K	
ART UNIT	PAPER NUMBER
3792	

DATE MAILED: 03/01/2023

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 17/942,353	Applicant(s) BOYAJIAN et al.	
	Examiner TAMMIE K MARLEN	Art Unit 3792	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the amendment filed on 2/16/2023.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are See Continuation Sheet . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

Continuation of 3. The allowed claim(s) is/are: 1-2,4-5,7-18 and 20-24

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

2. The information disclosure statement(s) (IDS) submitted on 2/16/2023 has/have been acknowledged and is/are being considered by the Examiner.

Allowable Subject Matter

3. Claims 1, 2, 4, 5, 7-18, and 20-24 are allowed.

4. The following is an examiner's statement of reasons for allowance: It is in the opinion of the examiner that the art of record neither anticipates nor renders obvious "wherein each of the five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges" in combination with the rest of the claimed limitations set forth in the independent claim.

Searching by the Examiner yielded prior art as cited in the previous Office Actions. Based on Applicant's arguments and the Examiner's review of the Office Action mailed on November 18, 2022, the subject matter is deemed to be allowable. Further explanation can be reviewed in the Applicant's arguments filed on February 16, 2023. Therefore, it is concluded by the examiner that claims 1, 2, 4, 5, 7-18, and 20-24 of the present invention are allowable..

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAMMIE K MARLEN whose telephone number is (571)272-1986. The examiner can normally be reached Monday through Friday from 8 am until 4 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno can be reached on 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61N 5/06,062,0616	11/10/2022	TKM
A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662	11/10/2022	TKM
A61B5/0064,0082	11/10/2022	TKM
Updated above	02/21/2023	TKM

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
Inventor name and assignee search	11/10/2022	TKM
Text-limited and related application search -- see search history printout	11/10/2022	TKM
Consulted Alyssa Alter	10/20/2021	TKM
Similarity and More Like This search	11/10/2022	TKM
Updated above	02/21/2023	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	PGPUB text search -- see interference search printout	02/21/2023	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	**Art Unit**
	TAMMIE K MARLEN	3792

CPC						
Symbol					**Type**	**Version**
A61N	/	5	/	062	F	2013-01-01
A61B	/	5	/	0064	I	2013-01-01
A61B	/	5	/	0082	I	2013-01-01
A61N	/	2005	/	0633	A	2013-01-01
A61N	/	2005	/	0626	A	2013-01-01
A61N	/	2005	/	0642	A	2013-01-01
A61N	/	2005	/	0652	A	2013-01-01
A61N	/	2005	/	0663	A	2013-01-01
A61N	/	2005	/	0662	A	2013-01-01
A61N	/	2005	/	0651	A	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	21	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	21 February 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office — Part of Paper No.: 20230221

BIOFRONTERA EXHIBIT 1002
Page 124 of 482

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	**Art Unit**
	TAMMIE K MARLEN	3792

INTERNATIONAL CLASSIFICATION					
CLAIMED					
A61N5/06	/	5	/	06	

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	21 February 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office — Part of Paper No.: 20230221

BIOFRONTERA EXHIBIT 1002
Page 125 of 482

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	8	10		19										
2	2	9	11	17	20										
	3	10	12	18	21										
3	4	13	13	19	22										
4	5	11	14	20	23										
	6	12	15	21	24										
5	7	14	16												
6	8	15	17												
7	9	16	18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	21 February 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office Part of Paper No.: 20230221

BIOFRONTERA EXHIBIT 1002
Page 126 of 482

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	31	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2019/03/25 10:32 AM
L2	30	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 10:32 AM
L3	6	("0000002"|"0000003"|"0000004"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L6	4	("0000001"|"0000002"|"0000003"|"0000004").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L7	14	("0000001"|"0000002"|"0000003"|"0000004"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045"|"20050075703"|"20060241726"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L8	8	(US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 10:37 AM
L9	3	("0000002"|"20050075703"|"20060241726").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 01:09 PM
L10	9	(("20030088296") or ("20050090877") or ("20060253175") or ("20070283655") or ("20100010591") or ("20110106222") or ("20140067024") or ("9533170")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:12 PM
L11	6	("0000002"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 01:13 PM
L12	14	(US-0162109-$ | US-0287671-$ | US-0287696-$ | US-	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 01:16 PM

		20060287696-$ | US-20120287671-$ | US-20150162109-$ | US-7156865-$).DID.					
L13	3	(("20080031924") or ("20100174223") or ("20150238776")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:18 PM
L14	2	(("20160166846") or ("20130190845")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:19 PM
L15	12	"2007112427"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 02:58 PM
L16	5	"38541884".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 02:58 PM
L17	8	"2011124912"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 02:59 PM
L18	4	"42228866".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 03:00 PM
L19	6	("0000002"|"0000003"|"0000004"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L20	4	("0000001"|"0000002"|"0000003"|"0000004").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L21	14	("0000001"|"0000002"|"0000003"|"0000004"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045"|"20050075703"|"20060241726"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L22	8	(US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L23	3	("0000002"|"20050075703"|"20060241726").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L24	9	(("20030088296") or ("20050090877") or ("20060253175") or ("20070283655") or ("20100010591") or ("20110106222") or ("20140067024") or ("9533170")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L25	6	("0000002"|"20040162596"|"20040260365"|"58	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM

		14008"|"5849027"|"9108045").PN.					
L26	14	(US-0162109-$ | US-0287671-$ | US-0287696-$ | US-20060287696-$ | US-20120287671-$ | US-20150162109-$ | US-7156865-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L27	3	(("20080031924") or ("20100174223") or ("20150238776")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L28	2	(("20160166846") or ("20130190845")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L29	2008929	L19 a4 "s5" L20 L21 L22 L23 L24 L25 L26 L27 L28	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L30	50	L19 L20 L21 L22 L23 L24 L25 L26 L27 L28	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:02 PM
L31	6784	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L32	5	L16	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L33	11523	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L34	8633	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L35	2743	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L36	6725	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L37	572	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L38	1341	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L39	4107	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L40	1289	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L41	285	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM

L42	282	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM
L43	30801	L31 L33 L34 L35 L36 L37 L38 L39 L40 L41 L42	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM
L44	3652	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L45	31604	L43 L44	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L46	8642	L45 and (diode led)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L47	280	(L41 L37) and (L36 L39 L44 (diode led))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:18 PM
L48	280	(L41 L37) and (L36 L39 L44 (diode led))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:18 PM
L49	1828	L46 and (panel$4 hing$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:19 PM
L50	21	(US-20180236259-$ or US-20170007844-$ or US-20150134032-$ or US-20120265275-$ or US-20140350644-$ or US-20120150265-$ or US-20180015297-$ or US-20180193660-$ or US-20180280718-$ or US-20070016269-$ or US-20180345034-$ or US-20110054573-$ or US-20100017953-$ or US-20160129279-$ or US-20170231058-$ or US-20170238401-$ or US-20160235980-$ or US-20180133497-$ or US-20180008839-$).did. or (US-9950136-$).did. or (WO-2018067411-$).did.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 03:35 PM
L51	21	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2019/03/25 04:11 PM

		US-20180345034-$ or US-20180015297-$).did. or (US-9533170-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.					
L52	17	L51 and (@ad<="20151015" @rlad<="20151015" @prad<="20151015")	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 04:12 PM
L53	4	L51 not L52	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 04:12 PM
L54	3	"39774377".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 04:18 PM
L55	4	(("20050090877") or ("20060253175") or ("20140067024") or ("20060253175") or ("20150162109")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/29 08:51 AM
L56	6786	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L57	11526	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L58	8637	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L59	2747	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L60	6728	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L61	572	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L62	1341	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L63	4110	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L64	1289	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L65	285	A61N2005/064.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2019/03/29

			USOCR; FPRS; EPO; JPO; DERWENT)				08:56 AM
L66	282	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L67	30814	L56 L57 L58 L59 L60 L61 L62 L63 L64 L65 L66	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L68	3653	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L69	31617	L67 L68	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L70	2785	L69 and (panel$4 hing$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L71	45	L69 and ((five fifth) with (panel$4 hing$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:58 AM
L72	1	("8021501").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/29 10:10 AM
L73	6919	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L74	11077	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L75	8626	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L76	2800	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L77	6742	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L78	578	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L79	1351	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L80	4117	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L81	1294	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L82	285	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM

L83	283	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L84	30469	L73 L74 L75 L76 L77 L78 L79 L80 L81 L82 L83	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L85	3612	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L86	31266	L84 L85	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L87	10	L86 and ((nest$6 near3 hing$6) (optical$6 near3 dead))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L88	618	L86 and ((sens$6 determin$6 detect$6) near3 (size shape))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:29 AM
L89	6941	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L90	11104	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L91	8674	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L92	2822	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L93	6752	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L94	581	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L95	1355	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L96	4132	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L97	1295	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L98	287	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L99	285	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L100	30552	L89 L90 L91 L92 L93	(US-PGPUB; USPAT;	OR	ON	ON	2019/10/31

		L94 L95 L96 L97 L98 L99	USOCR; FPRS; EPO; JPO; DERWENT)				01:34 PM
L101	3643	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L102	31352	L100 L101	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L103	242	L102 and ((measur$6) near3 (size shape))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L104	6943	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L105	11105	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L106	8678	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L107	2825	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L108	6754	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L109	583	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L110	1356	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L111	4135	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L112	1295	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L113	287	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L114	285	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L115	30563	L104 L105 L106 L107 L108 L109 L110 L111 L112 L113 L114	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L116	3643	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L117	31363	L115 L116	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2019/11/04 11:37 AM

			JPO; DERWENT)				
L118	10	L117 and ((nest$6 near3 hing$6) (optical$6 near3 dead))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L124	1	("20120283328").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2020/01/31 08:26 AM
L125	22	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$).did. or (US-9533170-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2020/11/23 01:14 PM
L126	0	L125 and aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 01:15 PM
L127	0	L125 and ala	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 01:15 PM
L128	13320	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L129	4618	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L130	2839	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L131	4119	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L132	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L133	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L134	5449	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM

L135	8056	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L136	4864	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L137	5508	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L138	8097	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L139	13320	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L140	10819	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L141	4119	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L142	8056	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L143	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L144	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L145	5508	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L146	1413	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L147	365	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L148	441	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L149	36840	L138 L139 L140 L141 L142 L143 L144 L145 L146 L147 L148	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L150	4864	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L151	37870	L149 L150	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L152	46164	L128 L129 L130 L131	(US-PGPUB; USPAT;	OR	ON	ON	2020/11/23

		L132 L133 L134 L135 L136 L137 L151	USOCR; FPRS; EPO; JPO; DERWENT)				03:05 PM
L153	845	L152 and $2aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:07 PM
L154	13321	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L155	4619	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L156	2842	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L157	4120	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L158	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L159	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L160	5449	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L161	8057	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L162	4865	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L163	5509	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L164	8098	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L165	13321	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L166	10819	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L167	4120	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L168	8057	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L169	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2020/11/24 06:15 AM

			JPO; DERWENT)				
L170	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L171	5509	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L172	1413	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L173	365	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L174	441	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L175	36843	L164 L165 L166 L167 L168 L169 L170 L171 L172 L173 L174	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L176	4865	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L177	37873	L175 L176	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L178	46171	L154 L155 L156 L157 L158 L159 L160 L161 L162 L163 L177	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L179	845	L178 and $2aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L180	1	(10/466734).APP.	(USPAT; USOCR)	OR	ON	ON	2020/11/24 01:51 PM
L181	12	"19912039".FMID.	(US-PGPUB; USPAT; FPRS; JPO)	OR	ON	ON	2020/11/24 01:58 PM
L182	39	("0000001"|"0000002"|"20040010299"|"20090324727"|"20110053965"|"20140010761"|"20030088296"|"20040162596"|"20040260365"|"20050075703"|"20050090877"|"20060241726"|"20060253175"|"20060287696"|"20070283655"|"20080031924"|"20100010591"|"20100174223"|"20110106222"|"20120283328"|"20120287671"|"20130066405"|"20130190845"|"20140067024"|"20150162109"|"20150238776"|"20160166846"|"20160175609"|"5849	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 02:10 PM

		027"|"6223071"|"6709446"|"7156865"|"7190109"|"7723910"|"8030836"|"8216289"|"8758418"|"9108045"|"9533170").PN.					
L183	25	(US-20070283655-$ or US-20130066405-$ or US-20160175609-$ or US-20160175610-$ or US-20120287671-$ or US-20060241726-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or US-20050075703-$).did. or (US-9227082-$ or US-9017391-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2020/11/27 01:52 PM
L184	56	(US-0010591-$ | US-0031924-$ | US-0066405-$ | US-0067024-$ | US-0075703-$ | US-0088296-$ | US-0090877-$ | US-0106222-$ | US-0162109-$ | US-0162596-$ | US-0166846-$ | US-0174223-$ | US-0175609-$ | US-0175610-$ | US-0190845-$ | US-0238776-$ | US-0241726-$ | US-0253175-$ | US-0260365-$ | US-0283328-$ | US-0283655-$ | US-0287671-$ | US-0287696-$ | US-16787667-$ | US-20030088296-$ | US-20040162596-$ | US-20040260365-$ | US-	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/27 01:55 PM

		20050075703-$ | US-20050090877-$ | US-20060241726-$ | US-20060253175-$ | US-20060287696-$ | US-20070283655-$ | US-20080031924-$ | US-20100010591-$ | US-20100174223-$ | US-20110106222-$ | US-20120283328-$ | US-20120287671-$ | US-20130066405-$ | US-20130190845-$ | US-20140067024-$ | US-20150162109-$ | US-20150238776-$ | US-20160166846-$ | US-20160175609-$ | US-20160175610-$ | US-5814008-$ | US-5849027-$ | US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$ | US-9533170-$).DID.					
L185	6	("0000001"|"0000002"|"20040010299"|"20090324727"|"20110053965"|"20140010761").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/27 01:59 PM
L186	1	("10357567").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2020/11/27 01:59 PM
L187	18	L183 not (L184 L185 L186)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/27 01:59 PM
L188	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L189	4832	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L190	3002	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L191	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L192	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L193	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/03/16

			USOCR; FPRS; EPO; JPO; DERWENT)				12:49 PM
L194	5775	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L195	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L196	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L197	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L198	8407	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L199	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L200	11191	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L201	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L202	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L203	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L204	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L205	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L206	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L207	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L208	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L209	38191	L198 L199 L200 L201 L202 L203 L204 L205 L206 L207 L208	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L210	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/03/16 12:49 PM

			JPO; DERWENT)				
L211	39273	L209 L210	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L212	47948	L188 L189 L190 L191 L192 L193 L194 L195 L196 L197 L211	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L213	987	L212 and hinge	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L214	23	L212 and (((wide$4 and narrow$6) or (first and second)) adj width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:50 PM
L215	117	L212 and (((wide$4 and narrow$6) or (first and second)) near3 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:51 PM
L216	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L217	4832	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L218	3002	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L219	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L220	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L221	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L222	5775	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L223	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L224	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L225	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L226	8407	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L227	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM

L228	11191	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L229	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L230	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L231	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L232	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L233	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L234	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L235	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L236	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L237	38191	L226 L227 L228 L229 L230 L231 L232 L233 L234 L235 L236	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L238	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L239	39273	L237 L238	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L240	47948	L216 L217 L218 L219 L220 L221 L222 L223 L224 L225 L239	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L241	199	L240 and (((wide$4 and narrow$6) or (first and second)) near6 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L242	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L243	4833	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L244	3005	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L245	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/03/18

			USOCR; FPRS; EPO; JPO; DERWENT)				09:35 AM
L246	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L247	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L248	5776	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L249	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L250	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L251	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L252	8408	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L253	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L254	11195	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L255	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L256	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L257	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L258	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L259	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L260	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L261	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L262	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/03/18 09:35 AM

			JPO; DERWENT)				
L263	38197	L252 L253 L254 L255 L256 L257 L258 L259 L260 L261 L262	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L264	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L265	39279	L263 L264	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L266	47959	L242 L243 L244 L245 L246 L247 L248 L249 L250 L251 L265	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L267	199	L266 and (((wide$4 and narrow$6) or (first and second)) near6 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L268	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L269	4833	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L270	3005	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L271	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L272	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L273	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L274	5776	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L275	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L276	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L277	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L278	8408	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L279	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM

L280	11195	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L281	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L282	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L283	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L284	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L285	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L286	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L287	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L288	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L289	38197	L278 L279 L280 L281 L282 L283 L284 L285 L286 L287 L288	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L290	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L291	39279	L289 L290	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L292	47959	L268 L269 L270 L271 L272 L273 L274 L275 L276 L277 L291	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L293	0	2007/112427	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:22 PM
L294	582470	(stephen tobin).in.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:23 PM
L295	242	(stephen and tobin).in.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:23 PM
L296	10	("0000001"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20160045757"|"5601838	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM

		"|"5686065"|"6897238"). PN.					
L297	2	("0000002"|"D000001"). PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM
L298	3	("0000001"|"0000002"|" 7730893").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM
L299	10	("5032400"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20160045757"|"5601838"|"5686065"|"6897238"). PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:14 PM
L300	1	("20110224598").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2021/07/07 03:15 PM
L301	3	("0000001"|"7033381"|" 7730893").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:16 PM
L302	14	L299 L300 L301	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:16 PM
L303	9	L302 and (wid$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:18 PM
L304	13949	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L305	4963	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L306	3093	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L307	4694	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L308	785	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L309	1739	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L310	5920	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L311	8474	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L312	5338	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L313	6023	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/07/07 03:19 PM

			JPO; DERWENT)				
L314	8498	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L315	13949	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L316	11425	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L317	4694	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L318	8474	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L319	785	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L320	1739	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L321	6023	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L322	1468	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L323	399	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L324	469	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L325	38854	L314 L315 L316 L317 L318 L319 L320 L321 L322 L323 L324	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L326	5338	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L327	39953	L325 L326	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L328	48853	L304 L305 L306 L307 L308 L309 L310 L311 L312 L313 L327	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L329	217	L328 and ((((wide$4 and narrow$6) or (first and second)) near6 width) or ((wide$6 and narrow$6) near6 panel))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:21 PM
L331	3	("0000001"|"0000002"|"	(US-PGPUB; USPAT)	OR	ON	ON	2021/08/26

		20200100997").PN.					12:36 PM
L332	2	(("20160346392") or ("20200100997")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2021/08/26 12:37 PM
L333	14216	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L334	5141	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L335	3204	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L336	4914	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L337	808	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L338	1778	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L339	6128	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L340	8649	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L341	5526	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L342	6224	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L343	8694	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L344	14216	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L345	11742	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L346	4914	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L347	8649	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L348	808	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L349	1778	A61N2005/0642.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/08/26

			USOCR; FPRS; EPO; JPO; DERWENT)				12:42 PM
L350	6224	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L351	1481	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L352	408	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L353	492	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L354	39744	L343 L344 L345 L346 L347 L348 L349 L350 L351 L352 L353	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L355	5526	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L356	40873	L354 L355	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L357	50063	L333 L334 L335 L336 L337 L338 L339 L340 L341 L342 L356	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L358	222	L357 and ((((wide$4 and narrow$6) or (first and second)) near6 width) or ((wide$6 and narrow$6) near6 panel))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L360	37	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2021/10/18 03:52 PM
L361	38	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:52 PM
L362	64	("0000002"|"0000011"|"20200100997"|"0000001"|"20190290763"|"20200269063"|"20200398071"|"7730893"|"20090247932"|"20110224598"|"20130274834"|"20130289089"|"20150290028"|"20160008623"|"20200261580"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20	(US-PGPUB; USPAT)	OR	ON	ON	2021/10/18 03:52 PM

		160045757"|"5601838"|"5686065"|"6897238"|"0017109"|"20010021812"|"D000001"|"20040010299"|"20090324727"|"20110053965"|"20140010761"|"20030088296"|"20040162596"|"20040260365"|"20050075703"|"20050090877"|"20060241726"|"20060253175"|"20060287696"|"20070283655"|"20080031924"|"20100010591"|"20100174223"|"20110106222"|"20120283328"|"20120287671"|"20130066405"|"20130190845"|"20140067024"|"20150162109"|"20150238776"|"20160166846"|"20160175609"|"5849027"|"6223071"|"6709446"|"7156865"|"7190109"|"7723910"|"8030836"|"8216289"|"8758418"|"9108045"|"9533170").PN.				
L363	14281	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L364	5189	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L365	3246	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L366	4993	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L367	815	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L368	1794	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L369	6171	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L370	8713	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L371	5588	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L372	6285	A61N2005/0663.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/18

			USOCR; FPRS; EPO; JPO; DERWENT)				03:53 PM
L373	8738	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L374	14281	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L375	11844	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L376	4993	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L377	8713	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L378	815	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L379	1794	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L380	6285	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L381	1484	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L382	413	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L383	498	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L384	39984	L373 L374 L375 L376 L377 L378 L379 L380 L381 L382 L383	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L385	5588	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L386	41124	L384 L385	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L387	50408	L363 L364 L365 L366 L367 L368 L369 L370 L371 L372 L386	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L388	3097	L387 and (uniform$6 with (light illuminat$8))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L389	29	(US-20070283655-$ or US-20130066405-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2021/10/18 03:54 PM

		US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or US-20050075703-$ or US-20160310756-$ or US-20130190845-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.					
L390	10	L389 and (uniform$6 with (light illuminat$8))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:54 PM
L391	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L392	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L393	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L394	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L395	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L396	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L397	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L398	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L399	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM

L400	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L401	8783	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L402	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L403	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L404	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L405	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L406	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L407	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L408	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L409	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L410	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L411	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L412	40271	L401 L402 L403 L404 L405 L406 L407 L408 L409 L410 L411	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L413	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L414	41417	L412 L413	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L415	50819	L391 L392 L393 L394 L395 L396 L397 L398 L399 L400 L414	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L416	15	L415 and (nest$6 near3 hing$9)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L417	7	L415 and (recess$6	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/19

		near3 hing$9)	USOCR; FPRS; EPO; JPO; DERWENT)				10:30 AM
L418	0	L415 and (hidden near3 hing$9)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:30 AM
L419	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L420	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L421	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L422	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L423	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L424	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L425	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L426	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L427	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L428	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L429	8783	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L430	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L431	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L432	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L433	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L434	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/10/19 03:50 PM

			JPO; DERWENT)				
L435	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L436	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L437	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L438	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L439	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L440	40271	L429 L430 L431 L432 L433 L434 L435 L436 L437 L438 L439	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L441	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L442	41417	L440 L441	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L443	50819	L419 L420 L421 L422 L423 L424 L425 L426 L427 L428 L442	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L444	59	L443 and (dead near3 space)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L445	61	L443 and (hing$6 with (reduce reduced reducing reduction minim$9))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:51 PM
L446	66	L443 and (hing$6 with (reduce reduced reducing reduction minim$9 decreas$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:52 PM
L447	112	L444 L445 L446	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:52 PM
L448	30	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2021/10/20 01:42 PM

		US-20180093107-$ or US-20010021812-$ or US-20050075703-$ or US-20160310756-$ or US-20130190845-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$ or US-20160310756-$).did.					
L449	17	L448 and output	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:42 PM
L450	19	L448 and (shape size measur$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:45 PM
L451	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L452	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L453	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L454	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L455	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L456	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L457	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L458	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L459	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L460	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L461	8783	A61N5/06.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/20

			USOCR; FPRS; EPO; JPO; DERWENT)				01:49 PM
L462	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L463	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L464	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L465	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L466	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L467	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L468	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L469	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L470	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L471	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L472	40271	L461 L462 L463 L464 L465 L466 L467 L468 L469 L470 L471	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L473	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L474	41417	L472 L473	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L475	50819	L451 L452 L453 L454 L455 L456 L457 L458 L459 L460 L474	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L476	1292	L475 and ((sens$6 detect$6) near5 (shape size))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L477	45	L475 and ((sens$6 detect$6) with (shape size) with (treatment adj (surface area)))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:51 PM
L478	54	L475 and ((sens$6	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/20

		detect$6 measur$6) with (shape size) with (treatment adj (surface area)))	USOCR; FPRS; EPO; JPO; DERWENT)				01:54 PM
L479	162	L475 and ((sens$6 detect$6 measur$6 adjust adjusting adjusted adjustable "based on") with (shape size) with (treatment adj (surface area)))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:58 PM
L480	88	L479 and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:59 PM
L481	17	L448 and ("j/cm" "mw/cm" nm nanometer)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:47 PM
L482	0	L448 and ("j/cm" "mw/cm")	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:47 PM
L483	7	L475 and ("j/cm" "mw/cm" nm nanometer)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	AND	ON	ON	2021/10/20 03:47 PM
L484	46	L475 and ("j/cm" "mw/cm" (nm or nanometer))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	AND	ON	ON	2021/10/20 03:48 PM
L485	34	L484 and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:48 PM
L486	629	L475 and (intensity with red) and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:52 PM
L487	442	L475 and (intensity with red with light) and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:52 PM
L488	0	L475 and (intensity with red with "j/cm") and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:53 PM
L489	7	L475 and (intensity with "j/cm") and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:53 PM
L490	32	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2022/01/24 10:45 AM

		US-20050075703-$ or US-20160310756-$ or US-20130190845-$ or US-20130066404-$ or US-20030216795-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$ or US-20160310756-$).did.					
L491	20	L490 and intensity	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2022/01/24 10:45 AM
L492	3	("0000002" OR "0017487" OR "0017506").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L493	2	("0000001" OR "0000002").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L494	3	("0000001" OR "0000002" OR "20150290470").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L495	3	("11135293" "20100174222" "20150290470").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:17 AM
L496	53969	A61N5/062,06,0616.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:37 PM
L497	40946	A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2022/03/23 03:38 PM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L498	13206	A61B5/0064,0082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:38 PM
L499	85960	496 497 498	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:38 PM
L500	20151	499 AND (intensity WITH light)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:39 PM
L501	7575	499 AND (intensity WITH light WITH (more	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	OR	ON	ON	2022/03/23 03:40 PM

		less higher lower highest lowest greater))	AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L502	2876	499 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/03/23 03:47 PM
L503	4680	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:48 PM
L504	1777	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/03/23 03:48 PM
L505	4689	501 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/05/06 02:25 PM
L508	408	L505 AND hing$6	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY,	OR	ON	ON	2022/05/06 02:47 PM

			CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L509	116	((US-20130190845-A1 OR US-20120148975-A1 OR US-20130196284-A1 OR US-20120148976-A1 OR US-20100179622-A1 OR US-20130280671-A1 OR US-20140072932-A1 OR US-20050004632-A1 OR US-20070248930-A1 OR US-20150140502-A1 OR US-20110176326-A1 OR US-20070129776-A1 OR US-20020035386-A1 OR US-20020120312-A1 OR US-20070283655-A1 OR US-20120150265-A1 OR US-20160129279-A1 OR US-20140277291-A1 OR US-20130303972-A1 OR US-20020029071-A1 OR US-20070150031-A1 OR US-20130079759-A1 OR US-20130178919-A1 OR US-20160158485-A1 OR US-20160175609-A1 OR US-20100030013-A1 OR US-20090054953-A1 OR US-20040249423-A1 OR US-20160101295-A1 OR US-20030004499-A1 OR US-20120330386-A1 OR US-20090005839-A1 OR US-20140187998-A1 OR US-20160325109-A1	(US-PGPUB; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); USPAT; DERWENT)	OR	ON	ON	2022/05/06 02:53 PM

		OR US-20060241726-A1 OR US-20140100455-A1 OR US-20050075703-A1 OR US-20050234383-A1 OR US-20100100160-A1 OR US-20050237423-A1 OR US-20110178582-A1 OR US-20060064144-A1 OR US-20010021812-A1 OR US-20140315142-A1 OR US-20050131500-A1 OR US-20060007390-A1 OR US-20080269730-A1 OR US-20120203310-A1 OR US-20120215291-A1 OR US-20160096042-A1 OR US-20110290005-A1 OR US-20060047329-A1 OR US-20090005837-A1 OR US-20160066791-A1 OR US-20140060546-A1 OR US-20080027317-A1 OR US-20170238401-A1 OR US-20170105265-A1 OR US-20100211136-A1 OR US-20170231058-A1 OR US-20080245371-A1 OR US-20140350395-A1 OR US-20150265366-A1).did. AND PGPB.dbnm.) OR ((DE-102015107669-A1 OR KR-20150126087-A OR CN-88102683-A OR KR-20140058327-A OR KR-101350503-B1 OR WO-2015041919-A1 OR WO-2006028465-A1 OR DE-202012004264-U1 OR FR-2931685-A1 OR CN-102300605-A OR WO-2012086991-A2 OR DE-202006017153-U1 OR DK-201500153-A1 OR CN-102300606-A OR CN-102481456-A OR WO-9614792-A1 OR KR-20160041129-A					

		OR KR-20150124016-A OR CA-2638508-A1 OR RU-2483764-C2 OR KR-20120036564-A OR KR-20020088833-A OR EP-2502647-A1 OR CN-103930162-A OR EP-1839703-A1 OR FR-2601784-A1 OR CN-104640602-A OR DE-4015406-A1 OR WO-2014102791-A2 OR CA-2771517-A1 OR KR-20080094715-A OR EP-2749317-A1 OR CN-1039119-A OR CN-1602172-A OR CN-102883776-A OR WO-2014080103-A2 OR CN-105380745-B OR DE-102007018863-A1 OR CA-2551311-A1 OR DE-10326522-A1 OR GB-2415387-A OR CN-101646924-A OR DE-202007005751-U1 OR CN-1708261-A OR CN-104602638-A).did. AND FTDB.dbnm.) OR ((US-4612604-A OR US-4848323-A OR US-7033381-B1 OR US-8170657-B1 OR US-9808644-B2 OR US-10052393-B2 OR US-10194808-B1).did. AND USPT.dbnm.) OR ((WO-2012075584-A1).did. AND DWPI.dbnm.)					
L510	408	((US-20130190845-A1 OR US-20120148975-A1 OR US-20130196284-A1 OR US-20120148976-A1 OR US-20100179622-A1 OR US-20130280671-A1 OR US-20140072932-A1 OR US-20050004632-A1 OR US-20070248930-A1 OR US-20100318161-A1 OR US-20130253620-A1 OR US-20140121731-A1 OR US-20150079536-A1 OR US-20150140502-	(US-PGPUB; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); USPAT; DERWENT)	OR	ON	ON	2022/05/06 02:55 PM

		A1 OR US-20110176326-A1 OR US-20070129776-A1 OR US-20020035386-A1 OR US-20020120312-A1 OR US-20070283655-A1 OR US-20120150265-A1 OR US-20160129279-A1 OR US-20140277291-A1 OR US-20130303972-A1 OR US-20020029071-A1 OR US-20040127961-A1 OR US-20070233209-A1 OR US-20070150031-A1 OR US-20130079759-A1 OR US-20130178919-A1 OR US-20160158485-A1 OR US-20160175609-A1 OR US-20100030013-A1 OR US-20090054953-A1 OR US-20040249423-A1 OR US-20060009822-A1 OR US-20160101295-A1 OR US-20030004499-A1 OR US-20120330386-A1 OR US-20090005839-A1 OR US-20140187998-A1 OR US-20160325109-A1 OR US-20060241726-A1 OR US-20070038269-A1 OR US-20140100455-A1 OR US-20170035299-A9 OR US-20050075703-A1 OR US-20050234383-A1 OR US-20070129778-A1 OR US-20100100160-A1 OR US-20050237423-A1 OR US-20080079802-A1 OR US-20110178582-A1 OR US-20060064144-A1 OR US-20010021812-A1 OR US-20040143308-A1 OR US-20140315142-A1 OR US-20050131500-A1 OR					

		US-20060007390-A1 OR US-20080269730-A1 OR US-20120203310-A1 OR US-20130253619-A1 OR US-20120215291-A1 OR US-20160096042-A1 OR US-20110290005-A1 OR US-20130152670-A1 OR US-20130179120-A1 OR US-20130184846-A1 OR US-20130182882-A1 OR US-20130191084-A1 OR US-20130197888-A1 OR US-20060047329-A1 OR US-20100076526-A1 OR US-20090005837-A1 OR US-20160066791-A1 OR US-20140060546-A1 OR US-20080027317-A1 OR US-20080045841-A1 OR US-20080287806-A1 OR US-20130123640-A1 OR US-20140194751-A1 OR US-20150080745-A1 OR US-20170238401-A1 OR US-20170105265-A1 OR US-20100211136-A1 OR US-20170231058-A1 OR US-20080245371-A1 OR US-20140107404-A1 OR US-20140350395-A1 OR US-20150265366-A1 OR US-20150265353-A1).did. AND PGPB.dbnm.) OR ((WO-2010142031-A1 OR WO-2010142013-A1 OR KR-20120047227-A OR JP-2012529299-A OR CN-102802726-A OR JP-5705838-B2 OR KR-101670537-B1 OR CN-102802726-B OR WO-2012048423-A1 OR EP-2627283-B1 OR DE-102015107669-A1 OR WO-2012075584-					

		A1 OR EP-2648651-B1 OR WO-2009004412-A1 OR CN-101687099-A OR EP-2164566-B1 OR CN-101687099-B OR KR-20150126087-A OR CN-88102683-A OR DE-3814611-A1 OR NL-8801071-A OR IT-1217200-B OR WO-2013155632-A1 OR CN-104379087-A OR JP-2015515333-A OR JP-6007313-B2 OR CN-104379087-B OR CN-106621060-A OR EP-2838468-B1 OR EP-3263066-A1 OR CN-106621060-B OR EP-3626206-A1 OR KR-20140058327-A OR KR-101350503-B1 OR WO-2015041919-A1 OR WO-2015058284-A1 OR CN-105682603-A OR JP-2016538028-A OR JP-6484235-B2 OR CN-111330163-A OR EP-3845200-A1 OR WO-2011082420-A1 OR WO-2006028465-A1 OR CA-2579639-A1 OR DE-202012004264-U1 OR FR-2931685-A1 OR CN-102300605-A OR WO-2007047892-A1 OR CA-2343843-A1 OR GB-2361430-A OR EP-1147785-A2 OR JP-2002102364-A OR WO-2012086991-A2 OR KR-20120069588-A OR KR-20140072854-A OR KR-101845073-B1 OR DE-202006017153-U1 OR DE-102006008774-A1 OR WO-2007098883-A2 OR CA-2373594-C OR CA-2706642-C OR WO-2007112427-A2 OR CA-2664898-A1 OR WO-2012082739-A2 OR EP-0148144-A2 OR HU-189454-B OR SE-455837-B OR FI-79470-B OR FI-79470-C OR WO-2016007798-A2					

		OR DK-201500153-A1 OR DK-178588-B1 OR CN-102300606-A OR CA-2846344-A1 OR EP-2778752-A2 OR KR-20140113561-A OR JP-2014180565-A OR AU-2014201546-A1 OR SG-10201400483T-A OR BR-102014006370-A2 OR EP-2778752-B1 OR TW-I576092-B OR RU-2661020-C2 OR JP-6362885-B2 OR WO-2012176071-A2 OR CN-102481456-A OR JP-2012532643-A OR WO-9614792-A1 OR CN-1164180-A OR CN-1124822-C OR CA-2672092-A1 OR CA-2341951-A1 OR GB-2360461-A OR GB-2360460-A OR EP-1138349-A2 OR JP-2002065875-A OR EP-1457234-A2 OR JP-2005334670-A OR EP-1457234-B1 OR JP-4889247-B2 OR WO-2007000059-A1 OR CA-2613973-A1 OR CN-101242871-A OR KR-20160041129-A OR KR-101642839-B1 OR NL-8700329-A OR EP-0283062-A2 OR EP-0283062-B1 OR WO-2012010861-A1 OR CA-2842275-A1 OR NZ-607470-A OR KR-20150124016-A OR WO-2012040854-A1 OR CA-2812302-A1 OR CN-103237574-A OR JP-2013541977-A OR CA-2638508-A1 OR WO-2010015080-A1 OR CN-102143731-A OR RU-2483764-C2 OR WO-2006013390-A1 OR GB-2425481-A OR JP-2008508918-A OR EP-1824561-B1 OR WO-2004110305-A2 OR JP-2007526003-A OR WO-03001984-A2 OR KR-20040048881-A						

		OR CN-1578688-A OR JP-2005521432-A OR AU-2002320215-B2 OR CA-2452408-C OR CN-1578688-B OR KR-20120036564-A OR KR-101181054-B1 OR KR-20020088833-A OR KR-100848391-B1 OR WO-2011067603-A1 OR CA-2782496-A1 OR AU-2010326393-A1 OR CN-102711912-A OR WO-2007040691-A1 OR CA-2624668-A1 OR WO-2012174245-A1 OR WO-2015006872-A1 OR WO-2004075985-A2 OR WO-2004075984-A1 OR JP-2006519047-A OR JP-2011098207-A OR WO-02062420-A1 OR EP-1359977-B1 OR DE-60207202-T2 OR NO-331280-B1 OR WO-9919024-A1 OR EP-1021223-B1 OR DE-69827286-T2 OR JP-4257718-B2 OR CA-2304774-C OR WO-2010044879-A2 OR CA-2777481-A1 OR JP-2012505706-A OR WO-2006122229-A2 OR CA-2605346-A1 OR AU-2006243966-A1 OR JP-2008541092-A OR EP-1889470-B1 OR EP-2975834-A1 OR GB-2461806-A OR WO-2010007419-A1 OR EP-2339999-B1 OR WO-2006012123-A2 OR EP-2502647-A1 OR WO-2005049127-A1 OR AU-2004291100-A1 OR JP-2007511286-A OR CN-103930162-A OR EP-1839703-A1 OR WO-2012106541-A1 OR CA-2826245-A1 OR CN-103338818-A OR KR-20140044302-A OR EP-2670481-B1 OR DK-2670481-T3 OR RU-2600223-C2 OR CN-103338818-B OR					

		TW-I603754-B OR KR-101842423-B1 OR FR-2601784-A1 OR EP-0255426-A1 OR WO-2012106542-A1 OR CA-2826247-A1 OR KR-20140044300-A OR EP-2670482-B1 OR RU-2580983-C2 OR TW-I598127-B OR KR-101834155-B1 OR CN-104640602-A OR CN-104640602-B OR DE-4015406-A1 OR WO-2014102791-A2 OR WO-2016057729-A1 OR JP-2017534373-A OR CN-107427407-A OR JP-6608440-B2 OR CN-107427407-B OR CA-2771517-A1 OR KR-20080094715-A OR CN-101495182-A OR KR-101370160-B1 OR WO-2013002935-A1 OR CA-2840434-A1 OR JP-2014526166-A OR CA-2840434-C OR EP-2749317-A1 OR CN-1039119-A OR CN-1602172-A OR CA-2465906-C OR CN-102883776-A OR WO-2014080103-A2 OR EP-2922518-B1 OR ES-2828000-T3 OR CN-105380745-B OR DE-102007018863-A1 OR DE-102007018863-B4 OR CA-2551311-A1 OR DE-10326522-A1 OR EP-1486186-B1 OR WO-2008094252-A2 OR CA-2677217-A1 OR CA-2677217-C OR GB-2415387-A OR CA-2570919-A1 OR AU-2005256804-A1 OR KR-20070052742-A OR CN-1988932-A OR EP-1771225-B1 OR ES-2385991-T3 OR CN-101646924-A OR WO-2013112856-A2 OR EP-2807111-B1 OR WO-2015113003-A1 OR WO-2015184019-A1 OR DE-					

		202007005751-U1 OR EP-2489402-A2 OR EP-2489401-A2 OR EP-2489400-A2 OR WO-2016022612-A1 OR CN-1708261-A OR WO-2008124641-A2 OR CA-2858610-A1 OR CN-104080400-A OR EP-3466335-A1 OR BR-112014014781-A2 OR WO-2015143026-A1 OR CN-104602638-A OR CN-104602638-B OR CN-108113762-A).did. AND FTDB.dbnm.) OR ((US-9242118-B2 OR US-9463333-B2 OR US-8900282-B2 OR US-9308389-B2 OR US-9730780-B2 OR US-8702291-B2 OR US-6626932-B2 OR US-6796994-B2 OR US-7517101-B2 OR US-8425577-B2 OR US-4612604-A OR US-9289623-B2 OR US-8980174-B2 OR US-6645230-B2 OR US-4848323-A OR US-9533170-B2 OR US-8070669-B2 OR US-7033381-B1 OR US-9138595-B2 OR US-10252079-B2 OR US-10342991-B2 OR US-8170657-B1 OR US-9808644-B2 OR US-6663659-B2 OR US-9854977-B2 OR US-7311722-B2 OR US-7730893-B2 OR US-7298415-B2 OR US-8279334-B2 OR US-9079021-B2 OR US-6223071-B1 OR US-9320580-B2 OR US-7449026-B2 OR US-7147319-B2 OR US-10384070-B2 OR US-9248309-B2 OR US-10667990-B2 OR US-8384916-B2 OR US-8493574-B2 OR US-8743377-B2 OR US-8874404-B2 OR US-					

		9013701-B2 OR US-9175945-B2 OR US-9448061-B2 OR US-7544204-B2 OR US-10238294-B2 OR US-9907688-B2 OR US-8380291-B2 OR US-8391960-B2 OR US-8706200-B2 OR US-8838210-B2 OR US-9186063-B2 OR US-9226664-B2 OR US-10052393-B2 OR US-10357662-B2 OR US-10194808-B1 OR US-8528563-B2 OR US-9301770-B2 OR US-10165976-B2 OR US-9700342-B2).did. AND USPT.dbnm.) OR ((WO-2012075584-A1).did. AND DWPI.dbnm.)					
L511	408	L510 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/05/06 02:55 PM
L512	5	("0000001" OR "0000002" OR "20160030565" OR "5211938" OR "6559183").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:04 PM
L513	1	kennedy.in. AND @pd="19970708"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:05 PM
L514	1	("5211938").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:07 PM
L515	1	("5211938").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/19 12:07 PM
L516	5	("5211938").pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/08/19 12:07 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L517	1	5211938b1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/19 12:07 PM
L518	0	"5211938-b1"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/19 12:08 PM
L519	1	"5211938 b1"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/08/19 12:08 PM

			IBM_TDB)				
L520	2545	@pd="19970708"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:09 PM
L521	16	@pd="19970708" AND kennedy	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:09 PM
L522	0	kennedy.in. AND @pd="19970807"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:11 PM
L523	20	kennedy.in. AND malignant.ti.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/30 02:23 PM
L524	39	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/11/07 09:16 AM
L525	41	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/07 09:17 AM
L526	103	524 525	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/07 09:17 AM
L527	82	("0000002" OR "0000081" OR "0017854" OR "0017876" OR "0017889" OR "9597150" OR "10357567" OR "11135293" OR "20010021812" OR "20030088296" OR "20030216795" OR "20040010299" OR "20040162596" OR "20040260365" OR "20050075703" OR "20050090877" OR "20060241726" OR "20060253175" OR "20060287696" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/07 11:33 AM

		"20070283655" OR "20080031924" OR "20080188558" OR "20090247932" OR "20090324727" OR "20100010591" OR "20100174222" OR "20100174223" OR "20100298758" OR "20110020441" OR "20110053965" OR "20110106222" OR "20110224598" OR "20110293528" OR "20120283328" OR "20120287671" OR "20130066404" OR "20130190845" OR "20130274834" OR "20130289089" OR "20130304019" OR "20130315999" OR "20140010761" OR "20140067024" OR "20150162109" OR "20150238776" OR "20150290028" OR "20150290470" OR "20160008623" OR "20160030565" OR "20160045757" OR "20160166846" OR "20160175609" OR "20160175610" OR "20160346392" OR "20190290763" OR "20200100997" OR "20200261580" OR "20200269063" OR "20200398071" OR "20220008538" OR "20220040494" OR "5211938" OR "5601838" OR "5686065" OR "5814008" OR "5849027" OR "6223071" OR "6559183" OR "6709446" OR "6897238" OR "7033381" OR "7156865" OR "7190109" OR "7723910" OR "7730893" OR "8030836" OR "8216289" OR					

		"8226289" OR "8758418" OR "9108045" OR "9227082" OR "9533170").pn.					
L528	43	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 0 Text Selections Text: (US-20170216616-A1 OR US-11446512-B2 OR US-7723910-B2 OR US-10603508-B2 OR CA-3057840-A1 OR AU-2018250595-A1 OR WO-2018191356-A2 OR US-20170106205-A1 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-10589122-B2 OR EP-3851161-A1 OR US-20200246630-A1 OR US-11179574-B2 OR EP-3362145-B1 OR US-20200398071-A1 OR ES-2860807-T3 OR US-20200269063-A1 OR US-20220040494-A1 OR EA-201590362-A1 OR BR-112015004114-A2 OR CA-2881614-A1 OR WO-2014033254-A1 OR EP-2890458-A1 OR US-20140067024-A1 OR ES-2685326-T3 OR US-20160367832-A1 OR EP-2890458-B1 OR JP-2015528338-A OR US-20160008623-A1 OR US-9399146-B2 OR US-20210353148-A1 OR US-20210046326-A1 OR WO-2022050963-A1 OR CN-114010954-A OR CN-114010955-A OR CN-110876836-B OR US-20210402211-A1 OR TW-202200233-A OR US-20220288411-A1 OR US-20180117355-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2022/11/10 09:04 AM

		CA-2984963-A1 OR EP-3294413-A1 OR WO-2016179705-A1 OR WO-2022078955-A1 OR US-11452883-B1 OR US-20120165716-A1 OR US-8372128-B2 OR WO-2018191356-A3).did.					
L529	39	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 1 Text Selection Text: (US-20170216616-A1 OR US-7723910-B2 OR US-11446512-B2 OR WO-2018191356-A2 OR AU-2018250595-A1 OR CA-3057840-A1 OR US-10603508-B2 OR US-8372128-B2 OR US-20120165716-A1 OR US-20210353148-A1 OR WO-2011109628-A1 OR US-20200246630-A1 OR US-10589122-B2 OR US-10231942-B2 OR ES-2860807-T3 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-20170106205-A1 OR US-8758418-B2 OR EP-3362145-B1 OR EP-3851161-A1 OR US-20220249042-A1 OR JP-2013540554-A OR US-20200269063-A1 OR EP-4033980-A1 OR US-11118172-B2 OR US-11179574-B2 OR US-20160074669-A1 OR US-20200398071-A1 OR BR-PI0818453-A2 OR US-6709446-B2 OR US-20130211482-A1 OR WO-2012056397-A1 OR EP-2632549-A1 OR CN-114423481-A OR US-20210085386-A1 OR WO-2021053482-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2022/11/10 09:04 AM

		EP-4031007-A1 OR IL-139397-A OR IL-291143-A OR BR-112013009899-A2 OR CN-103180015-A OR RU-2013124017-A OR ES-2323073-T3 OR US-20220040494-A1 OR JP-2010540163-A OR MX-2010003658-A OR AU-2020103365-A4 OR AU-2021102111-A4).did.					
L530	1810	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L531	58003	A61N5/062,06,0616.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L532	45364	A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L533	14582	A61B5/0064,0082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2022/11/10 09:06 AM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L534	93358	531 532 533	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L535	8176	534 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L536	3118	534 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L537	1810	536 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:07 AM
L538	3415	534 AND ((uniform$6 consistan$8) WITH (light illuminat$6 irradiat$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:09 AM
L539	3680	534 AND ((uniform$6 consistan$8) WITH (light illuminat$6 irradiat$6 radiat$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:09 AM
L540	2294	539 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2022/11/10 09:09 AM

			JPO; IBM_TDB)				
L541	82	("0000002" OR "0000081" OR "0017854" OR "0017876" OR "0017889" OR "9597150" OR "10357567" OR "11135293" OR "20010021812" OR "20030088296" OR "20030216795" OR "20040010299" OR "20040162596" OR "20040260365" OR "20050075703" OR "20050090877" OR "20060241726" OR "20060253175" OR "20060287696" OR "20070283655" OR "20080031924" OR "20080188558" OR "20090247932" OR "20090324727" OR "20100010591" OR "20100174222" OR "20100174223" OR "20100298758" OR "20110020441" OR "20110053965" OR "20110106222" OR "20110224598" OR "20110293528" OR "20120283328" OR "20120287671" OR "20130066404" OR "20130190845" OR "20130274834" OR "20130289089" OR "20130304019" OR "20130315999" OR "20140010761" OR "20140067024" OR "20150162109" OR "20150238776" OR "20150290028" OR "20150290470" OR "20160008623" OR "20160030565" OR "20160045757" OR "20160166846" OR "20160175609" OR "20160175610" OR "20160346392" OR "20190290763" OR "20200100997" OR "20200261580" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/10 09:27 AM

		"20200269063" OR "20200398071" OR "20220008538" OR "20220040494" OR "5211938" OR "5601838" OR "5686065" OR "5814008" OR "5849027" OR "6223071" OR "6559183" OR "6709446" OR "6897238" OR "7033381" OR "7156865" OR "7190109" OR "7723910" OR "7730893" OR "8030836" OR "8216289" OR "8226289" OR "8758418" OR "9108045" OR "9227082" OR "9533170").pn.					
L542	32	((US-20030216795-A1 OR US-20130066405-A1 OR US-20120287671-A1 OR US-20060241726-A1 OR US-20160175609-A1 OR US-20160175610-A1 OR US-20140157511-A1 OR US-20170131693-A1 OR US-20170007844-A1 OR US-20130066404-A1 OR US-20160310756-A1 OR US-20050075703-A1 OR US-20010021812-A1 OR US-20180093107-A1 OR US-20180015297-A1 OR US-20180345034-A1 OR US-20070283655-A1 OR US-20040068305-A1 OR US-20130190845-A1 OR US-20040093043-A1).did. AND PGPB.dbnm.) OR ((US-9533170-B2 OR US-9017391-B2 OR US-9227082-B2 OR US-4100415-A).did. AND USPT.dbnm.) OR ((US-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:49 PM

		20160175609-A1 OR US-20160175608-A1 OR GB-2501670-A OR US-20160175610-A1 OR US-20140157511-A1 OR US-20160310756-A1).did. AND DWPI.dbnm.) OR ((EP-2016977-A1 OR WO-2018191356-A2).did. AND FPRS.dbnm.)					
L543	41	(542 541) AND fan	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:50 PM
L544	35	543 AND (uniform$6 constant$6 consisten$6)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:52 PM
L545	39	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/11/14 04:04 PM
L546	41	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/14 04:04 PM
L547	19	(545 546) AND intensity.clm.	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	ON	ON	2022/11/14 04:05 PM

			DERWENT)				
L548	43	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 0 Text Selections Text: (US-20170216616-A1 OR US-11446512-B2 OR US-20220387816-A1 OR US-7723910-B2 OR US-10603508-B2 OR JP-20200516393-A5 OR CA-3057840-A1 OR AU-2018250595-A1 OR WO-2018191356-A2 OR US-20170106205-A1 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-20230001227-A1 OR US-10589122-B2 OR EP-3851161-A1 OR US-11179574-B2 OR US-20200246630-A1 OR US-20200398071-A1 OR EP-3362145-B1 OR ES-2860807-T3 OR US-20200269063-A1 OR US-20220040494-A1 OR CA-2881614-A1 OR EP-2890458-A1 OR WO-2014033254-A1 OR ES-2685326-T3 OR US-20140067024-A1 OR US-20160367832-A1 OR EP-2890458-B1 OR US-20160008623-A1 OR JP-2015528338-A OR US-9399146-B2 OR US-20210353148-A1 OR WO-2021231913-A1 OR US-20210046326-A1 OR US-11452883-B1 OR US-20120165716-A1 OR US-8372128-B2 OR CN-114010954-A OR CN-114010955-A OR WO-2022078955-A1 OR WO-2023285921-A1 OR US-20180117355-A1 OR CN-110876836-B OR CA-2984963-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/02/21 03:13 PM

		EP-3294413-A1 OR WO-2016179705-A1 OR US-11033752-B2 OR US-20200121944-A1).did.					
L549	44	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 1 Text Selection Text: (US-20170216616-A1 OR US-7723910-B2 OR JP-20200516393-A5 OR US-11446512-B2 OR US-20220387816-A1 OR WO-2018191356-A2 OR CA-3057840-A1 OR AU-2018250595-A1 OR US-10603508-B2 OR US-20120165716-A1 OR US-8372128-B2 OR WO-2021231913-A1 OR US-20210353148-A1 OR US-20230001227-A1 OR WO-2011109628-A1 OR US-20200246630-A1 OR US-10589122-B2 OR CN-102164542-A OR US-11179574-B2 OR US-20130274598-A1 OR EP-3362145-A1 OR WO-2017066270-A1 OR WO-2017066270-A9 OR US-20170106205-A1 OR ES-2860807-T3 OR US-20200398071-A1 OR EP-3851161-A1 OR US-8758418-B2 OR EP-3362145-B1 OR IL-139397-A OR US-20200269063-A1 OR AU-2021102111-B4 OR AU-2021102111-A4 OR AU-2020103365-A4 OR US-6709446-B2 OR US-20220040494-A1 OR CZ-284897-A3 OR US-20030158258-A1 OR US-7190109-B2 OR CA-2331090-C OR JP-2002512205-A OR JP-2020516393-A OR CA-2327393-C OR JP-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/02/21 03:14 PM

		2017079940-A OR ES-2323073-T3 OR GB-2525432-A OR KR-101638664-B1 OR US-9723991-B2 OR US-7335684-B2 OR US-5079262-A).did.					
L550	6	("0000001" OR "0000002" OR "10786571" OR "10814114" OR "11235169" OR "20190216927").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/02/21 03:29 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N119	882	(panel AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:19 AM
N120	882	(panel AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:20 AM
N121	189	(panel AND width AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:23 AM
N122	213	(panel AND (width wide wider) AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:23 AM
N123	3	(panel AND (width wide wider) AND (light illuminat$6 led) AND ((nest$6 near3 hing$6) (optical$6 near3 dead))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:38 AM
N330	15	(panel AND (width wide wider) AND (light illuminat$6 led) AND (ala aminolevul$8)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 07:14 PM
N359	15	(panel AND (width wide wider) AND (light	(US-PGPUB; USPAT)	OR	ON	ON	2021/08/26 12:42 PM

		illuminat$6 led) AND (ala aminolevul$8)).clm.					
N361	3	(panel AND (width wide wider longer long short shorter bigger) AND ((light illuminat$6 led) WITH intens$6) AND (nest$6 WITH hing$6)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/05/06 02:49 PM
N362	1471	(panel AND (width wide wider longer long short shorter bigger) AND ((light illuminat$6 led) WITH intens$6)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/02/21 03:21 PM
N363	46	(panel AND (width wide wider longer long short shorter bigger) AND ((light illuminat$6 led) WITH intens$6) AND hing$6).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/02/21 03:21 PM

Bibliographic Data

Application No: 17/942,353

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /TAMMIE K MARLEN/ (Examiner's Signature) | (Initials)

Title: ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/12/2022	604	3792	067286-0483
RULE			

APPLICANTS

DUSA Pharmaceuticals, Inc.,

INVENTORS

Thomas BOYAJIAN, Wilmington, MA, UNITED STATES

Mark CAROTA, Chelmsford, MA, UNITED STATES

Brian MAZEJKA, Salem, NH, UNITED STATES

CONTINUING DATA

This application is a CON of 16791004 02/14/2020 PAT 11446512

16791004 is a DIV of 15292731 10/13/2016 PAT 10589122

15292731 has PRO of 62241902 10/15/2015

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

09/27/2022

STATE OR COUNTRY

UNITED STATES

ADDRESS

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109
UNITED STATES

FILING FEE RECEIVED

$6,360

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	17/942,353
Date Submitted: February 16, 2023				**Filing Date**	9/12/2022
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	3792
				Examiner Name	Tammie K. MARLEN
Sheet	1	of	1	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	C1	4,667,658-A	05-26-1987	GUIBERT	
	C2	10,786,571-B2	09-29-2020	SOLIOZ ET AL.	
	C3	10,814,114-B2	10-27-2020	BOYAJIAN ET AL.	
	C4	11,235,169-B1	02-01-2022	OSTERLOH ET AL.	
	C5	2019/0216927-A1	07-18-2019	LUNDAHL ET AL.	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	C6	EP-3 143 986-A1	03-22-2017	ZIMMER MEDIZINSYSTEME GMBH		
	C7	JP-2010-513363-	04-30-2010	BIOFRONTERA BIOSCIENCE		T

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	C8	Ang et al., "Photodynamic Therapy and Pain: A Systematic Review," Photodiagnosis and Photodynamic Therapy 19 (Jul. 2017) 308–344	
	C9	Kim et al. "In vivo skin absorption dynamics of topically applied pharmaceuticals monitored by fiberoptic diffuse reflectance spectroscopy," Spectrochimica Acta Part A 66, Mar 2007, 768-772	
	C10	Mordon S, A Commentary on the Role of Skin Temperature on the Effectiveness of ALA-PDT in Dermatology, Photodiagnosis and Photodynamic Therapy (Accepted Aug 2014)	
	C11	Nishimura et al., "Iontophoretic Photosensitization of the Skin Re-evaluated by Colorimetric Imaging in Senile Patients," Bioimages 19, Jan. 2011, 1-6	
	C12	Warren et al., "Pain Associated with Aminolevulinic Acid-Photodynamic Therapy of Skin Disease," J Am Acad Dermatol., Dec. 2009 61(6): 1033–1043	
	C13	Willey et al., "Temperature-Modulated Photodynamic Therapy for the Treatment of Actinic Keratosis on the Extremities: A Pilot Study" Dermatol Surg; 40:1094-1102, Oct 2014	
	C14	Ye et al. "Evaluation of Hydrogel Suppositories for Delivery of 5-Aminolevulinic Acid and Hematoporphyrin Monomethyl Ether to Rectal Tumors," Molecules, Oct. 2016, 21, 1347, 1-12	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	02/21/2023

4855-3230-2914.2

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :Crystal Queen

Sale Accounting Date:02/21/2023

Sale Item Reference Number	Effective Date
17942353	02/16/2023

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20232I728556800	1201	INDEPENDENT CLAIMS IN EXCESS OF 3	$960.00	Deposit Account

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/942,353	Filing Date 09/12/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	02/16/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 22	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 3	= 2		x $480 =	960
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	960

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/CRYSTAL QUEEN/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed	PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	17942353
Filing Date	12-Sep-2022
First Named Inventor	Thomas BOYAJIAN
Attorney Docket Number	067286-0483
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
DUSA Pharmaceuticals, Inc.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

11446512

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status: ○ Small Entity ○ Micro Entity ◉ Regular Undiscounted I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number 71828 ○ A sole inventor ○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ○ A joint inventor; all of whom are signing this request	
Signature	/Kiri Lee Sharon/
Name	Kiri Lee Sharon

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	17942353
Filing Date:	12-Sep-2022
Title of Invention:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
First Named Inventor/Applicant Name:	Thomas BOYAJIAN
Filer:	Kiri Lee Sharon/Janet Lee
Attorney Docket Number:	067286-0483

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	170	170
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**170**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 17942353

Filing Date: 12-Sep-2022

Applicant/Patent under Reexamination: BOYAJIAN

Electronic Terminal Disclaimer filed on February 16, 2023

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	47546339
Application Number:	17942353
International Application Number:	
Confirmation Number:	3138
Title of Invention:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
First Named Inventor/Applicant Name:	Thomas BOYAJIAN
Customer Number:	22428
Filer:	Kiri Lee Sharon/Janet Lee
Filer Authorized By:	Kiri Lee Sharon
Attorney Docket Number:	067286-0483
Receipt Date:	16-FEB-2023
Filing Date:	12-SEP-2022
Time Stamp:	17:45:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$170
RAM confirmation Number	E20232FH45156604
Deposit Account	190741
Authorized User	Janet Lee

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	41197 85af24286e926981a6426c898ba24d7d0785a92a	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38009 f2f873434bbdcf4f0ee32fa007c49f309ca208ec	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	79206		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Thomas BOYAJIAN
Title:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
Appl. No.:	17/942,353
Filing Date:	9/12/2022
Examiner:	Tammie K. MARLEN
Art Unit:	3792
Confirmation No.:	3138

AMENDMENT AND REPLY UNDER 37 C.F.R. § 1.111

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This communication is responsive to the non-final Office Action mailed November 18, 2022, concerning the above-referenced patent application.

Amendments to the Specification begin on page 2 of this document.

Amendments to the Claims begin on page 3 of this document.

Remarks begin on page 8 of this document.

Amendments to the Specification:

Please amend the specification as follows:

Please replace paragraph [0001] starting at page 1 with the following rewritten paragraph:

> **[0001]** This application is a continuation of U.S. application serial number 16/791,004, filed February 14, 2020, now granted as U.S. Patent No. 11,446,512, which is a divisional application of U.S. application serial number 15/292,731, filed October 13, 2016, now granted as U.S. Patent No. 10,589,122, which claims the benefit of priority to U.S. Provisional Application No. 62/241,902 filed on October 15, 2015, now expired, the entire contents of all of which are incorporated herein by reference.

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A system for photodynamically diagnosing or treating a patient, comprising:

an illuminator comprising ~~at least~~ five panels connected by hinged structures on inner side surfaces of adjacent panels; and

light sources disposed on surfaces of the ~~at least~~ five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources,

one of the ~~at least~~ five panels being positioned as a center panel configured to face the treatment surface, and two or more of the ~~at least~~ five panels being configured to be angled relative to the center panel,

wherein the ~~at least~~ five panels are positioned to allow treatment within approximately four inches of the treatment surface, and

wherein each of the ~~at least~~ five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

2. (Currently Amended) The system of claim 1, wherein the illuminator is configured to output red light at a dose of ~~about~~ 30 J/cm^2 to ~~about~~ 150 J/cm^2.

3. (Canceled)

4. (Original) The system of claim 1, wherein the illuminator is configured to output light at an irradiance density of 10 mW/cm^2 to 30 mW/cm^2.

5. (Original) The system of claim 1, wherein a plurality of the light sources are configured to emit light having a wavelength in a range of 400 nm to 700 nm.

6. (Canceled)

7. (Currently Amended) A method of photodynamically diagnosing or treating a patient, comprising:

administering 5-aminolevulinic acid (ALA) to the patient;

positioning an illuminator proximate to the patient, the illuminator comprising ~~at least~~ five panels connected by hinged structures on inner side surfaces of adjacent panels; and

uniformly illuminating a treatment surface of the patient with light sources disposed on the ~~at least~~ five panels of the illuminator, the ~~at least~~ five panels being positioned to allow treatment within approximately four inches of the treatment surface,

wherein each of the ~~at least~~ five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

8. (Original) The method of claim 7, wherein the illuminating comprises outputting red light during at least part of the time when the treatment surface is illuminated.

9. (Original) The method of claim 7, wherein the illuminating comprises outputting blue light during at least part of the time when the treatment surface is illuminated.

10. (Original) The method of claim 7, further comprising changing intensities of the light sources of the illuminator with a controller in accordance with information received from at least one sensor relating to a curvature of the treatment surface.

11. (Original) The method of claim 7, wherein:

the illuminator comprises at least three first panels having first widths, at least two second panels having second widths, wherein each of the second widths of the at least two second panels is narrower than each of the first widths of the at least three first panels; and

the at least three first panels and the at least two second panels are connected in an alternating manner such that each of the at least two second panels has a first lateral side

connected to a respective one of the at least three first panels and a second lateral side connected to another respective one of the at least three first panels.

12. (Original) The method of claim 7, further comprising determining a size of the treatment surface of the patient using a sensor.

13. (Original) The method of claim 7, further comprising determining a shape of the treatment surface of the patient using a sensor.

14. (Original) The method of claim 12, further comprising adjusting an overall light dose with a controller based on the determined size of the treatment surface.

15. (Original) The method of claim 12, further comprising adjusting positioning of panels with at least one actuator based on the determined size of the treatment surface.

16. (Original) The method of claim 13, further comprising adjusting an overall light dose with a controller based on the determined shape of the treatment surface.

17. (Original) The method of claim 13, further comprising adjusting positioning of panels with at least one actuator based on the determined shape of the treatment surface.

18. (Currently Amended) A system for photodynamically diagnosing or treating a patient, comprising:

a mobile base supported by at least four wheels;

a pillar perpendicular to the base;

a controller disposed to be supported by the pillar;

an arm mounted to a top portion of the pillar; and

an illuminator connected at an end of the arm, the arm being hinged to allow adjustment of a position of the illuminator relative to the base, the illuminator comprising:

~~at least~~ five panels connected by hinged structures to allow continuous illumination across the ~~at least~~ five panels, wherein the ~~at least~~ five panels are individually configurable to control illumination from each of the ~~at least~~ five panels,

light sources disposed on surfaces of the ~~at least~~ five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources, the light sources being configured to output light uniformly during at least part of a time when the treatment surface is illuminated, each of the five panels having two first edges and two second edges shorter than the two first edges, the light sources arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges, and

one or more fans mounted to at least one of the five panels.

19. (Canceled)

20. (Currently Amended) The system of claim 18, wherein one of the ~~at least~~ five panels is positioned as a center panel configured to face the treatment surface, and two or more of the ~~at least~~ five panels are configured to be angled relative to the center panel.

21. (Original) The system of claim 18, wherein the light sources are configured to output blue light during at least part of the time when the treatment surface is illuminated.

22. (Original) The system of claim 18, wherein the light sources are configured to output red light during at least part of the time when the treatment surface is illuminated.

23. (New) A system for photodynamically diagnosing or treating a patient, comprising:

an illuminator comprising five panels connected by hinged structures on inner side surfaces of adjacent panels, wherein the illuminator is configured to output light at a variable irradiance density during treatment; and

light sources disposed on surfaces of the five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources,

one of the five panels being positioned as a center panel configured to face the treatment surface, and two or more of the five panels being configured to be angled relative to the center panel,

wherein the five panels are positioned to allow treatment within approximately four inches of the treatment surface, and

wherein each of the five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

24. (New) A system for photodynamically diagnosing or treating a patient, comprising:

an illuminator comprising five panels connected by hinged structures on inner side surfaces of adjacent panels; and

light sources disposed on surfaces of the five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources,

one of the five panels being positioned as a center panel configured to face the treatment surface, and two or more of the five panels being configured to be angled relative to the center panel,

wherein the five panels are positioned to allow treatment within approximately four inches of the treatment surface,

wherein the five panels are individually configurable to control illumination from each of the five panels, and

wherein each of the five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and the reasons that follow.

Status of Claims

Claims 1-22 were pending. Claims 1, 2, 7, 18 and 20 are amended, and new claims 23 and 24 are added, with support being found at least in the claims as originally presented. Claims 3, 6, and 19 are canceled. No new matter is added. These amendments are made without prejudice or disclaimer.

After amending the claims as set forth above, claims 1, 2, 4, 5, 7-18 and 20-24 remain pending in this application. Applicant respectfully requests favorable consideration of these claims.

Allowable Subject Matter

Applicant sincerely appreciates the indication that claims 3, 6, 9, and 19 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for the indication of allowable subject matter. Amended claim 18 and new claims 23 and 24 respectively include subject matter relating to allowable claims 19, 3, and 6.

Specification Objection

The specification was objected to for an informality. Without adding new matter, Applicant hereby amends the specification to include the current status of all referenced patent applications, and submits that this objection is overcome.

Rejection under 35 U.S.C. § 112

Claim 2 was rejected under 35 U.S.C. § 112(b) as allegedly being indefinite.

Without conceding to the propriety of this rejection, and solely in the interest of advancing prosecution, claim 2 is amended to omit the term at issue in the rejection. Withdrawal of this rejection is therefore respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 18 and 20-22 were rejected under 35 U.S.C. § 103 as allegedly being unpatentable over U.S. Patent No. 7,033,381 ("Larsen") in view of U.S. Patent Publication No. 2006/0253175 ("Fan"). Claims 18 and 20-22 were rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Fan. Applicant traverses these rejections.

Without conceding to the propriety of this rejection, and solely in the interest of advancing prosecution, Applicant amends independent claim 18 herewith to recite subject matter relating to dependent claim 19. Amended independent claim 18 and claims 20-22 which depend therefrom are therefore allowable. Withdrawal of these rejections is therefore respectfully requested.

Rejection for Double Patenting

Claims 1, 2, 4, 5, 7, 8 and 10-17 were rejected on the ground of nonstatutory double patenting as allegedly being unpatentable over claims (1 and 2), 3-5, (8 and 2), 3, 16, 19, 9, 12, 10, 11, 13, 14 of U.S. Patent No. 11,446,512.

Without conceding to the propriety of this rejection, and solely in the interest of advancing prosecution, Applicant submits herewith a terminal disclaimer over U.S. Patent No. 11,446,512, thereby obviating this rejection.

New Claims 23 and 24

New claim 23 recites subject matter relating to previously presented allowable claim 3 in independent form, and new claim 24 recites subject matter relating to previously presented allowable claim 6 in independent form.

Concluding Remarks

Applicant believes that the application is in condition for allowance. Favorable reconsideration is respectfully requested.

Examiner Marlen is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance prosecution.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extensions under 37 CFR § 1.136 and authorizes payment of any such extension fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 16 Feb 2023

By /Kiri Lee Sharon/

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4092
Facsimile: (202) 672-5399

Kiri Lee Sharon
Attorney for Applicant
Registration No. 71,828

Eric Finnerty
Agent for Applicant
Registration No. 79,038

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 143 986 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.03.2017 Bulletin 2017/12

(51) Int Cl.:
A61K 9/00 *(2006.01)* ***A61K 41/00*** *(2006.01)*
A61K 9/06 *(2006.01)* ***A61K 47/36*** *(2006.01)*

(21) Application number: **15186006.1**

(22) Date of filing: **21.09.2015**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(71) Applicant: **Zimmer MedizinSysteme GmbH**
89231 Neu-Ulm (DE)

(72) Inventor: **The designation of the inventor has not yet been filed**

(74) Representative: **Isarpatent**
Patent- und Rechtsanwälte Behnisch Barth Charles
Hassa Peckmann & Partner mbB
Friedrichstrasse 31
80801 München (DE)

(54) HYDROPHILIC GEL FOR TOPICAL DELIVERY OF 5-AMINOLEVULINIC ACID AND PRODUCTION THEREOF

(57) The present invention relates to a pharmaceutical topical gel solution that contains 5-aminolevulinic acid (5-ALA) and an aqueous low viscous gel matrix. This invention also relates to a pharmaceutical preparation containing this composition. The formulation of this type can be used in photodynamic therapy as well as in the photodynamic detection of abnormally proliferating cells.

EP 3 143 986 A1

Description

Field of the invention

[0001] The present invention relates to a pharmaceutical topical gel solution that contains 5-aminolevulinic acid (5-ALA). This invention also relates to a pharmaceutical preparation containing this composition. The formulation of this type can be used in photodynamic therapy as well as in the photodynamic detection of abnormally proliferating cells.

Background of the invention

[0002] The world is currently experiencing steadily increasing cancer rates that are largely due to the steadily advancing age of populations in large, industrialized nations and changing lifestyles. Because the rates of many cancers are steadily increasing, this brings a high demand for more and higher quality treatments. Of the various types of pre-cancer and cancers, pre-cancerous lesions such as Actinic Keratosis and other types of non-melanoma skin cancer continue to be a serious and increasing issue in countries with large populations of white people with fair complexions (blond hair, blue eyes) and/or a high exposure to UV radiation.

[0003] Photodynamic therapy is a fast growing and promising therapeutic method for treating those premalignant and malignant diseases, which are connected to cell proliferation. 5-ALA has been used for more than two decades in commercial products due to its high safety factor based on its endogenous nature, non-toxicity and selectivity for cancerous cells. It is known as a second-generation photosensitizer, since the sensitivity to daylight after treatment is dramatically reduced to only 1 - 2 days in comparison to the 30 - 60 days of the still marketed Photofrin® (Porfimer Sodium).

[0004] For therapeutic purposes 5-ALA is administered topically or systemically and penetrates non-selectively into all cells, where it is metabolized to an active sensitizer PPIX (Protoporphyrin IX) utilizing the heme biosynthesis pathway. As cancerous or neoplastic (fast-growing) cells commonly have lower intracellular iron (Fe^{2+}) levels than normal, healthy cells, PPIX cannot be quickly converted to its final product heme and therefore accumulates only within cancer cells.

[0005] Since PPIX is a potent photosensitizer this metabolic pathway can be exploited in Photodynamic Therapy (PDT). This is an already approved therapeutic strategy making 5-ALA one of the most successful prodrugs used in treatment of a wide range of pre-cancerous and cancerous lesions. (M. Wachowska et al, Aminolevulinic Acid as a Prodrug in Photodynamic Therapy of Cancer, Molecules 2011, 16, 4140-4164).

[0006] After selective accumulation of the photosensitizer in the tumor it can be activated by illumination using light of the appropriate wavelength and dose.

[0007] The PPIX molecule absorbs the light and the absorbed energy is subsequently transferred to molecular oxygen, creating the singlet state oxygen $^1O_2$. The singlet oxygen that is generated from the PDT process on PPIX is then resulting in oxidative damage to intracellular macromolecules and consequently leads to cell death. This cytotoxic effect, in particular on proliferating cells, stems from reactions of the singlet oxygen with for example the cell membrane and the mitochondria or triggers the formation of cell-damaging free radicals. The mode of PDT-induced cell death is usually a mixture of apoptosis, necrosis and autophagy. It is generally agreed that apart from the direct cellular cytotoxicity, two other important factors contribute to the overall PDT effect: the vascular shutdown (which stops angiogenesis and thus prevents metastasis) and the local inflammatory reaction. Furthermore, irradiation of the photosensitizer gives rise to a characteristic fluorescence radiation which can be used for detection proliferating cells.

[0008] In addition to 5-ALA, the wavelength of light chosen to perform the PPIX excitation is quite important, as is the penetration depth of the 5-ALA itself into the affected tissue. For purely superficial treatment, the wavelength of maximum absorption is generally considered to be the best for treatment. However, for deeper lesions, a compromise between excitation and penetration depth of the light must be reached, which usually means a shift to longer (i.e. more red) wavelengths. 5-ALA is a polar molecule and occurs in physiological conditions as a charged Zwitterion. This accounts for its low lipid solubility and this ultimately limits the penetration through the outermost skin layer, the *stratum corneum*, which is of lipidic nature.

[0009] A number of investigations using topically applicable 5-aminolevulinic acid compositions are known from the prior art. While these investigations have the feature in common that the 5-aminolevulinic acid or derivatives thereof are employed, differences exist with regard to other parameters, such as period of penetration, period of treatment, type of light employed and the dose of light applied.

[0010] Although the investigations disclosed in the prior art clearly demonstrate the potential of photodynamic therapy using 5-aminolevulinic acid, the different formulations already marketed suffer from a number of disadvantages.

[0011] Of general importance for the development of a PDT therapy is the guideline for Photosensitizers in clinical PDT (RR Allison et al, Photodiagnosis and Photodynamic Therapy (2004) 1, 27-42) which has defined relevant points that need to be considered. Among them the most important requirements the product needs to fulfill are the following:

- Non-toxic and no toxic or cancerogenous by-products should be formed; otherwise chemotherapeutic agents can

BIOFRONTERA EXHIBIT 1002
Page 210 of 482

be used
- Easy removal is mandatory (short half-life of the photosensitizer)
- Needs to easily penetrate into the skin, deep enough to reach the entire pre-cancerous or cancerous tissue as well as get there reliably and to selectively accumulate within the mitochondrium of the cancer cells for effective induction of apoptosis when illuminated
- Reliable activation by an appropriate wavelength of light is needed to prevent accidental treatment
- Hours or only few days of photosensitivity of the entire skin after treatment are preferred over several weeks or months
- Versatile application: topical, oral, inhalation or IV without causing of side effects like e.g. allergic reactions or hypertension
- Must get to where you need it and activate when you need it, each and every time
- Activation of PDT using longer wavelength lightto allow for deeper tissue penetration
- The ability to be used in conjunction with other forms of treatment such as surgery, radiation, and chemotherapy
- Should easily permit treatment overdosage of illumination without causing side effects
- Easily and safely administered, targets the appropriate structure, normal cells unaffected by treatment, activates when needed until the structure in question is destroyed and then eliminates itself without causing permanent damage to the rest of the body.

[0012] Particularly valid for 5-ALA is that it is known to degrade in aqueous solution however it has to be stable for the period of usage in order to be therapeutically useful. Aqueous solutions show best stability below pH < 6 (V. von Arx et al. (J. Pharm. Pharmacol. 49: 652-656, 1997)). Another disadvantage is that the depth to which the photosensitizer penetrates into the damaged tissue is compromised by its low lipid solubility. As a result, the diseased tissue is in many cases only accessible to the photodynamic therapy in its superficial layers even though the depth to which the light employed for activating the photosensitizer penetrates would also enable more deeply lying layers to be treated.

Object of the Invention

[0013] The object of the present invention is therefore to provide a composition comprising 5-ALA which overcomes the disadvantages known from prior art products and which provides an improved penetration of 5-ALA into a patient's tissue. At the same time the invention provides an adequate stability of 5-ALA.

Summary of the Invention

[0014] These objects are achieved by a composition according to the present invention comprising:

a) 5-ALA or its HCl salt as an active ingredient;
b) a first penetration enhancer selected from one or more water-miscible ether compounds; and
c) a second penetration enhancer selected from one or more glycosaminoglycan compounds.

[0015] The inventors surprisingly found that a two-step approach may result in an unexpected increased penetration of 5-ALA into deep tissue layers. In the first step, a chemical penetration enhancer selected from one or more water-miscible ether compounds which changes the partition coefficient of the *stratum corneum* to enable hydrophilic molecules to penetrate into the skin, is used. By this approach, components a) and c) are allowed to penetrate the *stratum corneum* much better than as it has been disclosed in prior art compositions.

[0016] Once these components have passed the *stratum corneum* into the epidermis, the second penetration enhancer, i.e. one selected from one or more glycosaminoglycan compounds, allows the 5-ALA or its HCl salt to penetrate into the dermis by hydration of the basal layer cells.

[0017] This two-step approach has been closely adapted to the characteristics of the diseased skin (for example affected by actinic keratosis) which is known to be dry, scaly and rough. The present composition therefore makes it possible for 5-ALA or its HCl salt to maximally penetrate into the skin even without any occlusion of the treated area being needed.

[0018] Occlusion is usually performed in topical PDT using currently marketed products like Metvix® or Ameluz®, representing galenical forms that contain a high level of oils and fats.

[0019] At increased ambient temperatures (like e.g. during summertime) these oily / fatty products show a tendency to liquify under occlusion leading to smearing out of the desired treatment area and hence decrease their effectivity. Even more severe they can drip down a patient's face, when areas on the forehead are treated, leading to contamination of other areas of the face like the eyes, where it causes strong discomfort of the patient leading to reduced patient compliance. Another product, Alacare®, is even an occlusive patch formulation itself.

BIOFRONTERA EXHIBIT 1002
Page 211 of 482

Description of the Figures

[0020] In the Figures, the following is shown:

Figure 1 - depicts an untreated pig ear image reflecting natural porphyrin fluorescence.
Figure 2 - depicts porphyrin fluorescence images (Example 11 Table 1) reflecting the penetration depth of the formulation of the present invention (and comparative compositions) into the pig ear.

Detailed Description of the Invention

[0021] In a preferred embodiment, the composition according to the present invention comprises 5 ALA in the form of its hydrochloride salt (5-ALA HCl) and is contained in the composition in a concentration range of 5-30 wt.%. An even more preferred concentration range of 5-ALA HCl is about 15-25 wt.% each based on the overall weight of the composition.

[0022] The composition of the present invention preferably is a composition for pharmaceutical use and thus, will contain one or more pharmaceutically acceptable auxiliaries. Those auxiliaries are, for example, selected from gel-forming polymers, in particular polymers for forming a hydrogel.

[0023] These types of polymers may be selected (but are not restricted to) hydrogels forming highly absorbent natural or synthetic polymeric networks which might include polyvinyl alcohol, sodium polyacrylate, acrylate (co)polymers or natural hydrogel materials such as agarose, methylcellulose, hyaluronic acid/ hyaluronate. Other gel-forming polymers are hydroxypropylcellulose, methylhydroxyethylcellulose or sodium carboxymethylcellulose. A further polymer is xanthan gum.

[0024] For further information, it is referred to Rudolf Voigt, Pharmazeutische Technologie, 11th Edition, 2010, in particular page 396 and subsequent pages.

[0025] Other auxiliaries which might be used in a pharmaceutical composition according to the present invention are substances for preserving the composition, chelating agents, buffering agents and/or acidity regulators.

[0026] As usual preservatives, para-hydroxybenzoic acid esters such as methylparaben, ethylparaben or propylparaben (or sodium salts thereof and also in combination) can be used or, alternatively, potassium sorbate or sorbic acid. A preserving activity can also be achieved by using alcoholic additives, for example, containing more than 15% of propylene glycol or glycerol.

[0027] Further auxiliaries might be selected from humidifying agents such as glycerol, propylene glycol or sorbitol, preferably in concentrations of 10-20 wt% based on the overall weight of the composition. These ingredients will prevent the hydrogel from drying out and enhance the applicability of the final pharmaceutical product.

[0028] Furthermore, the pharmaceutical composition of the present invention, in case of a hydrogel, might contain acidity regulators which ensure a suitable pH value. As mentioned above, 5-ALA degrades in aqueous solution and show best stability below pH values of 6. Therefore, it is a suitable approach to adapt the pH value of the overall composition to this pH range, for example by setting the pH value to a well-tolerated range of between 3.5-4.5 by suitable ingredients. Those ingredients might be selected from different kinds of acids or acidic salts such as trisodium citrate dihydrate.

[0029] Further auxiliaries for use in a hydrogel of the present invention are chelating agents such as EDTA and buffering agents should that be required.

[0030] Further auxiliaries in addition to the ones listed above might be included in the composition as well. Regarding compositions different from topical compositions in form of hydrogels it is generally referred to pharmaceutical standard literature such as Remington, the Science and Practice of Pharmacy, 22nd Edition, 2013.

[0031] Preferably, the hydrogel takes the form of a low viscous hydrogel. The term "low viscous" is generally defined herein as describing a viscosity of between (and including) 1,000 and 13,000 mPas measured at 32 °C. The viscosity can be measured using a cone/plate Rheometer (Rheostress RS-1, Thermo Haake, Karlsruhe, Germany), with the geometry 35 mm, cone angle 2°, in oscillatory mode using constant deformation at 1Hz and Auto-Strain. The measurement is performed by applying a linear temperature-ramp from 20°C to 40°C at a rate of 1°C / min, using the built in peltier element of the Rheometer. Viscosity readings [mPas] were taken from the resulting curve at 25 and 32°C, the latter representing the average skin surface temperature.

[0032] A preferred range of viscosity for the low viscous hydrogel is about 3,000-7,000 mPas.

[0033] According to a more preferred embodiment, the pharmaceutical composition of the present invention contains one or more water miscible ether compounds selected from diethyleneglycol monoethylether, diethyleneglycol monomethylether, ethyleneglycol monoethylether and 1,4:3,6-dianhydrosorbitol 2,5-dimethylether (dimethyl isosorbide). This group of ether compounds serves as a chemical penetration enhancer that changes the partition coefficient of the *stratum corneum* and enables hydrophilic molecules to penetrate the skin. The suitable concentration ranges of these ether compounds are usually in a range of about 4-15 wt.%, more preferably in the range of 8-12 wt.% based on the overall weight of the composition.

BIOFRONTERA EXHIBIT 1002
Page 212 of 482

[0034] The one or more glycosaminoglycan compounds forming the hydrophilic intradermal penetration enhancer is preferably selected from chondroitin sulfate, keratan sulfate, dermatan sulfide, heparin sulfate, heparan sulfate and/or hyaluronic acid/sodium hyaluronate. The group of hyaluronic acid and its sodium salt is also termed "non-sulfated glycosaminoglycan".

[0035] These compounds usually are added to the composition of the present invention (based on the overall weight of the composition) in a concentration range of 0.5-1.5 wt.%, more preferably in the range of 0.8-1.2 %.

[0036] In one preferred embodiment, the pharmaceutical composition of the present invention is a low viscous hydrogel containing: 5-ALA HCl, dimethyl isosorbide and sodium hyaluronate. Optional auxiliaries are trisodium citrate as a pH regulating agent, disodium edetate as a chelating agent, methyl and propylparaben as preservatives and Xanthan gum as viscosity enhancer. Further, the hydrogel contains purified water of pharmaceutical grade.

[0037] In this preferred composition, 5-ALA HCl is present in an amount of about 20% by weight, dimethylisosorbide is contained in an amount of about 10 wt.% and sodium hyaluronate in an amount of about 1% by weight based on the overall weight of the composition (including water).

[0038] The topical pharmaceutical composition according to the present invention might be formulated in an apparatus for applying 5-ALA containing hydrogels such as a two chamber system that separates the active ingredient 5-ALA from the gel matrix (which is contained in a separate chamber) wherein both chambers are mixed prior to treatment by breaking a seal that separates both chambers to give a ready-to-use topical gel solution that can be focused on the area of application on the skin.

[0039] The hydrogel thus may be stored in a double chamber system which might be made of a transparent, laminated polymer consisting of two chambers separated by a breakable wall. The material chosen protects the sensitive active ingredient in one chamber from oxygen and water, thus providing long-term stability to 5-ALA, while in the other chamber the matrix of the hydrogel is stored. It was observed that the 5-ALA ingredient was long-term stable at different storage conditions without degradation in such a double chamber tube.

[0040] For example, the seal that separates the two chambers can be broken by applying pressure to the liquid containing chamber which leads to breakage of the seal. Once the seal is open, the resulting slurry needs to be vigorously kneaded until a clear gel results. After this procedure, the product is ready for final application to the patient's skin.

[0041] The composition of the present invention is used in the photochemotherapeutic treatment or diagnosis of disorders or abnormalities of internal or external surfaces of the body. These disorders or abnormalities are selected from pre-cancer and cancers, pre-cancerous lesions of the skin such as actinic keratosis and types of non-melanoma skin cancer, SCC (squamous cell carcinoma), or BCC (basal cell carcinoma).

[0042] The present invention now is described by the following examples which illustrate the present invention:

Examples

[0043] Formulation trials were carried out to further meet the above stated requirements for topically applied photosensitizers. The examples according to the invention were prepared in a Two-Step process as follows:

Step I: Disodium edetate (Komplexon III, Merck, Darmstadt) was dissolved in purified water at room temperature, approximately 22°C, under stirring using a magnetical stirring motor (IKAMAG RT 15, IKA Werke, Germany) at a stirring rate of 300 rpm for 5 min. To the resulting solution, sodium hyaluronate (HA-EP1, 760KDa, Shandong Freda Biopharm Co., Ltd, Jinan, China) was added and dispersed using a glass stick in slow circular movements for 1min. The resulting dispersion was kept refrigerated at 2 - 8°C for 12-18hrs. After this period the sodium hyaluronate was fully swollen and the resulting preparation had a clear and viscous aspect.

Step II: Methylparaben and propylparaben (Sigma-Aldrich Chemie GmbH, Buchs, Switzerland), if present, were dissolved in dimethyl isosorbide (Dottisol®, Dottikon Exclusive Synthesis, Dottikon, Switzerland) under stirring using the magnetic stirring motor with a stirring rate of 300 rpm for 10min at room temperature, at 22°C. The resulting clear solution was added to Step I under stirring at a stirring rate of initially 300 rpm. The stirring rate was gradually increased to 700rpm within 20 min, at 22°C, resulting in a clear gel.

[0044] To this clear gel, trisodium citrate dihydrate (Sigma-Aldrich Chemie GmbH, Buchs, Switzerland) was slowly (within 1min) added under stirring with at a stirring rate of 700rpm for 30 minutes at 22°C. Xanthan gum (Type: FNCS, Jungbunzlauer, Basel, Switzerland), if present, was then added during mixing using a rotor/stator homogenizer (Polytron PT 10-35 GT, Kinematica, Switzerland) at 5000 rpm for 20 min at 22°C, until a homogeneous gel results.

[0045] For the final product the matrix gel is mixed with an appropriate amount of 5-ALA (ingredient a).

[0046] Viscosity was measured using a cone/plate Rheometer (Rheostress RS-1, Thermo Haake, Karlsruhe, Germany), with a geometry of 35 mm and cone angle 2° in oscillatory mode using constant deformation at 1Hz and Auto-Strain. The measurement was performed by applying a linear temperature-ramp from 20°C to 40°C at a rate of 1°C / min, using

BIOFRONTERA EXHIBIT 1002
Page 213 of 482

the built in peltier element of the Rheometer. Viscosity readings [mPas] were taken from the resulting curve at 25 and 32°C, the latter representing the average skin surface temperature.

[0047] The numbers in table 1 below represent % by weight of total product.

[0048] The following compounds were used in the compositions:

a) 5-ALA HCl: active ingredient

b) Dimethyl Isosorbide: surface penetration enhancer

c) HA-Na LMW: (Sodium hyaluronate, Low Molecular Weight) intradermal penetration enhancer

d) Trisodium citrate: pH regulating agent

e) Disodium edetate: metal chelating agent

f) Methylparaben: preservative

g) Propylparaben: preservative

h) Xanthan gum: viscosity enhancer

i) Purified water: filler

Table 1:

	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6
5-ALA HCl	20	20	20	20	20	20
Dimethyl Isosorbide	-	15	-	4	11	-
HA-Na LMW	-	-	1	1	1	2
Trisodium citrate	12	12	12	12	12	12
Disodium edetate	-	-	-	-	-	-
Methylparaben	-	-	-	-	-	-
Propylparaben	-	-	-	-	-	-
Xanthan gum	0.5	0.5	0.5	0.5	0.5	0.5
Purified water	67.5	52.5	66.5	62.5	57.5	65.5
Viscosity at 25°C [mPas]	2300	3450	5300	7750	3000	12850
Viscosity at 32°C [mPas]	2180	3350	4600	6650	2400	11300

BIOFRONTERA EXHIBIT 1002
Page 214 of 482

	Ex. 7	Ex. 8	Ex. 9	Ex. 10	Ex. 11
5-ALA HCl	20	20	20	20	20
Dimethyl Isosorbide	-	-	15	15	10
HA-Na LMW	-	0.5	0.5	1.5	1
Trisodium citrate	12	12	12	12	12
Disodium edetate	0.02	0.02	0.02	0.02	0.02
Methylparaben	0.1	0.1	0.1	0.1	0.1
Propylparaben	0.03	0.03	0.03	0.03	0.03
Xanthan gum	0.8	0.3	1.0	-	-
Purified water	67.05	67.05	51.35	51.35	56.85
Viscosity at 25°C [mPas]	6600	2000	6200	6800	4100
Viscosity at 32°C [mPas]	6600	1750	6100	5700	3900

[0049] To estimate the ideal ratios of the two penetration enhancers, a design of experiments, according to regulatory (ICH) requirements for a Quality by Design (QbD) approach, was performed.

[0050] As part of the development, *ex vivo* testing on pig ear skin has been performed to assess the penetration depth and surprisingly it was found that very significant penetration depths could be achieved by using the composition of the present invention (> 1 mm, Fig 2). The greater penetration depths were particularly surprising because it had previously been assumed that, due to its hydrophilicity, 5-aminolevulinic acid would in any case be not readily able to penetrate through the epidermis.

[0051] Another surprising advantage is that, by using the second penetration enhancer, in accordance with the invention, 5-aminolevulinic acid is evidently taken up through basal membrane into the dermis.

[0052] According to the invention, the formulation comprises an active substance which is 5-aminolevulinic acid in its hydrochloride salt form which is converted in a cell into Protoporphyrin IX. The matrix is an essentially aqueous phase that is optimal for dermal applications and the pH adjusted for treatment is in an acceptable and well tolerated range between pH 3.5 to pH 4.5. This pH range guarantees stability of the product for 24 hours in order to be used therapeutically. The adjusted viscosity led to a rather low viscous gel for final mixture at 32°C (skin temperature) of a range of 3000 - 5000 mPas. This viscosity allows easy spreading of the gel over the application area and exploring also hard to reach skin surfaces while it has enough adhesion to the skin that it stays on the skin without spreading uncontrolled.

Results

[0053] Ex vivo trials were performed on pig-ear skin considering the following standard literature:

- W. Meyer, Dermatologist 47 .178-182, 1996; Meyer et al, Munch Tierarztl Wschr. 114: 92-99, 2001; Meyer et al., Munch Tierarztl Wschr 114: 100-111, 2001)
- Patent WO 2004092726 A1
- Biana Godin, Eika Touitou Transdermal skin delivery: Predictions for humans from in vivo, ex vivo and animal models
- Histochemical Techniques, JD Bancroft

[0054] Pig ears were taken from freshly slaughtered pigs (Süddeutsches Schweinefleischzentrum Ulm Donautal GmbH, Germany). The pig ears were cut, before washing of the entire pig using hot water, in order to leave the skin as intact as possible.

[0055] A defined amount of drug product was applied on a marked, square-shaped area of the pig-ear skin and the entire pig ear was then incubated in a Heracell 150i Incubator (Thermo Scientific, Waltham, USA) at 37°C. After 4h, the pig ears were taken out from the incubator and the previously marked areas, containing the drug product, were cut out, using a scalpel.

[0056] The resulting patch of pig-ear skin was then embedded in embedding media for cryotoms (Nr. 020108926; Leica Instruments, Nussloch). After freezing of the embedded patches at -20°C, vertical slices of a defined thickness

BIOFRONTERA EXHIBIT 1002
Page 215 of 482

were prepared using a Cryo Microtome (CM-3050S, Leica Instruments, Nussloch). These slices were then fixated on glass slides using glycerol jelly (Glycerol Gelatin aqueous slide mounting medium, Sigma-Aldrich, St. Louis, USA). These samples were then stored at -40°C.

[0057] By a confocal laserscanning microscope (CLSM 510 Meta ZEISS AG, Oberkochen, Germany), using a 10x objective (10x 0.3NA EC Plan-Neofluar Ph1 M27, ZEISS AG, Oberkochen, Germany) the pictures as shown in the Figures were taken. Figure 2 reflects the penetration depth of the formulation of the present invention, Example 11, and comparative compositions into the pig ear. As it can be readily seen, the composition of the present invention showed a much greater penetration depth than those of the comparative Examples (illustrated by arrow).

Claims

1. A composition comprising

   a) 5-amino-4-oxo-pentanoic acid (5-aminolevulinic acid or 5-ALA) or the HCl salt (5-ALA-HCl) thereof as an active ingredient;
   b) a first penetration enhancer selected from one or more water-miscible ether compounds; and
   c) a second penetration enhancer selected from one or more glycosaminoglycan compounds.

2. The composition of claim 1, where the active ingredient is 5-aminolevulinic acid in its hydrochloride salt form (5-ALA HCl), and is contained in the composition in a concentration range of 5-30% (w/w), more preferably 15-25% (w/w) based on the overall weight of the composition.

3. The composition of claim 1 or 2, which is a pharmaceutical composition and comprises one or more pharmaceutically acceptable auxiliaries, and preferably is a topical composition in form of a low viscous hydrogel.

4. The composition of claim 3, where the low viscous hydrogel has a viscosity of about 1,000-13,000 mPas at 32°C.

5. The composition of one or more of the preceding claims, wherein the one or more water-miscible ether compounds are selected from diethyleneglycol monoethylether, diethyleneglycol monomethylether, ethyleneglycol monoethyl-ether and 1,4:3,6-dianhydrosorbitol 2,5-dimethyl ether (dimethyl isosorbide).

6. The composition of claim 5, wherein the one or more water-miscible ether compounds are contained in the composition in a concentration range of 4 - 15% (w/w), more preferably in the range of 8 - 12% (w/w) based on the overall weight of the composition.

7. The composition of one or more of the preceding claims, wherein the one or more glycosaminoglycan compounds are selected from chondroitin sulfate, keratan sulfate, dermatan sulfate, heparin sulfate, heparan sulfate and/or hyaluronic acid/sodium hyaluronate (non-sulfated glycosaminoglycan).

8. The composition of claim 7, wherein the one or more glycosaminoglycan compounds are contained in the composition in a concentration range of 0.5 - 1.5% (w/w), more preferably in the range of 0.8 - 1.2% (w/w) based on the overall weight of the composition.

9. The composition of one or more of the preceding claims, which is low viscous hydrogel and contains 5-ALA HCl, dimethyl isosorbide and sodium hyaluronate.

10. The composition of claim 9, containing 5-ALA HCl in an amount of about 20% (w/w), dimethyl isosorbide in an amount of about 10% (w/w) and sodium hyaluronate in an amount of about 1% (w/w).

11. The composition of one or more of the preceding claims, which further comprises one or more preservatives, chelating agents and/or buffering agents/acidity regulators.

12. The composition of one or more of the preceding claims for use in a photochemotherapeutic treatment or diagnosis of disorders or abnormalities of internal or external surfaces of the body.

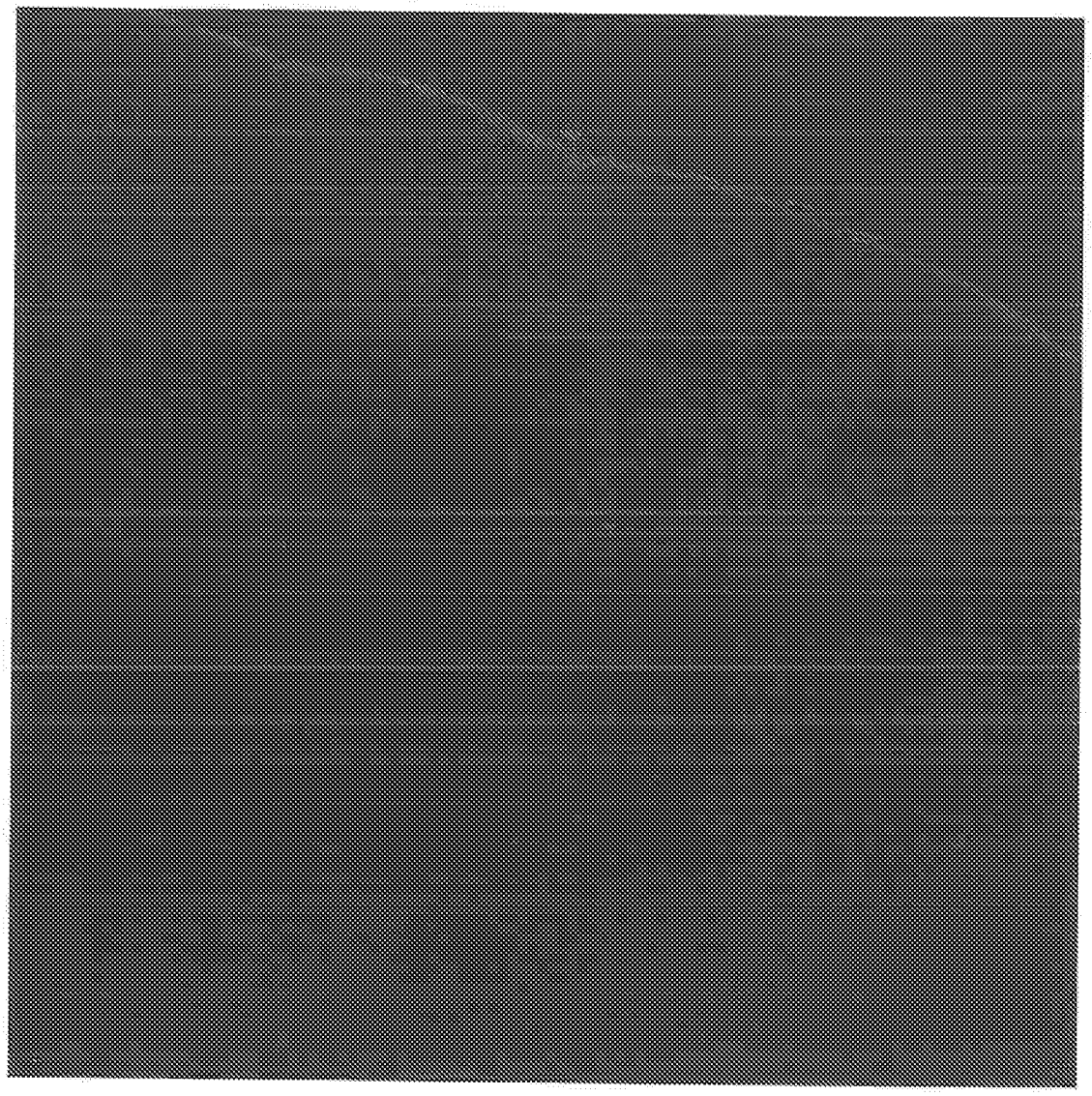
13. The composition of claim 12 for use in a photochemotherapeutic treatment or diagnosis, wherein the disorders or abnormalities of internal or external surfaces of the body are selected from pre-cancer and cancers, pre-cancerous

BIOFRONTERA EXHIBIT 1002
Page 216 of 482

lesions of the skin such as Actinic Keratosis and other types of non-melanoma skin cancer, SCC (squamous cell carcinoma), or BCC (basal cell carcinoma).

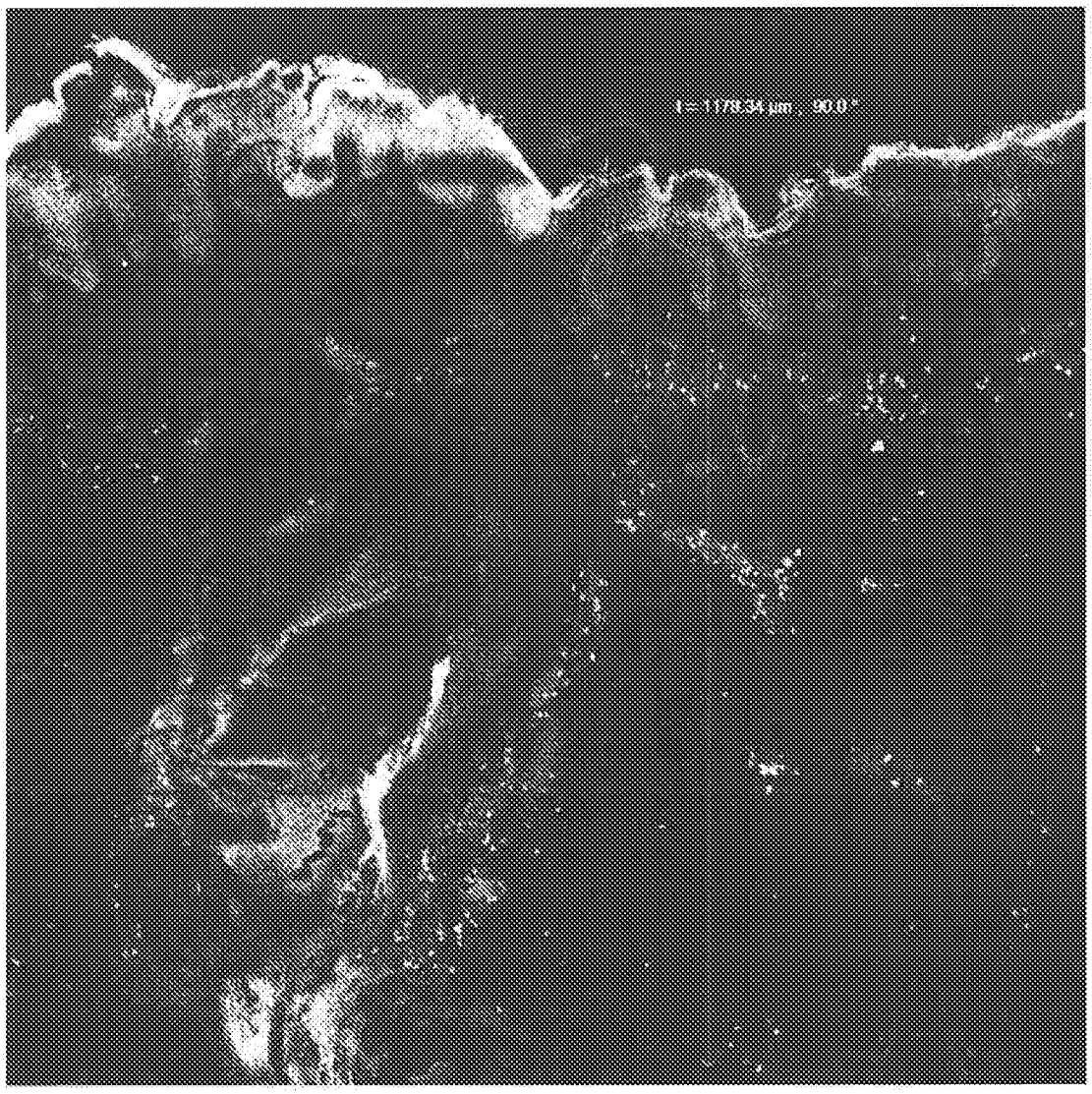
BIOFRONTERA EXHIBIT 1002
Page 217 of 482

Figure 1:



BIOFRONTERA EXHIBIT 1002
Page 218 of 482

Figure 2:



BIOFRONTERA EXHIBIT 1002
Page 219 of 482

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 15 18 6006

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2012/283328 A1 (NODI PANKAJ [CA]) 8 November 2012 (2012-11-08) * paragraph [0014] - paragraph [0017] * * paragraph [0040] - paragraph [0042] * * examples 1,4 *	1-13	INV. A61K9/00 A61K41/00 A61K9/06 A61K47/36
Y	EP 1 716 845 A1 (UNIV BRAUNSCHWEIG TECH [DE]) 2 November 2006 (2006-11-02) * the whole document *	1-13	
Y	US 5 910 489 A (FALK RUDOLF EDGAR [CA] ET AL) 8 June 1999 (1999-06-08) * column 7, line 21 - column 9, line 62 * * column 16, line 41 - line 50 *	1-13	

TECHNICAL FIELDS SEARCHED (IPC)
A61K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 October 2015	Giró, Annalisa

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

BIOFRONTERA EXHIBIT 1002
Page 220 of 482

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 18 6006

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-10-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2012283328 A1	08-11-2012	NONE	
EP 1716845 A1	02-11-2006	AT 459336 T	15-03-2010
		AU 2006201726 A1	09-11-2006
		DE 102005019628 A1	09-11-2006
		DK 1716845 T3	28-06-2010
		EP 1716845 A1	02-11-2006
		US 2008227757 A1	18-09-2008
US 5910489 A	08-06-1999	US 5910489 A	08-06-1999
		US 5962433 A	05-10-1999

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

BIOFRONTERA EXHIBIT 1002
Page 221 of 482

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2004092726 A1 **[0053]**

Non-patent literature cited in the description

- **M. WACHOWSKA et al.** Aminolevulinic Acid as a Prodrug in Photodynamic Therapy of Cancer. *Molecules,* 2011, vol. 16, 4140-4164 **[0005]**
- **RR ALLISON et al.** *Photodiagnosis and Photodynamic Therapy,* 2004, vol. 1, 27-42 **[0011]**
- **V. VON ARX et al.** *J. Pharm. Pharmacol.*, 1997, vol. 49, 652-656 **[0012]**
- **REMINGTON.** Science and Practice of Pharmacy. 2013 **[0030]**
- **W. MEYER.** *Dermatologist,* 1996, vol. 47, 176-182 **[0053]**
- **MEYER et al.** *Munch Tierarztl Wschr.*, 2001, vol. 114, 92-99 **[0053]**
- **MEYER et al.** *Munch Tierarztl Wschr,* 2001, vol. 114, 100-111 **[0053]**

BIOFRONTERA EXHIBIT 1002
Page 222 of 482

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/942,353	**02/16/2023 05:38:01 PM ET**	**067286-0483**

Title of Invention

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3138	FILED BY	Janet Lee
PATENT CENTER #	61609926	FILING DATE	09/12/2022
CUSTOMER #	22428	FIRST NAMED INVENTOR	Thomas BOYAJIAN
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Kiri Sharon

Documents

TOTAL DOCUMENTS: 12

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
NPL_C10--Mordon_S__A_Commentary_on_the_Role_of_.pdf	12	Non Patent Literature	614 KB
NPL_C11--Nishimura_et_al____Iontophoretic_Photo.pdf	7	Non Patent Literature	473 KB
NPL_C12--Warren_et_al____Pain_Associated_with_A.pdf	18	Non Patent Literature	1401 KB
NPL_C13--Willey_et_al____Temperature_Modulated_.pdf	11	Non Patent Literature	1251 KB

NPL_C14--Ye_et_al___Evaluation_of_Hydrogel_Supp.pdf	13	Non Patent Literature	740 KB
067286-0483_IDS_SB08_C.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	105 KB

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

067286-0483_IDS_Transmittal.pdf	3	Transmittal Letter	113 KB
067286-0483_Resp_NFOA.pdf	10	Amendment/Request for Reconsideration-After Non-Final Rejection	135 KB
FOR_C6--EP_3143986A1.pdf	14	Foreign Reference	909 KB
FOR_C7--JP_2010_513363.pdf	90	Foreign Reference	3914 KB
NPL_C8--Ang_et_al____Photodynamic_Therapy_and_.pdf	37	Non Patent Literature	2035 KB
NPL_C9--Kim_et_al___In_vivo_skin_absorption_dy.pdf	6	Non Patent Literature	344 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
NPL_C10--Mordon_S__A_Commentary_on_the_Role_of_.pdf	7123BEEF7DAF12316A999F01423E871C1EBAAABDCDB4D7BF6BA807488B8A91B0B065837E1146596DD3A3EC5AC984C0EA15B694FC0BC3DDBD3170294B953E07D4

NPL_C11--Nishimura_et_al_____Iontophoretic_Photo.pdf	89A1554522686572B87C7B83B52CF31DDC059C1D11D1D28751BA52AB06F3B0DE1CDCBDA01A10EBC19ACF07A697400C5D61F23DD7CE54C55CCDC06908861F9875
NPL_C12--Warren_et_al_____Pain_Associated_with_A.pdf	28FF04F75FEBDA48213BEF66F63DD863DA6C768BCBA576CB82E58724D245CE2024E3483CF3490239C777CD6D517A6646548D347BAABF60A5B438AD696C6EB6FB
NPL_C13--Willey_et_al_____Temperature_Modulated_.pdf	24428F21E814E177DB6A13F297E8E4DC3715EFF0FF978628B8E598651589CC917153424F63868DE6078E9906C19A87C0168AED10539501A32DC4FFD42AFEF0DB
NPL_C14--Ye_et_al____Evaluation_of_Hydrogel_Supp.pdf	058DF7B8535D16A74C84C71DB4AD885105B2015283820107B91B66D40D08D015D92848595EFCC68638F3E146891538529ECDDC652813462D99DB70266771D7BC
067286-0483_IDS_SB08_C.pdf	8E79A8571EB74D166892112AC06C515331C76D27049F903FC52DEBF4AC7C908D09D665F5C0E9C49F58999D65E69A7CAEE3CE0F9E7A2060A94FB9FE8B421DD839
067286-0483_IDS_Transmittal.pdf	F49EDC8F3CB97E509DBB0E3D217CCD0FC27C6425FBB834CFC6D770665748ED98BD649A279358F8665EC8ACA2A7422C4175D7F330FBF763F38ECCDFB23D237BBE
067286-0483_Resp_NFOA.pdf	8ED2E7D8668E410FB60273AE2927EE2C769CA3E5B39A3A667EF3187B9FB1D0048D9C64F02B5AE835A4A1C03C190CE3E14001A05A9E788DF1AB2FBA1BB04B6236
FOR_C6--EP_3143986A1.pdf	79242C457F4B6619907A766FB0A4B9C14220ED9DEDF29B98D3EF04371926671C0CE06B979A9DB29D1A1AE372EF16FD4CD2FE15639AEEAEEB5032A3F09FA144E6
FOR_C7--JP_2010_513363.pdf	7BCCB6F4424A8E49AA03954F5949BEFA911E8412E238C7E685AC4990B5124D9AB27254AEF1C376DA755A1AE07FAA54B1C2558EE70028C49382BB76DB72902C8A
NPL_C8--Ang_et_al_____Photodynamic_Therapy_and_.pdf	4B35E6C8DD4029269A32B1328A13430E20CD4464926EF8445E26A7EC5D59248DBA0A56624C8D06FC97A17B09CE9BD163DDEA7457A50CBE2B248932FBECE73132

NPL_C9--Kim_et_al____In_vivo_skin_absorption_dy.pdf	6E8F0CF151A148D31D55049D0DFA135D38C3221BC34C45CC34A54C68E268CCA94965D4903293FEA7AC29686C16D7BA4D26936C3E541830B9FC35F6D269D4837C

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/942,353	02/16/2023 05:38:01 PM ET	067286-0483

Title of Invention

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3138	FILED BY	Janet Lee
PATENT CENTER #	61609926	AUTHORIZED BY	Kiri Sharon
CUSTOMER #	22428	FILING DATE	09/12/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Thomas BOYAJIAN

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 7145	E20232FH38545716	Janet Lee

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
190741	37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	$260.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	17/942,353
Date Submitted: February 16, 2023				**Filing Date**	9/12/2022
				First Named Inventor	Thomas BOYAJIAN
				Art Unit	3792
(use as many sheets as necessary)				Examiner Name	Tammie K. MARLEN
Sheet	1	of	1	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	C1	4,667,658-A	05-26-1987	GUIBERT	
	C2	10,786,571-B2	09-29-2020	SOLIOZ ET AL.	
	C3	10,814,114-B2	10-27-2020	BOYAJIAN ET AL.	
	C4	11,235,169-B1	02-01-2022	OSTERLOH ET AL.	
	C5	2019/0216927-A1	07-18-2019	LUNDAHL ET AL.	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	C6	EP-3 143 986-A1	03-22-2017	ZIMMER MEDIZINSYSTEME GMBH		
	C7	JP-2010-513363-	04-30-2010	BIOFRONTERA BIOSCIENCE		T

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	C8	Ang et al., "Photodynamic Therapy and Pain: A Systematic Review," Photodiagnosis and Photodynamic Therapy 19 (Jul. 2017) 308–344	
	C9	Kim et al. "In vivo skin absorption dynamics of topically applied pharmaceuticals monitored by fiberoptic diffuse reflectance spectroscopy," Spectrochimica Acta Part A 66, Mar 2007, 768-772	
	C10	Mordon S, A Commentary on the Role of Skin Temperature on the Effectiveness of ALA-PDT in Dermatology, Photodiagnosis and Photodynamic Therapy (Accepted Aug 2014)	
	C11	Nishimura et al., "Iontophoretic Photosensitization of the Skin Re-evaluated by Colorimetric Imaging in Senile Patients," Bioimages 19, Jan. 2011, 1-6	
	C12	Warren et al., "Pain Associated with Aminolevulinic Acid-Photodynamic Therapy of Skin Disease," J Am Acad Dermatol., Dec. 2009 61(6): 1033–1043	
	C13	Willey et al., "Temperature-Modulated Photodynamic Therapy for the Treatment of Actinic Keratosis on the Extremities: A Pilot Study" Dermatol Surg; 40:1094-1102, Oct 2014	
	C14	Ye et al. "Evaluation of Hydrogel Suppositories for Delivery of 5-Aminolevulinic Acid and Hematoporphyrin Monomethyl Ether to Rectal Tumors," Molecules, Oct. 2016, 21, 1347, 1-12	

Examiner Signature		Date Considered	

TotalPatent One®

Report created:

2023-02-08 01:56:48 PM

Number of publications:

1

Exported fields:

Publication Number, Application/Filing Date, Application Number, Priority Date, Authority, Priority Number(s), Publication Date, Title, Abstract, Claims, First Claim, Independent Claims, Claims Count, Description, Ultimate Owner, Original Assignee, Standardized Assignee, Normalized Assignee, Current Assignee, Current Standardized Assignee, All Assignees, Inventor, Attorney/Registered Agent, Examiner, Status, Legal Status(INPADOC), Legal Status(Post Issuance), Legal Status(Standardized), Litigation/Opposition, Litigation/Opposition Indicator, Domestic, Main, Complete, Extended, Family ID, US Related Applications, PCT Application, PCT Publication, Backward Patent Citations, Backward Citations Count, Forward Patent Citations, Forward Citations Count, Designated States, IPC, IPC Main, CPC, CPC Main, US Class, US Main Class, USPC, F TERMS, FI, FI Main, ECLA, ECLA Main, ICO, Locarno, Orange Book Information, SPC Information, Pharmaceutical Indicator, Document Link, PDF Link, Annotation

Search Strategy

Search query:

PN:(JP2010513363)

Authorities:

All

Search language(s):

English

Sorted by:

Publication number (ASC)

List of contents:

JP2010513363A 2010-04-30 Nano-emulsion

JP2010513363A

Application/Filing Date:

2007-12-21

Application Number:

JP2009541922

Priority Date:

2006-12-22

Authority:

JP

Priority Number(s):

EP06026698

Publication Date:

2010-04-30

Title:

Nano-emulsion

Abstract:

The present invention relates to a nanoemulsion comprising at least one aqueous component and a carrier, wherein the carrier comprises at least one lipophilic component, at least one surfactant and at least one alcohol. The present invention further relates to a composition comprising said nanoemulsion and an active agent. In particular, the composition is present as a gel and the active agent is 5-aminolevulinic acid, a derivative, precursor and/or metabolite thereof. The invention further relates to the preparation of said nanoemulsion and/or composition and to their use for the treatment of dermatological diseases, virus-associated diseases as well as diseases associated with cell proliferation, in particular, tumor diseases and/or psoriasis. The present invention is further directed to the use of said nanoemulsion in cosmetics.

Claims:

Claim 1: A) at least one aqueous component 1 and, b) i) and at least one liphophilic component 1, ii) 1 and at least one surfactant, iii) at least one alcohol and 1 and includes a carrier containing, at least one alcohol is 1, 3 having at least two carbon atoms, nano-emulsion.

Claim 2: The carrier is present in the aqueous component, described in the claim 1 of emulsion.

Claim 3: For the total mass of the nano-emulsion, 0 the lipophilic component. 1% by mass is present in an amount of 15% by mass-, the surface active agent is present in an amount of 1% by mass to 30% by mass, the alcohol is 0. 1% by mass to 10% by mass present in an amount of, described in claim 1 or 2 of emulsion.

Claim 4: The aqueous component is, for the total mass of the nano-emulsion, present in an amount of 50% by mass -98% by mass, any one of the claims from 1 to 3 described in Claim 1 of emulsion.

Claim 5: 1, the at least one alcohol, isopropyl alcohol and/or 1-propyl alcohol, either one of claim from 1 to 4 described in Claim 1 of emulsion.

Claim 6: The at least one liphophilic component 1, triglyceride and/or a mixture thereof, either one of claim from 1 to 5 described in Claim 1 of emulsion.

Claim 7: The at least one surfactant is 1, and Lecithinized/ethylene type surfactant or polyoxymethylene, either one of claim from 1 to 6 described in Claim 1 of emulsion.

Claim 8: Wherein the Lecithinized soybeans Lecithinized, polyoxyethylene type of the surface active agent is polysolvate 80 which, as described in claim 7 the emulsion.

Claim 9: The soybean Lecithinized is, for at least 80% by mass having contg. amt. cholinergic phosphatidyglycerol, described in the claim 8 of emulsion.

Claim 10: The average diameter of particles emulsifiability, 5 nm-500nm, preferably less than

100 nm, any one of the claims from 1 to 9 described in Claim 1 of emulsion.

Claim 11: The average diameter of particles in the emulsion, is in the range of 10-50nm, either one of claim from 1 to 10 described in Claim 1 of emulsion.

Claim 12: Any one of the claims from 1 to 11 described in claim 1 wherein the production of nano-emulsion, a) a step of providing a water component and, b) at least one of a lipophilic component and 1, 1 and at least one surfactant, and at least one alcohol 1 including a carrier, at least one of the at least two alcohol is 1 to 3 carbon atoms, and having a step of providing a carrier, c) the step a) the step of aqueous component b) and a step of mixing and carrier, the method including.

Claim 13: Any one of the claims from 1 to 11, described in the claim 1 comprising nanoparticles, medical and/or cosmetic composition.

Claim 14: Claim 13 defined in any claim 1 and nano-emulsion, and including an active agent.

Claim 15: The active agent, 5-aminolevulinic acid, its derivative, precursor, and/or selected from the group consisting of dysbolism, described in claim 14.

Claim 16: 5-aminolevulinic acid, its derivative, precursor, and/or dysbolism product, the particles of the nano-emulsion is deposited on the outside of a single layer, described in claim 15.

Claim 17: 1 described in either one of claim from 14 to 16 containing a composition of, pharmaceutical, cosmetic, and/or composition for diagnosis.

Claim 18: As there is, for the total mass of the composition, the active agent 0. 50% by mass and -01% by mass, and the nano-emulsion 1% by mass -60% by mass, the at least one filler 0

1. 4% by mass and -01% by mass, the at least one and 1 includes reuteri 1% by mass -3% by mass, at least one of the remaining solvent in which 1, 1 described in any one of the claims from 14 to 17.

Claim 19: 18 from any one of the claim 14 defined in claim 1 in which the production of composition, a) a step of providing a water component and, b) at least one of a lipophilic component and 1, 1 and at least one surfactant, and at least one alcohol 1 including a carrier, at least one of the at least two alcohol is 1 to 3 carbon atoms, and having a step of providing a carrier, c) in order to form a nanostructure, the step a) the step of aqueous component b) and a step of mixing and carrier, d) the step c) before the formation of emulsion of nano and/or after the formation, the active agent is added to the step and, e) depending on the case, step d) further additives and/or additive and a shaping step, the method including.

Claim 20: The step d) is active, the step c) is added after the formation of emulsion of, in the method described in claim 19.

Claim 21: As an anti-aging agent, any one of the claims from 1 to 11 described in Claim 1 of emulsion, or any one of the claims from 13 to 18 described in Claim 1 of the use of the composition.

Claim 22: For the treatment of diseases related virus for preparation of medicine, any one of the claims from 1 to 11 described in Claim 1 of emulsion, and/or any of the claims from 13 to 18 described in claim 1.

Claim 23: The virus-related diseases caused by human papilloma virus (HPV), described in claim 22.

Claim 24: In the virus condyloma acuminatum related diseases, described in claim 23.

Claim 25: For the manufacture of a medicament for treating dermatopathy of, any one of the claim from 1 to 11 described in Claim 1 of emulsion, and/or any of the claims from 13 to 18 described in claim 1.

Claim 26: The fault is selected from the group consisting of neurocyte dermatitis, described in claim 25.

Claim 27: The skin diseases, acnegenic and/or angle calcinosis related disease, described in claim 26.

Claim 28: The angle by which the light angle calcinosis calcinosis, described in claim 27.

Claim 29: For the treatment of diseases related cytostatic for producing medicament, any one of the claims from 1 to 11 described in Claim 1 of emulsion, and/or any of the claims from 13 to 18 described in claim 1.

Claim 30: In the related diseases oncocyte cytostatic dermatopathy, described in claim 29.

Claim 31: The tumor disease, basal cell adenoma, flat canceration epitheliocyte, periodontosis bowen, vulva oncocyte ectocornea in (VIN), and/or embryoblast resistance and/or is selected from the group consisting of canceration hypodermically dermatopathy, described in claim 30.

Claim 32: As the disease psoriasis, described in claim 25 or 29.

Claim 33: For the manufacture of chemicals in photodynamic therapy, described in any one of claim 1 to claim from 15 to 18 use of composition.

Claim 34: An effective amount of the composition are administered to a patient, treatment in

the structure to provide a sufficient amount of the active agent is left for the appropriate time, the tissue to receive the beam of radiation, the use of the described in claim 33.

Claim 35: For detection of the cell, mentioned in any one of claim 1 to claim from 15 to 18 use of composition.

Claim 36: Skin and/or for the diagnosis of a tumor disease, described in any one of claim 1 to claim from 15 to 18 use of composition.

Claim 37: 1 described in any one of the claims from 15 to 18 and of the composition, a) and coated with a photoresist, b) the coating is applied to the attachment means and, c) a means for applying the composition and an application area, and at least one component selected from 1, the kit including.

Claim 38: Related disease virus, skin diseases, and/or related diseases cytostatic method, any one of the claims from 1 to 11 described in claim 1 and an effective amount of a pharmaceutical nano emulsion and/or from any one of the claim 13 defined in claim 18 compsn. 1, and these require a method including a step for administering the test body.

Claim 39: 5-aminolevulinic acid, its derivative, precursor, and/or dysbolism polypore active agent selected from a group consisting of the product and, if the composition including nano and emulsion, the emulsion composition containing alcohol of the nanoparticles.

Claim 40: At least one aqueous component 1, preferably water, at least one of a lipophilic component 1, and/or at least one surfactant 1 further includes, as described in the claim 39.

Claim 41: The alcohol is C2-C8 alcohol, especially C3-C8 alcohol, claim 39 or 40 described in any of 1.

Claim 42: The alcohol, isopropyl alcohol and/or 1-propyl alcohol, described in claim 41.

Claim 43: 5-aminolevulinic acid, its derivative, precursor and/or dysbolism product, a single layer of the nanoparticles deposited on the outside of the emulsion, described in either one of claim from 38 to 42 of claim 1.

Claim 44: At least one of the components has liphophilic migriol 1, at least one surfactant is Lecithinized 1, preferably soybean Lecithinized, and/or polyoxyethylene type surfactant, which preferably polysolvate 80, described in any one of claim 1 to claim from 38 to 42 of the composition.

Claim 45: 1 described in either one of claim from 38 to 44 containing a composition of, medical and/or diagnostic composition.

Claim 46: For the treatment of diseases related virus for preparation of medicine, described in either one of claim from 38 to 44 and use of the composition of 1.

Claim 47: The virus-related diseases caused by human papilloma virus (HPV), described in claim 46.

Claim 48: In the virus dermatopathy condyloma acuminatum is associated, as described in claim 47 used.

Claim 49: For the preparation of a medicament for treating dermatopathy of, described in either one of claim from 39 to 44 and use of the composition of 1.

Claim 50: The skin diseases, acnegenic and/or angle calcinosis diseases related to that, described in claim 49.

Claim 51: The angle by which the light angle calcinosis calcinosis, described in claim 44.

Claim 52: For the treatment of diseases related to production cytostatic for drug, described in either one of claim from 39 to 44 and use of the composition of 1.

Claim 53: In the related diseases oncocyte cytostatic dermatopathy, described in claim 52.

Claim 54: The tumor disease, basal cell adenoma, flat canceration epitheliocyte, periodontosis bowen, vulva oncocyte ectocornea in (VIN), and/or embryoblast resistance and/or is selected from the group consisting of canceration hypodermically dermatopathy, described in claim 53.

Claim 55: As the disease psoriasis, described in claim 49 or 52.

Claim 56: For the manufacture of chemicals in photodynamic therapy, described in any one of claim 1 to claim from 39 to 44 use of composition.

Claim 57: The composition is, effective amount is administered to a patient, the tissue treatment the active agent in an amount sufficient to provide the proper time, the tissue to receive the beam of radiation, the use of the described in claim 56.

Claim 58: For the detection of the cell, mentioned in any one of claim 1 to claim from 39 to 44 use of composition.

Claim 59: Skin and/or for the diagnosis of a tumor disease, described in any one of claim 1 to claim from 39 to 44 use of composition.

Claim 60: Nano-emulsion and active agent in the composition including and, the nano-particles of the active agent is deposited on the outside of the emulsion composition

containing a single layer.

Claim 61: The nano-emulsion and/or the active agent, either one of claim from 1 claim 39 and 44 are defined in the same manner, described in claim 60.

Claim 62: The composition of claim 60 or 61 contg. described, medical and/or cosmetic composition.

Claim 63: The virus-related diseases, skin diseases, drug therapy for the treatment of diseases related cytostatic, and/or in the manufacture of a medicament for photodynamic therapy, use of composition described in claim 60 or 61.

First Claim:

Claim 1: A) at least one aqueous component 1 and, b) i) and at least one liphophilic component 1, ii) 1 and at least one surfactant, iii) at least one alcohol and 1 and includes a carrier containing, at least one alcohol is 1, 3 having at least two carbon atoms, nano-emulsion.

Independent Claims:

Claims Count:

63

Description:

[0001] The present invention, at least one of the carrier 1 and water emulsion and includes, at least one of the carrier and a lipophilic component 1, 1 and at least one surfactant, and at least one alcohol emulsion includes 1. The present invention, further, the nanoparticles and active agent composition containing and emulsion. Specifically, the composition is present as a gel, the 5-aminolevulinic acid (ALA), its derivative, precursor, and/or dysbolism product. The present invention, further, the nanoparticles emulsion and/or composition, and skin diseases, virus-related diseases, and related dermatopathy cytostatic, specifically tumor disease and/or relating to their use for the treatment of psoriasis. The present invention,

further, the nanoparticles used in cosmetics and also of the emulsion.

[0002] The nano-emulsion, nanocolloid systems. The colloidal, premicell, lipsome, [...] , nano-suspension, micro-emulsion, and the polymer solution is contained. The nano-emulsion, its physical and chemical characteristics based on, belonging to a group of a microemulsion. The microemulsion, surface active agent and co-surfactant glycolipid core surrounded by a single layer of the aqueous dispersion of uniform micro-size particles. The nano-emulsion, less than 200 nm, and the average grain size (average diameter) of less than 100 nm shapeoften, feature and a narrow particle size distribution and a single dispersion. Furthermore, nano-emulsion is transparent, slightly milky white light. Generally these, the presence of a surface active agent, water in the oil phase produced by mechanically and fragments. A small ball of very small size, in many cases, a high pressure homogenizer or sonicator 1 obtained by passing at least twice. The nanoparticles described herein for the manufacture of an emulsion, and does not require such high shear device. A small ball of the small size and its high homogeneity, and beauty of the conventional emulsion to distinguish these advantageous characteristics. These are transparent, indicating a new texture. Furthermore, the active agent which can be transported more efficiently, therefore in the fields of medical and pharmaceutical and becomes increasingly important.

[0003] The microemulsion and liq. Nanodiffusivity called, is known in the technical field, a) film forming molecules, e.g. soybean Lecithinized, b) coemulsifier, c) a lipophilic component, for example, capryl lactam and/or [...] (migriol 812 or Myritol 318), and in some cases, d) alcohol, specifically including ethanol (EP 0 956 853). These Nanodiffusivity soln., pharmaceutically active agent, as a transport medium, which is used in a pharmaceutical preparation.

[0004] However, nano and ethanol is used in the emulsion, some disadvantages.

[0005] 1 at first, the use of ethanol as a co-surfactant, alcohols having a carbon chain is longer than the use of nano-particles larger t The larger particles, nano and skin to reduce the contact surface between the emulsion, causing a decrease in penetration. 2 at first, ethanol, relatively low 1. 10cp viscosity, this is not the optimum stability of a microemulsion. Furthermore, hydrophobic by relatively low ethanol, through the skin of the penetration of the nano-emulsion liphophilic bioactivation is impaired. As a result, the stability of the

emulsion nanoparticles, and its biological, in other words into tissue penetration is reduced. Furthermore, ethanol, and isopropyl alcohol such as compared with other kinds of alcohol, expensive alcohol. Furthermore, the ethanol, in a plurality of countries, under predetermined conditions, and a special alcohol tax.

[0006] Therefore, the present invention of, overcomes the disadvantages referred to in the prior art, further specifically, exhibits optimum physical characteristics and stability can be improved by infiltration into the cell and tissue, to provide an inexpensive nano emulsion is simultaneously advanced technologies of nano-emulsion.

[0007] In this way, a) and at least one of the aqueous component 1, b) i) at least one liphophilic component 1, ii) at least one surfactant 1, and iii) at least one alcohol-containing carrier 1, 1 3, at least one alcohol having at least two carbon atoms and carrier, by providing an emulsion containing nanoparticles, achieved by the present invention.

[0008] The invention, in the present invention by emulsion, optimally low average particle diameter and have a narrow particle size distribution. The reduction of particle size, and increase the stability of the emulsion nanoparticles, cells and contributing to the improvement of penetration into the tissue.

[0009] The component carrier i), i.e., the amount the lipophilic component, for the total mass of the nano-emulsion, preferably 0. 1% by mass to 15% by mass, more preferably 1% by mass -8% by mass, further preferably present in an amount of 3% by mass -4% by mass. The component carrier, ii), that is, the amount of the surface active agent, for the total mass of the nano-emulsion, preferably 1% by mass to 30% by mass, more preferably 2% by mass to 15% by mass, further preferably present in an amount of 4% by mass -6% by mass. The component carrier iii), i.e. the alcohol, for the total mass of the nano-emulsion, preferably 0. 1% by mass to 10% by mass, more preferably 0. 5% by mass to 5% by mass, further preferably present in an amount of 1% by mass -2% by mass.

[0010] The aqueous component, for the total mass of the nano-emulsion, preferably 98% by mass to 50% by mass, more preferably 70% by mass -95% by mass, and most preferably in an amount of 92% by mass nano -88% by mass present in the emulsion. Advantageously, the specific configuration of the nano-emulsion, and very acceptable to the skin, the skin is not

caused at the time of application of a sticky feeling of nano-emulsion, it is especially, surface active agent and a relatively low ratio of the lipophilic component.

[0011] In the preferred embodiment of the present invention, the nano-emulsion, as the surfactant, film containing a surface active agent and O/W emulsion formation formed to co-surfactant. Film forming surface active agent: co-surfactant O/W emulsion formed of the mass ratio of the, 0. 1:1-10:1, preferably 0. 2:1-0. 8:1, more preferably 0. 4:1-0. In the range of 6:1.

[0012] In the present invention the application range of at least 3 carbon atoms in the alcohol having a suitable, 3-10 pieces, preferably 3-7 pieces, more preferably 3-5 pieces, also most preferably alcohols having 3 carbon atoms. One particularly suitable alcohol is a carbon atom having 5 a, 1-pentanol and/or 4-methyl-2-pentanol. One suitable alcohol is a carbon atom having 4, 1-butyl alcohol, tert-butyl alcohol (2-methyl-2-propanol), and/or sec-butyl alcohol (2-butanol). The most suitable one, alcohols having a carbon atom 3 pieces, in other words 1-propyl alcohol and isopropyl alcohol, isopropyl alcohol is preferable. The present invention of nano-emulsion, C_3-alcohol, specifically by isopropyl alcohol is used, the present invention, the emulsion is, alcohol, ethanol is used as compared with the latest technology and nano-emulsion, reduced particle size and a narrow particle size distribution, and the improvement of the stability and to promote penetration into the structure shown. The ethanol and isopropanol and, its physilogically and chemical characteristics are very similar to each other, this is unexpected.

[0013] The present invention of isopropanol alcohol such as when using nano-emulsion, and compared with the use of ethanol, nanoemulsified particle size is small. As a result obtained by the increase of the contact surface of the skin of the emulsion, permeation characteristics are improved. Further reduction of particle size, finally leading to the phase separation of the particle diameter of the agglomerated particles in accordance with the speed increasing as it is known, the improvement of the stability of the emulsion nano decisive significance. The advantageous effect of isopropanol, due to the possibility of hydrophobic slightly higher, than it is to penetrate through the film liphophilic bioactivation brings an excellent capability. Furthermore, the isopropanol, ethanol (viscosity/cp, 25 °C, 1. 10) and compared with higher viscosity (25 °C cp2. 32). The higher viscosity of the isopropanol, viscosity for lowering the degree of movement of the molecules, nano-emulsion stabilizing mechanism useful in a more excellent. A further advantage of ethanol and isopropanol, in comparison, available at a

relatively low cost price of about 1/3 of ethanol, there is an additional alcohol tax acquitting.

[0014] Preferably, the carrier of the present invention, at least one of a nano-emulsion liphophilic component 1, glycolipid, vegetable oil, and/or animal oil. In the present invention by appropriate lipidic, glycolipid physilogically permissible, for example ofceramide, mono-, di-, and tri-acylcarboxylic glycerol (oxadiazol), especially capryl lactam and/or [...] , and/or a mixture thereof, particularly preferably migriol (for example available from Henkel, migriol 812 or Myritol 318, etc.). The animal oil, vegetable oil and a suitable, for example, sunflower oil, soybean oil, peanut oil, rapeseed oil, fish oil, and/or spermaceti.

[0015] A suitable film forming surface active agent, phosphatide, glycolipid phospholipases, ofceramide, and/or a mixture thereof. Preferably, the eggs or Lecithinized phosphatide cephalin soybean derived or, more preferably, the soybean Lecithinized Lecithinized.

[0016] Preferably, the Lecithinized, containing at least 80% by mass amt. cholinergic phosphatidyglycerol, more preferably at least 90% by mass, and most preferably at least 94% by mass. The inventors, Lecithinized quality, i.e. its phosphatidyglycerol contg. amt. cholinergic, nano-particle size of a serious influence on the emulsion. The higher content of Lecithinized cholinergic phosphatidyglycerol, nano-emulsion particle diameter is reduced.

[0017] O/W emulsion formed as the co-surfactant, an anionic, nonionic, cationic, and/or amphoteric surfactant is, in addition to the block copolymer. Suitable anionic surfactant, soap, alkylbenzene sulfonate, alkanesulfonate, alkyl sulfate, and/or ether sulfate salt. Suitable cationic surface active agent, a quaternary ammonium compound 4, two sets of 1 or 2 and preferably has a hydrophobic group (for example, odor and cetyltrimetylammonium cetyltrimetylammonium chloride), and/or tertiary amine salts of long chain 1. The appropriate amphoteric surfactant, N-(acylcarboxylic amidealkyl) propylbetain, N-alkyl-β-amiono propionnate, and/or an amine-N-oxide. The appropriate block copolymers, propylene oxide, for example. In the present invention the application range, a nonionic surface active agent, is particularly suitable as a co-surfactant O/W emulsion formation. Suitable nonionic surfactant, aliphatic alcohol polyglycol ether, alkyl phenol poly- glycol ether , alkylpolyglucoside, glucamide fatty acid, fatty acid polyglycol ether, ethylene oxide/propylene oxide block polymers, polyglycerolated fatty acid esters, fatty acid alkanol amide, sorbitan fatty acid ester and (ethoxylated) is selected from the group consisting of

(sorbitan). Suitable ethoxylated sorbitan fatty acid ester is particularly, polyoxyethylene sorbitan monooleate, most preferably polysolvate 80.

[0018] The present invention of an aqueous component of the emulsion, preferably a small amount of salt containing a weak shock system, more preferably phosphate buffer solution of 5 mm -30 mm, 10 mm and most preferably of phosphate buffer solution. The pH value of the phosphate buffer solution, preferably pH4-pH8, more preferably pH5-pH7, also most preferably pH5. 5-pH6. 5. For manufacturing a phosphate buffer solution of water, preferably deionized water sterilization and/or water injection, more preferably a water injector.

[0019] Nano-emulsion in the average diameter of the particles ([...]) emulsifiability, 5 nm-500nm, preferably 10 nm -200 nm, more preferably less than 100 nm, in particular up to 90 nm, preferably from 70 nm, more preferably 10 nm -50 nm, and most preferably 15 nm -35 nm. The size distribution of the nanoparticles, pref. monodispersing and, following a Gaussian distribution. The present invention of a diameter of emulsified particles, particle size distribution is determined, the same dynamic light scattering (DLS) (photon correlation spectroscopy (PCS) and called) is measured by the method. The statistical analysis of particle distribution, according to the present invention, the method is called a load distribution and number of particles.

[0020] The present invention further autorun, present invention by a method for the manufacture of an emulsion, a) a step of providing a water component and, b) at least one of a lipophilic component and 1, 1 and at least one surfactant, and at least one alcohol 1 including a carrier, at least one of the at least one alcohol is 1 to 3 carbon atoms, and having a step of providing a carrier, c) step a) the step of component b) and the carrier and the method includes a step of mixing. By producing a nano-emulsion, the component of the carrier in the aqueous component, the mixture thereof, or a mild homogenized emulsion by violent nanoparticles. The homogenizing, for example premarketing homogenizer can be implemented. After production of the nano-emulsion, and can be added to the additive agent is not proper shaping exists during further homogenized.

[0021] The method for the manufacture of an emulsion of nanoparticles, preferably under sterile conditions, for example, by using a flow hood.

[0022] The invention, in addition to the composition, even if some of the steps of the manufacturing method, nano-size particles in the emulsion and finally emulsifiability of decisive important for particle size distribution. Especially, when the condition of step c and the temperature of the homogeneous, plays an important role. The step c, 50-60 ° C of temperature. All of the raw material, previously heated to this temperature. Furthermore, the container and the mixer, very quickly (within several seconds) in order to obtain a homogeneous mixture of the component by optimizing, which avoids the formation of bubbles. The explanation of this procedure, in reference to the embodiment 1. Alternatively, the homogenization, and does not require a high pressure homogenizer or high shear device, such as a sonicator.

[0023] Another embodiment of the present invention, including medical and/or cosmetic composition of the present invention in which the emulsion. The present invention of nano-emulsion, which can be used in a variety of product type, and to provide an elegant semi-transparent for the transparent medium, in the field of cosmetics, anti-aging agent is suitable as an example. The emulsion is, to provide a very elaborate system of which a balance, and it is considered that the emulsifier irritativeness at a relatively low level. The present invention of nano-emulsion, preferably transparent or translucent and is held, an appropriate amount of an additive, for example, a perfume or moisturizing agent which is capable of receiving, by a low level of emulsifiers, stable on the skin of a user, irritating, and mild condition is maintained. In the case of use of the decorative article in the final product, a non-active agent or a non-therapeutic agent, a softening agent, for example, flavor, coloring agents, perfume, gelling agent, a thickening agent, such as sunscreening can be added, particularly those of the products of the final cosmetic purpose when used for improving the local, however, restrict the degree of product tetraphosphoric ~~~ components are selected so as to avoid the attention. The final product, especially, dampish, cream, lotion, gel, sedum ram, or can take the form of a liquid spray. In the case of sunscreening, of the present invention, two or more sunscreening agent 1, e.g. polyhydroxybenzophenone, [...] , cinnamic acid ester, such as a salicylic ester can be incorporated.

[0024] The nano-emulsion, a pharmaceutical composition can also be used, particularly, these can be used for the manufacture of a medicament dermatopathy locally, for example neurocyte dermatitis, psoriasis, Keratinizing hyperlipidemia, especially the light angle calcinosis, and related dermatopathy cytostatic, for example tumor disease treatment.

Preferably, the tumor disease, canceration cell, flat canceration epitheliocyte, periodontosis bowen, vulva oncocyte ectocornea in (VIN), or or embryoblast property is selected from the group consisting of canceration hypodermically dermatopathy. Furthermore, the nano-emulsion, such as human papilloma virus condyloma acuminatum of neuropeptides due to suitable related virus. By taking a lipophilic component of nano-emulsion, affecting endermatic water loss can be advantageous. In other words, the skin barrier function is improved, thereby advantageously neurocyte dermatopathy acting on such skin.

[0025] Another embodiment of the present invention, the active agent of the present invention and including a nano and emulsion. At this point, the composition, medical and/or cosmetic composition as, for example, particularly useful for application to the skin or hair. The present invention is included in the composition of the emulsion, various active agent to provide a very efficient delivery systems. An example of active agent, which can be a useful, stains, Keratinizing hyperlipidemia, and material for the extermination of wrinkles, analgesic drugs, anesthetic, antiacne agents, antibacterial agents, Antiyeast agent, antimycotic agent, antiviral agents, anti-slacking agent, anti-dermatitic agent, antipruritic medicine, antiemetic, anti-rocking periodontosis agents, anti-inflammatory agents, anti-high cornification dissolving agents, anti-dry skin, anhidrotic agent, psoriasis remedy, antiseborrheic drug, hair conditioner and hair treatment agent, anti-aging agent, anti-wrinkle agents, anti-antiasthmatic agents and bronchodilator, sunscreening agent, antihistamic, whitening agent, decolorant, vitamins, Deoxycorticosteroid, antiandrogenic, immunosuppression and retinol retinoids such, local cardiovascula agent, clotrimazole, ketoconazole, miconazole, griseofulvin, hydroxyzine, diphenhydramines, [...] , lidocaine, procainamide, [...] , dihydrobenzo monopulse pattern, homoerythromycin, dioxytetracycline, clindamycin, corinebacterium, [...] , hydroquinone, minocycline, naproxen, Eveprophene, theophylline, dephosphorizing chromophore, Arbutenol, local hydroxysteroid compounds, for example, hydrocortisone, hydrocortisone 21-acetate, hydrocortisone 17-ate cyanovaleramide, hydrocortisone 17-butyrate and, valeric acid dipropionate, [...] acid dipropionate, triamcinolone acetonide, [...] , prop accessory clobetasol acid, benzoyl peroxide, crotamiton, propranolol, promethazine, palmitate Vitamin A, vitamin E acetate, and mixtures thereof.

[0026] In the preferred embodiment of the present invention, the active agent, selected from the group consisting of 5-aminolevulinic acid, its derivative, precursor, and/or dysbolism from product. The "derivative", 1 or 2) an alkyl group, preferably methyl group, 1) 5-

aminolevulinic acid ester of the amino groups as is understood. The most favorable deriv., methylaminobutyrate Aminolebulinic acid. The derivative, salt and complex compound, and as can be understood even perfluoroalkylated compd.. "Precursor" and the "dysbolism product", as understood in the converted protoporphyrins IX. 5-aminolevulinic acid or its derivatives of the active agent, especially preferred.

[0027] 5-aminolevulinic acid, as used in drag provitamin photodynamic therapy. The photodynamic therapy, and various related to prior malignat cytostatic for the treatment of diseases malignat promisingness method (Taylor EL and Brown SB, 2002, Journal of Dermatological Treatment, 13, Suppl. 1, S3-11, and Peng Q. Et al. , 1997, Cancer, 79, S2282-2308). The theory of the photodynamic therapy, called morbit hyposensitization agent introduced into the tissue, then by emitting a beam of appropriate wavelength, the medicine Lymphotoxin converted into chemical activity, thereby causing cytoclastic based on it. The selection of this method, or a fast breeder lesioned cells in the cell, and compared to normal tissues, hyposensitization concn. is high. Furthermore, the light-sensitive material to cause fluorescence radiation characteristic, this is for the purpose of diagnosis, for example, can be used to detect the cell.

[0028] 5-aminolevulinic acid, in cell and synthesized from acylglycine CoA and succinyllysine endogeneous substance. Within the range of raw synthetic hemoferrum, having high photoactivator protoporphyrins IX is formed from 5-aminolevulinic acid (5-ALA), hemoferrum thereafter. This restraining mechanism, 5-aminolevulinic acid produced by the synthesis from outside by administration is avoided, thereby causing an increase in the generation of protoporphyrins IX. IX protoporphyrins by decomposition of the natural restraining mechanism for inhibiting further, this compound is integrated inside the cell. And the light beam is irradiated, the protoporphyrins IX, photochemical reaction occurs, as a result, the light-sensitive substance acting as photodynamic therapy.

[0029] 5-aminolevulinic acid in the whole of the application, which is related to a plurality of effects, by local application of the chemicals can be avoided. 5-aminolevulinic acid can be applied locally using the plurality of research, known from the prior art. These research has, 5-amino acid is used in the form of an oil-in-water emulsion drebrin that have common features, other parameters, for example the permeation time, processing time, the type of light to be used, and such a difference with respect to the use of a ray dosemeter.

[0030] B. Thiele et al. (H+G, Vol. 69, No. 3, pp 161-164 (1994)) is, in the form of an oil-in-water emulsion to 20% of the penetration time δ-aminolevulinic acid 5-6 using time, then argon ion-pump is irradiated by the laser (emission peak 630 nm), cumulative total dosemeter 50-100J/cm ^{2} contg. ~~~ research is described.

[0031] Wolf et al. (Journal of the American Academy of Dermatology, Vol. 28, pp. 17-21, 1993) is, in the form of an oil-in-water emulsion 5-20% of the penetration time deltaaminolevulinic acid, 4, 6, or 8 used in time, the filter is not irradiated with light or red light, 30J/cm ^{2} - 100J/cm ^{2} contg. research and apply a light amount is described.

[0032] In the conventional technique disclosed in the research, 5-aminolevulinic acid promisingness photodynamic therapy using a possibility of clearly shows, a known oil-in-water emulsions, having a plurality of disadvantages.

[0033] For example, m. Novo Rodriguez et al. (SPIE, Vol. 2371, pp. 204-209) is, in the application of the required high concn. biocomponents, Aminolebulinic acid, pH of the aqueous solution of the basic neutral is unstable in area. 25 during the time of research, satisfactory results, obtained only at a concentration of 3% and pH5, 5-aminolevulinic acid aqueous solution of these optimum conditions as stated. However in the clinical use, in general, and will require a higher concentration range of composition. Furthermore, in order to be used in commercial, 5-ALA soln., for a period of several weeks or months of scale must be stable.

[0034] V. Von Arx et al. (J. Pharm. Pharmacol. 49 : 652-656, 1997) the, 5-aminolevulinic acid gel at various local application of study is described. In this publication, the, 5-aminolevulinic acid for maintaining stability of the max. prescription, pH [at 6, and a combination of Noveon AA-1 (polyacrylic acid) is described.

[0035] Huerlimann et al. (Dermatology, Vol. 197, No. 3, 1998, pp. 248-254) the, 5-Aminolebulinic nano- colloid lotion containing an acid, and its use in photodynamic therapy, further disclosed without specifying the emulsion.

[0036] The disclosure of the international patent application Number 00/28971 first, nano-emulsion composition containing acid and 5-Aminolebulinic is described. In this case, the

nano-emulsion, egg Lecithinized (83% phosphatidyglycerol anticholinergic), (oxadiazol) migriol 812, and phosphate buffer solution of 20 mm contg. polysolvate 80 is made (international patent application Number 00/28971 disclosed in reference to the first embodiment of the 1), alcohol is not used as a solvent. However, as the emulsifier egg Lecithinized nanocolloid formulation containing, as an emulsifier contg. soybean Lecithinized remarkably more than 5-Aminolebulinic acid emulsion has the advantage that strongly colored. This color change in the formulation, active agent 5-aminolevulinic acid and correlation of formation of a decomposition product. In this way, the emulsion formulations containing Lecithinized egg, emulsifier and soybean Lecithinized formulation as compared with contg., 5-aminolevulinic acid stabilization of a significant reduction to be determined.

[0037] 5-aminolevulinic acid and other known oil-in-water emulsion by combining the advantages of, the damage of the light-sensitive substance is not optimum penetration depth into the tissue. As a result, the light sensitive material used for activating the light beam of the permeation depth, the depth of the layer would be operative even though possible, only in its upper periodonal tissue reaction photodynamic therapy.

[0038] Therefore, the present invention further, the latest technology to at least partially overcome the disadvantages of known, 5-aminolevulinic acid-containing composition.

[0039] By the present invention, the, present invention and nano-emulsion, as 5-aminolevulinic acid, its derivative, precursor, and/or dysbolism contg. compsn. and product. In these compositions, the stability of the emulsion present invention nanoparticles, in structure, low cost and for utilizing the above-mentioned advantageous characteristics, 5-aminolevulinic acid can be transported to the target site of tissue.

[0040] Aminolebulinic acid and between the emulsion of nano-particles, is found in the specific interaction. More specifically, 5-aminolevulinic acid, its derivative, precursor, and/or the product dysbolism, nano-emulsion of a single layer of nano-particles adhering to the o Therefore, the Aminolebulinic acid, which is transported by the particles, the particles are not contained in the core. On the contrary, the Aminolebulinic acid, and a single layer of deltaaminolevulinic acid by interaction between the outside, located on the outside of the core of the particles. In the conventional emulsion, and in contrast to the above, the particles of the nano-emulsion glycolipid chemicals contained in the core.

[0041] Surprisingly, the stability of the 5-aminolevulinic acid, 5-aminolevulinic acid having at least 3 carbon atoms containing at least one alcohol present invention 1 also in the case of emulsion formulation, it has been found to greatly improve. The reason for this is not known, the micro environment created by [...] , particularly to stability of 5-aminolevulinic acid and has a beneficial effect.

[0042] Also, surprisingly, the cell and tissue penetration by the present invention by emulsion can be improved, and as a result the depth position diseases, and/or even higher layer having a thickness that is easily dermatopathy treatment. The permeation depth higher than this, especially, the 5-aminolevulinic acid, due to the smallness of size, in which case, for example antiphlogistic, canceration state before, and a skin tumor tissue damage existing in capable of easily penetrating through and will therefore be estimated, an unexpected.

[0043] 3 th the surprising advantages, due to the present invention and when [...] prescription, 5-aminolevulinic acid is, obviously very efficiently from the cell. This improves the first target, the penetration time, in other words compsn. and application of the irradiation of a light beam between periodonal structure capable of reducing the time it, therefore the patient is obviously facilitated. As can be inferred from the embodiment 4 of fig. 5, cultured cells 5-aminolevulinic acid into the uptake, and cells Aminolebulinic acid PpIX conversion to the, present invention has a constant density of nanoparticles deltaaminolevulinic acid with increase in the density of the emulsion.

[0044] Furthermore, even if the storage stability, in the carrier solvent at least 3 carbon atoms as including an alcohol having an emulsion of present invention can be improved.

[0045] According to the present invention and, composition, preferably 5-aminolevulinic acid, or a derivative thereof, precursor, and/or an active agent selected from dysbolism. The "derivative", 1 or 2) an alkyl group, preferably methyl group, 1) 5-aminolevulinic acid ester of the amino groups as is understood. The most suitable one, or 5-5-aminolevulinic acid monomethylamino Aminolebulinic acid. The derivative, salt and complex compound, and as can be understood even perfluoroalkylated compd.. "Precursor" and the "dysbolism product", as understood in the converted protoporphyrins IX. 5-aminolevulinic acid or its derivatives of the active agent, especially preferred.

[0046] The size of the particles of the nano-emulsion emulsifiability ([...]), as mentioned a In each case the optimum particle size, further parameters, such as, for example, depending on the viscosity of the composition. For example, using the nanoholes emulsion having a viscosity 1-10mPas, good results are obtained with an average particle size of 100 nm or less.

[0047] In the composition of the active agent, preferably the amount of 5-aminolevulinic acid, essentially, depending on the application purpose. In the preferred embodiment, with respect to the total mass of the composition, the active agent is present at about 1-30% by mass. However, higher or lower angiopathy. Preferably the amount of 3-15% by mass, the proved suitable and related application example photodynamic therapy.

[0048] The composition of the present invention, preferably, at least one of the at least two reuteri 1 and 1 and may also include a solvent.

[0049] Particularly, in the preferred embodiment, as the gel composition. The gel forming agent containing, matrix-forming agent, preferably xanthan. A nano-particle size is preferably in the form of gel emulsion <100 nm, the viscosity is very high, for example 500-2000mPas.

[0050] Another embodiment of the present invention, containing a composition of the present invention, pharmaceutical, cosmetic, and/or composition for diagnosis. In this case, the cosmetic composition and/or pharmaceutically acceptable additive and/or excipient, specifically a cosmetic or chemicals used in general can further include a substance. An example of such a material, a buffering agent, a stabilizer, a further emulsifier, thickening agent or the l Furthermore, the composition, or diagnostic pharmaceutical contains no components can not be allowed, and, preferably, for example, inducing stimulation and/or does not contain a constituent element gets wrong diagnosis. In addition to a carrier substance already referred to, medical and/or diagnostic preparation, permissible, preferably further auxiliary agent or good tolerability/and may contain an additive.

[0051] Preferably, the composition, existing as a liquid or semi-solid. The present invention in the application range of a suitable liquid, solution, preferably liquid droplets, spray, aerosol, emulsion, or is selected from the group consisting of lotion. In the present invention, the applicable range of appropriate semi-solid, ointment, cream (O/W emulsion), oily cream (W/O emulsion), gel, lotion, foam, paste, and/or is selected from the group consisting of

suspension.

[0052] In the case of the application example of gynopathy orchidaceous skin and, preferably, preferably in appropriate form locally, especially in the form of a gel. Preferably, after the administration of the pharmaceutical, 5-aminolevulinic acid which is filled with a suitable extent [...] penetrating into the target tissue in order to ensure that the desired, embodiments in which a suitable characteristics, such as, for example, having a viscosity and rheology. The viscosity of the rheological characteristics and, a thickening agent, for example, stearyl ether polyethylene glycol, polyethylene glycol stearate, and/or polysaccharide, such as, for example, by adding a polysaccharide B-1459 can be adjusted.

[0053] Particularly, in the preferred embodiment, the present invention in which the composition of the gel. The gel, and by comparing the above formulation, crude with improved characteristics. The present invention of a gel preparation, more excellent adhesion, stability, the release of the active agent, and skin and mucous resistant on top. The present invention of gel, relative to the total mass of the composition, preferably 0. 01% by mass to 50% by mass, more preferably 0. 5% by mass to 30% by mass, further preferably 1% by mass to 20% by mass of active agent and, 1% by mass/60% by mass, more preferably 15% by mass to 50% by mass, and most preferably 10% by mass -30% by mass of nano-emulsion, 0. 4% by mass -01% by mass, more preferably 1% by mass and at least one filler, 1-3% by mass, 3% by mass of at least 1% by mass -1 and includes two reuteri, 1 the remaining at least one solvent.

[0054] Another embodiment of the present invention, the composition of the present invention to provide a method of producing, A) a step of providing a water component and, B) and at least one liphophilic component 1, 1 and at least one surfactant, and at least one alcohol 1 including a carrier, at least one of the at least one alcohol is 1 to 3 carbon atoms and a step of providing a carrier having, C) in order to form a nanostructure, step a) of water step b) and step and a mixture of the carrier, D) the step c) before the formation of emulsion of nano and/or later, and a step of adding an active agent, E) depending on the case, step d) further additives and/or additive and a shaping step, the method including.

[0055] Particularly preferably, in step d) of the active agent, the step c) after the formation of emulsion.

[0056] The method, preferably under sterile conditions, for example, by using a flow hood. The method of using an aqueous components mentioned above, the carrier, and the active agent, and similarly the meaning of suitable and appropriate. The mixture of the aqueous component and carrier, preferably by violent homogenization. 5-aminolevulinic acid, and the additive and/or the excipient, homogenization before and/or after, preferably can be added after the homogenization.

[0057] Preferably, a method is executed, for example, a vacuum and/or by applying a protective gas atmosphere, air is excluded. Furthermore, while performing the method, it is preferable to exclude light.

[0058] The method, desired nano-emulsion can be formed as mentioned above, because of the subsequent step further, constituent elements, specifically at a temperature which is sufficiently stable active substance. In general, the temperature range of about 5-30 ° C is known to be suitable. However, for example, another first mixed in the mixture, when properly made uniform, then the first additive is added to the composition and/or shaping the treatment, higher temperature, for example at a temperature of about 70 °C up can be performed. Especially in the case of a medical application, the product is obtained as a result of, for example, using the starting materials for sterilization, a sterilization method maintains conditions, or/and by using a sterilization step after manufacture, so that attention sterity accurately.

[0059] In the field of cosmetics, the composition of the present invention, preferably, the bleeding, for example, for the extermination wrinkles, and/or an anti-aging agent to be used as drying.

[0060] An important use of the present invention the composition, in the field of photodynamic therapy, nano-emulsion topical application is particularly preferred. In the present invention by emulsion, that is, 5-aminolevulinic acid formed from a light sensitive material or be activated or narrow cell by the destruction of tissue growth inhibition of containing them, can be used in the case of all the disease. In these diseases, specifically including related disease virus, virus is preferably selected from the group of human papilloma virus (HPV). Most preferably, the virus condyloma acuminatum related diseases. The condyloma acuminatum, within the limits only anuses approx. genitals, its pathogen

human papilloma virus (HPV) 6, 11, and 42 as, defined as derived nonionicity epithelialoma virus. In the process of disease, pin tip papule is larger, and comb-like teat-like cauliflowers causing proliferation of poultry.

[0061] Furthermore, the composition of the present invention, angle calcinosis diseases related to the treatment of such suitable dermatopathy, is especially favorable calcinosis beam angle. The beam angle calcinosis, skin cancer cells in planoepitheliale. The beam angle calcinosis, skin is limited to a proliferation of keratinocyte Transformant. The beam angle calcinosis, (also called and actinic keratosis) induced by exposure to ultraviolet clonic, especially as to the sunlight. The beam angle calcinosis, diameter of about 1 mm to about 2 cm-desquamative uneven spots, papule, or as mottles appears.

[0062] Furthermore, the composition of the present invention, preferably, the increase of neuropeptides cytostatic and a related object is, therefore, in this case, the light-sensitive substance, due to increase of cellular metabolism, especially for high degree periodonal integrated cells.

[0063] The present invention therefore by compsn., tumor disease, adenoma cell, for example, flat canceration epitheliocyte, periodontosis bowen, vulva oncocyte ectocornea in (VIN), and/or embryoblast properties and/or treatment of disease canceration hypodermically. The psoriasis, relating to the increase of Antitumoral cytostatic dermatopathy example.

[0064] The composition of the present invention, the basic cell adenomatous particularly suitable for treatment. The basal cell adenoma, and destruction of a local uninvasively, very rarely, without being transferred, and therefor being slightly malignat ectocornea tumor and this is considered. This is mainly in the head and neck (80%), especially on the front head, canthus part, and located in the nose portion. In the case of the advance is not desirable, for example, bone and erosion of associated therewith and by bleeding a blood vessel, also by CNS infiltration, tissue damage or death. The basal cell adenoma, skin and/or the outer sheath of the roots of the trichocyte mesodermal derived from a modified cell (cell layer). Usually the skin when passing through its mitosis ability is lost, cornification layer by collapsing a, re-formed and in contrast to the normal cell, the cell base plasmacytoma, its mitosis ability is maintained, no longer cornification layer can be formed.

[0065] The present invention, furthermore, for the production of chemicals in photodynamic therapy, relates to the use of the present invention by emulsion.

[0066] Therefore, the above-mentioned diseases by, for example, active agent, for example 5-aminolevulinic acid containing emulsion locally applying, after a sufficient amount of 5-aminolevulinic acid treatment is performed in order to penetrate into the tissue by left can be carried out. At the left, a light beam irradiated by the treating part of, preferably, for example, by avoiding a treatment section, to avoid undesirable too early activation. In general, about 1-8 time, usually about 4 after completion of a time period, by using a light source, a suitable dose of radiation in the structure. At the proper light source, to emit white light lamp, the monochromatic light source are included. The amount of radiation, per 1 turn about the application of ordinary 20J/cm ^{2}-number 100J/cm ^{2} range.

[0067] 5-aminolevulinic acid gel of the present invention by the application field of the separate, sample in, for example, in the detection of the presence of the tissue sample cell. Detecting the, active agent dysbolism normally generated by a photo-sensitive material and the cell to cell selectively based on the integration. Preferably, the active agent and 5-aminolevulinic acid, IX protoporphyrins the photosensitive material. The photosensitive material is integrated to a degree, optical diagnostic method is used, for example, by irradiating a light beam having a wavelength of 405 nm, a fluorescence radiation generated by the light-sensitive material can be determined by measuring. In the present invention by emulsion, particularly suited for use in diagnosing tumors.

[0068] Furthermore, in the present invention, suitable for topical application, and 5-aminolevulinic acid present invention of nano-emulsion, its derivative, precursor, and/or by the present invention and including a product dysbolism and composition, and a kit comprising one or more auxiliary material 1. An example of these auxiliary substance, in order to avoid too early activated by light, after the application of the emulsion to a treatment site of essential part of a coating material is applied to the photoresist, e.g. plastic film, and a means for attaching a covering materials, or nano-emulsion and there is a means for applying a treatment site.

[0069] Furthermore, in the present invention, in the method of treating diseases related virus, skin diseases, and/or related diseases cytostatic, present invention an effective amount of a

pharmaceutical composition, the method including a step and a required to test them. Preferably, a mammalian subject, more preferably human.

[0070] Another embodiment of the present invention, 5-aminolevulinic acid, its derivative, precursor, and/or dysbolism selected from the group consisting of product and an active agent, and emulsion contains nanoparticles, nano-emulsion composition containing alcohol.

[0071] Preferably, composition, and the emulsion of nanotubes, at least two aqueous component 1, preferably water, at least one of a lipophilic component 1, and/or at least one surfactant 1.

[0072] A suitable for topical application, 5-aminolevulinic acid, its derivative, precursor, and/or dysbolism product is used. The "derivative", 1 or 2) an alkyl group, preferably methyl group, 1) 5-aminolevulinic acid ester of the amino groups, as should be understood. The most suitable one, or 5-5-aminolevulinic acid monomethylamino Aminolebulinic acid. The derivative, salt and complex compound, and as can be understood even perfluoroalkylated compd.. "Precursor" and the "dysbolism product", should be understood as IX protoporphyrins converted in the cells. 5-aminolevulinic acid or its derivatives of the active agent, especially suitable.

[0073] As the alcohol, C_2-C_8 alcohol, especially C_3-C_8 pref. and alcohol, the isopropanol and/or 1-propyl alcohol, because of the more favorable.

[0074] Preferably, Aminolebulinic acid, its derivative, precursor, and/or the product dysbolism, nano-particles adhering to the outside of the emulsion layer. Therefore, the particles of deltaaminolevulinic acid is positioned on the outside of the core, and an outer single layer of the same between deltaaminolevulinic acid.

[0075] Preferably, at least one of the components has liphophilic migriol 1, at least one surfactant is Lecithinized 1, preferably soybean Lecithinized, and/or ethylene-type surfactant polyoxymethylene, pref. polysolvate 80.

[0076] Another embodiment of the present invention, including the above-mentioned composition for pharmaceutical and/or diagnostic composition.

[0077] Another embodiment of the present invention, the use of nano-emulsion in a pharmaceutical composition, specifically dermatopathy, e.g. psoriasis, Keratinizing hyperlipidemia, especially the light angle calcinosis use for treatment of drugs. Furthermore, the composition, associated cytostatic, tumor diseases such as, for example, cell cancer, flat canceration epitheliocyte, periodontosis bowen, vulva oncocyte ectocornea in (VIN), or embryoblast properties and/or suitable canceration hypodermically dermatopathy. Furthermore, the composition, virus-related diseases, e.g. condyloma acuminatum treatment.

[0078] Another embodiment of the present invention, the active agent and including nano-emulsion composition and, outside of the nano-particles of the emulsion deposited in a single layer. Therefore, the chemical properties of the active agent (for example, stability) and pharmaeutically characteristics (for example, into the skin and permeation depth of biological) is especially useful in order to improve.

[0079] Preferably, nano-emulsion and/or the active agent, and a composition described above are defined in the same way macroquantum (described below in reference to page 9).

[0080] A further embodiment, the active agent is a single layer of nano-particles adhering to the outside of the emulsion composition including medical and/or cosmetic composition.

[0081] Furthermore, nano-emulsion and active agent in the composition including and, outside of the active agent is a nano-particles of the emulsion is deposited in a single layer of composition, virus-related diseases, skin diseases, drugs for the treatment of diseases related to production cytostatic, and/or for the manufacture of chemicals in photodynamic therapy is also included in the present invention is used. The photodynamic therapy and dermatopathy of suitable embodiment, as mentioned a

[0082] The following embodiments and drawings, and further explanation of a present invention.

[0083] A typical batch of nano-emulsion BF-200 measured by a photon correlation spectroscopy drawing showing the particle size distribution. For nano-emulsion BF-200 freezing fracture electronic microphotqgraphic (A) magnification 1,200,000 times, (B) a

magnification factor 250,000 times drawing showing. Nano-emulsion BF-200 of staining negative electron microscope photograph (A) magnification 1,200,000 times, (B) a magnification factor 250,000 times drawing showing. 3 BF-200 ALA and different densities and the incubation time measured by Hela cells, UV fluorescent drawing showing PpIX induced. The phosphor, measured after 2 hours of medium away. This figure shows an electron microscope photograph freezing fracture expansion rate of 50,000 times deltaaminolevulinic acid gel. Electronic microphotqgraphic freezing fracture deltaaminolevulinic acid gel showing of Fig. (A) magnification 250,000 times (B) magnification 1,200,000 times

[0084] Embodiment Embodiment 1: production of nano-emulsion BF200 The qualitative and quantitative compsn. nano emulsion BF200 lower shown.

[0085] Table 1 first: nano-emulsion BF200 compsn.

[0086] The method of manufacturing the emulsion BF200, comprising the following steps: Step 1:10 mm phosphate buffer solution (pH6) (aqueous component) of manufacturing Step 2: liphophilic component, a surface active agent, and an alcohol-containing carrier Step 3: step 1 to step 2 and the aqueous component of the emulsion by mixing a carrier Step 4: filtration and sterilization, and sterilization of a laminar flow hood under filling of nano-emulsion BF200 releasabilty In the case of the manufacturing method of a typical batch size of explanation: Step 1:10 mm phosphate buffer solution (1000g) (pH6) is produced by, 0 a phosphate buffer solution thereof. 2 μm sterilizing filter sterilized by filtration. Step 2: liphophilic component, a surface active agent, and an alcohol-containing carrier Table 2 first: carrier

[0087] Soybean Lecithinized (17. 30g) placed in a suitable container by metering, isopropyl alcohol (14. 20g) is added, in order to avoid evaporation of the alcohol in the container to the lid. Using a suitable agitator under continuous stirring, soybean Lecithinized dissolved at room temperature. Capryl lactam/ [...] (34. 50g) and polysolvate 80 (34. 00g) weighing, soybean Lecithinized soln. added. At room temperature, using a suitable stirring, the mixture is stirred until homogeneous tetraphosphoric soln. is obtained. In the solution, and all of the emulsifier glycolipid nano emulsion BF200 concentrate containing components.

[0088] Step 3:900 g and 100g of phosphate buffer solution (due to the step 1) and the carrier

(due to the step 2) by mixing an emulsion First of all, a phosphate buffer solution in a suitable container containing water is heated up to about 55 °C. Next, step 2 of the carrier is heated up to about 55 °C (concentrate). Subsequently, under continuous stirring (700rpm) using a propeller mixer, a phosphate buffer solution injected into the carrier. 15 minutes stirring the emulsion is obtained. Throughout the entire procedure, maintained at a temperature of about 55 °C. Finally, nano-emulsion is cooled to ambient temperature in a water bath.

[0089] Step 4: nano-emulsion is 0. 2 μm sterilization is sterilized by filtration in a filter, a laminar flow hood 100 ml bottles filled under sterilization.

[0090] Embodiment 2: Aminolebulinic acid 1%, 3%, and 10%, and producing [...] The quantitative and qualitative [...] compsn. showing, and 1%, 3%, 10% on the sloping deltaaminolevulinic acid gel.

[0091] 3 table first: [...] compsn.

[0092] 4 table first: Aminolebulinic acid 1% gel composition

[0093] 5 table first: Aminolebulinic acid 3% gel composition

[0094] 6 table first: Aminolebulinic acid 10% gel composition

[0095] The method of manufacturing the placebo or Aminolebulinic acid gel, comprising the following steps: A step -1: xanthane additives to the water injection, mixing, due to steam sterilization, producing a gel base A step -2: and in which methyl alkylbenzonic para hydroxy reuteri alkylbenzonic para hydroxy during manufacture of concentrated solution of propylene glycol propyl Step 3, in the case of the placebo: reuteri concentrated solution is applied to the base of the gel, the gel is added to the emulsion BF200 base, by homogenizing the gel, the gel preparation of the final Step 3, in the case of acid gel Aminolebulinic: reuteri base of concentrated solution is formed by applying, final preparation of the gel. The nano-emulsion BF200 soln. hydrocloride Aminolebulinic acid during manufacturing. The nano-emulsion BF200 soln. hydrocloride Aminolebulinic acid gel of the additive to the base, and the homogenization of the gel.

[0096] The explanation of the manufacturing method: Step 1: xanthane production using a gel base The disinfection Stephan bowl isopropanol 70%. The injection water to the bowl (amt. unit 97. 50) is put, the xanthan (amount of unit 2. 5) is sprayed. The vacuum pressure in the mixture is about 100mbar/min, 90 min is dispersed by the rotation number 600. The base gel obtained in advance of the rinsing water injector 200 ml flask filled Schott (max. 1/3 filling). Next, the autoclave in flask base 121 °C gel in a steam sterilization of 20 minutes.

[0097] Step 2:of a concentration parabens para hydroxy benzoic acid methyl (7. 0 part) and para hydroxy benzoic acid propylheptyl (3. 0 part) is measured, is placed in a suitable container. It is a mixture of propylene glycol (90 part), para hydroxy benzoic acid dissolved in propylene glycol. The mixture is heated by the heating plate, the mixture is stirred until dissolved (70 °C) by using a magnetic stirrer, soln. tetraphosphoric.

[0098] Step 3, part 1 : [...] manufacturing 7 table first: base gel [...] paraben and concentrate of manufacturing

[0099] All of the steps below, layer down, which is performed in a sterile condition. 1 unit amount of concentrate parabens (D) and 81. 5 unit quantity of gel (A) in addition to a suitable container. 17. The unit amount of 0 to 5 nano emulsion (B). 2 μm sterilization, filtering, base gel. The mixture is stirred for 10 minutes. Subsequently, the unit amount of the aluminum tube 2 is filled with the gel are laminated.

[0100] Step 3, part 2: Aminolebulinic acid 1% of 8 table first: Aminolebulinic acid 1% of

[0101] All of the work, layer down, which is performed in a sterile condition. 1 unit amount of concentrate parabens (D) and 80. 5 unit quantity of gel (A) in addition to a suitable container. By gentle agitation, 17 a quantity of 1 unit ALA (C). 5 unit amount of dissolving the nano-emulsion (B), the solution is obtained. The solution is 0. 2 μm sterilization, filtering, base gel. In order to obtain a homogeneous gel, the mixture is stirred for 10 minutes. Subsequently, filled with a gel 2g laminated aluminum pipe, respectively.

[0102] Step 3, part 3: Aminolebulinic acid 3% and 10% of Description of same and about 1% gel, however each 78. 50 of base unit ALA amt. and 3 the unit amount of gel, or 71. The unit amount of the base 50 and 10 ALA1 a unit amount of the gel, the gel is produced by 3% and

10%.

[0103] Embodiment 3: particle size of the nano-emulsion BF-200 Photon correlation spectroscopy (PCS) (dynamic laser light scattering method (DLS) and called) is evaluated, the average particle size of the nano-emulsion, 100 nm or less. Furthermore, in the emulsion, and is characterized by a very narrow particle size distribution (refers to the following fig. 1).

[0104] The emulsion, which is stable over a wide temperature range, and can be damaged by freezing an autoclave. The emulsion is, relatively difficult to react to a change in pH and ionic strength, because of its small size, 0. 2 μm filter can be sterilized by filtration. The nano-emulsion, in delivery to the skin of the active substance is improved, thereby locally applying a possibility for amplifying the effectiveness of chemicals.

[0105] The nano-emulsion BF-200, low energy technology. That is, the production of nano-emulsion, and does not require high shear device, for example a high pressure homogenizer or sonicator.

[0106] The research of nano-particles in the nano-emulsion BF-200, by photon correlation spectroscopy, 2 the two electron microscope method: freezing fracture performed using EM and staining negative.

[0107] The photon correlation spectroscopy, BF-200 is, very reliable and consistent in particle size, and a narrow particle distribution has the result that the emulsion to guarantee. These features are, over a long period of time, which is stable under different temperature (refer to the table 9 monodispersility).

[0108] 9 table first: stability of nano-emulsion BF-200 test result

[0109] Summarizing and, after storage max. 12 months at various storage conditions, all results in the standard range.

[0110] An electron microscope photograph of nano-emulsion BF-200 freezing fracture and 250,000 times magnification factor 1,200,000 times in fig. 2 shown in the f The most significant feature in microphotqgraphic, between a number of various diameter 15-50nm having very

small spherical vesicles. The value of these, as measured by a photon correlation spectroscopy and related is sufficient (referring to the first table 9). The vesicle, vesicle 3-4nm at a thickness of a film, which can be a single layer is very high. In this case, there is a main component of Lecithinized, cholinergic phosphatidyglycerol a length corresponding to the surface active agent in the emulsion molecule. The vesicle lyposome and other double layer, having a thickness of 7 nm.

[0111] The structure of the vehicle, produced by a negative-staining can be observed even in an electron microscope photograph. The nano-particles in the nano-emulsion BF-200, spherical, about 20 nm in diameter, having a thickness of about 3-4nm recess, is filled with a substance urethanized (referring to fig. 3 below). The hollow particles is not observed.

[0112] Aminolebulinic acid gel of nanoparticles in the research, and staining negative freezing fracture by using a technique, a method with an electron microscope.

[0113] By means of an electron microscope photograph freezing fracture deltaaminolevulinic acid gel, nano-particles present in the gel, emulsion extrapure nano BF-200 in size and having a similar value. The microphotograph, shows a single particle (fig. 5) and assembly. The size and shape of the nanoparticles in the gel, is not affected by the storage conditions. BF-200 ALA (25 °C (60% relative humidity) 4 months after storage at 10% gel) freezing fracture in the inspection of an electron microscope, a gel in newly manufactured and particles of a size and shape that is similar. In a first test phase III biocomponents BF-200 ALA gel used to gel and BF-200 ALA placebo (10% Aminolebulinic acid) are plan using a batch of the test, the test biocomponents parallel and, at a point of time after the inspection by an electron microscope includes a particle diameter.

[0114] The fig. 6, created by the higher rate of magnification, freezing fracture indicates an electron microscope photograph of the gel. The fracture surface, is coated on the outer skin of the main. Through the fracture of the particle itself, very rarely does not occur. The vesicle, representing Aminolebulinic acid and interpretation of the material as it is surrounded by layer. This is an image of a fryer supplyer (indicated by the arrow B part of fig. 6).

[0115] 10% Aminolebulinic acid gel prepared by negative-staining of the electron microscope photograph, freezing fracture electron microscope photograph of the nano-particles can be

formed on a backing and a layer of a material, having a diffusion surface structure glossness shows the nano-particles.

[0116] Embodiment 4: antiandrogen absorbed into the: for taking in vitro testing cell culture ALA: cell culture test In the uptake of cultured cells and protoporphyrins IX (PpIX) conversion to the ALA, induced by UV fluorescence PpIX can be monitored. The experimental cell culture, plurality of Antitumoral cell: HELA, HepG2, and CCD 106 KERTr (human ectocornea keratinocyte cell) is used. The cells, methyl-ALA (MAL), ALA, or ALA BF-200 and containing, incubating max. 3 hours in an aqueous medium. All the incubation medium under the selected chemical concentration, one 3, similar to a pH value. After incubation, cell is gently washed, adding a new medium. The PpIX generated, by quantifying the phosphor, measured at different points of time. The fig. 5, showing the result obtained by HELA cells.

[0117] Nano-emulsion BF-200 (constant ALA concn.) due to the increase in the concentration of fig. 5 shows the influence of PpIX synthesis. In the cells of the fluorescence PpIX, increases in accordance with increase of the BF200 concn., reaches the highest point of 3% BF200.

[0118] Example 5 The light angle calcinosis 5-ALA photodynamic therapy of nano-emulsion to the effectiveness of the formulation, year 2006 starts to fall, a first phase and a client Biofrontera Bioscience GmbH angiopathy biocomponents II is shown in the test set. The randomization of contrasting placebo Prof a double blind test. Dr. Under the command of the medical Rolf-Markus Szeimies (University Clinics of Regensburg), German simplities biocomponents 13 out of center. 3 kinds of actual quantity (1, 3, and 10% ALA) and using the placebo. In order to verify the effectiveness of a compound, two different patient 105 name or ALA concn. placebo 3 1 using two out of operative once the photodynamic therapy.

[0119] The face or scalp lesioned calcinosis 3-10 having light angle of a patient is included. Each of the patient, the patient 1 out of all four morbit treatment (1%, 3%, or 10% of 5-aminolevulinic acid (ALA) or placebo) is received. 3 after being left to stand for a period of time, red light is applied. After treatment session, the test, and the result of the curing process for monitoring biocomponents, after 3 weeks, after 8 weeks, and 12 visitings after weeks. In each, the charge of clinical doctor, treatment of a beam angle calcinosis (AK) AK signs and symptoms lesioned biocomponents judges that the trace of the remaining portion. The main variables effectiveness, complete lytic (lesioned is completely eliminated, visible AK of

synechia of another mottles desquamating resistance does not exist) is defined as the number of lesioned indicating, during the first week of 12 the total of all visitings misexclusion rate lesioned AK. During irradiation BF-200 ALA after the application, the expression of the monitored even pain.

[0120] Result: the PDT 10% ALA pretreatment before due, among the concentration of the test 3, AK is most effective in eliminating lesioned ☒12 (placebo than is statistically significant). After treatment with single 12 weeks BF-200 ALA by evaluation of the patient, and the center of the head portions of the weighted biocomponents, treating at least a completely healing lesioned 60-70%. The placebo group misexclusion rate, by weighting biocomponents center, about which a treatment of lesioned 5-15%. This rejection rate, similar test design is used, or a higher concentration of active substance 5-ALA ALA-PDT test results using methyl ALA matches and fully open. The best result cosmetrogical. Only 6% of a patient, strong appeal to pain. The related effects, does not occur during the test, the best result cosmetrogical. When PDT, and after PDT 12 weeks, even for the groups 4, safety-related pending item.

[0121] As an additional safety measure, this dynamic evaluation angiopathy setting part including a drug. The whole blood and urine measuring protoporphyrins concn. ALA IX of dysbolism and product thereof. Treating a patient ALA compound in the blood and urine concn., naturally occurring in the individual nonphysiological value and comparing are not increased.

Ultimate Owner:

BIOFRONTERA AG

Original Assignee:

Biofrontera Bioscience GmbH

Standardized Assignee:

BIOFRONTERA BIOSCIENCE

Normalized Assignee:

BIOFRONTERA

Current Assignee:

Biofrontera Bioscience GmbH
バイオフロンテラ バイオサイエンス ゲゼルシャフト ミット ベシュレンクテル ハフツング

Current Standardized Assignee:

BIOFRONTERA BIOSCIENCE
バイオフロンテラ バイオサイエンス ゲゼルシャフト ミット ベシュレンクテル ハフツング

All Assignees:

Biofrontera Bioscience GmbH
BIOFRONTERA BIOSCIENCE
BIOFRONTERA
Biofrontera Bioscience GmbH
バイオフロンテラ バイオサイエンス ゲゼルシャフト ミット ベシュレンクテル ハフツング
BIOFRONTERA AG

Inventor:

モンセラート ロカ フォゲット

Attorney/Registered Agent:

矢野 敏雄
山崎 利臣
久野 琢也
杉本 博司
高橋 佳大
星 公弘
二宮 浩康
アインゼル・フェリックス＝ラインハルト

Examiner:

Status:

Granted

Legal Status(INPADOC):

Date	Event Code	Legal Event	Additional Details
2022-04-27	R350	WRITTEN NOTIFICATION OF REGISTRATION OF TRANSFER	**Additional Information**: JAPANESE INTERMEDIATE CODE: R350;
2022-04-14	S111	REQUEST FOR CHANGE OF OWNERSHIP OR PART OF OWNERSHIP	**Additional Information**: JAPANESE INTERMEDIATE CODE: R313113;

Date	Event Code	Legal Event	Additional Details
2022-03-30	R250	RECEIPT OF ANNUAL FEES	**Additional Information**: JAPANESE INTERMEDIATE CODE: R250;
2021-06-03	R250	RECEIPT OF ANNUAL FEES	**Additional Information**: JAPANESE INTERMEDIATE CODE: R250;
2020-06-03	R250	RECEIPT OF ANNUAL FEES	**Additional Information**: JAPANESE INTERMEDIATE CODE: R250;
2019-06-11	R250	RECEIPT OF ANNUAL FEES	**Additional Information**: JAPANESE INTERMEDIATE CODE: R250;
2018-06-12	R250	RECEIPT OF ANNUAL FEES	**Additional Information**: JAPANESE INTERMEDIATE CODE: R250;
2017-06-13	R250	RECEIPT OF ANNUAL FEES	**Additional Information**: JAPANESE INTERMEDIATE CODE: R250;
2014-06-13	R150	CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL	**Additional Information**: JAPANESE INTERMEDIATE CODE: R150;
2014-06-12	A61	FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)	**Additional Information**: JAPANESE INTERMEDIATE CODE: A61; **Effective Date**: 2014-06-05;
2014-05-08	A01	WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL)	**Additional Information**: JAPANESE INTERMEDIATE CODE: A01; **Effective Date**: 2014-05-07;
2014-04-28	TRDD	DECISION OF GRANT OR	

Date	Event Code	Legal Event	Additional Details
		REJECTION WRITTEN	
2014-04-02	A521	REQUEST FOR WRITTEN AMENDMENT FILED	**Additional Information**: JAPANESE INTERMEDIATE CODE: A523; **Effective Date**: 2014-04-01;
2014-02-04	A131	NOTIFICATION OF REASONS FOR REFUSAL	**Additional Information**: JAPANESE INTERMEDIATE CODE: A131; **Effective Date**: 2014-02-03;
2013-05-14	A521	REQUEST FOR WRITTEN AMENDMENT FILED	**Additional Information**: JAPANESE INTERMEDIATE CODE: A523; **Effective Date**: 2013-05-13;
2013-04-25	A602	WRITTEN PERMISSION OF EXTENSION OF TIME	**Additional Information**: JAPANESE INTERMEDIATE CODE: A602; **Effective Date**: 2013-04-24;
2013-04-18	A601	WRITTEN REQUEST FOR EXTENSION OF TIME	**Additional Information**: JAPANESE INTERMEDIATE CODE: A601; **Effective Date**: 2013-04-17;
2013-01-21	A131	NOTIFICATION OF REASONS FOR REFUSAL	**Additional Information**: JAPANESE INTERMEDIATE CODE: A131; **Effective Date**: 2013-01-18;
2010-12-29	RD04	NOTIFICATION OF RESIGNATION OF POWER OF ATTORNEY	**Additional Information**: JAPANESE INTERMEDIATE CODE: A7424; **Effective Date**: 2010-12-28;
2010-11-23	A621	WRITTEN	**Additional Information**: JAPANESE

Date	Event Code	Legal Event	Additional Details
		REQUEST FOR APPLICATION EXAMINATION	INTERMEDIATE CODE: A621; **Effective Date**: 2010-11-22;
2010-11-23	A521	REQUEST FOR WRITTEN AMENDMENT FILED	**Additional Information**: JAPANESE INTERMEDIATE CODE: A523; **Effective Date**: 2010-11-22;

Legal Status(Post Issuance):

Legal Status(Standardized):

Status:

Event	Date	Description
Granted	2014-07-23	GRANTED
Filed	2007-12-21	FILED

Ownership:

From Date	To Date	Original Assignee	Standardized Assignee	Normalized Assignee
2006-12-22		Biofrontera Bioscience GmbH	BIOFRONTERA BIOSCIENCE	BIOFRONTERA
2006-12-22		バイオフロンテラ バイオサイエンス ゲゼルシャフト ミット ベシュレンクテル ハフツング	バイオフロンテラ バイオサイエンス ゲゼルシャフト ミット ベシュレンクテル ハフツング	

Payment Status:

Date	Status	Event Code	Description
2022-03-30	Fee paid	R250	RECEIPT OF ANNUAL FEES
2021-06-03	Fee paid	R250	RECEIPT OF ANNUAL FEES
2020-06-03	Fee paid	R250	RECEIPT OF ANNUAL FEES

Date	Status	Event Code	Description
2019-06-11	Fee paid	R250	RECEIPT OF ANNUAL FEES
2018-06-12	Fee paid	R250	RECEIPT OF ANNUAL FEES
2017-06-13	Fee paid	R250	RECEIPT OF ANNUAL FEES
2014-06-05	Fee paid	A61	FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)

Litigation/Opposition:

Litigation/Opposition Indicator:

false

Family:

Domestic	Main	Complete	Extended
JP2010513363A5	ZA200903468A	ZA200903468A	ZA200903468A
JP2010513363A	BRPI0720853A2	BRPI0720853A2	BRPI0720853A2
JP5558827B2	AR064659A1	AR064659A1	AR064659A1
	US20090324727A1	US20090324727A1	US20090324727A1
	EP2120872B1	EP2120872B1	EP2120872B1
	AU2007338323B2	AU2007338323B2	AU2007338323B2
	CA2670715A1	CA2670715A1	CA2670715A1
	CN101588792A	CN101588792A	CN101588792A
	RU2009128179A	RU2009128179A	RU2009128179A
	MX2009006088A	MX2009006088A	MX2009006088A
	IL198934A0	JP2010513363A5	JP2010513363A5
	IN2145KOLNP2009A	IL198934A0	IL198934A0
	IL198934A	IN2145KOLNP2009A	IN2145KOLNP2009A
	NZ577061A	IL198934A	IL198934A
	US11540981B2	NZ577061A	NZ577061A
	EP2120872A1	US11540981B2	US11540981B2

Domestic	Main	Complete	Extended
	RU2491917C2	IN267105A1	IN267105A1
	AU2007338323A1	EP2120872A1	EP2120872A1
	WO2008077641A1	RU2491917C2	RU2491917C2
	UA101471C2	AU2007338323A1	AU2007338323A1
	CN101588792B	WO2008077641A1	WO2008077641A1
	UY30833A1	UA101471C2	UA101471C2
	ES2602107T3	CN101588792B	CN101588792B
	JP2010513363A	UY30833A1	UY30833A1
	CL2007003730A1	ES2602107T3	ES2602107T3
	JP5558827B2	JP2010513363A	JP2010513363A
	EP1938801A1	CL2007003730A1	CL2007003730A1
	CA2670715C	JP5558827B2	JP5558827B2
		EP1938801A1	EP1938801A1
		CA2670715C	CA2670715C

Family ID:

192382308

US Related Applications:

PCT Application:

EP07011404 / 2007-12-21

PCT Publication:

2008077641 / 2008-07-03

Backward Patent Citations (11):

Publication Number	Date	Origin	Relevance
JP2001504467A	2001-04-03	Search Report.	
JP2006273821A	2006-10-12	Search Report.	
WO2005110370A1	2005-11-24	Search Report.	

Publication Number	Date	Origin	Relevance
JP2000212030A	2000-08-02	Search Report.	
JP2000191503A	2000-07-11	Search Report.	
JP2000191502A	2000-07-11	Search Report.	
JP2005527493A	2005-09-15	Search Report.	
JP2004506005A	2004-02-26	Search Report.	
JP08175986A	1996-07-09	Search Report.	
JP2003526637A	2003-09-09	Search Report.	
JP2001039867A	2001-02-13	Search Report.	

Backward Citations Count:

11

Forward Patent Citations (12):

Publication Number	Date
JP6030565B2	2011-12-09
JP6112498B2	2012-07-20
US9645154B2	2011-12-22
JP6189749B2	2011-06-23
JP6596475B2	2017-10-26
US10532019B2	2017-07-07
US10576034B2	2016-10-07
JP2013544852A	2011-12-09
JP2016183202A	2016-07-29
WO2012029456A1	2011-07-27
JP2013539402A	2011-06-23
US11311496B2	2017-09-25

Forward Citations Count:

12

Designated States:

National:AE
AG
AL
AM
AT
AU
AZ
BA
BB
BG
BH
BR
BW
BY
BZ
CA
CH
CN
CO
CR
CU
CZ
DE
DK
DM
DO
DZ
EC
EE
EG
ES
FI
GB
GD
GE
GH
GM
GT
HN
HR
HU
ID
IL

IN
IS
JP
KE
KG
KM
KN
KP
KR
KZ
LA
LC
LK
LR
LS
LT
LU
LY
MA
MD
ME
MG
MK
MN
MW
MX
MY
MZ
NA
NG
NI
NO
NZ
OM
PG
PH
PL
PT
RO
RS
RU
SC
SD
SE
SG

SK
SL
SM
SV
SY
TJ
TM
TN
TR
TT
TZ
UA
UG
US
UZ
VC
VN
ZA
ZM
ZW

European:AT
BE
BG
CH
CY
CZ
DE
DK
EE
ES
FI
FR
GB
GR
HU
IE
IS
IT
LT
LU
LV
MC
MT
NL

PL
PT
RO
SE
SI
SK
TR

Eurasian:AM
AZ
BY
KG
KZ
MD
RU
TJ
TM

ARIPO:BW
GH
GM
KE
LS
MW
MZ
NA
SD
SL
SZ
TZ
UG
ZM
ZW

OAPI:BF
BJ
CF
CG
CI
CM
GA
GN
GQ
GW
ML
MR

NE
SN
TD
TG

IPC:

A61K31 / 197
A61K8 / 06
A61K8 / 34
A61K8 / 37
A61K8 / 44
A61K8 / 55
A61K8 / 86
A61K8 / 92
A61K9 / 107
A61K41 / 00
A61K47 / 10
A61K47 / 14
A61K47 / 24
A61K47 / 34
A61K49 / 00
A61P17 / 02
A61P17 / 06
A61P17 / 10
A61P17 / 12
A61P31 / 14
A61P31 / 20
A61P35 / 00
A61Q19 / 08

IPC Main:

A61K31 / 197

CPC:

A61K8 / 06
A61K8 / 34
A61K8 / 375
A61K8 / 44
A61K8 / 4993
A61K8 / 553
A61K9 / 107
A61K2800 / 21
A61K2800 / 413
A61Q19 / 00
B82Y5 / 00

A61P17 / 00
A61P17 / 02
A61P17 / 06
A61P17 / 10
A61P17 / 12
A61P31 / 12
A61P31 / 14
A61P31 / 20
A61P35 / 00
A61K8 / 06
A61K8 / 553
A61Q19 / 00
A61K8 / 375
A61K2800 / 21
A61K8 / 44
A61K8 / 4993
B82Y5 / 00
A61K9 / 107
A61K8 / 34
A61K2800 / 413

CPC Main:

A61K8 / 06
A61K8 / 06

F TERMS:

4C076/AA17
4C076/BB31
4C076/CC18
4C076/CC27
4C076/DD09.F
4C076/DD37.E
4C076/DD38
4C076/DD46.A
4C076/DD63.F
4C076/EE30
4C076/FF15
4C076/FF16
4C076/FF34
4C083/AC10
4C083/AC10
4C083/AC12
4C083/AC42
4C083/AC42
4C083/AC44

4C083/AC44
4C083/AC48
4C083/AD35
4C083/AD57
4C083/AD57
4C083/CC02
4C083/DD33
4C083/DD35
4C083/DD41
4C083/EE13
4C083/EE14
4C083/FF01
4C084/AA11
4C084/MA05
4C084/MA22
4C084/MA63
4C084/NA06
4C084/NA11
4C084/ZB26
4C085/JJ03
4C085/KA20
4C085/KB41
4C085/KB42
4C085/KB60
4C206/AA01
4C206/AA02
4C206/FA47
4C206/MA03
4C206/MA05
4C206/MA42
4C206/MA83
4C206/NA06
4C206/NA11
4C206/ZA89
4C206/ZB26
4C206/ZB33

FI:

A 61K 31/19
A 61K 9/10
A 61K 8/06
A 61K 8/34
A 61K 47/10
A 61K 47/14
A 61K 8/37

A 61K 8/92
A 61K 47/24
A 61K 8/55
A 61K 8/86
A 61K 47/34
A 61K 8/44
A 61P 31/14
A 61Q 19/08
A 61K 41/00
A 61K 49/00 . A
A 61P 31/20
A 61P 17/12
A 61P 17/02
A 61P 17/10
A 61P 35/00
A 61P 17/06

FI Main:

A 61K 31/19

ECLA:

A61K 8/06
A61K 8/34
A61K 8/37C
A61K 8/44
A61K 8/49P
A61K 8/55C
A61K 9/107
A61Q 19/00
B82Y 5/00

ECLA Main:

A61K 8/06

ICO:

K61K800:413
K61K800:21

Orange Book Information:

SPC Information:

Pharmaceutical Indicator:

false

Document Link:

JP2010513363A

PDF Link:

JP2010513363A

Annotation:

(19)日本国特許庁(JP)　(12)公表特許公報(A)　(11)特許出願公表番号
特表2010-513363
(P2010-513363A)
(43)公表日　平成22年4月30日(2010.4.30)

(51)Int.Cl.		F I		テーマコード（参考）
A61K 31/197	(2006.01)	A61K	31/197	4C076
A61K 9/107	(2006.01)	A61K	9/107	4C083
A61K 8/06	(2006.01)	A61K	8/06	4C084
A61K 8/34	(2006.01)	A61K	8/34	4C085
A61K 47/10	(2006.01)	A61K	47/10	4C206

審査請求 未請求　予備審査請求 有　（全 38 頁）　最終頁に続く

(21)出願番号　特願2009-541922 (P2009-541922)
(86)(22)出願日　平成19年12月21日 (2007.12.21)
(85)翻訳文提出日　平成21年8月21日 (2009.8.21)
(86)国際出願番号　PCT/EP2007/011404
(87)国際公開番号　WO2008/077641
(87)国際公開日　平成20年7月3日 (2008.7.3)
(31)優先権主張番号　06026698.8
(32)優先日　平成18年12月22日 (2006.12.22)
(33)優先権主張国　欧州特許庁 (EP)

(71)出願人　500386688
バイオフロンテラ　バイオサイエンス　ゲゼルシャフト　ミット　ベシュレンクテル　ハフツング
Ｂｉｏｆｒｏｎｔｅｒａ　Ｂｉｏｓｃｉｅｎｃｅ　ＧｍｂＨ
ドイツ連邦国、レバークセン、Ｄ－５１３７７、ヘメルラテール　ウエグ　２０１
Ｈｅｍｍｅｌｒａｔｈｅｒ　Ｗｅｇ　２０１，　Ｄ－５１３７７　Ｌｅｖｅｒｋｕｓｅｎ，　Ｇｅｒｍａｎｙ
(74)代理人　100061815
弁理士　矢野　敏雄
(74)代理人　100094798
弁理士　山崎　利臣

最終頁に続く

(54)【発明の名称】ナノエマルジョン

(57)【要約】
本発明は、少なくとも１つの水性成分と担体とを含むナノエマルジョンであって、担体は少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含み、少なくとも１つのアルコールは少なくとも３つの炭素原子を有することを特徴とする、ナノエマルジョンに関する。本発明は、さらに、前記ナノエマルジョンと活性剤とを含む組成物に関する。具体的には、組成物はゲルとして存在し、活性剤は５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物である。本発明は、さらに、前記ナノエマルジョンおよび／または組成物の製造、および皮膚疾患、ウイルス関連疾患、ならびに細胞増殖関連疾患、具体的には腫瘍疾患および／または乾癬の処置のためのそれらの使用に関する。本発明は、さらに、前記ナノエマルジョンの化粧品における使用も対象とする。

【特許請求の範囲】
【請求項１】
ａ）少なくとも１つの水性成分と、ｂ）ｉ）少なくとも１つの親油性成分と、ｉｉ）少なくとも１つの界面活性剤と、ｉｉｉ）少なくとも１つのアルコールとを含む担体とを含み、前記少なくとも１つのアルコールが、少なくとも３つの炭素原子を有する、ナノエマルジョン。
【請求項２】
前記担体が水性成分中に存在する、請求項１に記載のナノエマルジョン。
【請求項３】
前記ナノエマルジョンの総質量に対して、前記親油性成分が０．１質量％～１５質量％の量で存在し、前記界面活性剤が１質量％～３０質量％の量で存在し、前記アルコールが０．１質量％～１０質量％の量で存在する、請求項１または２に記載のナノエマルジョン。
【請求項４】
前記水性成分が、前記ナノエマルジョンの総質量に対して、５０質量％～９８質量％の量で存在する、請求項１から３までのいずれか１項に記載のナノエマルジョン。
【請求項５】
前記少なくとも１つのアルコールが、イソプロピルアルコールおよび／または１－プロピルアルコールである、請求項１から４までのいずれか１項に記載のナノエマルジョン。
【請求項６】
前記少なくとも１つの親油性成分が、トリグリセリド類および／またはそれらの混合物である、請求項１から５までのいずれか１項に記載のナノエマルジョン。
【請求項７】
前記少なくとも１つの界面活性剤が、レシチンおよび／またはポリオキシエチレン型界面活性剤である、請求項１から６までのいずれか１項に記載のナノエマルジョン。
【請求項８】
前記レシチンが大豆レシチンであり、前記ポリオキシエチレン型界面活性剤がポリソルベート８０である、請求項７に記載のナノエマルジョン。
【請求項９】
前記大豆レシチンが、少なくとも８０質量％のホスファチジルコリン含有量を有する、請求項８に記載のナノエマルジョン。
【請求項１０】
乳化粒子の平均直径が、５ｎｍ～５００ｎｍ、好ましくは１００ｎｍ未満である、請求項１から９までのいずれか１項に記載のナノエマルジョン。
【請求項１１】
前記乳化粒子の平均直径が、１０～５０ｎｍの範囲である、請求項１から１０までのいずれか１項に記載のナノエマルジョン。
【請求項１２】
請求項１から１１までのいずれか１項に記載のナノエマルジョンの製造方法であって、
ａ）水性成分を提供するステップと、
ｂ）少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含む担体であって、前記少なくとも１つのアルコールは少なくとも３つの炭素原子を有する担体を提供するステップと、
ｃ）前記ステップａ）の水性成分を前記ステップｂ）の担体と混合するステップと、
を含む方法。
【請求項１３】
請求項１から１１までのいずれか１項に記載のナノエマルジョンを含む、医薬用および／または美容用組成物。
【請求項１４】
請求項１３までのいずれか１項に定義されるナノエマルジョンと、活性剤とを含む組成

物。
【請求項１５】
前記活性剤が、５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物からなる群から選択される、請求項１４に記載の組成物。
【請求項１６】
５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物が、前記ナノエマルジョンの粒子の外側単層に付着している、請求項１５に記載の組成物。
【請求項１７】
請求項１４から１６までのいずれか１項に記載の組成物を含む、医薬用、美容用、および／または診断用組成物。
【請求項１８】
ゲルとして存在し、前記組成物の総質量に対して、前記活性剤０．０１質量％～５０質量％と、前記ナノエマルジョン１質量％～６０質量％と、前記少なくとも１つの充填剤０．０１質量％～４質量％と、前記少なくとも１つの保存剤１質量％～３質量％とを含み、残りは前記少なくとも１つの溶媒である、請求項１４から１７までのいずれか１項に記載の組成物。
【請求項１９】
請求項１４から１８のいずれか１項に定義される組成物の製造方法であって、
ａ）水性成分を提供するステップと、
ｂ）少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含む担体であって、前記少なくとも１つのアルコールは少なくとも３つの炭素原子を有する担体を提供するステップと、
ｃ）ナノエマルジョンを形成するために、前記ステップａ）の水性成分を前記ステップｂ）の担体と混合するステップと、
ｄ）前記ステップｃ）のナノエマルジョンの形成前および／または形成後に、前記活性剤を添加するステップと、
ｅ）場合によっては、ステップｄ）にさらなる添加剤および／または賦形剤を添加するステップと、
を含む方法。
【請求項２０】
前記ステップｄ）における活性剤が、前記ステップｃ）のナノエマルジョンの形成後に添加される、請求項１９に記載の方法。
【請求項２１】
抗老化剤としての、請求項１から１１までのいずれか１項に記載のナノエマルジョン、または請求項１３から１８までのいずれか１項に記載の組成物の美容用の使用。
【請求項２２】
ウイルス関連疾患処置用の薬物の製造のための、請求項１から１１までのいずれか１項に記載のナノエマルジョン、および／または請求項１３から１８までのいずれか１項に記載の組成物の使用。
【請求項２３】
前記ウイルス関連疾患がヒトパピローマウイルス（ＨＰＶ）に起因する、請求項２２に記載の使用。
【請求項２４】
前記ウイルス関連疾患が尖圭コンジロームである、請求項２３に記載の使用。
【請求項２５】
皮膚疾患処置用の薬物の製造のための、請求項１から１１までのいずれか１項に記載のナノエマルジョン、および／または請求項１３から１８までのいずれか１項に記載の組成物の使用。
【請求項２６】
前記障害が神経皮膚炎からなる群から選択される、請求項２５に記載の使用。

【請求項２７】
前記皮膚疾患が、ざ瘡および／または角化症関連疾患である、請求項２６に記載の使用。
【請求項２８】
前記角化症が光線角化症である、請求項２７に記載の使用。
【請求項２９】
細胞増殖関連疾患の処置のための薬物を製造するための、請求項１から１１までのいずれか１項に記載のナノエマルジョン、および／または請求項１３から１８までのいずれか１項に記載の組成物の使用。
【請求項３０】
前記細胞増殖関連疾患が腫瘍疾患である、請求項２９に記載の使用。
【請求項３１】
前記腫瘍疾患が、基底細胞腺腫、扁平上皮細胞癌、ボーエン病、外陰上皮内腫瘍（ＶＩＮ）、および／または結節性および／または皮下癌疾患からなる群から選択される、請求項３０に記載の使用。
【請求項３２】
前記疾患が乾癬である、請求項２５または２９に記載の使用。
【請求項３３】
光線力学療法における薬物の製造のための、請求項１５から１８までのいずれか１項に記載の組成物の使用。
【請求項３４】
前記組成物が有効量で患者に投与されて、処置を行なう組織内に十分量の前記活性剤を提供するのに適切な時間放置され、前記組織は光線放射を受ける、請求項３３に記載の使用。
【請求項３５】
増殖細胞の検出のための、請求項１５から１８までのいずれか１項に記載の組成物の使用。
【請求項３６】
皮膚および／または腫瘍疾患の診断のための、請求項１５から１８までのいずれか１項に記載の組成物の使用。
【請求項３７】
請求項１５から１８までのいずれか１項に記載の組成物と、
ａ）フォトレジスト被覆と、
ｂ）前記被覆を適用部位に付着する手段と、
ｃ）前記組成物を適用部位に適用する手段と、
から選択される少なくとも１つの成分と、
を含むキット。
【請求項３８】
ウイルス関連疾患、皮膚疾患、および／または細胞増殖関連疾患を処置する方法であって、請求項１から１１までのいずれか１項に記載の薬学有効量のナノエマルジョンおよび／または請求項１３から１８のいずれか１項において定義される組成物を、それらを必要とする被験体に投与するステップを含む方法。
【請求項３９】
５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物からなる群から選択さる活性剤と、ナノエマルジョンとを含む組成物であって、前記ナノエマルジョンはアルコールを含む組成物。
【請求項４０】
少なくとも１つの水性成分、好ましくは水、少なくとも１つの親油性成分、および／または少なくとも１つの界面活性剤をさらに含む、請求項３９に記載の組成物。
【請求項４１】

前記アルコールがC_2～C_8アルコール、特にC_3～C_8アルコールである、請求項３９または４０までのいずれか１項に記載の組成物。

【請求項４２】

前記アルコールが、イソプロピルアルコールおよび／または１－プロピルアルコールである、請求項４１に記載の組成物。

【請求項４３】

５－アミノレブリン酸、その誘導体、前駆体および／または代謝生成物が、前記ナノエマルジョンの外側単層に付着している、請求項３８から４２までのいずれか１項に記載の組成物。

【請求項４４】

前記少なくとも１つの親油性成分がミグリオールであり、前記少なくとも１つの界面活性剤がレシチン、好ましくは大豆レシチン、および／またはポリオキシエチレン型界面活性剤、好ましくはポリソルベート８０である、請求項３８から４２までのいずれか１項に記載の組成物。

【請求項４５】

請求項３８から４４までのいずれか１項に記載の組成物を含む、医薬用および／または診断用組成物。

【請求項４６】

ウイルス関連疾患処置用の薬物の製造のための、請求項３８から４４までのいずれか１項に記載の組成物の使用。

【請求項４７】

前記ウイルス関連疾患がヒトパピローマウイルス（ＨＰＶ）に起因する、請求項４６に記載の使用。

【請求項４８】

前記ウイルス関連疾患が尖圭コンジロームである、請求項４７に記載の使用。

【請求項４９】

皮膚疾患処置用の薬剤の製造のための、請求項３９から４４までのいずれか１項に記載の組成物の使用。

【請求項５０】

前記皮膚疾患が、ざ瘡および／または角化症に関連する疾患である、請求項４９に記載の使用。

【請求項５１】

前記角化症が光線角化症である、請求項４４に記載の使用。

【請求項５２】

細胞増殖関連疾患処置用の薬物を製造するための、請求項３９から４４までのいずれか１項に記載の組成物の使用。

【請求項５３】

前記細胞増殖関連疾患が腫瘍疾患である、請求項５２に記載の使用。

【請求項５４】

前記腫瘍疾患が、基底細胞腺腫、扁平上皮細胞癌、ボーエン病、外陰上皮内腫瘍（ＶＩＮ）、および／または結節性および／または皮下癌疾患からなる群から選択される、請求項５３に記載の使用。

【請求項５５】

前記疾患が乾癬である、請求項４９または５２に記載の使用。

【請求項５６】

光線力学療法における薬物の製造のための、請求項３９から４４までのいずれか１項に記載の組成物の使用。

【請求項５７】

前記組成物が、有効量で患者に投与されて、処置を行なう組織内に十分な量の前記活性剤を提供するのに適切な時間放置され、前記組織は光線放射を受ける、請求項５６に記載

の使用。
【請求項５８】
増殖細胞の検出ための、請求項３９から４４までのいずれか１項に記載の組成物の使用。
【請求項５９】
皮膚および／または腫瘍疾患の診断ための、請求項３９から４４までのいずれか１項に記載の組成物の使用。
【請求項６０】
ナノエマルジョンと活性剤とを含む組成物であって、前記活性剤が前記ナノエマルジョンの粒子の外側単層に付着している組成物。
【請求項６１】
前記ナノエマルジョンおよび／または前記活性剤が、請求項３９から４４のいずれか１項と同様に定義される、請求項６０に記載の組成物。
【請求項６２】
請求項６０または６１に記載の組成物を含む、医療用および／または美容用組成物。
【請求項６３】
前記ウイルス関連疾患、皮膚疾患、細胞増殖関連疾患処置用の薬物の治療、および／または前記光線力学療法における薬物の製造のための、請求項６０または６１に記載の組成物の使用。
【発明の詳細な説明】
【技術分野】
【０００１】
本発明は、少なくとも１つの水性成分と担体とを含むナノエマルジョンであって、担体は少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含むナノエマルジョンに関する。本発明は、さらに、前記ナノエマルジョンと活性剤とを含む組成物に関する。具体的には、組成物はゲルとして存在し、活性剤は５－アミノレブリン酸（ＡＬＡ）、その誘導体、前駆体、および／または代謝生成物である。本発明は、さらに、前記ナノエマルジョンおよび／または組成物の製造、および皮膚疾患、ウイルス関連疾患、ならびに細胞増殖関連疾患、具体的には腫瘍疾患および／または乾癬の処置のためのそれらの使用に関する。本発明は、さらに、前記ナノエマルジョンの化粧品における使用も対象とする。
【０００２】
ナノエマルジョンは、コロイド系を構成する。コロイド系には、ミセル、リポソーム、ビロソーム、ナノ懸濁液、マイクロエマルジョン、およびポリマー溶液が含まれる。ナノエマルジョンは、その物理学的および化学的特徴に基づき、マイクロエマルジョンのグループに属する。マイクロエマルジョンは、界面活性剤および共界面活性剤の単層で包囲された脂質コアから構成される均質なマイクロサイズ粒子の水性分散液である。ナノエマルジョンは、２００ｎｍ未満であり、しばしば１００ｎｍ未満の平均粒径（平均直径）と、狭い単分散粒径分布とを特徴とする。さらに、ナノエマルジョンは透明であり、わずかに乳白光を放つ。これらは一般的に、界面活性剤の存在下、水相中で油相を機械的に断片化することによって製造される。非常に小さいサイズの油性小球は、多くの場合、高圧ホモジナイザーまたはソニケーターを少なくとも１回通過させることによって得られる。本明細書に記載されるナノエマルジョンの製造は、かかる高せん断装置を必要としない。小球の小さいサイズおよびその高い均質性は、それらを従来の乳剤と区別する美容に有利な特性を与える。それらは透明であって、新規の質感を示す。さらに、それらは活性剤をより効率的に運搬することができ、したがって医療および薬学の分野においてますます重要となっている。
【０００３】
ナノ分散液と称されるマイクロエマルジョンは、当該技術分野で公知であり、ａ）膜形成分子、例えば大豆レシチン、ｂ）共乳化剤、ｃ）親油性成分、例えばカプリルおよび／

またはカプリントリグリセリド（ミグリオール　８１２またはＭｙｒｉｔｏｌ　３１８）、および場合によっては、ｄ）アルコール、具体的にはエタノール（ＥＰ　０　９５６　８５３）を含む。これらのナノ分散液は、薬学的活性剤の輸送媒体として、医薬製剤に使用される。

【０００４】

しかしながら、ナノエマルジョン中にエタノールを使用すると、いくつかの不利益を被る。

【０００５】

第１に、共界面活性剤としてのエタノールの使用は、より長い炭素鎖を有するアルコールの使用よりも大きいナノ粒子をもたらす。より大きい粒子は、皮膚とナノエマルジョンとの間の接触面を減少させ、浸透率の低下を引き起こす。第２に、エタノールは、比較的低い１．１０ｃｐの粘度を有し、これはマイクロエマルジョンの安定性に最適ではない。さらに、エタノールの比較的低い疎水性により、皮膚の親油性生理膜を通してのナノエマルジョンの浸透が損なわれうる。結果として、ナノエマルジョンの安定性、ならびにその生物学的利用能、すなわち組織内への浸透が低下する。さらに、エタノールは、イソプロピルアルコールなどの他の種類のアルコールと比較して、高価なアルコールである。さらに、エタノールは、複数の国において、一定の条件下で特別なアルコール税の対象となる。

【０００６】

したがって、本発明の目的は、従来技術において言及した不利点を克服し、また具体的には、安定性ならびに細胞および組織内への浸透を向上させうる最適な物理学的特性を示し、同時に最新技術のナノエマルジョンよりも安価なナノエマルジョンを提供することであった。

【０００７】

この目的は、ａ）少なくとも１つの水性成分と、ｂ）ｉ）少なくとも１つの親油性成分、ｉｉ）少なくとも１つの界面活性剤、およびｉｉｉ）少なくとも１つのアルコールを含む担体であって、少なくとも１つのアルコールは少なくとも３つの炭素原子を有する担体と、を含むナノエマルジョンを提供することにより、本発明によって達成される。

【０００８】

発明者は、本発明によるナノエマルジョンは、最適に低い平均粒径と狭い粒径分布を有することを発見した。粒径の減少は、ナノエマルジョンの安定性の増加と、細胞および組織内への浸透の向上に寄与する。

【０００９】

担体の成分ｉ）、すなわち親油性成分の量は、ナノエマルジョンの総質量に対して、好ましくは０．１質量％～１５質量％、より好ましくは１質量％～８質量％、また最も好ましくは３質量％～４質量％の量で存在する。担体の成分ｉｉ）、すなわち界面活性剤量は、ナノエマルジョンの総質量に対して、好ましくは１質量％～３０質量％、より好ましくは２質量％～１５質量％、また最も好ましくは４質量％～６質量％の量で存在する。担体の成分ｉｉｉ）、すなわちアルコールは、ナノエマルジョンの総質量に対して、好ましくは０．１質量％～１０質量％、より好ましくは０．５質量％～５質量％、また最も好ましくは１質量％～２質量％の量で存在する。

【００１０】

水性成分は、ナノエマルジョンの総質量に対して、好ましくは５０質量％～９８質量％、より好ましくは７０質量％～９５質量％、また最も好ましくは８８質量％～９２質量％の量でナノエマルジョン中に存在する。有利には、ナノエマルジョンのこの特定の構成は、皮膚に対して極めて許容可能であり、皮膚への塗布時にべたついた感触を生じないナノエマルジョンをもたらすが、これはとりわけ、界面活性剤と親油性成分の比較的低い比率による。

【００１１】

本発明の好適な実施形態では、ナノエマルジョンは、界面活性として、膜形成界面活性

剤およびＯ／Ｗ乳剤形成共界面活性剤を含む。膜形成界面活性剤：Ｏ／Ｗ乳剤形成共界面活性剤の量の質量比は、０．１：１～１０：１、好ましくは０．２：１～０．８：１、より好ましくは０．４：１～０．６：１の範囲である。

【００１２】

本発明の適用範囲内の少なくとも３個の炭素原子を有する好適なアルコールは、３～１０個、好ましくは３～７個、より好ましくは３～５個、また最も好ましくは３個の炭素原子を有するアルコールである。炭素原子５個を有する特に適切なアルコールは、１－ペンタノールおよび／または４－メチル－２－ペンタノールである。炭素原子４個を有する適切なアルコールは、１－ブチルアルコール、ｔｅｒｔ－ブチルアルコール（２－メチル－２－プロパノール）、および／またはｓｅｃ－ブチルアルコール（２－ブタノール）である。最も好適なものは、炭素原子３個を有するアルコール、すなわち１－プロピルアルコールおよびイソプロピルアルコールであり、イソプロピルアルコールが好ましい。本発明のナノエマルジョンに、C_3－アルコール、具体的にはイソプロピルアルコールを使用することにより、本発明者らは、このナノエマルジョンが、アルコールとしてエタノールを使用する最新技術のナノエマルジョンと比較して、減少した粒径およびより狭い粒径分布、ならびに安定性の改善および組織内への浸透の促進を示すことを発見した。イソプロパノールとエタノールとは、その生理学的および化学的特性が非常に類似していることから、これは意外なことであった。

【００１３】

本発明のナノエマルジョンにアルコールとしてイソプロパノールを使用する場合、エタノールの使用と比較して、乳化粒子のサイズが小さい。結果として得られるナノエマルジョンの皮膚との接触面の増加により、浸透特性が向上する。また粒径の減少も、最終的に相分離につながる粒子凝集の速度は粒径に伴って増加することが知られていることから、ナノエマルジョンの安定性の改善には決定的に重要である。イソプロパノールの有利な効果は、そのわずかに高い疎水性による可能性があり、これは親油性生理膜を通して浸透するより優れた能力をもたらしうる。さらに、イソプロパノールは、エタノール（粘度／ｃｐ、２５℃、１．１０）と比較してより高い粘度（２５℃でｃｐ２．３２）を有する。前記のイソプロパノールのより高い粘度は、粘度が分子の移動度を低下させるため、ナノエマルジョンにおけるより優れた安定化機構に役立ちうる。エタノールと比較したイソプロパノールのさらなる利点には、エタノールの価格の約１／３という比較的低価格で入手でき、付加的なアルコール税が免除されることがある。

【００１４】

好ましくは、本発明のナノエマルジョンの担体の少なくとも１つの親油性成分は、脂質、植物油、および／または動物油である。本発明による適切な脂質は、生理学的に許容される脂質、例えばセラミド、モノ－、ジ－、およびトリアシルグリセリン（トリグリセリド）、特にカプリルおよび／またはカプリントリグリセリド、および／またはそれらの混合物、特に好ましくはミグリオール（例えばＨｅｎｋｅｌから入手可能な、ミグリオール８１２またはＭｙｒｉｔｏｌ　３１８など）である。適切な植物油および動物油は、例えば、ひまわり油、大豆油、落花生油、菜種油、魚油、および／または鯨蝋である。

【００１５】

適切な膜形成界面活性剤は、リン脂質、リゾリン脂質、セラミド、および／またはそれらの混合物である。好ましくは、リン脂質は大豆または鶏卵由来のレシチンまたはセファリン、より好ましくは、レシチンは大豆レシチンである。

【００１６】

好ましくは、レシチンは、ホスファチジルコリン含有量少なくとも８０質量％、より好ましくは少なくとも９０質量％、また最も好ましくは少なくとも９４質量％を有する。発明者らは、レシチンの質、すなわちそのホスファチジルコリン含有量は、ナノエマルジョンの粒径に重大な影響を与えることを見いだした。レシチンのホスファチジルコリン含有量が高いほど、ナノエマルジョンの粒径は小さくなる。

【００１７】

Ｏ／Ｗ乳剤形成共界面活性剤としては、アニオン性、非イオン性、カチオン性、および／または両性の界面活性剤が、ブロックコポリマーに加えて適している。適切なアニオン性界面活性剤は、石けん、アルキルベンゼンスルホン酸塩、アルカンスルホン酸塩、アルキル硫酸塩、および／またはアルキルエーテル硫酸塩である。適切なカチオン性界面活性剤は、４級アンモニウム化合物、好ましくは１個または２個の疎水性基を有するもの（例えば、臭化セチルトリメチルアンモニウムおよび塩化セチルトリメチルアンモニウム）、および／または長鎖１級アミンの塩である。適切な両性界面活性剤は、Ｎ－（アシルアミドアルキル）ベタイン、Ｎ－アルキル－β－アミノプロピオン酸塩、および／またはアミン－Ｎ－オキシドである。適切なブロックコポリマーは、例えばプロピレンオキシドである。本発明の適用範囲において、非イオン性界面活性剤は、Ｏ／Ｗ乳剤形成共界面活性剤として特に好適である。適切な非イオン性界面活性剤は、脂肪アルコールポリグリコールエーテル、アルキルフェノールポリグリコールエーテル、アルキルポリグルコシド、脂肪酸グルカミド、脂肪酸ポリグリコールエーテル、エチレンオキシド－プロピレンオキシド－ブロックポリマー、ポリグリセロール脂肪酸エステル、脂肪酸アルカノールアミド、および（エトキシル化）ソルビタン脂肪酸エステル（ソルビタン）からなる群から選択される。特に好適なエトキシル化ソルビタン脂肪酸エステルは、ポリオキシエチレンソルビタンモノオレエート、最も好ましくはポリソルベート８０である。

【００１８】

本発明のナノエマルジョンの水性成分は、好ましくは塩含有量の少ない弱い緩衝系、より好ましくは５ｍＭ～３０ｍＭのリン酸緩衝液、また最も好ましくは１０ｍＭのリン酸緩衝液を含む。リン酸緩衝液のｐＨ値は、好ましくはｐＨ４～ｐＨ８、より好ましくはｐＨ５～ｐＨ７、また最も好ましくはｐＨ５．５～ｐＨ６．５の範囲である。リン酸緩衝液を製造するための水は、好ましくは滅菌脱イオン水および／または注射用水、より好ましくは注射用水である。

【００１９】

ナノエマルジョン中の乳化粒子（ナノソーム）の平均直径は、５ｎｍ～５００ｎｍ、好ましくは１０ｎｍ～２００ｎｍ、より好ましくは１００ｎｍ未満、特に９０ｎｍまで、好ましくは７０ｎｍまで、さらに好ましくは１０ｎｍ～５０ｎｍ、また最も好ましくは１５ｎｍ～３５ｎｍである。ナノ粒子のサイズ分布は、好ましくは単分散であり、ガウス分布に従う。本発明の乳化粒子の直径は、粒径分布を用いて判断されるが、これは動的光散乱（ＤＬＳ）（光子相関分光法（ＰＣＳ）とも称される）の方法によって測定される。粒子分布の統計的解析は、本発明に従って、粒子数加重分布と称される方法によって実施される。

【００２０】

本発明のさらなる主題は、本発明によるナノエマルジョンの製造のための方法であって、ａ）水性成分を提供するステップと、ｂ）少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含む担体であって、少なくとも１つのアルコールは少なくとも３つの炭素原子を有する担体を提供するステップと、ｃ）ステップａ）の水性成分をステップｂ）の担体と混合するステップとを含む方法である。ナノエマルジョンを製造することによって、担体の成分が水性成分中に提供され、その混合物は、激しいあるいは穏やかな均質化によってナノエマルジョンに変換される。均質化は、例えば市販のホモジナイザーによって実施してもよい。ナノエマルジョンの製造後、均質化中に存在することが適当ではないさらなる添加物および賦形剤を添加してもよい。

【００２１】

ナノエマルジョンの製造のための方法は、好ましくは無菌状態下で、例えば層流フードを用いて実施する。

【００２２】

発明者らは、組成以外に、製造方法のいくつかのステップも、ナノエマルジョン中の乳化粒子の最終的なサイズおよび粒径分布にとって決定的に重要であることを見いだした。特に、ステップｃ時の温度および均質化の条件は、重要な役割を果たす。ステップｃは、

５０～６０℃の温度で実施する。全ての原料は、あらかじめこの温度まで加熱する。また、容器およびミキサーは、非常に迅速に（数秒内に）成分の均質な混合物を得るために最適化して、泡の形成を回避するべきである。かかる手順の説明は、実施例１を参照されたい。あるいは、均質化は、ソニケーターまたは高圧ホモジナイザーなどの高せん断装置を必要としない。

【００２３】

本発明の別の態様は、本発明のナノエマルジョンを含む医療用および／または美容用組成物である。本発明のナノエマルジョンは、多様な製品タイプに使用することができる上品な半透明および透明の媒体を提供するため、化粧品の分野において、例えば抗老化剤として適している。このナノエマルジョンは、非常に精巧なバランスの系を提供するが、これは刺激性であると考えられる乳化剤を比較的低レベルで有する。本発明のナノエマルジョンは、望ましい透明性または半透明性を保持し、適当な量の添加剤、例えば香料または保湿剤を受け入れることができるが、低レベルの乳化剤により、使用者の皮膚上では安定し、刺激が少なく、かつ穏やかな状態を保つ。化粧品の場合の最終製品の使用目的で、非治療剤または非活性剤、例えば皮膚軟化剤、香味料、着色剤、香料、ゲル化剤、増粘剤、日焼け止めなどを添加することが可能であり、これらは製品の最終的な使用を特に局所美容目的の場合に向上させるが、ただし製品の澄明度を妨げる成分を選択することを避けるように注意する。最終製品は、とりわけ、乳液、クリーム、ローション、ゲル、セラム、または液体スプレーの形態をとることができる。日焼け止めの場合、本発明のナノエマルジョンは、１つ以上の日焼け止め剤、例えばベンゾフェノン、アヴォベンゾン、桂皮酸エステル、サリチル酸エステルなどを組み込むことができる。

【００２４】

ナノエマルジョンは、医薬組成物にも使用することができるが、具体的には、これらは皮膚疾患、例えば神経皮膚炎、乾癬、角化症、特に光線角化症、および細胞増殖関連疾患、例えば腫瘍疾患処置用の局所用薬物の製造に用いることができる。好ましくは、腫瘍疾患は、基底細胞癌、扁平上皮細胞癌、ボーエン病、外陰上皮内腫瘍（ＶＩＮ）、または結節性もしくは皮下癌疾患からなる群から選択される。さらに、ナノエマルジョンは、尖圭コンジロームなどのヒトパピローマウイルスに起因するウイルス関連疾患の処置に適している。ナノエマルジョンの親油性成分を取り込むことにより、経皮水分喪失に有利な影響を与えることができる。すなわち、皮膚のバリア機能を向上させ、それによって神経皮膚炎などの皮膚疾患に有利に作用しうる。

【００２５】

本発明の別の態様は、本発明のナノエマルジョンと活性剤とを含む組成物に関する。この点において、組成物は、医療用および／または美容用組成物として、例えば皮膚または毛髪への適用に特に有用である。前記の組成物に含まれる本発明のナノエマルジョンは、多様な活性剤の非常に効率的な送達系を提供する。有用でありうる活性剤の例には、染み、角化症、およびしわの根絶のための物質、鎮痛薬、麻酔薬、抗ざ瘡剤、抗菌薬、抗酵母菌薬、抗真菌薬、抗ウイルス薬、抗フケ剤、抗皮膚炎剤、鎮痒薬、制吐薬、抗動揺病薬、抗炎症薬、抗高角質溶解薬、抗乾燥肌剤、制汗剤、乾癬治療薬、抗脂漏剤、ヘアコンディショナーおよびヘアトリートメント剤、抗老化剤、抗しわ剤、抗ぜんそく薬および気管支拡張薬、日焼け止め剤、抗ヒスタミン剤、皮膚美白剤、脱色剤、ビタミン、コルチコステロイド、ホルモン、レチノイン酸およびレチノールなどのレチノイド、局所心血管剤、クロトリマゾール、ケトコナゾール、ミコナゾール、グリセオフルビン、ヒドロキシジン、ジフェンヒドラミン、プラモキシン、リドカイン、プロカイン、メピバカイン、モノベンゾン、エリスロマイシン、テトラサイクリン、クリンダマイシン、カナマイシン、メクロサイクリン、ハイドロキノン、ミノサイクリン、ナプロキセン、イブプロフェン、テオフィリン、クロモリン、アルブテロール、局所ステロイド類、例えばヒドロコルチゾン、ヒドロコルチゾン２１－アセテート、ヒドロコルチゾン１７－バレエート、およびヒドロコルチゾン１７－ブチレート、吉草酸ベタメタゾン、ジプロプリオン酸ベタメタゾン、トリアムシノロンアセトニド、フルオシノニド、プロプリオン酸クロベタゾール、過酸化ベン

ゾイル、クロタミトン、プロプラノロール、プロメタジン、ビタミンＡパルミテート、ビタミンＥアセテート、ならびにそれらの混合物が含まれる。

【００２６】

本発明の好適な実施形態では、活性剤は、５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物からなる群から選択される。「誘導体」は、１個または２個のアルキル基、特に好ましくは１個のメチル基で置換された５－アミノレブリン酸のアミノ基のエステル化として理解される。最も好適な誘導体は、メチルアミノレブリン酸である。誘導体化は、塩錯体および付加化合物、ならびにアルキル化化合物としても理解することができる。「前駆体」および「代謝生成物」は、細胞中でプロトポルフィリンＩＸに変換された物質として理解される。活性剤の５－アミノレブリン酸またはその誘導体は、特に好ましい。

【００２７】

５－アミノレブリン酸は、光線力学療法におけるプロドラッグとして使用される。光線力学療法は、細胞増殖に関連する様々な前悪性および悪性疾患の処置のための有望な方法である（Ｔａｙｌｏｒ ＥＬ ａｎｄ Ｂｒｏｗｎ ＳＢ，２００２，Ｊｏｕｒｎａｌ ｏｆ Ｄｅｒｍａｔｏｌｏｇｉｃａｌ Ｔｒｅａｔｍｅｎｔ，１３，Ｓｕｐｐｌ．１，Ｓ３－１１、およびＰｅｎｇ Ｑ．ｅｔ ａｌ．，１９９７，Ｃａｎｃｅｒ，７９，Ｓ２２８２－２３０８）。光線力学療法の原理は、いわゆる光感作薬の病変組織内に導入し、その後適切な波長の光線を放射することによって、その薬剤を細胞傷害活性を有する薬剤に転換し、それによって細胞破壊を生じることに基づく。本方法の選択性は、高速増殖細胞または病変細胞では、正常組織と比較して、感作薬の濃度が高いことによる。さらに、光感受性物質の照射は特徴的な蛍光放射を生じさせ、これは診断目的で、例えば増殖細胞を検出するために使用できる。

【００２８】

５－アミノレブリン酸は、細胞内でグリシンとスクシニルＣｏＡとから合成される内因性物質である。ヘム生合成の範囲内で、高い光活性を有するプロトポルフィリンＩＸが５－アミノレブリン酸（５－ＡＬＡ）から形成され、その後ヘムに変換される。この抑制機構は、合成によって製造した５－アミノレブリン酸を外部から投与することによって回避され、それによってプロトポルフィリンＩＸの生成の増加を引き起こす。プロトポルフィリンＩＸの分解は天然の抑制機構によってさらに阻害されるため、この化合物は細胞内に集積する。光線を照射すると、プロトポルフィリンＩＸは、光化学酸化反応を起こし、その結果、光線力学療法の光感受性物質として作用する。

【００２９】

５－アミノレブリン酸の全身適用は、複数の副作用に関連するが、この薬品を局所適用することによって回避できる。局所適用可能な５－アミノレブリン酸組成物を用いた複数の研究は、従来技術から公知である。これらの研究は、使用する５－アミノレブリン酸が水中油型乳剤の形態であるという共通の特徴を有するが、その他のパラメータ、例えば浸透時間、処置時間、使用する光線の種類、および使用する光線の線量などに関しては相違する。

【００３０】

Ｂ．Ｔｈｉｅｌｅ ｅｔ ａｌ．（Ｈ＋Ｇ，Ｖｏｌ．６９，Ｎｏ．３，ｐｐ １６１－１６４ （１９９４））は、水中油型乳剤の形態で２０％のδ－アミノレブリン酸を浸透時間５～６時間で用い、その後アルゴンイオン－ポンプ色素レーザー（発光ピーク６３０ｎｍ）で照射し、累積総線量５０～１００Ｊ／ｃｍ^{2}を付与することを含む研究を記載している。

【００３１】

Ｗｏｌｆ ｅｔ ａｌ．（Ｊｏｕｒｎａｌ ｏｆ ｔｈｅ Ａｍｅｒｉｃａｎ Ａｃａｄｅｍｙ ｏｆ Ｄｅｒｍａｔｏｌｏｇｙ，Ｖｏｌ．２８，ｐｐ．１７－２１，１９９３）は、水中油型乳剤の形態で２０％の５－アミノレブリン酸を浸透時間４、６、または８時間で用い、フィルターをかけていない光線または赤色光で照射し、３０Ｊ／

ｃｍ^2～１００Ｊ／ｃｍ^{2}の光線量を付与することを含む研究を記載している。

【００３２】

従来技術において開示されている研究は、５－アミノレブリン酸を用いた光線力学療法の有望な可能性を明らかに示しているが、これまでに知られている水中油型乳剤は、複数の不利点を有する。

【００３３】

例えば、Ｍ．Ｎｏｖｏ Ｒｏｄｒｉｇｕｅｚ ｅｔ ａｌ．（ＳＰＩＥ，Ｖｏｌ．２３７１，ｐｐ．２０４－２０９）は、臨床適用に要求される高濃度では、アミノレブリン酸は、中性から塩基性のｐＨ領域の水性溶液中で不安定であることを示している。２５時間の研究時間中、満足のいく結果は、濃度３％およびｐＨ５においてのみ得られ、これらは５－アミノレブリン酸の水性溶液に対する最適条件として明記されている。しかし臨床使用では、一般的に、より高い濃度範囲の組成物を提供することも必要となるであろう。さらに、市販で使用するためには、５－ＡＬＡ溶液は、数週間または数ヶ月の規模の期間安定でなければならない。

【００３４】

Ｖ．ｖｏｎ Ａｒｘ ｅｔ ａｌ．（Ｊ．Ｐｈａｒｍ．Ｐｈａｒｍａｃｏｌ．４９：６５２－６５６，１９９７）は、５－アミノレブリン酸の様々なゲルでの局所適用に関する研究を記載している。この出版物は、５－アミノレブリン酸の安定性を維持するための最高の処方は、ｐＨ＜６における、Ｎｏｖｅｏｎ ＡＡ－１（ポリアクリル酸）との組み合わせであると記載している。

【００３５】

Ｈｕｅｒｌｉｍａｎｎ ｅｔ ａｌ．（Ｄｅｒｍａｔｏｌｏｇｙ，Ｖｏｌ．１９７，Ｎｏ．３，１９９８，ｐｐ．２４８－２５４）は、５－アミノレブリン酸を含むナノコロイドローション、ならびに光線力学療法におけるその使用を、さらに乳剤を特定せずに開示している。

【００３６】

国際特許出願公開第００／２８９７１号は、ナノエマルジョンおよび５－アミノレブリン酸を含む組成物を記載している。ここではナノエマルジョンは、卵レシチン（８３％ホスファチジルコリン）、ミグリオール ８１２（トリグリセリド）、およびポリソルベート８０を含む２０ｍＭのリン酸緩衝液からなるが（国際特許出願公開第００／２８９７１号の実施例１を参照）、溶媒としてアルコールは使用されていない。しかし、乳化剤として卵レシチンを含有するナノコロイド処方物は、乳化剤として大豆レシチンを含有する５－アミノレブリン酸ナノエマルジョンよりも著しく強く着色されるという不利点を有する。この処方物における色の変化は、活性剤５－アミノレブリン酸の分解生成物の形成と相関する。このことから、卵レシチンを含有するナノエマルジョン処方物は、乳化剤として大豆レシチンを含有する処方物と比較して、５－アミノレブリン酸の安定化の大幅な低下を伴うことが判断されるべきである。

【００３７】

５－アミノレブリン酸と組み合わせた公知の水中油型乳剤の別の不利点は、光感受性物質の損傷組織内への浸透深度が最適でないことである。結果として、その光感受性物質を活性化させるために使用する光線の浸透深度は、より深部に位置する層の処置も可能にするであろうにもかかわらず、罹患組織はその上層においてのみ光線力学療法に反応する。

【００３８】

したがって、本発明のさらなる目的は、少なくとも部分的に最新技術の公知の不利点を克服する、５－アミノレブリン酸を含む組成物を提供することであった。

【００３９】

本発明により、この目的は、本発明のナノエマルジョンと、活性剤としての５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物とを含む組成物を提供することによって達成される。これらの組成物において、本発明のナノエマルジョンの安定性、組織内への浸透、ならびに低費用に関する上述の有利な特性を活用して、５－アミノレ

ブリン酸を組織の標的部位に輸送することができる。

【００４０】

アミノレブリン酸と乳剤のナノ粒子との間には、特異的相互作用が発見されている。具体的には、５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物は、ナノエマルジョンのナノ粒子の単層外側に付着している。したがって、アミノレブリン酸は、それらの粒子によって輸送されるが、粒子のコア内には含有されない。逆に、アミノレブリン酸は、アミノレブリン酸と外側単層との間の相互作用により、粒子のコアの外側に位置する。従来のナノエマルジョンでは、それとは対照的に、薬品はナノエマルジョンの粒子の脂質コア内に含有される。

【００４１】

驚くべきことに、５－アミノレブリン酸の安定性は、５－アミノレブリン酸が少なくとも３個の炭素原子を有する少なくとも１つのアルコールを含む本発明のナノエマルジョンとともに処方された場合に、大幅に向上しうることが見いだされた。この理由は分かっていないが、ナノソームによって作り出される微小環境は、５－アミノレブリン酸の安定性に対する特に有益な効果を有すると考えられる。

【００４２】

また、驚くべきことに、本発明によるナノエマルジョンによって細胞および組織浸透を改善することができ、その結果より深部に位置する疾患、および／またはより高い層厚を有する疾患も処置を受けやすくなることも判明した。このより高い浸透深度は、特にこれまで５－アミノレブリン酸は、サイズの小ささにより、どのような場合にも、例えば炎症、前癌状態、および腫瘍を伴う組織中に存在する損傷表皮を通して容易に浸透することができるであろうと推測されていたため、意外なことであった。

【００４３】

３番目の驚くべき利点は、本発明によるナノソームとともに処方したときに、５－アミノレブリン酸が、細胞から明らかに非常に効率的に取り込まれることである。これは第一に標的化を向上させ、第二に浸透時間、すなわち組成物の適用と罹患組織の光線での照射との間の時間を減少させることができることを意味し、これにより患者は明らかに楽になる。実施例４の図５から推測できるように、培養細胞内への５－アミノレブリン酸の取り込み、および細胞内でのアミノレブリン酸のＰｐＩＸへの変換は、一定濃度のアミノレブリン酸を有する本発明のナノエマルジョンの濃度の増加に伴って促進される。

【００４４】

また、保存安定性も、担体中に溶媒として少なくとも３個の炭素原子を有するアルコールを含む本発明のナノエマルジョンを用いて改善することができる。

【００４５】

本発明によると、組成物は、好ましくは５－アミノレブリン酸、あるいはその誘導体、前駆体、および／または代謝生成物から選択された活性剤を含む。「誘導体」は、１個または２個のアルキル基、特に好ましくは１個のメチル基で置換された５－アミノレブリン酸のアミノ基のエステル化として理解される。最も好適なものは、５－アミノレブリン酸または５－メチルアミノレブリン酸である。誘導体化は、塩錯体および付加化合物、ならびにアルキル化化合物としても理解してもよい。「前駆体」および「代謝生成物」は、細胞中でプロトポルフィリンＩＸに変換された物質として理解される。活性剤の５－アミノレブリン酸またはその誘導体は、特に好ましい。

【００４６】

ナノエマルジョン中の乳化粒子（ナノソーム）のサイズは、上述の通りである。各場合に最適な粒径は、さらなるパラメータ、例えば組成物の粘度などに依存する。例えば、粘度１～１０ｍＰａｓを有するナノエマルジョンを用いて、平均粒径１００ｎｍ未満で良好な結果が得られた。

【００４７】

組成物中の活性剤、好ましくは５－アミノレブリン酸の量は、本質的に、適用目的に依存する。好適な実施形態では、組成物の総質量に対して、活性剤約１～３０質量％が存在

する。ただし、より高いまたは低い用量も適している。好ましくは３～１５質量％の量が、光線力学療法と関連した適用例に適していることが証明されている。

【００４８】

本発明の組成物は、好ましくは、少なくとも１つの保存剤と少なくとも１つの溶媒とをさらに含んでもよい。

【００４９】

特に好適な実施形態では、組成物はゲルとして処方される。含有されるゲル形成剤は、マトリックス形成剤、好ましくはキサンタンである。ゲル形態でのナノエマルジョンの粒径も好ましくは１００ｎｍ未満であるが、粘度は大幅に高く、例えば５００～２０００ｍＰａｓである。

【００５０】

本発明の別の態様は、本発明の組成物を含む、医薬用、美容用、および／または診断用組成物である。この場合、組成物は美容的および／または薬学的に許容される添加剤および／または賦形剤、具体的には化粧品または薬品に一般に使用されている物質をさらに含むことができる。かかる物質の例には、緩衝剤、安定剤、さらなる乳化剤、増粘剤などがある。さらに、組成物は、薬学的または診断的に許容できない構成要素を含まず、また好ましくは、例えば刺激を誘発するおよび／または診断を誤らせる構成要素を含まない。すでに言及した担体物質に加え、医薬用および／または診断用製剤は、許容でき、好ましくは耐容性が良好なさらなる補助薬または／および添加剤を含有していてもよい。

【００５１】

好ましくは、組成物は、液体または半固体として存在する。本発明の適用範囲内の適切な液体は、溶液、好ましくは液滴、スプレー、エアロゾル、乳剤、またはローションからなる群から選択される。本発明の適用範囲内の適切な半固体は、軟膏、クリーム（Ｏ／Ｗ乳剤）、脂性クリーム（Ｗ／Ｏ乳剤）、ゲル、ローション、フォーム、ペースト、および／または懸濁液からなる群から選択される。

【００５２】

皮膚科および婦人科の適用例の場合、製剤は、好ましくは局所投与に適切な形態、特にゲル形態である。製剤は、製剤の投与後に、５－アミノレブリン酸を詰めたナノソームが適当な程度まで標的組織内に浸透することを確実にするために望まれる、適用形態それぞれに適した特性、例えば粘度およびレオロジーなどを有する。前記の粘度およびレオロジー特性は、増粘剤、例えばポリエチレングリコールステアリルエーテル、ポリエチレングリコールステアレート、および／または多糖類、例えば多糖Ｂ－１４５９などを添加することによって調整することができる。

【００５３】

特に好適な実施形態では、本発明の組成物はゲルである。ゲルは、上述の処方物と比較して、改善された生薬特性を示す。本発明のゲル製剤は、より優れた付着性、安定性、活性剤の放出、ならびに皮膚上および粘膜上での耐性を示す。本発明のゲルは、組成物の総質量に対して、好ましくは０．０１質量％～５０質量％、より好ましくは０．５質量％～３０質量％、また最も好ましくは１質量％～２０質量％の活性剤と、１質量％～６０質量％、より好ましくは１５質量％～５０質量％、最も好ましくは１０質量％～３０質量％のナノエマルジョンと、０．０１質量％～４質量％、より好ましくは１質量％～３質量％の少なくとも１つの充填剤と、１質量％～３質量％の少なくとも１つの保存剤とを含み、残りは少なくとも１つの溶媒である。

【００５４】

本発明の別の態様は、本発明の組成物の製造のための方法であって、

ａ）水性成分を提供するステップと、

ｂ）少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含む担体であって、少なくとも１つのアルコールは少なくとも３つの炭素原子を有する担体を提供するステップと、

ｃ）ナノエマルジョンを形成するために、ステップａ）の水性成分をステップｂ）の担体

と混合するステップと、
ｄ）前記のステップｃ）のナノエマルジョンの形成前および／または後に、活性剤を添加するステップと、
ｅ）場合によっては、ステップｄ）にさらなる添加剤および／または賦形剤を添加するステップと、を含む方法である。
【００５５】
特に好ましくは、ステップｄ）の活性剤は、前記のステップｃ）のナノエマルジョン形成後に添加する。
【００５６】
方法は、好ましくは無菌状態下で、例えば層流フードを使用して実施する。上述の方法で使用する水性成分、担体、および活性剤は、上記と同様の好適かつ適切な意味を有する。水性成分と担体との混合は、好ましくは激しい均質化によって実施する。５－アミノレブリン酸、および場合によっては存在する添加物および／または賦形剤は、均質化前および／または後、好ましくは均質化後に添加してよい。
【００５７】
好ましくは、方法を実施する間、例えば真空および／または保護ガス雰囲気を適用することによって、空気を排除する。さらに、方法を行なう間、光を排除することも好ましい。
【００５８】
方法は、所望のナノエマルジョンが上述のように形成でき、またその後のステップのために、構成要素、具体的には活性物質が十分に安定である温度で実施する。一般的に、約５～３０℃の温度範囲が適当であることがわかっている。しかしながら、例えば、別の混合物中でまず混合し、適切な場合には均質化し、その後はじめて組成物に添加する添加剤および／または賦形剤の処理は、より高い温度、例えば約７０℃までの温度で実施してもよい。特に医薬適用の場合、結果として得られる生成物が、例えば滅菌出発物質を用い、滅菌方法条件を維持し、または／および製造後に滅菌ステップを用いることによって、確実に無菌であるよう注意する。
【００５９】
化粧品の分野においては、本発明の組成物は、好ましくは、例えば染み、しわを根絶するための、および／または乾燥肌に対する抗老化剤として使用される。
【００６０】
本発明による組成物の重要な使用領域は、光線力学療法の分野にあり、ナノエマルジョンの局所適用が特に好ましい。本発明によるナノエマルジョンは、その抑制が、５－アミノレブリン酸から形成された感受性物質を光活性化することによる細胞または組織の増殖の阻害あるいは細それらの破壊を含む、全ての疾患の場合に使用できる。これらの疾患には、具体的にはウイルス関連疾患が含まれ、ウイルスは好ましくはヒトパピローマウイルス（ＨＰＶ）の群から選択される。最も好ましくは、ウイルス関連疾患は尖圭コンジロームである。尖圭コンジロームは、ほぼ性器肛門のみに限局し、その病原体はヒトパピローマウイルス（ＨＰＶ）６、１１、および４２型である、ウイルス由来の両性上皮腫として定義される。疾患の過程において、ピン先大の丘疹が、カリフラワー様および鶏のトサカ様の乳頭状増殖を生じる。
【００６１】
また、本発明の組成物は、角化症に関連する疾患などの皮膚疾患の処置に適しており、光線角化症が特に好適である。光線角化症は、表皮内扁平上皮細胞癌である。光線角化症は、表皮に限定される形質転換したケラチノサイトの増殖である。光線角化症は、主として紫外線、特に日光への慢性曝露により誘発される（日光角化症とも称される）。光線角化症は、直径約１ｍｍ～約２ｃｍの凹凸のある落屑性の斑点、丘疹、または斑として現れる。
【００６２】
さらに、本発明の組成物は、好ましくは、細胞増殖の増加に関連する疾患の処置を対象

とするが、これはこの場合に、光感受性物質が、細胞代謝の増加によって、特に高い度合いで罹患細胞に集積するためである。

【００６３】

したがって本発明による組成物は、腫瘍疾患、例えば基底細胞腺腫、扁平上皮細胞癌、ボーエン病、外陰上皮内腫瘍（ＶＩＮ）、および／または結節性および／または皮下癌疾患の治療に適している。乾癬は、細胞増殖の増加に関連する非腫瘍性疾患の一例である。

【００６４】

本発明の組成物は、基底細胞腺腫の処置に特に好適である。基底細胞腺腫は、局所侵襲的および破壊的に成長するが、非常にまれにしか転移せず、そのためやや悪性であるとみなされる上皮性腫瘍を特徴とする。これは主に頭部および頸部（８０％）、特に前頭部、眼角部、および鼻部に位置する。進行が好ましくない場合には、例えばそれに伴う骨および血管の侵食および出血によって、またＣＮＳ浸潤によって、組織の破壊あるいは死に至ることさえある。基底細胞腺腫は、表皮および／または毛包の外毛根鞘の胚葉（基底細胞層）の変性細胞に由来する。通常は表皮通過時にその分裂能を喪失し、角質層を崩壊し、再形成する正常な基底細胞とは対照的に、基底細胞腫の細胞は、その分裂能を維持し、もはや角質層を形成することができない。

【００６５】

本発明は、さらに、光線力学療法における薬物の製造のための、本発明によるナノエマルジョンの使用に関する。

【００６６】

したがって、上述の疾患の処置は、例えば、活性剤、例えば５－アミノレブリン酸を含有するナノエマルジョンを局所的に適用し、その後十分な量の５－アミノレブリン酸を処置を行なう組織内に浸透させるために放置することによって実施することができる。放置時、光線による処置部の照射は、好ましくは、例えば処置部を被覆することで回避して、望ましくない早すぎる活性化を避ける。一般的に約１～８時間であり、通常は約４時間の放置期間終了後、光源を用いて、適当な線量の放射線で組織を照射する。適切な光源には、白色光を発するランプ、また単色光源が含まれる。放射線量は、普通は１回の適用当たり約２０Ｊ／ｃｍ^2～数１００Ｊ／ｃｍ^{2}の範囲である。

【００６７】

本発明による５－アミノレブリン酸ゲルの別の適用分野は、試料中、例えば組織試料中の増殖細胞の存在の検出に関する。検出は、活性剤の代謝によって生成される光感受性物質を正常細胞と比較して増殖細胞に選択的に集積させることに基づく。好ましくは、活性剤は５－アミノレブリン酸であり、光感受性物質はプロトポルフィリンＩＸである。光感受性物質が集積した程度は、光診断法を用いて、例えば波長４０５ｎｍを有する光線を照射して、光感受性物質によって生じた蛍光放射を測定することによって判断できる。本発明によるナノエマルジョンは、腫瘍診断における使用に特に適している。

【００６８】

さらに、本発明は、局所的適用に適した、本発明のナノエマルジョンと５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物とを含む本発明による組成物と、１つ以上の補助物質とを含むキットに関する。これらの補助物質の例には、光線による早すぎる活性化を避けるために、処置部位へのナノエマルジョンの適用後にその部位に適用する必須のフォトレジスト被覆材料、例えばプラスチックフィルム、およびその被覆材料を付着するための手段、あるいはナノエマルジョンを処置部位に適用するための手段がある。

【００６９】

さらに、本発明は、ウイルス関連疾患、皮膚疾患、および／または細胞増殖関連疾患を処置する方法であって、薬学有効量の本発明の組成物を、それらを必要とする被験体に投与するステップを含む方法に関する。好ましくは、被験体は哺乳動物、より好ましくはヒトである。

【００７０】

本発明の別の態様は、５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物からなる群から選択された活性剤と、ナノエマルジョンとを含み、ナノエマルジョンはアルコールを含む組成物に関する。

【００７１】

好ましくは、組成物、および特にナノエマルジョンは、少なくとも１つの水性成分、好ましくは水、少なくとも１つの親油性成分、および／または少なくとも１つの界面活性剤をさらに含む。

【００７２】

局所的適用に適した、５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物を使用する。「誘導体」は、１個または２個のアルキル基、特に好ましくは１個のメチル基で置換された５－アミノレブリン酸のアミノ基のエステル化として理解されるべきである。最も好適なものは、５－アミノレブリン酸または５－メチルアミノレブリン酸である。誘導体化は、塩錯体および付加化合物、ならびにアルキル化化合物としても理解することができる。「前駆体」および「代謝生成物」は、細胞中でプロトポルフィリンＩＸに変換された物質として理解されるべきである。活性剤の５－アミノレブリン酸またはその誘導体は、特に好適である。

【００７３】

アルコールとしては、C_2～C_8アルコール、特にC_3～C_8アルコールが好適であり、またイソプロパノールおよび／または１－プロピルアルコールは、上記の理由からさらに好適である。

【００７４】

好ましくは、アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物は、ナノエマルジョンの粒子の外側単層に付着している。したがって、アミノレブリン酸は粒子のコアの外側に位置するが、これはアミノレブリン酸と外側単層との間の相互作用による。

【００７５】

好ましくは、少なくとも１つの親油性成分はミグリオールであり、少なくとも１つの界面活性剤はレシチン、好ましくは大豆レシチン、および／またはポリオキシエチレン型界面活性剤、好ましくはポリソルベート８０である。

【００７６】

本発明の別の態様は、上述の組成物を含む医薬用および／または診断用組成物に関する。

【００７７】

本発明の別の態様は、前記のナノエマルジョンの医薬組成物における使用、具体的には皮膚疾患、例えば乾癬、角化症、また特に光線角化症処置用の薬物の製造のための使用に関する。さらに、組成物は、細胞増殖に関連する、腫瘍疾患などの疾患、例えば、基底細胞癌、扁平上皮細胞癌、ボーエン病、外陰上皮内腫瘍（ＶＩＮ）、あるいは結節性および／または皮下癌疾患にも適している。さらに、組成物は、ウイルス関連疾患、例えば尖圭コンジロームの処置にも適している。

【００７８】

本発明の別の態様は、ナノエマルジョンと活性剤とを含む組成物であって、活性剤はナノエマルジョンの粒子の外側単層に付着している組成物に関する。これは、活性剤の化学的特性（例えば、安定性）および薬学的特性（例えば、皮膚内への浸透深度および生物学的利用能）を向上させるために特に有用である。

【００７９】

好ましくは、ナノエマルジョンおよび／または活性剤は、上記に記載の組成物に関してと同様に定義される（９ページ以下の記載を参照）。

【００８０】

さらなる態様は、活性剤がナノエマルジョンの粒子の外側単層に付着している組成物を含む医療用および／または美容用組成物に関する。

【００８１】
また、ナノエマルジョンと活性剤とを含む組成物であって、活性剤がナノエマルジョンの粒子の外側単層に付着している組成物の、ウイルス関連疾患、皮膚疾患、細胞増殖関連疾患処置用の薬物の製造、および／または光線力学療法における薬物の製造のための使用も本発明に包含される。前記の疾患および光線力学療法の好適な実施形態は、上述の通りである。

【００８２】
図およびそれに続く実施例は、本発明をさらに説明することを目的とする。

【図面の簡単な説明】

【００８３】
【図１】ナノエマルジョンＢＦ－２００の代表バッチの光子相関分光法で測定した粒径分布を示す図である。
【図２】ナノエマルジョンＢＦ－２００のフリーズフラクチャー電子顕微鏡写真（Ａ）拡大率１，２００，０００倍、（Ｂ）拡大率２５０，０００倍を示す図である。
【図３】ナノエマルジョンＢＦ－２００のネガティブ染色電子顕微鏡写真（Ａ）拡大率１，２００，０００倍、（Ｂ）拡大率２５０，０００倍を示す図である。
【図４】ＡＬＡおよび異なる濃度のＢＦ－２００とともに３時間インキュベートしたＨｅｌａ細胞で測定した、ＵＶ誘発ＰｐＩＸ蛍光を示す図である。蛍光は、培地の洗い流し２時間後に測定した。
【図５】アミノレブリン酸ゲルのフリーズフラクチャー電子顕微鏡写真を拡大率５０，０００倍で示す図である。
【図６】アミノレブリン酸ゲルのフリーズフラクチャー電子顕微鏡写真を示す図である。（Ａ）拡大率２５０，０００倍　（Ｂ）拡大率１，２００，０００倍

【００８４】
実施例
実施例１：ナノエマルジョンＢＦ２００の製造
ナノエマルジョンＢＦ２００の定性的および定量的組成を下表に示す。

【００８５】
第１表：ナノエマルジョンＢＦ２００の組成

【表１】

原料	% (w/w)	機能	品質
大豆レシチン	1.73	界面活性剤	> 94% ホスファチジルコリン、医薬用、 米国薬局方
ポリソルベート80 （ポリオキシエチレンソルビトール モノオレエート）	3.40	共界面活性剤	欧州薬局方
カプリル／カプリントリグリセリド	3.45	脂質コア	欧州薬局方
イソプロピルアルコール	1.42	溶媒	Ph. Eur.
10mMリン酸緩衝液、pH6	100.00 まで	溶媒	注射用水：欧州薬局方 欧州薬局方 リン酸二ナトリウムおよびリン酸水素 ナトリウム：欧州薬局方

【００８６】
乳剤ＢＦ２００の製造方法は、以下のステップからなる：

ステップ１：１０ｍＭリン酸緩衝液（ｐＨ６）（水性成分）の製造
ステップ２：親油性成分、界面活性剤、およびアルコールを含有する担体の製造
ステップ３：ステップ１の水性成分をステップ２の担体と混合することによるナノエマルジョンの製造
ステップ４：濾過滅菌、および層流フード下での滅菌ガラス瓶へのナノエマルジョンＢＦ２００の充填
典型的なバッチサイズの場合の製造方法の説明：
ステップ１：１０ｍＭリン酸緩衝液（１０００ｇ）（ｐＨ６）を製造し、そのリン酸緩衝液を０．２μｍ滅菌フィルターでの濾過によって滅菌した。
ステップ２：親油性成分、界面活性剤、およびアルコールを含有する担体の製造
第２表：担体
【表２】

原料	質量（g）
大豆レシチン	17.30
ポリソルベート80	34.00
カプリル／カプリントリグリセリド	34.50
イソプロピルアルコール	14.20

【００８７】
大豆レシチン（１７．３０ｇ）を計量して適切な容器に入れ、イソプロピルアルコール（１４．２０ｇ）を加え、アルコールの蒸発を避けるためにその容器に蓋をした。適切な撹拌機を用いた連続的攪拌下、室温で大豆レシチンを溶解した。カプリル／カプリントリグリセリド（３４．５０ｇ）およびポリソルベート８０（３４．００ｇ）を計量し、大豆レシチン溶液に加えた。室温で、適切な撹拌機を用いて、均質な澄明溶液が得られるまで混合物を攪拌した。この溶液は、ナノエマルジョンＢＦ２００の全ての乳化剤および脂質成分を含有する濃縮物である。
【００８８】
ステップ３：９００ｇのリン酸緩衝液（ステップ１による）と１００ｇの担体（ステップ２による）とを混合することによる乳剤の製造
まず、リン酸緩衝液を含む水性成分を適切な容器内でおよそ５５℃まで加熱した。次に、ステップ２の担体（濃縮物）をおよそ５５℃まで加熱した。続いて、プロペラミキサーを用いた連続的攪拌下（７００ｒｐｍ）、担体をリン酸緩衝液に注入した。得られたナノエマルジョンを１５分間攪拌する。手順全体を通じて、温度をおよそ５５℃に維持した。最後に、ナノエマルジョンを水浴中で室温まで冷却した。
【００８９】
ステップ４：ナノエマルジョンを０．２μｍ滅菌フィルターでの濾過によって滅菌し、層流フード下で１００ｍｌ滅菌ガラス瓶に充填した。
【００９０】
実施例２：アミノレブリン酸１％、３％、および１０％、ならびにプラセボゲルの製造
プラセボゲル、および１％、３％、１０％アミノレブリン酸ゲルの定性的および定量的組成を下表に示す。
【００９１】
第３表：プラセボゲルの組成

【表３】

原料	ゲル1グラム当たりの量	機能	品質
キサンタンガム	20.375 mg	充填剤	欧州薬局方
ナノエマルジョンBF200	175.0 mg	担体	社内
プロピレングリコール	9.0 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸メチル	0.7 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸プロピル	0.3 mg	保存剤	欧州薬局方
注射用水	794.625 mg	溶媒	欧州薬局方

【００９２】
第４表：アミノレブリン酸１％ゲルの組成
【表４】

組成	ゲル1グラム当たりの量	機能	品質
アミノレブリン酸塩酸塩	10.0 mg	原体	社内
キサンタンガム	20.125 mg	充填剤	欧州薬局方
ナノエマルジョンBF200	175.0 mg	担体	社内
プロピレングリコール	9.0 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸メチル	0.7 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸プロピル	0.3 mg	保存剤	欧州薬局方
注射用水	784.875 mg	溶媒	欧州薬局方

【００９３】
第５表：アミノレブリン酸３％ゲルの組成
【表５】

原料	ゲル1グラム当たりの量	機能	品質
アミノレブリン酸塩酸塩	30.0 mg	原体	社内
キサンタンガム	19.625 mg	充填剤	欧州薬局方
ナノエマルジョンBF200	175.0 mg	担体	社内
プロピレングリコール	9.0 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸メチル	0.7 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸プロピル	0.3 mg	保存剤	欧州薬局方
注射用水	765.375 mg	溶媒	欧州薬局方

【００９４】
第６表：アミノレブリン酸１０％ゲルの組成

【表６】

原料	ゲル1グラム当たりの量	機能	品質
アミノレブリン酸塩酸塩	100.0 mg	原体	社内
キサンタンガム	17.875 mg	充填剤	欧州薬局方
ナノエマルジョンBF200	175.0 mg	担体	社内
プロピレングリコール	9.0 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸メチル	0.7 mg	保存剤	欧州薬局方
パラヒドロキシ安息香酸プロピル	0.3 mg	保存剤	欧州薬局方
注射用水	697.125 mg	溶媒	欧州薬局方

【００９５】

プラセボまたはアミノレブリン酸ゲルの製造方法は、以下のステップからなる：

－　ステップ１：キサンタンガムの注射用水への添加、混合、蒸気滅菌による、ゲル基剤の製造

－　ステップ２：保存剤であるパラヒドロキシ安息香酸メチルおよびパラヒドロキシ安息香酸プロピルのプロピレングリコール中濃縮溶液の製造

－　ステップ３、プラセボの場合：保存剤の濃縮溶液をゲル基剤に加え、そのゲル基剤にナノエマルジョンＢＦ２００を加え、そのゲルを均質化することによる、最終ゲル製剤の製造

－　ステップ３、アミノレブリン酸ゲルの場合：保存剤の濃縮溶液をゲル基剤に加えることによる、最終ゲル製剤の製造。アミノレブリン酸塩酸塩のナノエマルジョンＢＦ２００溶液中の製造。アミノレブリン酸塩酸塩のナノエマルジョンＢＦ２００溶液のゲル基剤への添加、およびゲルの均質化。

【００９６】

製造方法の説明：

ステップ１：キサンタンガムを用いたゲル基剤の製造

Ｓｔｅｐｈａｎボウルをイソプロパノール７０％を用いて消毒した。そのボウルに注射用水（単位量９７．５０）を入れてから、その上にキサンタン（単位量２．５）を散布した。混合物を真空内で圧力およそ１００ｍｂａｒ／分、回転数６００で９０分間分散させた。得られた基剤ゲルをあらかじめ注射用水で濯いでおいた２００ｍｌのＳｃｈｏｔｔフラスコに充填した（最大１／３充填）。次に、フラスコ内の基剤ゲルを１２１℃のオートクレーブ内で２０分間蒸気滅菌した。

【００９７】

ステップ２：パラベン濃縮物の製造

パラヒドロキシ安息香酸メチル（７．０部）およびパラヒドロキシ安息香酸プロピル（３．０部）を計量して、適切な容器に入れた。それにプロピレングリコール（９０部）を混ぜ、パラヒドロキシ安息香酸をプロピレングリコールに溶解させた。混合物を加熱プレート上で加熱しながら、混合物が溶解するまで磁気撹拌機を用いて攪拌し（７０℃）、澄明溶液を得る。

【００９８】

ステップ３、パート１：プラセボゲルの製造

第７表：基剤ゲルおよびパラベン濃縮物からのプラセボゲルの製造

【表７】

	成分	単位量
A	ゲル基剤	81.50
B	ナノエマルジョンBF200	17.50
D	パラベン濃縮物FH	1.0
	合計	100.0

【００９９】

以下の全ステップは、層流下、無菌状態で実施した。１単位量のパラベン濃縮物（Ｄ）および８１．５単位量の基剤ゲル（Ａ）を適切な容器に加えた。１７．５単位量のナノエマルジョン（Ｂ）を０．２μｍ滅菌フィルターで濾過し、基剤ゲルに加える。混合物を１０分間攪拌する。続いて、２単位量のゲルをそれぞれラミネートアルミニウム管に充填した。

【０１００】

ステップ３、パート２：アミノレブリン酸１％ゲルの製造

第８表：アミノレブリン酸１％ゲルの製造

【表８】

	成分	単位量
A	基剤ゲル	80.50
B	ナノエマルジョンBF200	17.50
C	5 ALA （アミノレブリン酸塩酸塩）	1.00
D	パラベン濃縮物FH	1.0
	合計	100.0

【０１０１】

以下の全作業は、層流下、無菌状態で実施した。１単位量のパラベン濃縮物（Ｄ）および８０．５単位量の基剤ゲル（Ａ）を適切な容器に加えた。穏やかに攪拌することによって、１単位量のＡＬＡ（Ｃ）を１７．５単位量のナノエマルジョン（Ｂ）に溶解させて、溶液を得た。前記溶液を０．２μｍ滅菌フィルターで濾過し、基剤ゲルに加える。均質なゲルを得るために、混合物を１０分間攪拌する。続いて、ゲル２ｇをそれぞれラミネートアルミニウム管に充填した。

【０１０２】

ステップ３、パート３：アミノレブリン酸３％および１０％ゲルの製造

１％ゲルについての記載と同様であるが、ただしそれぞれ７８．５０単位量の基剤ゲルおよび３単位量のＡＬＡ、あるいは７１．５０単位量の基剤ゲルおよび１０単位量のＡＬＡ１を用いて、３％および１０％ゲルを製造した。

【０１０３】

実施例３：ナノエマルジョンＢＦ－２００の粒径

光子相関分光法（ＰＣＳ）（動的レーザー光散乱法（ＤＬＳ）とも称される）で評価した、製造したナノエマルジョンの平均粒径は、１００ｎｍ未満である。さらに、このナノエマルジョンは、非常に狭い粒径分布を特徴とする（下記図１を参照）。

【０１０４】

このナノエマルジョンは、広範囲の温度で安定であるが、凍結およびオートクレーブに

よって損なわれうる。このナノエマルジョンは、ｐＨおよびイオン強度の変化に比較的反応しにくく、またその小さいサイズのため、０．２μｍフィルターでの濾過によって殺菌することができる。ナノエマルジョンは、活性物質の皮膚内への送達を改善し、それにより局所的に適用した薬品の有効性を増幅させる可能性を有する。

【０１０５】

ナノエマルジョンＢＦ－２００は、低エネルギー技術を用いて製造される。すなわちナノエマルジョンの製造は、高せん断装置、例えばソニケーターまたは高圧ホモジナイザーを必要としない。

【０１０６】

ナノエマルジョンＢＦ－２００中のナノ粒子の研究は、光子相関分光法によって、また２つの電子顕微鏡法：フリーズフラクチャーＥＭおよびネガティブ染色を用いて実施した。

【０１０７】

光子相関分光は、ＢＦ－２００が、非常に一貫性があり信頼できる粒径、および狭い粒子分布を有するナノエマルジョンであるという結果を裏付けた。これらの特徴は、長期にわたり、また異なる温度においても安定である（下記の第９表を参照）。

【０１０８】

第９表：ナノエマルジョンＢＦ－２００の安定性試験の結果

【表９】

時点 月	保存条件	外観	pH	粘度 20°C	ナノ粒子 平均サイズ	ナノ粒径分布	
						90% ≤200 nm	
規格		わずかに乳白光を発する液体	5.5-6.5	参考mPas	≤ 100 nm	結果	標準偏差
0	-	> 乳白光を発する	6.2	n.t.	15	90% < 21 nm	4.7
1	25°C/60 % r.h.	> 乳白光を発する	6.2	n.t.	16	90% < 22 nm	4.6
	40°C/75 % r.h.	> 乳白光を発する	6.2	n.t.	15	90% < 22 nm	5.7
2	5°C	> 乳白光を発する	6.2	1	12	90% < 17 nm	4.2
	25°C/60 % r.h.	> 乳白光を発する	6.2	1	15	90% < 21 nm	4.7
3	5°C	> 乳白光を発する	6.2	6	14	90% < 20 nm	4.7
	25°C/60 % r.h.	> 乳白光を発する	6.1	1	14	90% < 20 nm	4.8
6	5°C	> 乳白光を発する	6.3	6	17	90% < 23 nm	5.0
	25°C/60 % r.h.	> 乳白光を発する	6.3	6	14	90% < 20 nm	5.2
12	5°C	> 乳白光を発する	6.2	2	9	90% <12 nm	-
	25°C/60 % r.h.	> 乳白光を発する	6.1	2	11	90% < 15 nm	-
18	5°C	> 乳白光を発する	6.2	10	13	90% < 18 nm	-
	25°C/60 % r.h.	> 乳白光を発する	6.0	8	11	90% < 15 nm	-

【０１０９】

要約すると、様々な保存条件での最大１２ヶ月間の保存後、全ての結果は規格範囲内である。

【０１１０】

ナノエマルジョンＢＦ－２００のフリーズフラクチャー電子顕微鏡写真を拡大率１，２００，０００倍および２５０，０００倍で下記の図２に示す。顕微鏡写真における最も顕著な特徴は、多数の１５～５０ｎｍの間の様々な直径を有する非常に小さい球状ベシクルである。これらの値は、光子相関分光法で測定したものと十分に関連している（上記の第９表を参照）。ベシクルは、ベシクル膜の厚さが３～４ｎｍであることから、単層である可能性が非常に高い。これは、レシチンの主成分であり、ナノエマルジョン中の界面活性剤であるホスファチジルコリン分子の長さに相当する。リポソームおよびその他の二重層

ベシクルは、７ｎｍ超の膜厚を有する。

【０１１１】

ベシクルの構造は、ネガティブ染色によって作成した電子顕微鏡写真においても観察できる。ナノエマルジョンＢＦ－２００中のナノ粒子は、球状で、直径およそ２０ｎｍ、およそ３～４ｎｍの厚さのくぼみを備え、無定形物質で満たされている（下記の図３を参照）。中空粒子は観察されなかった。

【０１１２】

アミノレブリン酸ゲル中のナノ粒子の研究は、フリーズフラクチャーおよびネガティブ染色技法を用いて、電子顕微鏡法によって実施した。

【０１１３】

アミノレブリン酸ゲルのフリーズフラクチャー電子顕微鏡写真により、ゲル中に存在するナノ粒子が、純ナノエマルジョンＢＦ－２００中のものと類似するサイズを有することを確認した。顕微鏡写真は、単一粒子および集合体を示している（図５）。ゲル中のナノ粒子の形態およびサイズは、保存条件に影響されない。ＢＦ－２００　ＡＬＡ（２５℃（６０％相対湿度）で４ヶ月間保存後の１０％ゲル）のフリーズフラクチャー電子顕微鏡法による検査では、新しく製造したゲル中に観察されるものと類似するサイズおよび形状の粒子が見られた。第ＩＩＩ相臨床試験で使用されるＢＦ－２００　ＡＬＡゲル（１０％アミノレブリン酸）およびＢＦ－２００　ＡＬＡゲルに対するプラセボのバッチを用いた計画されている安定性試験は、臨床試験と並行して、後の時点での電子顕微鏡法による粒径の検査を含むことになっている。

【０１１４】

図６は、より高い拡大率で作成した、ゲルのフリーズフラクチャー電子顕微鏡写真を示している。フラクチャー面は、主に被覆された粒子の外皮を示している。粒子自体を通してのフラクチャーは、非常にまれにしか発生しない。ベシクルは、アミノレブリン酸を表わすと解釈される物質の層に囲まれているように見える。これは目玉焼き様の画像を作り出している（図６のパートＢに矢印で示す）。

【０１１５】

１０％アミノレブリン酸ゲルのネガティブ染色によって作成された電子顕微鏡写真は、フリーズフラクチャー電子顕微鏡写真において観察されたナノ粒子上の物質の層形成を裏付けうる、曇った拡散表面構造を有するナノ粒子を示している。

【０１１６】

実施例４：哺乳動物細胞内への吸収：ＡＬＡ取り込みについてのｉｎ　ｖｉｔｒｏ細胞培養試験：細胞培養試験

培養細胞におけるＡＬＡの取り込みおよびプロトポルフィリンＩＸ（ＰｐＩＸ）への変換は、ＵＶ誘発ＰｐＩＸ蛍光を測定することによってモニターできる。細胞培養実験は、複数の腫瘍性細胞株：ＨＥＬＡ、ＨｅｐＧ２、およびＣＣＤ　１０６　ＫＥＲＴｒ（ヒト上皮ケラチノサイト細胞株）を用いて実施した。細胞は、メチル－ＡＬＡ（ＭＡＬ）、ＡＬＡ、またはＡＬＡを含むＢＦ－２００とともに、水性媒体中で最大３時間インキュベートした。選択した薬品濃度下、３つ全てのインキュベーション培地は、類似するｐＨ値を有した。インキュベーション後、細胞を穏やかに洗浄し、新しい培地を追加した。ＰｐＩＸ生成は、蛍光を定量化することにより、異なる時点で測定した。図５は、ＨＥＬＡ細胞で得られた結果を示している。

【０１１７】

ナノエマルジョンＢＦ－２００（一定のＡＬＡ濃度）の濃度の増加によるＰｐＩＸ合成への影響を図５に示す。細胞におけるＰｐＩＸ蛍光は、ＢＦ２００濃度の増加に伴って上昇し、３％のＢＦ２００で最高点に達した。

【０１１８】

実施例５

光線角化症の光線力学療法に対する５－ＡＬＡのナノエマルジョン処方物の有効性は、２００６年秋季に開始した、Ｂｉｏｆｒｏｎｔｅｒａ　Ｂｉｏｓｃｉｅｎｃｅ　ＧｍｂＨ

を治験依頼者とする第ＩＩ相用量設定臨床試験において示されている。プラセボ対照無作為化二重盲検試験をＰｒｏｆ．　Ｄｒ．　Ｒｏｌｆ－Ｍａｒｋｕｓ　Ｓｚｅｉｍｉｅｓ（Ｕｎｉｖｅｒｓｉｔｙ　Ｃｌｉｎｉｃｓ　ｏｆ　Ｒｅｇｅｎｓｂｕｒｇ）の医学的指示の下、ドイツ国内の１３の臨床センターにおいて実施した。３種の実薬用量（１、３、および１０％ＡＬＡ）およびプラセボを使用した。化合物の有効性を検証するために、患者１０５名を３つの異なるＡＬＡ濃度またはプラセボのうちの１つを用いた光線力学療法で一度処置した。

【０１１９】

顔面または頭皮に３～１０の光線角化症病変を有する患者が含まれた。各患者は、その患者の全ての病変のうちの１つの処置（１％、３％、または１０％の５－アミノレブリン酸（ＡＬＡ）あるいはプラセボ）を受けた。３時間の放置後、赤色光を適用した。処置セッションのあと、被験体は、臨床成果および治癒過程のモニターのために、３週間後、８週間後、および１２週間後に再来院した。各回に、治験担当医師は、処置した光線角化症（ＡＫ）病変部分のＡＫの徴候および臨床症状が残っている部分の形跡を判断した。主要有効性変数は、完全な寛解（病変が完全に排除され、目に見えるＡＫの癒着性の落屑性斑はもう存在しない）を示す病変の数として定義される、１２週目の来院時における全てのＡＫ病変の合計排除率であった。ＢＦ－２００　ＡＬＡ適用後の照射中、痛みの発現もモニターした。

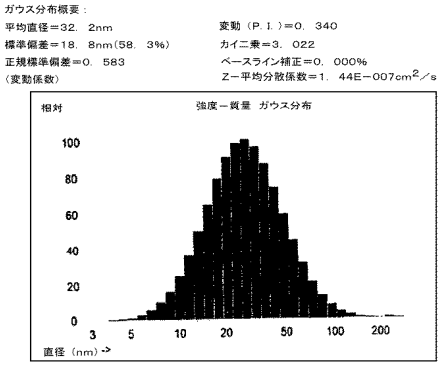
【０１２０】

結果：ＰＤＴ前の１０％ＡＬＡによる前処置は、テストした３種の濃度のうち、ＡＫ病変の排除に最も有効であることがわかった（プラセボよりも統計的に有意に優れている）。ＢＦ－２００　ＡＬＡによる単回処置１２週間後の患者の評価時、臨床センターの重み付けおよび頭部の部位により、処置した病変の少なくとも６０～７０％は完全に治癒した。プラセボ群における排除率は、臨床センターの重み付けにより、処置した病変の約５～１５％であった。この排除率は、類似する試験デザインを用いるが、より高濃度の活性物質５－ＡＬＡまたはメチルＡＬＡを用いたＡＬＡ－ＰＤＴ試験による公開結果と十分に一致した。美容上の結果は優良であった。患者の６％のみが、強い痛みを訴えた。関連する副作用は、試験中に発生せず、美容上の結果は優良であった。ＰＤＴ時、およびＰＤＴ後１２週間にわたり、４群のいずれに関しても、安全性に関する懸案事項は存在しなかった。

【０１２１】

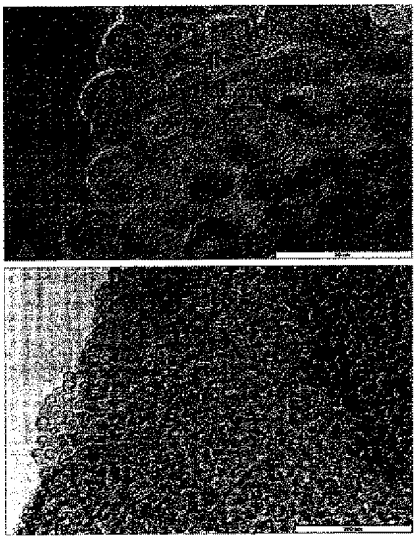
追加的な安全性対策として、この用量設定部分に薬物動力学的評価を含めた。ＡＬＡおよびその代謝生成物であるプロトポルフィリンＩＸの全身血漿中および尿中濃度を測定した。ＡＬＡ処置を受けた患者におけるこれらの化合物の血漿中および尿中濃度は、同一個人における自然に生じる生理的値と比較して増加していなかった。

【図１】

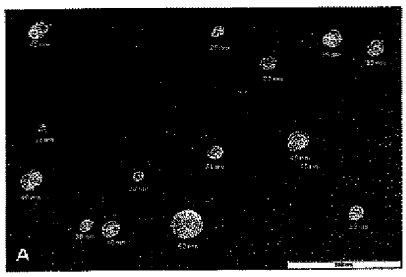


【図２】

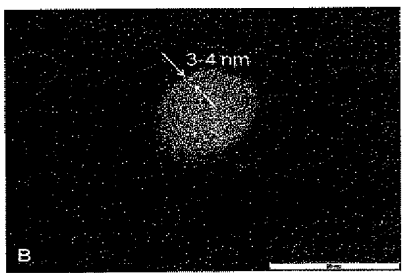
Fig. 2/6



【図３Ａ】

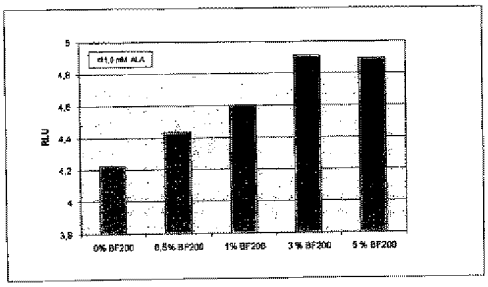


【図３Ｂ】



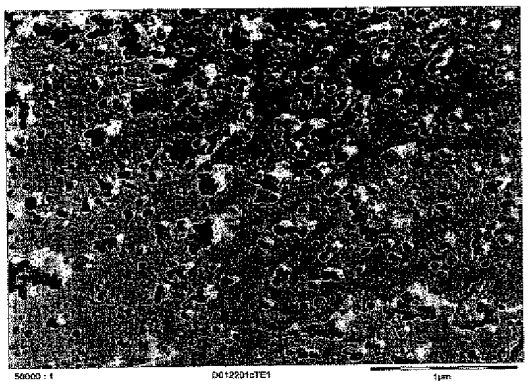
【図４】

Fig. 4/6



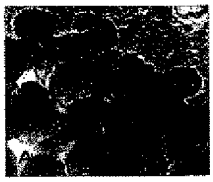
【図５】

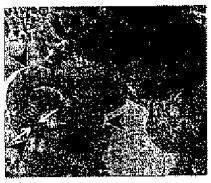
Fig. 5/6



【図６】

Fig. 6/6





【手続補正書】
【提出日】平成20年10月22日(2008.10.22)
【手続補正１】
【補正対象書類名】特許請求の範囲
【補正対象項目名】全文
【補正方法】変更
【補正の内容】
【特許請求の範囲】
【請求項１】
ａ）少なくとも１つの水性成分と、ｂ）ｉ）０．１質量％～１５質量％の量で存在する少なくとも１つの親油性成分と、ｉｉ）少なくとも１つの界面活性剤と、ｉｉｉ）少なくとも１つのアルコールとを含む担体とを含み、前記少なくとも１つのアルコールが、少なくとも３つの炭素原子を有し、かつ乳化粒子の平均直径が、１００ｎｍ未満である、ナノエマルジョン。
【請求項２】
前記担体が水性成分中に存在する、請求項１に記載のナノエマルジョン。
【請求項３】
前記ナノエマルジョンの総質量に対して、前記界面活性剤が１質量％～３０質量％の量で存在し、前記アルコールが０．１質量％～１０質量％の量で存在する、請求項１または２に記載のナノエマルジョン。
【請求項４】
前記水性成分が、前記ナノエマルジョンの総質量に対して、５０質量％～９８質量％の量で存在する、請求項１から３までのいずれか１項に記載のナノエマルジョン。
【請求項５】
前記少なくとも１つのアルコールが、イソプロピルアルコールおよび／または１－プロ

ピルアルコールである、請求項１から４までのいずれか１項に記載のナノエマルジョン。
【請求項６】
前記少なくとも１つの親油性成分が、トリグリセリド類および／またはそれらの混合物である、請求項１から５までのいずれか１項に記載のナノエマルジョン。
【請求項７】
前記少なくとも１つの界面活性剤が、レシチンおよび／またはポリオキシエチレン型界面活性剤である、請求項１から６までのいずれか１項に記載のナノエマルジョン。
【請求項８】
前記レシチンが大豆レシチンであり、前記ポリオキシエチレン型界面活性剤がポリソルベート８０である、請求項７に記載のナノエマルジョン。
【請求項９】
前記大豆レシチンが、少なくとも８０質量％のホスファチジルコリン含有量を有する、請求項８に記載のナノエマルジョン。
【請求項１０】
前記乳化粒子の平均直径が、１０～５０ｎｍの範囲である、請求項１から９までのいずれか１項に記載のナノエマルジョン。
【請求項１１】
請求項１から１０までのいずれか１項に記載のナノエマルジョンの製造方法であって、
ａ）水性成分を提供するステップと、
ｂ）少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含む担体であって、前記少なくとも１つのアルコールは少なくとも３つの炭素原子を有する担体を提供するステップと、
ｃ）前記ステップａ）の水性成分を前記ステップｂ）の担体と混合するステップと、
を含む方法。
【請求項１２】
請求項１から１０までのいずれか１項に記載のナノエマルジョンを含む、医薬用および／または美容用組成物。
【請求項１３】
請求項１２までのいずれか１項に定義されるナノエマルジョンと、活性剤とを含む組成物。
【請求項１４】
前記活性剤が、５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物からなる群から選択される、請求項１３に記載の組成物。
【請求項１５】
５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物が、前記ナノエマルジョンの粒子の外側単層に付着している、請求項１４に記載の組成物。
【請求項１６】
請求項１３から１５までのいずれか１項に記載の組成物を含む、医薬用、美容用、および／または診断用組成物。
【請求項１７】
ゲルとして存在し、前記組成物の総質量に対して、前記活性剤０．０１質量％～５０質量％と、前記ナノエマルジョン１質量％～６０質量％と、前記少なくとも１つの充填剤０．０１質量％～４質量％と、前記少なくとも１つの保存剤１質量％～３質量％とを含み、残りは前記少なくとも１つの溶媒である、請求項１３から１６までのいずれか１項に記載の組成物。
【請求項１８】
請求項１３から１７のいずれか１項に定義される組成物の製造方法であって、
ａ）水性成分を提供するステップと、
ｂ）少なくとも１つの親油性成分と、少なくとも１つの界面活性剤と、少なくとも１つのアルコールとを含む担体であって、前記少なくとも１つのアルコールは少なくとも３つの

炭素原子を有する担体を提供するステップと、
ｃ）ナノエマルジョンを形成するために、前記ステップａ）の水性成分を前記ステップｂ）の担体と混合するステップと、
ｄ）前記ステップｃ）のナノエマルジョンの形成前および／または形成後に、前記活性剤を添加するステップと、
ｅ）場合によっては、ステップｄ）にさらなる添加剤および／または賦形剤を添加するステップと、
を含む方法。
【請求項１９】
前記ステップｄ）における活性剤が、前記ステップｃ）のナノエマルジョンの形成後に添加される、請求項１８に記載の方法。
【請求項２０】
抗老化剤としての、請求項１から１０までのいずれか１項に記載のナノエマルジョン、または請求項１２から１７までのいずれか１項に記載の組成物の美容用の使用。
【請求項２１】
ウイルス関連疾患処置用の薬物の製造のための、請求項１から１０までのいずれか１項に記載のナノエマルジョン、および／または請求項１２から１７までのいずれか１項に記載の組成物の使用。
【請求項２２】
前記ウイルス関連疾患がヒトパピローマウイルス（ＨＰＶ）に起因する、請求項２１に記載の使用。
【請求項２３】
前記ウイルス関連疾患が尖圭コンジローマである、請求項２２に記載の使用。
【請求項２４】
皮膚疾患処置用の薬物の製造のための、請求項１から１０までのいずれか１項に記載のナノエマルジョン、および／または請求項１２から１７までのいずれか１項に記載の組成物の使用。
【請求項２５】
前記障害が神経皮膚炎からなる群から選択される、請求項２４に記載の使用。
【請求項２６】
前記皮膚疾患が、ざ瘡および／または角化症関連疾患である、請求項２５に記載の使用。
【請求項２７】
前記角化症が光線角化症である、請求項２６に記載の使用。
【請求項２８】
細胞増殖関連疾患の処置のための薬物を製造するための、請求項１から１０までのいずれか１項に記載のナノエマルジョン、および／または請求項１２から１７までのいずれか１項に記載の組成物の使用。
【請求項２９】
前記細胞増殖関連疾患が腫瘍疾患である、請求項２８に記載の使用。
【請求項３０】
前記腫瘍疾患が、基底細胞腺腫、扁平上皮細胞癌、ボーエン病、外陰上皮内腫瘍（ＶＩＮ）、および／または結節性および／または皮下癌疾患からなる群から選択される、請求項２９に記載の使用。
【請求項３１】
前記疾患が乾癬である、請求項２４または２８に記載の使用。
【請求項３２】
光線力学療法における薬物の製造のための、請求項１４から１７までのいずれか１項に記載の組成物の使用。
【請求項３３】

前記組成物が有効量で患者に投与されて、処置を行なう組織内に十分量の前記活性剤を提供するのに適切な時間放置され、前記組織は光線放射を受ける、請求項３２に記載の使用。

【請求項３４】

増殖細胞の検出のための、請求項１４から１７までのいずれか１項に記載の組成物の使用。

【請求項３５】

皮膚および／または腫瘍疾患の診断のための、請求項１４から１７までのいずれか１項に記載の組成物の使用。

【請求項３６】

請求項１４から１７までのいずれか１項に記載の組成物と、

ａ）フォトレジスト被覆と、

ｂ）前記被覆を適用部位に付着する手段と、

ｃ）前記組成物を適用部位に適用する手段と、

から選択される少なくとも１つの成分と、

を含むキット。

【請求項３７】

ウイルス関連疾患、皮膚疾患、および／または細胞増殖関連疾患を処置する方法であって、請求項１から１０までのいずれか１項に記載の薬学有効量のナノエマルジョンおよび／または請求項１２から１７のいずれか１項において定義される組成物を、それらを必要とする被験体に投与するステップを含む方法。

【請求項３８】

５－アミノレブリン酸、その誘導体、前駆体、および／または代謝生成物からなる群から選択さる活性剤と、ナノエマルジョンとを含む組成物であって、前記ナノエマルジョンはアルコールを含む組成物。

【請求項３９】

少なくとも１つの水性成分、好ましくは水、少なくとも１つの親油性成分、および／または少なくとも１つの界面活性剤をさらに含む、請求項３８に記載の組成物。

【請求項４０】

前記アルコールがC_2～C_8アルコール、特にC_3～C_8アルコールである、請求項３８または３９までのいずれか１項に記載の組成物。

【請求項４１】

前記アルコールが、イソプロピルアルコールおよび／または１－プロピルアルコールである、請求項４０に記載の組成物。

【請求項４２】

５－アミノレブリン酸、その誘導体、前駆体および／または代謝生成物が、前記ナノエマルジョンの外側単層に付着している、請求項３７から４１までのいずれか１項に記載の組成物。

【請求項４３】

前記少なくとも１つの親油性成分がミグリオールであり、前記少なくとも１つの界面活性剤がレシチン、好ましくは大豆レシチン、および／またはポリオキシエチレン型界面活性剤、好ましくはポリソルベート８０である、請求項３７から４１までのいずれか１項に記載の組成物。

【請求項４４】

請求項３７から４３までのいずれか１項に記載の組成物を含む、医薬用および／または診断用組成物。

【請求項４５】

ウイルス関連疾患処置用の薬物の製造のための、請求項３７から４３までのいずれか１項に記載の組成物の使用。

【請求項４６】

前記ウイルス関連疾患がヒトパピローマウイルス（ＨＰＶ）に起因する、請求項４５に記載の使用。

【請求項４７】

前記ウイルス関連疾患が尖圭コンジロームである、請求項４６に記載の使用。

【請求項４８】

皮膚疾患処置用の薬剤の製造のための、請求項３８から４３までのいずれか１項に記載の組成物の使用。

【請求項４９】

前記皮膚疾患が、ざ瘡および／または角化症に関連する疾患である、請求項４８に記載の使用。

【請求項５０】

前記角化症が光線角化症である、請求項４３に記載の使用。

【請求項５１】

細胞増殖関連疾患処置用の薬物を製造するための、請求項３８から４３までのいずれか１項に記載の組成物の使用。

【請求項５２】

前記細胞増殖関連疾患が腫瘍疾患である、請求項５１に記載の使用。

【請求項５３】

前記腫瘍疾患が、基底細胞腺腫、扁平上皮細胞癌、ボーエン病、外陰上皮内腫瘍（ＶＩＮ）、および／または結節性および／または皮下癌疾患からなる群から選択される、請求項５２に記載の使用。

【請求項５４】

前記疾患が乾癬である、請求項４８または５１に記載の使用。

【請求項５５】

光線力学療法における薬物の製造のための、請求項３８から４３までのいずれか１項に記載の組成物の使用。

【請求項５６】

前記組成物が、有効量で患者に投与されて、処置を行なう組織内に十分な量の前記活性剤を提供するのに適切な時間放置され、前記組織は光線放射を受ける、請求項５５に記載の使用。

【請求項５７】

増殖細胞の検出ための、請求項３８から４３までのいずれか１項に記載の組成物の使用。

【請求項５８】

皮膚および／または腫瘍疾患の診断ための、請求項３８から４３までのいずれか１項に記載の組成物の使用。

【請求項５９】

ナノエマルジョンと活性剤とを含む組成物であって、前記活性剤が前記ナノエマルジョンの粒子の外側単層に付着している組成物。

【請求項６０】

前記ナノエマルジョンおよび／または前記活性剤が、請求項３８から４３のいずれか１項と同様に定義される、請求項５９に記載の組成物。

【請求項６１】

請求項５９または６０に記載の組成物を含む、医療用および／または美容用組成物。

【請求項６２】

前記ウイルス関連疾患、皮膚疾患、細胞増殖関連疾患処置用の薬物の治療、および／または前記光線力学療法における薬物の製造のための、請求項５９または６０に記載の組成物の使用。

【国際調査報告】

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/011404

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K9/107 A61K9/12 A61K31/195 A61K47/10 A61K47/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 165 500 A (CEVC GREGOR [DE]) 26 December 2000 (2000-12-26) column 8, line 27 - line 31 column 9, line 41 - line 51 column 5, line 51 - line 65 column 3, line 6 - line 29	1-63
X	US 2002/155084 A1 (ROESSLER BLAKE J [US] ET AL) 24 October 2002 (2002-10-24) paragraphs [0004], [0006], [0039], [0041], [0044], [0069] - [0075], [0083], [0089], [0090], [0095], [0098], [0101], [0108], [0193]; claim 1	1-63

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 April 2008	09/05/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Giese, Hans-Hermann

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/011404

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/208083 A1 (ANNIS THEODORE C [US]) 22 September 2005 (2005-09-22) paragraphs [0008], [0009], [0029] - [0031], [0044], [0060] - [0067], [0076] - [0081]; claims 81-88,114	1-63
X	US 2005/158389 A1 (DOMB ABRAHAM J [IL]) 21 July 2005 (2005-07-21) paragraphs [0009] - [0014], [0025], [0037], [0044] - [0046], [0048]; claims 1,4,10,15	1-63
X	WO 2005/027872 A (NANOBIO CORP [US]; BAKER JAMES R [US]; ANNIS TED C [US]; HAMOUDA TAREK) 31 March 2005 (2005-03-31) paragraph [0034]; claims 1-6,27,41-33,36	1-63
X	EP 0 620 271 A (COLGATE PALMOLIVE CO [US]) 19 October 1994 (1994-10-19) page 2, line 9 - line 17; claim 1	60
X	WO 02/066589 A (COLGATE PALMOLIVE CO [US]) 29 August 2002 (2002-08-29) page 12, line 15 - line 23; claim 1	60
A	EP 1 655 021 A (NOVAGALI PHARMA SA [FR]) 10 May 2006 (2006-05-10) paragraphs [0008] - [0017], [0025], [0043], [0044]; claims 1-4,8,12	1-63
A	US 2006/140984 A1 (TAMARKIN DOV [IL] ET AL) 29 June 2006 (2006-06-29) paragraphs [0024], [0088], [0172] - [0216], [0240], [0262], [0281], [0285]; claim 1	1-20, 29-34

Form PCT/ISA/210 (continuation of second sheet) (April 2006)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2007/011404

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 35, 36, 38, 58, 59 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

2. [ ] Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[ ] No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2007/011404

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6165500 A	26-12-2000	JP 3765579 B2	12-04-2006
		JP 2006052226 A	23-02-2006
US 2002155084 A1	24-10-2002	WO 0191728 A2	06-12-2001
US 2005208083 A1	22-09-2005	NONE	
US 2005158389 A1	21-07-2005	NONE	
WO 2005027872 A	31-03-2005	AU 2004273779 A1	31-03-2005
		CA 2528095 A1	31-03-2005
		EP 1633322 A2	15-03-2006
EP 0620271 A	19-10-1994	AU 675500 B2	06-02-1997
		AU 5948094 A	20-10-1994
		BR 9401481 A	18-10-1994
		CA 2117274 A1	15-10-1994
		CN 1093743 A	19-10-1994
		HU 66866 A2	30-01-1995
		JP 6330098 A	29-11-1994
		NZ 260307 A	28-03-1995
		PT 101489 A	04-05-1995
		TR 27650 A	14-06-1995
WO 02066589 A	29-08-2002	AU 2002244009 A1	04-09-2002
EP 1655021 A	10-05-2006	CN 101014317 A	08-08-2007
		CN 101056615 A	17-10-2007
		US 2006100288 A1	11-05-2006
US 2006140984 A1	29-06-2006	US 2008031907 A1	07-02-2008

Form PCT/ISA/210 (patent family annex) (April 2005)

フロントページの続き

(51)Int.Cl.		F I		テーマコード（参考）
A61K 47/14	(2006.01)	A61K	47/14	
A61K 8/37	(2006.01)	A61K	8/37	
A61K 8/92	(2006.01)	A61K	8/92	
A61K 47/24	(2006.01)	A61K	47/24	
A61K 8/55	(2006.01)	A61K	8/55	
A61K 8/86	(2006.01)	A61K	8/86	
A61K 47/34	(2006.01)	A61K	47/34	
A61K 8/44	(2006.01)	A61K	8/44	
A61P 31/14	(2006.01)	A61P	31/14	
A61Q 19/08	(2006.01)	A61Q	19/08	
A61K 41/00	(2006.01)	A61K	41/00	
A61K 49/00	(2006.01)	A61K	49/00	A
A61P 31/20	(2006.01)	A61P	31/20	
A61P 17/12	(2006.01)	A61P	17/12	
A61P 17/02	(2006.01)	A61P	17/02	
A61P 17/10	(2006.01)	A61P	17/10	
A61P 35/00	(2006.01)	A61P	35/00	
A61P 17/06	(2006.01)	A61P	17/06	

(81)指定国 AP(BW,GH,GM,KE,LS,MW,MZ,NA,SD,SL,SZ,TZ,UG,ZM,ZW),EA(AM,AZ,BY,KG,KZ,MD,RU,TJ,TM),
EP(AT,BE,BG,CH,CY,CZ,DE,DK,EE,ES,FI,FR,GB,GR,HU,IE,IS,IT,LT,LU,LV,MC,MT,NL,PL,PT,RO,SE,SI,SK,TR),OA(
BF,BJ,CF,CG,CI,CM,GA,GN,GQ,GW,ML,MR,NE,SN,TD,TG),AE,AG,AL,AM,AT,AU,AZ,BA,BB,BG,BH,BR,BW,BY,BZ,CA,CH,
CN,CO,CR,CU,CZ,DE,DK,DM,DO,DZ,EC,EE,EG,ES,FI,GB,GD,GE,GH,GM,GT,HN,HR,HU,ID,IL,IN,IS,JP,KE,KG,KM,KN,K
P,KR,KZ,LA,LC,LK,LR,LS,LT,LU,LY,MA,MD,ME,MG,MK,MN,MW,MX,MY,MZ,NA,NG,NI,NO,NZ,OM,PG,PH,PL,PT,RO,RS,RU
,SC,SD,SE,SG,SK,SL,SM,SV,SY,TJ,TM,TN,TR,TT,TZ,UA,UG,US,UZ,VC,VN,ZA,ZM,ZW

(74)代理人 100099483
弁理士 久野 琢也
(74)代理人 100110593
弁理士 杉本 博司
(74)代理人 100112793
弁理士 高橋 佳大
(74)代理人 100128679
弁理士 星 公弘
(74)代理人 100135633
弁理士 二宮 浩康
(74)代理人 100114890
弁理士 アインゼル・フェリックス＝ラインハルト
(72)発明者 モンセラート ロカ フォゲット
ドイツ連邦共和国 レーファークーゼン ヘーエンシュトラーセ ５９

Ｆターム(参考) 4C076 AA17 BB31 CC18 CC27 DD09F DD37E DD38 DD46A DD63F EE30
FF15 FF16 FF34
4C083 AC101 AC102 AC122 AC421 AC422 AC441 AC442 AC482 AD352 AD571
AD572 CC02 DD33 DD35 DD41 EE13 EE14 FF01
4C084 AA11 MA05 MA22 MA63 NA06 NA11 ZB261
4C085 JJ03 KA20 KB41 KB42 KB60
4C206 AA01 AA02 FA47 MA03 MA05 MA42 MA83 NA06 NA11 ZA89

ZB26 ZB33

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Thomas BOYAJIAN
Title:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
Application No.:	17/942,353
Filing Date:	9/12/2022
Examiner:	Tammie K. MARLEN
Art Unit:	3792
Confirmation No.:	3138

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicant respectfully requests that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

In accordance with MPEP 609.02(I), Applicant understands the Examiner will consider all information considered in the following applications to which this application claims benefit under 35 U.S.C. § 120: U.S. Application No. 15/292,731, filed 10/13/2016 and Application No. 16/791,004, filed 2/14/2020.

In accordance with 37 CFR §1.98(d), copies of listed non-U.S. patent/application items previously submitted to, or cited by, the Office in the foregoing applications relied upon for an earlier effective filing date under 35 U.S.C. § 120, are not provided herewith.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicant does not waive any rights to take any action, which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(c), before the mailing date of any of a final action under 37 CFR §1.113, a notice of allowance under 37 CFR §1.311, or an action that otherwise closes prosecution in the application.

CONCISE EXPLANATION OF RELEVANCE

Any document not in English and listed on the attached Form PTO/SB/08 has been cited in a communication from another patent office or was otherwise known. An English abstract, English translation in full or in part, and/or an English-language counterpart is provided for any document not in English, as indicated on the Form PTO/SB/08 submitted herewith.

FEE

Fees in the amount of $260.00 to cover the fee associated with an information disclosure statement are being paid by credit card via EFS-Web.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application to Deposit Account Number 19-0741.

Respectfully submitted,

Date 16 Feb 2023

By /Kiri Lee Sharon/

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4092
Facsimile: (202) 672-5399

Kiri Lee Sharon
Attorney for Applicant
Registration No. 71,828

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483

CONFIRMATION NO. 3138

PUBLICATION NOTICE

22428
FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

OC000000137143769

Title:ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Publication No.US-2023-0001227-A1
Publication Date:01/05/2023

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

22428 7590 11/18/2022

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

EXAMINER	
MARLEN, TAMMIE K	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
11/18/2022	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

Office Action Summary	Application No. 17/942,353	Applicant(s) BOYAJIAN et al.	
	Examiner TAMMIE K MARLEN	Art Unit 3792	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 12 September 2022.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-22 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-2,4-5,7-8,10-18 and 20-22 is/are rejected.

8) ☑ Claim(s) 3,6,9 and 19 is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☑ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 12 September 2022 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

2. The information disclosure statement(s) (IDS) submitted on 9/12/2022 and 11/2/2022 has/have been acknowledged and is/are being considered by the Examiner.

Drawings

3. The Applicant is reminded to carefully review the drawing figures and the accompanying specification to ensure that all reference numerals present in the drawing figures are defined within the specification.

Specification

4. The disclosure is objected to because of the following informalities: the first paragraph of the specification should be updated to indicate the present status of all applications referred to therein.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 2 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

7. Claim 2 recites: “about 30 J/cm^2 to about 150 cm^2” The term "about" in the claims is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Please see MPEP 2173.05(b)IIIA relative terminology.

Claim Rejections - 35 USC § 103

8. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

9. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant

is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

12. Claims 18 and 20-22 are rejected under 35 U.S.C. 103 as being unpatentable over Larsen (U.S. Patent No. 7,033,381, cited by Applicant) in view of Fan et al. (U.S. 2006/0253175, cited by Applicant). Regarding claim 18, Larsen discloses a system for photodynamically diagnosing or treating a patient (see Abstract), comprising: a mobile base supported by at least four wheels 31 (see base shown in Figure 1 and wheels 31 shown and described in col. 5, lines 14-15, where although only two wheels are shown, it is inherent that there are at least two more wheels, for a total of 4, in order for the device to be stable); a pillar 11 perpendicular to the base (see Figure 1); a controller 16 disposed to be supported by the pillar (see Figure 1 and col. 5, lines 15-18); an arm 12 mounted to a top portion of the pillar (see Figure 1); and an illuminator connected at an end of the arm (shown by five interconnected panels 13 in Figure 1), the arm being hinged to allow adjustment of a position of the illuminator relative to the base (see Figures 1 and 3 which show the hinged arm and joints/hinges 25/26/27), the illuminator comprising: at least five panels 13 connected by hinged structures 10 (see Figure 1 and col. 5, lines 44-47) to allow continuous illumination across the at least five panels, wherein the at least five panels are individually configurable to control illumination from each of the at least five panels (see col. 5, lines 19-22, which describes that the panels can be controlled individually), light sources 17 disposed on surfaces of the at least five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources, the light sources being configured to output light uniformly during at least part of a time when the treatment surface is illuminated (see col. 6, lines 14-22, where the “constant effect” described is considered the claimed “configured to uniformly illuminate”). However, Larsen fails to disclose one or more fans mounted to at least one of the panels. Fan teaches a programmable photo power source including a mobile base

supported by at least four wheels (see base shown in Figure 3 and wheels 31 shown and described in paragraph [0023], where although only two wheels are shown, it is inherent that there are at least two more wheels, for a total of 4, in order for the device to be stable); a pillar 10 perpendicular to the base (see Figure 3); a controller 60 disposed to be supported by the pillar (see Figure 3 and paragraph [0023]); an arm 11 mounted to a top portion of the pillar (see Figure 3); and an illuminator 20 connected at an end of the arm (see Figure 3), the arm being hinged to allow adjustment of a position of the illuminator relative to the base (see Figure 3 which shows the hinged arm), the illuminator comprising: panels 21 connected by hinged structures (see Figures 7 and 8 and paragraph [0026], where the panels 21 are described as being folded to be between 0 and 90 degrees relative to each other and, therefore, it is inherent that there are hinged structures between the panels to allow for such an adjustment, where such hinged structures are shown as circles in Figures 7 and 8) to allow continuous illumination across the panels, wherein the panels are individually configurable to control illumination from each of the at least five panels (see paragraph [0023], which describes the control panel 60 as controlling "operation time, hours, current, and wavelength" of each of the surface-mounted LEDs 50 which are mounted on each of the panels 21), light sources 50 disposed on surfaces of the panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources, the light sources being configured to output light uniformly during at least part of a time when the treatment surface is illuminated (see paragraph [0026], where the "multi-directional irradiation results" as illustrated in Figure 6 is considered the claimed "configured to uniformly illuminate"), and one or more fans 72 mounted to at least one of the panels (see Figure 8 and paragraphs [0027] and [0029]). It would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to modify the invention of Larsen to include one or more fans mounted to at least one of the panels, as taught by Fan, as it has been held that combining prior art elements according to known methods to yield predictable results requires only routine skill in the art. *KSR Int'l Co. v. Teleflex Inc.,* 127 S.Ct. 1727, 1742, 82 USPQ2d 1385, 1396 (2007).

13. Regarding claim 20, Larsen discloses that one of the at least five panels is positioned as a center panel configured to face the treatment surface, and two or more of the at least five panels are configured to be angled relative to the center panel (see Figure 1 which shows the five panels being angled relative to each other and col. 5, lines 44-50, which describes the panels being angled relative to each other).

14. Regarding claim 21, Larsen discloses that the light sources are configured to output blue light during at least part of the time when the treatment surface is illuminated (see col. 5, lines 40-43).

15. Regarding claim 22, Larsen discloses that the light sources are configured to output red light during at least part of the time when the treatment surface is illuminated (see col. 5, lines 38-40).

16. Claims 18 and 20-22 are rejected under 35 U.S.C. 103 as being unpatentable over Fan (U.S. 2006/0253175, cited above). Fan discloses a system for photodynamically diagnosing or treating a patient (see Abstract), comprising: a mobile base supported by at least four wheels (see base shown in Figure 3 and wheels 31 shown and described in paragraph [0023], where although only two wheels are shown, it is inherent that there are at least two more wheels, for a total of 4, in order for the device to be stable); a pillar 10 perpendicular to the base (see Figure 3); a controller 60 disposed to be supported by the pillar (see Figure 3 and paragraph [0023]); an arm 11 mounted to a top portion of the pillar (see Figure 3); and an illuminator 20 connected at an end of the arm (see Figure 3), the arm being hinged to allow adjustment of a position of the illuminator relative to the base (see Figure 3 which shows the hinged arm), the illuminator comprising: panels 21 connected by hinged structures (see Figures 7 and 8 and paragraph [0026], where the panels 21 are described as being folded to be between 0 and 90 degrees relative to each other and, therefore, it is inherent that there are hinged structures between the panels to allow for such an adjustment, where such hinged structures are shown as circles in Figures 7 and 8) to allow

continuous illumination across the panels, wherein the panels are individually configurable to control illumination from each of the at least five panels (see paragraph [0023], which describes the control panel 60 as controlling "operation time, hours, current, and wavelength" of each of the surface-mounted LEDs 50 which are mounted on each of the panels 21), light sources 50 disposed on surfaces of the panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources, the light sources being configured to output light uniformly during at least part of a time when the treatment surface is illuminated (see paragraph [0026], where the "multi-directional irradiation results" as illustrated in Figure 6 is considered the claimed "configured to uniformly illuminate"), and one or more fans 72 mounted to at least one of the panels (see Figure 8 and paragraphs [0027] and [0029]). However, Fan only shows three panels 21 and fails to disclose at least five panels. It would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have five or more illumination panels 21 as taught by Fan, as it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. MPEP 2144.04

17. Regarding claim 20, Larsen discloses that one of the panels is positioned as a center panel configured to face the treatment surface, and two or more of the panels are configured to be angled relative to the center panel (see Figures 7 and 8 which show the panels being angled relative to one another and paragraph [0026] which shows the panels being angled relative to each other).

18. Regarding claim 21, Larsen discloses that the light sources are configured to output blue light during at least part of the time when the treatment surface is illuminated (see paragraph [0030]).

19. Regarding claim 22, Larsen discloses that the light sources are configured to output red light during at least part of the time when the treatment surface is illuminated (see paragraph [0030]).

Double Patenting

20. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and

approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

21. Claims 1, 2, 4, 5, 7, 8, and 10-17 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims (1 and 2), 3-5, (8 and 2), 3, 16, 19, 9, 12, 10, 11, 13, 14 of U.S. Patent No. 11,446,512. Although the claims at issue are not identical, they are not patentably distinct from each other because the differences which exist between the present claims and those of the patent are merely semantic or require the combining of claim elements from different claims together, which would be obvious to one having ordinary skill in the art.

Allowable Subject Matter

22. Claims 3, 6, 9, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAMMIE K MARLEN whose telephone number is (571)272-1986. The examiner can normally be reached Monday through Friday from 8 am until 4 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno can be reached on 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit:

https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61N 5/06,062,0616	11/10/2022	TKM
A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662	11/10/2022	TKM
A61B5/0064,0082	11/10/2022	TKM

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
Inventor name and assignee search	11/10/2022	TKM
Text-limited and related application search -- see search history printout	11/10/2022	TKM
Consulted Alyssa Alter	10/20/2021	TKM
Similarity and More Like This search	11/10/2022	TKM

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/942,353	BOYAJIAN et al.
	Examiner	Art Unit
	TAMMIE K MARLEN	3792

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: September 12, 2022				**First Named Inventor**	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	1	of	8	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	5,032,400-A	07-16-1991	WIERSUM ET AL.	
	A2	5,211,938	05-18-1993	KENNEDY ET AL.	
	A3	5,601,838-A	02-11-1997	HIND, HARRY	
	A4	5,686,065-A	11-11-1997	HANEY, DAVID N.	
	A5	5,814,008	09-29-1998	CHEN ET AL.	
	A6	5,849,027	12-15-1998	GART ET AL.	
	A7	6,223,071-B1	04-24-2001	LUNDAHL ET AL.	
	A8	6,559,183-B1	05-06-2003	SCHMID ET AL.	
	A9	6,709,446-B2	03-23-2004	LUNDAHL ET AL.	
	A10	6,897,238-B2	05-24-2005	ANDERSON, RICHARD ROX	
	A11	7,033,381-B1	04-25-2006	LARSEN, ERIK	
	A12	7,156,865-B2	01-02-2007	WALDMANN, GERHARD	
	A13	7,190,109-B2	03-13-2007	LUNDAHL ET AL.	
	A14	7,723,910-B2	05-25-2010	LUNDAHL ET AL.	
	A15	7,730,893-B2	06-08-2010	DOUGAL, GORDON REX PATERSON	
	A16	8,030,836-B2	10-04-2011	LUNDAHL ET AL.	
	A17	8,216,289-B2	07-10-2012	LUNDAHL ET AL.	
	A18	8,226,289-B2	07-24-2012	LINDEBERG	
	A19	8,758,418-B2	06-24-2014	LUNDAHL ET AL.	
	A20	9,108,045-B2	08-18-2015	SAKAMOTO ET AL.	
	A21	9,227,082-B2	01-05-2016	MCDANIEL, DAVID H.	
	A22	9,533,170-B2	01-03-2017	DYE ET AL.	
	A23	10,357,567-B1	07-23-2019	LUNDAHL ET AL.	
	A24	11,135,293-B2	10-05-2021	LUNDAHL ET AL.	
	A25	2001/0021812-A1	09-13-2001	LUNDAHL ET AL.	
	A26	2003/0088296-A1	05-08-2003	WALDMANN, GERHARD	
	A27	2003/0216795-A1	11-20-2003	HARTH ET AL.	
	A28	2004/0010299-A1	01-15-2004	TOLKOFF ET AL.	
	A29	2004/0162596-A1	08-19-2004	ALTSHULER ET AL.	
	A30	2004/0260365-A1	12-23-2004	GROSETH ET AL.	
	A31	2005/0075703-A1	04-07-2005	LARSEN, ERIC	
	A32	2005/0090877-A1	04-28-2005	HARTH ET AL.	
	A33	2006/0241726-A1	10-26-2006	WHITEHURST, COLIN	
	A34	2006/0253175-A1	11-09-2006	FAN ET AL.	
	A35	2006/0287696-A1	12-21-2006	WRIGHT ET AL.	
	A36	2007/0283655-A1	12-13-2007	TOBIN, STEPHEN M.	
	A37	2008/0031924-A1	02-07-2008	GILSON ET AL.	
	A38	2008/0188558-A1	08-07-2008	GODAL ET AL.	
	A39	2009/0247932-A1	10-01-2009	BAROLET, DANIEL	
	A40	2009/0324727-A1	12-31-2009	FOGUET ROCA	
	A41	2010/0010591-A1	01-14-2010	DAFFER, STEVEN J.	
	A42	2010/0174222-A1	07-08-2010	MCDANIEL, DAVID H.	
	A43	2010/0174223-A1	07-08-2010	SAKAMOTO ET AL.	
	A44	2010/0298758-A1	11-25-2010	CHRISTIANSEN ET AL.	
	A45	2011/0020441-A1	01-27-2011	KLAVENESS ET AL.	
	A46	2011/0053965-A1	03-03-2011	TRIGIANTE, GIUSEPPE	
	A47	2011/0106222-A1	05-05-2011	WILSON ET AL.	
	A48	2011/0224598-A1	09-15-2011	BAROLET, DANIEL	
	A49	2011/0293528-A1	12-01-2011	GODAL ET AL.	
	A50	2012/0283328-A1	11-08-2012	MODI, PANKAJ	
	A51	2012/0287671-A1	11-15-2012	PARKER ET AL.	
	A52	2013/0066404-A1	03-14-2013	TAPPER ET AL.	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

4869-7381-5090.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: September 12, 2022				**First Named Inventor**	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	2	of	8	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A53	2013/0066405-A1	03-14-2013	DOUGAL, GORDON REX PATERSON	
	A54	2013/0190845-A1	07-25-2013	LIU ET AL.	
	A55	2013/0274834-A1	10-17-2013	BAROLET ET AL.	
	A56	2013/0289089-A1	10-31-2013	MORRIS ET AL.	
	A57	2013/0304019-A1	11-14-2013	COOPER ET AL.	
	A58	2013/0315999-A1	11-28-2013	PAITHANKAR ET AL.	
	A59	2014/0010761-A1	01-09-2014	PARENT ET AL.	
	A60	2014/0067024-A1	03-06-2014	JONES ET AL.	
	A61	2015/0162109-A1	06-11-2015	NAGER, ZACHARY	
	A62	2015/0238776-A1	08-27-2015	SAKAMOTO ET AL.	
	A63	2015/0290028-A1	10-15-2015	ISSEROW ET AL.	
	A64	2015/0290470-A1	10-15-2015	TAPPER ET AL.	
	A65	2016/0008623-A1	01-14-2016	JONES ET AL.	
	A66	2016/0030565-A1	02-04-2016	WULF ET AL.	
	A67	2016/0045757-A1	02-18-2016	GROSETH, MORTEN	
	A68	2016/0166846-A1	06-16-2016	CHAE, HIUN SUK	
	A69	2016/0175609-A1	06-23-2016	DYE ET AL.	
	A70	2016/0175610-A1	06-23-2016	LIVINGSTON ET AL.	
	A71	2016/0346392-A1	12-01-2016	WULF, HANS CHRISTIAN	
	A72	2019/0290763-A1	09-26-2019	LUNDAHL ET AL.	
	A73	2020/0100997-A1	04-02-2020	SOLER ET AL.	
	A74	2020/0261580-A1	08-20-2020	WILLEY, ANDREA	
	A75	2020/0269063-A1	08-27-2020	BOYAJIAN ET AL.	
	A76	2020/0398071-A1	12-24-2020	BOYAJIAN ET AL.	
	A77	2022/0008538-A1	01-13-2022	LUNDAHL ET AL.	
	A78	2022/0040494-A1	02-10-2022	BOYAJIAN ET AL.	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A79	DE-69827286-T2	11-10-2005	VIRULITE LTD [GB]		
	A80	EP-1 238 652-A1	09-11-2002	COSMO OIL CO LTD		
	A81	JP-2002-529495-A	09-10-2002	ASAT AG APPLIED SCIENCE & TECHNOLOGY		ABS
	A82	JP-2010-515714-A	05-13-2010	PHOTOCURE ASA [NO]		ABS
	A83	JP-H04-500770A	02-13-1992	QUEENS UNIVERSITY		T
	A84	WO-02/13788-A1	02-21-2002	GEN HOSPITAL CORP		
	A85	WO-2007/112427-A2	10-04-2007	TOBIN, STEPHEN M.		
	A86	WO-2009/003173-A1	12-31-2008	THE GENERAL HOSPITAL CORPORATION		
	A87	WO-2011/124912-A1	10-13-2011	DOUGAL, GORDON REX, PATTERSON		

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

4869-7381-5090.1

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	3	of	8	Attorney Docket Number	067286-0483

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A88	WO-2013/110021-A1	07-25-2013	HARVARD BIOSCIENCE INC, UNIV NEW YORK STATE RES FOUND		
	A89	WO-2014/131115-A1	09-04-2014	KLOX TECHNOLOGIES INC [CA]		
	A90	WO-2015/041919-A1	03-26-2015	D-REV: DESIGN FOR THE OTHER NINETY PERCENT		
	A91	WO-2019/018408-A1	01-24-2019	WILLEY, ANDREA		
	A92	WO-93/09847-A1	05-27-1993	LARSEN ERIK [CH]		
	A93	WO-96/06602-A1	03-07-1996	NOVEN PHARMA		
	A94	WO-99/22802-A1	05-14-1999	DUSA PHARMACEUTICALS INC [CA]		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A95	Affidavit of Duncan Hall, August 10, 2021	
	A96	Agostinis et al. Photodynamic therapy of cancer: an update. CA: A Cancer Journal for Clinicians. May 2011; 61(4):250-2	
	A97	Aktilite CL128 Operators Manual with Metvixia, Revised 2008	
	A98	Ameluz, Prescribing Information (2016)	
	A99	Australian Examination Report, Application No. 2020267186, 11/19/2021, 6 pages	
	A100	Australian Examination Report, Application No. 2020267186, 2/3/2022, 4 pages	
	A101	Australian Examination Report, Application No. 2021107564, 4/4/2022, 4 pages	
	A102	Australian Office Action, Application No. 2019200152, 11/11/2019, 9 pages	
	A103	Berardesca E, Vignoli GP, Fideli D, Maibach H. Effect of occlusive dressings on the stratum corneum water holding capacity. The American Journal of the Medical Sciences. 1992 Jul; 304(1):25-28	
	A104	Bissonnette R. Photodynamic therapy. In: Gold M.H., editor. Photodynamic Therapy in Dermatology. Springer Science and Business Media, LLC; New York, NY, USA: 2011, pp. 221-229	
	A105	Blu-U, Operating Manual (2006)	
	A106	BRAATHEN, LASSE R., ET AL. "Guidelines on the Use of Photodynamic Therapy for Nonmelanoma Skin Cancer: an International Consensus." Journal of the American Academy of Dermatology 56.1, January 2007, pages 125-143.	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: September 12, 2022				**First Named Inventor**	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	4	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A107	Britannica, The Editors of Encyclopaedia, "Gel: Physics and Chemistry", 4 pages, July 20, 1998, and "Gel: Additional Information", 1 page, Available on line at: https://www.britannica.com/science/gel and https://www.britannica.com/science/gel/additional-info#history	
	A108	Calderhead RG. Light-emitting diode phototherapy in dermatological practice in lasers in dermatology and medicine. Lasers in Dermatology and Medicine. 2011 Aug: 231-265	
	A109	CV of Dr. Howard Rogers MD, Ph.D.	
	A110	DANIEL BAROLET ET AL., Radiant Near Infrared Light Emitting Diode Exposure as Skin Preparation to Enhance Photodynamic Therapy Inflammatory Type Acne Treatment Outcome, Lasers in Surgery and Medicine Vol. 42, No. 2, February 1, 2010, pages 171-178	
	A111	Declaration of Dr. Howard Rogers MD, Ph.D., Oct. 19, 2021	
	A112	DRAGIEVA, G. ET AL., "A Randomized Controlled Clinical Trial of Topical Photodynamic Therapy with Methyl Aminolaevulinate in the Treatment of Actinic Keratoses in Transplant Recipients." British Journal of Dermatology 151.1, July 2004, pages 196-200.	
	A113	DUSA Levulan Press Release, December 6, 1999	
	A114	European Medicines Agency CHMP Assessment Report (excerpts), October 20, 2011	
	A115	European Office Action, Application No. 16787667.1, Sep. 24, 2019, 5 pages	
	A116	Extended European Search Report, Application No. 18835929.3, March 12, 2021, 10 pages	
	A117	Extended European Search Report, Application No. 20214586.8, June 2, 2021, 8 pages	
	A118	Fauteck Europe PMC Website Database Listing, Oct. 25, 2007	
	A119	Fauteck JD, Ackermann G, Birkel M, Breuer M, Moor AC, Ebeling A, Ortland C. Fluorescence characteristics and pharmacokinetic properties of a novel self-adhesive 5-ALA patch for photodynamic therapy of actinic keratoses, 2008.	
	A120	FEHR ET AL., Photodynamic Therapy of Vulvar and Vaginal Condyloma and Intraepithelial Neoplasia Using Topically Applied 5-Aminolevulinic Acid, Lasers in Surgery and Medicine, 2002, 30:273-279, 7 pages	
	A121	FEHR ET AL., Selective Photosensitizer Distribution in Vulvar Condyloma Acuminatum After Topical Application of 5-Aminolevulinic Acid, Am. J. Obstet. Gynecol., Volume 174(3), March 1996, pages 951-957	
	A122	GLAD.com.au: "GLAD History", 2012, [online] URL: http://www.glad.com.au/about-glad/glad-history/, retrieved online 8 November 2019	
	A123	Harris DR. Percutaneous absorption and the surface area of occluded skin: a scanning electron microscopic study. British Journal of Dermatology. 1974; 91(27-32)	
	A124	Hongcharu W., Taylor C., Chang, Y., Aghasi, D., Suthamjariya, K., Anderson, R. Topical ALA-photodynamic therapy for the treatment of acne vulgaris. J Invest Dermatol. 2000 Aug;115(2):183-92	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

4869-7381-5090.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	5	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A125	HURLIMANN ET AL., Photodynamic Therapy of Superficial Basal Cell Carcinomas Using Topical 5-Aminolevulinic Acid in a Nanocolloid Lotion, Pharmacology and Treatment, Dermatology 197, 1998, pages 248-254	
	A126	International Patent Reviews, LLC review of U.S. Patent No. 10,357,567 dated July 26, 2021	
	A127	International Preliminary Report on Patentability, PCT/US2016/056572, April 26, 2018, 9 pages	
	A128	International Preliminary Report on Patentability, PCT/US2018/027070, 10/24/2019, 10 pages	
	A129	International Search Report and Written Opinion International Application No. PCT/US2018/027070, October 16, 2018, 18 pages	
	A130	International Search Report from PCT/US2018/042505, issued October 2, 2018.	
	A131	Japanese Office Action and English translation, Application No. 2019-555822, 1/11/2022, 13 pages	
	A132	Japanese Office Action and English Translation, Application No. JP 2020-503004, Dated 8/2/2022, 6 pages	
	A133	Jeffes E., McCullough J., Weinstein G., Fergin P., Nelson J., Shull T., Simpson K., Bukaty L., Hoffman W., Fong N. Photodynamic therapy of actinic keratosis with topical 5- aminolevulinic acid. A pilot dose-ranging study. Arch Dermatol. 1997	
	A134	JOHANNA T.H.M. VAN DEN AKKER ET AL., Effect of Elevating the Skin Temperature During Topical ALA Application on in vitro ALA penetration Through Mouse Skin and in vivo PpIX production in Human Skin, Photochemical and Photobiological Sciences, Royal Society of Chemistry, Cambridge, GB, Vol. 3, No. 3, March 1, 2004, pages 263-267	
	A135	KURWA, HABIB A., ET AL., "A Randomized Paired Comparison of Photodynamic Therapy and Topical 5-Fluorouracil in the Treatment of Actinic Keratoses." Journal of the American Academy of Dermatology 41.3, September 1999, pages 414-418.	
	A136	Letter to UVBiotek, LLC dated July 28, 2017 Re: K170187, Trade/Device Name: Photodynamic Therapy Device, available at https://www.accessdata.fda.gov/cdrh_docs/pdf17/K170187.pdf (accessed April 30, 2020)	
	A137	Levulan, Label (2002)	
	A138	Levulan, Label (2009)	
	A139	MACCORMACK, MOLLIE A., "Photodynamic Therapy in Dermatology: An Update on Applications and Outcomes." Seminars in Cutaneous Medicine and Surgery. Vol. 27, No. 1, WB Saunders, March 2008, pages 52-62.	
	A140	MAISCH ET AL., Fluorescence Induction of Protoporphyrin IX by a New 5-Aminolevulinic Acid Nanoemulsion Used for Photodynamic Therapy in a Full-Thickness ex vivo Skin Model, Experimental Dermatology, 19, 2009, pp. e302-e305	
	A141	McLaren G. Photodynamic therapy. In: Pfenninger and Fowler's procedures for primary care. Third Ed. Mosby Elsevier; Philadelphia, PA: 2011. pp 397-400	
	A142	News article entitled DUSA Pharmaceuticals To Pay U.S. $20.75 Million To Settle False Claims Act Allegations Relating To Promotion Of Unsupported Drug Administration Process, August 24, 2020	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

4869-7381-5090.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: September 12, 2022				**First Named Inventor**	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	6	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A143	Notice of Allowance, 15/487,991 (067286-0398), 01/15/2020, 11 pages	
	A144	Notice of Allowance, 15/487,991 (067286-0398), 10/02/2019, 16 pages	
	A145	Notice of Allowance, 17/487,698 (067286-0437), 04/29/2022, 11 pages	
	A146	NUCCI ET AL., Treatment of Anogenital Condylomata Acuminata with Topical Photodynamic Therapy: Report of 14 Cases and Review, International Journal of Infectious Diseases, 14S, 2010, pp. e280-e282	
	A147	OZOG, DAVID M., ET AL., "Photodynamic Therapy: A Clinical Consensus Guide." Dermatologic Surgery 42.7, July 2016, pages 804-827.	
	A148	Palm M., Goldman PM. Aminolevulinic acid: actinic keratosis and photorejuvenation. In: Gold M.H., editor. Photodynamic Therapy in Dermatology. Springer Science and Business Media, LLC. 2011 Nov:5-30	
	A149	Partial International Search, Annex to Form PCT/ISA/206, International Application No. PCT/US2018/027070, July 19, 2018, 10 pages	
	A150	Petition for Inter Partes Review Under 35 U.S.C. 312, October 19, 2021	
	A151	PETRAS JUZENAS ET AL., Uptake of Topically Applied 5-Aminolevulinic Acid and Production of Protoporphyrin IX in Normal Mouse Skin: Dependence on Skin Temperature, Photochemistry and photobiology, Vol. 69, No. 4, April 1, 1999, pages 478-481	
	A152	REINHOLD ET AL., A Randomized, Double-Blind, Phase III, Multicentre Study to Evaluate the Safety and Efficacy of BF-200 ALA (Ameluz®) vs. Placebo in the Field-Directed Treatment of Mild-to-Moderate Actinic Keratosis with Photodynamic Therapy (PDT) When Using the BF-RhodoLED® Lamp, British Journal of Dermatology, 175(4): 696-705, February 27, 2016, 10 pages	
	A153	Rick K, Sroka R, Stepp H, Kriegmair M, Huber RM, Jacob K, Baumgartner R. Pharmacokinetics of 5-aminolevulinic acidinduced protoporphyrin IX in skin and blood. J Photochem Photobiol B. 1997 Oct;40(3):313-9	
	A154	Sakamoto FH, Torezan L, Anderson RR. Photodynamic therapy for acne vulgaris: a critical review from basics to clinical practice: part II. Understanding parameters for acne treatment with photodynamic therapy. J Am Acad Dermatol. 2010 Aug;63(2):195-211	
	A155	Sotiriou E, Apalla Z, Maliamani F, Zaparas N, Panagiotidou D, Ioannides D. Intraindividual, right-left comparison of topical 5- aminolevulinic acid photodynamic therapy vs. 5% imiquimod cream for actinic keratoses on the upper extremities, 2009.	
	A156	Sotiriou Pubmed Website Database Listing, 09/23/2009	
	A157	Third Party Submission filed in Application No. 17/109,311, June 21, 2021, 21 pages	
	A158	USPTO Advisory Action, 15/487,991, 5/15/2018 (067286-0398), 5 pages	
	A159	USPTO Interview Summary, 15/487,991 (067286-0398), 9/22/2017, 4 pages	
	A160	USPTO Non-Final Office Action, 16/631,205 (067286-0423), 03/03/2022, 31 pages	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

4869-7381-5090.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	7	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A161	USPTO Notice of Allowance, 15/292,731 (067286-0395), 11/14/2019, 12 pages	
	A162	USPTO Notice of Allowance, 16/438,702 (067286-0405), 03/22/2021, 14 pages	
	A163	USPTO Notice of Allowance, 16/438,702 (067286-0405), 05/20/2021, 10 pages	
	A164	USPTO Notice of Allowance, 17/009,871 (067286-0411), 7/22/2021, 14 pages	
	A165	USPTO Notice of Allowance, 17/109,311 (067286-0419), 08/10/2021, 14 pages	
	A166	USPTO Office Action, 15/487,991 (067286-0398), 07/31/2018, 20 pages	
	A167	USPTO Office Action, 15/487,991 (067286-0398), 04/09/2019, 27 pages	
	A168	USPTO Office Action, 15/487,991 (067286-0398), 06/12/2017, 22 pages	
	A169	USPTO Office Action, 15/487991 (067286-0398), 2/6/2018, 19 pages	
	A170	USPTO Office Action, 16/438,702 (067286-0405), 10/13/2020, 17 pages	
	A171	USPTO Office Action, 16/791,004 (067286-0410), 10/25/2021, 26 pages	
	A172	USPTO Office Action, 16/808,631 (067286-0409), 1/21/2022, 28 pages	
	A173	USPTO Office Action, 17/009,871 (067286-0411), 12/02/2020, 15 pages	
	A174	USPTO Office Action, 17/109,311 (067286-0419), 07/20/2021, 17 pages	
	A175	USPTO Office Action, 17/487,698 (067286-0437), 12/17/2021, 21 pages	
	A176	USPTO Office Action, Serial No. 17/009,871 (067286-0411), 03/23/2021, 9 pages	
	A177	USPTO Office Action, Serial No. 17/109,311 (067286-0419), 3/2/2021, 16 pages	
	A178	Wachowska et al., Aminolevulinic acid (ALA) as a prodrug in photodynamic therapy of cancer. Molecules. 2011 May; 16(5): 4140-4164	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: September 12, 2022				**First Named Inventor**	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	8	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A179	Webpage printout, Hill Laboratories Company, "Aklarus Phototherapy Treatment System with Red, Blue and Infrared Wavelengths by Hill Therapeutics," available at https://hilllabs.com/therapeutics/Aklarus-Photo-Therapy-System.php (accessed April 30, 2020)	
	A180	Willey A, Anderson RR, Sakamoto FH. Temperature-modulated photodynamic therapy for the treatment of actinic keratosis on the extremities. Dermatologic Surgery. 2014 Oct;40(10):1094- 1102	
	A181	WILLEY ET AL., American Society for Laser Medicine and Surgery Abstracts, #147, Ultra Fast Thermal PDT for Facial AKs: Proof of Concept Study, March 2017, 2 pages	
	A182	Willey Pubmed Website Database Listing, October 2014	
	A183	WOLF, PETER, ET AL., "Topical Photodynamic Therapy With Endogenous Porphyrins After Application of 5-Aminolevulinic Acid: An Alternative Treatment Modality for Solar Keratoses, Superficial Squamous Cell Carcinomas, and Basal Cell Carcinomas?" Journal of the American Academy of Dermatology 28.1, January 1993, pages 17-21.	
	A184	Zhang et al., "Topical 5-Aminolevulinic Photodynamic Therapy with Red Light vs Intense Pulsed Light for the Treatment of Acne Vulgaris _ A Spilit [sic] Face, Randomized, Prospective Study," DERMATO-ENDOCRINOLOGY, 2018, VOL. 9, NO. 1, e1375634 (9 pages)	

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

4869-7381-5090.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	17/942,353
Date Submitted: November 2, 2022				**Filing Date**	9/12/2022
				First Named Inventor	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	1	of	1	Attorney Docket Number	067286-0483

3U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	B1	8,759,396-B2	06-24-2014	WULF ET AL.	
	B2	9,597,150-B2	03-21-2017	LUNDAHL, SCOTT	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	B3	17/854,066	06-30-2022	WILLEY, ANDREA	
	B4	17/876,224	07-28-2022	LUNDAHL, SCOTT ET AL.	
	B5	17/889,115	08-16-2022	BOYAJIAN, THOMAS ET AL.	
	B6	17/942,353	09-12-2022	BOYAJIAN, THOMAS ET AL	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	B7	Maisch et al., "Fluorescent Induction of Protoporphyrin IX by a New 5-Aminolevulinic Acid Nanoemulsion Used for Photodynamic Therapy in a Full-Thickness *ex vivo* Skin Model," Experimental Dermatology, 19, © 2009, pp. e302-e305, July 2010.	
	B8	Notice of Allowance on US 17/487,698 DTD 10/04/2022, 6 pages	
	B9	USPTO Office Action on US 17/876,224 DTD 09/27/2022, 20 pages	
	B10	Office Action in Japanese Application No. 2019-555822 mailed November 1, 2022 and English translation thereof, 11 pages	√

Examiner Signature	/TAMMIE K MARLEN/	Date Considered	11/10/2022

4871-8030-6492.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	31	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2019/03/25 10:32 AM
L2	30	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 10:32 AM
L3	6	("0000002"|"0000003"|"0000004"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L6	4	("0000001"|"0000002"|"0000003"|"0000004").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L7	14	("0000001"|"0000002"|"0000003"|"0000004"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045"|"20050075703"|"20060241726"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 10:34 AM
L8	8	(US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 10:37 AM
L9	3	("0000002"|"20050075703"|"20060241726").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 01:09 PM
L10	9	(("20030088296") or ("20050090877") or ("20060253175") or ("20070283655") or ("20100010591") or ("20110106222") or ("20140067024") or ("9533170")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:12 PM
L11	6	("0000002"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 01:13 PM
L12	14	(US-0162109-$ | US-0287671-$ | US-0287696-$ | US-	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 01:16 PM

		20060287696-$ | US-20120287671-$ | US-20150162109-$ | US-7156865-$).DID.					
L13	3	(("20080031924") or ("20100174223") or ("20150238776")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:18 PM
L14	2	(("20160166846") or ("20130190845")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 01:19 PM
L15	12	"2007112427"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 02:58 PM
L16	5	"38541884".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 02:58 PM
L17	8	"2011124912"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 02:59 PM
L18	4	"42228866".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 03:00 PM
L19	6	("0000002"|"0000003"|"0000004"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L20	4	("0000001"|"0000002"|"0000003"|"0000004").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L21	14	("0000001"|"0000002"|"0000003"|"0000004"|"20040162596"|"20040260365"|"5814008"|"5849027"|"9108045"|"20050075703"|"20060241726"|"0000005"|"0000006"|"0000007").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L22	8	(US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L23	3	("0000002"|"20050075703"|"20060241726").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM
L24	9	(("20030088296") or ("20050090877") or ("20060253175") or ("20070283655") or ("20100010591") or ("20110106222") or ("20140067024") or ("9533170")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L25	6	("0000002"|"20040162596"|"20040260365"|"58	(US-PGPUB; USPAT)	OR	ON	ON	2019/03/25 03:01 PM

		14008"|"5849027"|"9108045").PN.					
L26	14	(US-0162109-$ | US-0287671-$ | US-0287696-$ | US-20060287696-$ | US-20120287671-$ | US-20150162109-$ | US-7156865-$).DID.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L27	3	(("20080031924") or ("20100174223") or ("20150238776")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L28	2	(("20160166846") or ("20130190845")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/25 03:01 PM
L29	2008929	L19 a4 "s5" L20 L21 L22 L23 L24 L25 L26 L27 L28	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:01 PM
L30	50	L19 L20 L21 L22 L23 L24 L25 L26 L27 L28	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:02 PM
L31	6784	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L32	5	L16	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L33	11523	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L34	8633	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L35	2743	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L36	6725	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L37	572	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L38	1341	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L39	4107	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L40	1289	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:08 PM
L41	285	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM

L42	282	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM
L43	30801	L31 L33 L34 L35 L36 L37 L38 L39 L40 L41 L42	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:09 PM
L44	3652	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L45	31604	L43 L44	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L46	8642	L45 and (diode led)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:10 PM
L47	280	(L41 L37) and (L36 L39 L44 (diode led))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:18 PM
L48	280	(L41 L37) and (L36 L39 L44 (diode led))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:18 PM
L49	1828	L46 and (panel$4 hing$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 03:19 PM
L50	21	(US-20180236259-$ or US-20170007844-$ or US-20150134032-$ or US-20120265275-$ or US-20140350644-$ or US-20120150265-$ or US-20180015297-$ or US-20180193660-$ or US-20180280718-$ or US-20070016269-$ or US-20180345034-$ or US-20110054573-$ or US-20100017953-$ or US-20160129279-$ or US-20170231058-$ or US-20170238401-$ or US-20160235980-$ or US-20180133497-$ or US-20180008839-$).did. or (US-9950136-$).did. or (WO-2018067411-$).did.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 03:35 PM
L51	21	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2019/03/25 04:11 PM

		US-20180345034-$ or US-20180015297-$).did. or (US-9533170-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.					
L52	17	L51 and (@ad<="20151015" @rlad<="20151015" @prad<="20151015")	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 04:12 PM
L53	4	L51 not L52	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/25 04:12 PM
L54	3	"39774377".FMID.	(US-PGPUB; USPAT; FPRS)	OR	ON	ON	2019/03/25 04:18 PM
L55	4	(("20050090877") or ("20060253175") or ("20140067024") or ("20060253175") or ("20150162109")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/29 08:51 AM
L56	6786	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L57	11526	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L58	8637	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L59	2747	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L60	6728	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L61	572	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L62	1341	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L63	4110	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L64	1289	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L65	285	A61N2005/064.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2019/03/29

			USOCR; FPRS; EPO; JPO; DERWENT)				08:56 AM
L66	282	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L67	30814	L56 L57 L58 L59 L60 L61 L62 L63 L64 L65 L66	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L68	3653	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L69	31617	L67 L68	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L70	2785	L69 and (panel$4 hing$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:56 AM
L71	45	L69 and ((five fifth) with (panel$4 hing$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/03/29 08:58 AM
L72	1	("8021501").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2019/03/29 10:10 AM
L73	6919	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L74	11077	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L75	8626	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L76	2800	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L77	6742	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L78	578	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L79	1351	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L80	4117	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L81	1294	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L82	285	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM

L83	283	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L84	30469	L73 L74 L75 L76 L77 L78 L79 L80 L81 L82 L83	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L85	3612	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L86	31266	L84 L85	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L87	10	L86 and ((nest$6 near3 hing$6) (optical$6 near3 dead))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:24 AM
L88	618	L86 and ((sens$6 determin$6 detect$6) near3 (size shape))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/15 10:29 AM
L89	6941	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L90	11104	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L91	8674	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L92	2822	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L93	6752	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L94	581	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L95	1355	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L96	4132	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L97	1295	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L98	287	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L99	285	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L100	30552	L89 L90 L91 L92 L93	(US-PGPUB; USPAT;	OR	ON	ON	2019/10/31

		L94 L95 L96 L97 L98 L99	USOCR; FPRS; EPO; JPO; DERWENT)				01:34 PM
L101	3643	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L102	31352	L100 L101	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L103	242	L102 and ((measur$6) near3 (size shape))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/10/31 01:34 PM
L104	6943	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L105	11105	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L106	8678	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L107	2825	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L108	6754	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L109	583	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L110	1356	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L111	4135	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L112	1295	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L113	287	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L114	285	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L115	30563	L104 L105 L106 L107 L108 L109 L110 L111 L112 L113 L114	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L116	3643	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L117	31363	L115 L116	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2019/11/04 11:37 AM

			JPO; DERWENT)				
L118	10	L117 and ((nest$6 near3 hing$6) (optical$6 near3 dead))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2019/11/04 11:37 AM
L124	1	("20120283328").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2020/01/31 08:26 AM
L125	22	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$).did. or (US-9533170-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2020/11/23 01:14 PM
L126	0	L125 and aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 01:15 PM
L127	0	L125 and ala	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 01:15 PM
L128	13320	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L129	4618	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L130	2839	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L131	4119	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L132	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L133	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L134	5449	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM

L135	8056	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L136	4864	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:04 PM
L137	5508	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L138	8097	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L139	13320	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L140	10819	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L141	4119	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L142	8056	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L143	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L144	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L145	5508	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L146	1413	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L147	365	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L148	441	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L149	36840	L138 L139 L140 L141 L142 L143 L144 L145 L146 L147 L148	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L150	4864	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L151	37870	L149 L150	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:05 PM
L152	46164	L128 L129 L130 L131	(US-PGPUB; USPAT;	OR	ON	ON	2020/11/23

		L132 L133 L134 L135 L136 L137 L151	USOCR; FPRS; EPO; JPO; DERWENT)				03:05 PM
L153	845	L152 and $2aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/23 03:07 PM
L154	13321	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L155	4619	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L156	2842	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L157	4120	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L158	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L159	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L160	5449	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L161	8057	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L162	4865	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L163	5509	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L164	8098	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L165	13321	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L166	10819	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L167	4120	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L168	8057	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L169	733	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2020/11/24 06:15 AM

			JPO; DERWENT)				
L170	1645	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L171	5509	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L172	1413	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L173	365	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L174	441	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L175	36843	L164 L165 L166 L167 L168 L169 L170 L171 L172 L173 L174	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L176	4865	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L177	37873	L175 L176	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L178	46171	L154 L155 L156 L157 L158 L159 L160 L161 L162 L163 L177	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L179	845	L178 and $2aminolevulinic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/24 06:15 AM
L180	1	(10/466734).APP.	(USPAT; USOCR)	OR	ON	ON	2020/11/24 01:51 PM
L181	12	"19912039".FMID.	(US-PGPUB; USPAT; FPRS; JPO)	OR	ON	ON	2020/11/24 01:58 PM
L182	39	("0000001"|"0000002"|"20040010299"|"20090324727"|"20110053965"|"20140010761"|"20030088296"|"20040162596"|"20040260365"|"20050075703"|"20050090877"|"20060241726"|"20060253175"|"20060287696"|"20070283655"|"20080031924"|"20100010591"|"20100174223"|"20110106222"|"20120283328"|"20120287671"|"20130066405"|"20130190845"|"20140067024"|"20150162109"|"20150238776"|"20160166846"|"20160175609"|"5849	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 02:10 PM

		027"|"6223071"|"6709446"|"7156865"|"7190109"|"7723910"|"8030836"|"8216289"|"8758418"|"9108045"|"9533170").PN.					
L183	25	(US-20070283655-$ or US-20130066405-$ or US-20160175609-$ or US-20160175610-$ or US-20120287671-$ or US-20060241726-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or US-20050075703-$).did. or (US-9227082-$ or US-9017391-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2020/11/27 01:52 PM
L184	56	(US-0010591-$ | US-0031924-$ | US-0066405-$ | US-0067024-$ | US-0075703-$ | US-0088296-$ | US-0090877-$ | US-0106222-$ | US-0162109-$ | US-0162596-$ | US-0166846-$ | US-0174223-$ | US-0175609-$ | US-0175610-$ | US-0190845-$ | US-0238776-$ | US-0241726-$ | US-0253175-$ | US-0260365-$ | US-0283328-$ | US-0283655-$ | US-0287671-$ | US-0287696-$ | US-16787667-$ | US-20030088296-$ | US-20040162596-$ | US-20040260365-$ | US-	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/27 01:55 PM

		20050075703-$ | US-20050090877-$ | US-20060241726-$ | US-20060253175-$ | US-20060287696-$ | US-20070283655-$ | US-20080031924-$ | US-20100010591-$ | US-20100174223-$ | US-20110106222-$ | US-20120283328-$ | US-20120287671-$ | US-20130066405-$ | US-20130190845-$ | US-20140067024-$ | US-20150162109-$ | US-20150238776-$ | US-20160166846-$ | US-20160175609-$ | US-20160175610-$ | US-5814008-$ | US-5849027-$ | US-6223071-$ | US-6709446-$ | US-7190109-$ | US-7723910-$ | US-8030836-$ | US-8216289-$ | US-8758418-$ | US-9533170-$).DID.					
L185	6	("0000001"|"0000002"|"20040010299"|"20090324727"|"20110053965"|"20140010761").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/27 01:59 PM
L186	1	("10357567").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2020/11/27 01:59 PM
L187	18	L183 not (L184 L185 L186)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2020/11/27 01:59 PM
L188	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L189	4832	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L190	3002	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L191	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L192	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L193	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/03/16

			USOCR; FPRS; EPO; JPO; DERWENT)				12:49 PM
L194	5775	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L195	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L196	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L197	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L198	8407	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L199	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L200	11191	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L201	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L202	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L203	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L204	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L205	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L206	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L207	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L208	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L209	38191	L198 L199 L200 L201 L202 L203 L204 L205 L206 L207 L208	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L210	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/03/16 12:49 PM

			JPO; DERWENT)				
L211	39273	L209 L210	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L212	47948	L188 L189 L190 L191 L192 L193 L194 L195 L196 L197 L211	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L213	987	L212 and hinge	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:49 PM
L214	23	L212 and (((wide$4 and narrow$6) or (first and second)) adj width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:50 PM
L215	117	L212 and (((wide$4 and narrow$6) or (first and second)) near3 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 12:51 PM
L216	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L217	4832	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L218	3002	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L219	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L220	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L221	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L222	5775	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L223	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L224	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L225	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L226	8407	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L227	13760	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM

L228	11191	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L229	4465	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L230	8317	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L231	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L232	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L233	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L234	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L235	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L236	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L237	38191	L226 L227 L228 L229 L230 L231 L232 L233 L234 L235 L236	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L238	5142	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L239	39273	L237 L238	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L240	47948	L216 L217 L218 L219 L220 L221 L222 L223 L224 L225 L239	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L241	199	L240 and (((wide$4 and narrow$6) or (first and second)) near6 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/16 03:44 PM
L242	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L243	4833	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L244	3005	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L245	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/03/18

			USOCR; FPRS; EPO; JPO; DERWENT)				09:35 AM
L246	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L247	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L248	5776	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L249	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L250	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L251	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L252	8408	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L253	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L254	11195	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L255	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L256	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L257	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L258	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L259	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L260	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L261	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L262	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/03/18 09:35 AM

			JPO; DERWENT)				
L263	38197	L252 L253 L254 L255 L256 L257 L258 L259 L260 L261 L262	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L264	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L265	39279	L263 L264	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L266	47959	L242 L243 L244 L245 L246 L247 L248 L249 L250 L251 L265	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L267	199	L266 and (((wide$4 and narrow$6) or (first and second)) near6 width)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 09:35 AM
L268	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L269	4833	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L270	3005	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L271	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L272	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L273	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L274	5776	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L275	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L276	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L277	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L278	8408	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L279	13763	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM

L280	11195	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L281	4468	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L282	8318	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L283	757	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L284	1715	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L285	5842	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L286	1441	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L287	391	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L288	463	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L289	38197	L278 L279 L280 L281 L282 L283 L284 L285 L286 L287 L288	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L290	5144	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L291	39279	L289 L290	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L292	47959	L268 L269 L270 L271 L272 L273 L274 L275 L276 L277 L291	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/03/18 08:28 PM
L293	0	2007/112427	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:22 PM
L294	582470	(stephen tobin).in.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:23 PM
L295	242	(stephen and tobin).in.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 01:23 PM
L296	10	("0000001"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20160045757"|"5601838	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM

		"|"5686065"|"6897238").PN.					
L297	2	("0000002"|"D000001").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM
L298	3	("0000001"|"0000002"|"7730893").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:13 PM
L299	10	("5032400"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20160045757"|"5601838"|"5686065"|"6897238").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:14 PM
L300	1	("20110224598").PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2021/07/07 03:15 PM
L301	3	("0000001"|"7033381"|"7730893").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 03:16 PM
L302	14	L299 L300 L301	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:16 PM
L303	9	L302 and (wid$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:18 PM
L304	13949	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L305	4963	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L306	3093	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L307	4694	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L308	785	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L309	1739	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L310	5920	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L311	8474	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L312	5338	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L313	6023	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/07/07 03:19 PM

			JPO; DERWENT)				
L314	8498	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L315	13949	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L316	11425	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L317	4694	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L318	8474	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L319	785	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L320	1739	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L321	6023	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L322	1468	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L323	399	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L324	469	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L325	38854	L314 L315 L316 L317 L318 L319 L320 L321 L322 L323 L324	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L326	5338	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L327	39953	L325 L326	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L328	48853	L304 L305 L306 L307 L308 L309 L310 L311 L312 L313 L327	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:19 PM
L329	217	L328 and ((((wide$4 and narrow$6) or (first and second)) near6 width) or ((wide$6 and narrow$6) near6 panel))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/07/07 03:21 PM
L331	3	("0000001"|"0000002"|"	(US-PGPUB; USPAT)	OR	ON	ON	2021/08/26

		20200100997").PN.					12:36 PM
L332	2	(("20160346392") or ("20200100997")).PN.	(US-PGPUB; USPAT; USOCR; EPO; JPO)	OR	OFF	OFF	2021/08/26 12:37 PM
L333	14216	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L334	5141	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L335	3204	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L336	4914	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L337	808	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L338	1778	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L339	6128	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L340	8649	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L341	5526	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L342	6224	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L343	8694	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L344	14216	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L345	11742	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L346	4914	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L347	8649	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L348	808	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L349	1778	A61N2005/0642.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/08/26

			USOCR; FPRS; EPO; JPO; DERWENT)				12:42 PM
L350	6224	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L351	1481	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L352	408	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L353	492	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L354	39744	L343 L344 L345 L346 L347 L348 L349 L350 L351 L352 L353	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L355	5526	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L356	40873	L354 L355	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L357	50063	L333 L334 L335 L336 L337 L338 L339 L340 L341 L342 L356	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L358	222	L357 and ((((wide$4 and narrow$6) or (first and second)) near6 width) or ((wide$6 and narrow$6) near6 panel))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/08/26 12:42 PM
L360	37	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2021/10/18 03:52 PM
L361	38	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:52 PM
L362	64	("0000002"|"0000011"|"20200100997"|"0000001"|"20190290763"|"20200269063"|"20200398071"|"7730893"|"20090247932"|"20110224598"|"20130274834"|"20130289089"|"20150290028"|"20160008623"|"20200261580"|"20100298758"|"20110020441"|"20110293528"|"20130304019"|"20130315999"|"20	(US-PGPUB; USPAT)	OR	ON	ON	2021/10/18 03:52 PM

		160045757"|"5601838"|"5686065"|"6897238"|"0017109"|"20010021812"|"D000001"|"20040010299"|"20090324727"|"20110053965"|"20140010761"|"20030088296"|"20040162596"|"20040260365"|"20050075703"|"20050090877"|"20060241726"|"20060253175"|"20060287696"|"20070283655"|"20080031924"|"20100010591"|"20100174223"|"20110106222"|"20120283328"|"20120287671"|"20130066405"|"20130190845"|"20140067024"|"20150162109"|"20150238776"|"20160166846"|"20160175609"|"5849027"|"6223071"|"6709446"|"7156865"|"7190109"|"7723910"|"8030836"|"8216289"|"8758418"|"9108045"|"9533170").PN.					
L363	14281	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L364	5189	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L365	3246	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L366	4993	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L367	815	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L368	1794	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L369	6171	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L370	8713	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L371	5588	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L372	6285	A61N2005/0663.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/18

			USOCR; FPRS; EPO; JPO; DERWENT)				03:53 PM
L373	8738	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L374	14281	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L375	11844	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L376	4993	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L377	8713	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L378	815	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L379	1794	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L380	6285	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L381	1484	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L382	413	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L383	498	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L384	39984	L373 L374 L375 L376 L377 L378 L379 L380 L381 L382 L383	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L385	5588	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L386	41124	L384 L385	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L387	50408	L363 L364 L365 L366 L367 L368 L369 L370 L371 L372 L386	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L388	3097	L387 and (uniform$6 with (light illuminat$8))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:53 PM
L389	29	(US-20070283655-$ or US-20130066405-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2021/10/18 03:54 PM

		US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or US-20050075703-$ or US-20160310756-$ or US-20130190845-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$).did.					
L390	10	L389 and (uniform$6 with (light illuminat$8))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/18 03:54 PM
L391	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L392	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L393	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L394	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L395	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L396	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L397	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L398	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L399	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM

L400	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L401	8783	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L402	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L403	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L404	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L405	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L406	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L407	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L408	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L409	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L410	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L411	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L412	40271	L401 L402 L403 L404 L405 L406 L407 L408 L409 L410 L411	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L413	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L414	41417	L412 L413	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L415	50819	L391 L392 L393 L394 L395 L396 L397 L398 L399 L400 L414	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L416	15	L415 and (nest$6 near3 hing$9)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:27 AM
L417	7	L415 and (recess$6	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/19

		near3 hing$9)	USOCR; FPRS; EPO; JPO; DERWENT)				10:30 AM
L418	0	L415 and (hidden near3 hing$9)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 10:30 AM
L419	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L420	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L421	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L422	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L423	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L424	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L425	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L426	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L427	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L428	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L429	8783	A61N5/06.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L430	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L431	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L432	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L433	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L434	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2021/10/19 03:50 PM

			JPO; DERWENT)				
L435	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L436	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L437	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L438	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L439	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L440	40271	L429 L430 L431 L432 L433 L434 L435 L436 L437 L438 L439	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L441	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L442	41417	L440 L441	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L443	50819	L419 L420 L421 L422 L423 L424 L425 L426 L427 L428 L442	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L444	59	L443 and (dead near3 space)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:50 PM
L445	61	L443 and (hing$6 with (reduce reduced reducing reduction minim$9))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:51 PM
L446	66	L443 and (hing$6 with (reduce reduced reducing reduction minim$9 decreas$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:52 PM
L447	112	L444 L445 L446	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/19 03:52 PM
L448	30	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2021/10/20 01:42 PM

		US-20180093107-$ or US-20010021812-$ or US-20050075703-$ or US-20160310756-$ or US-20130190845-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$ or US-20160310756-$).did.					
L449	17	L448 and output	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:42 PM
L450	19	L448 and (shape size measur$6)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:45 PM
L451	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L452	5241	A61B5/0064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L453	3302	A61B5/0082.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L454	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L455	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L456	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L457	6249	A61N2005/0651.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L458	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L459	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L460	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L461	8783	A61N5/06.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/20

			USOCR; FPRS; EPO; JPO; DERWENT)				01:49 PM
L462	14390	A61N5/062.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L463	11938	A61N5/0616.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L464	5080	A61N2005/0626.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L465	8785	A61N2005/0652.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L466	826	A61N2005/0633.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L467	1805	A61N2005/0642.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L468	6340	A61N2005/0663.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L469	1489	A61N2005/0636.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L470	416	A61N2005/064.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L471	512	A61N2005/0658.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L472	40271	L461 L462 L463 L464 L465 L466 L467 L468 L469 L470 L471	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L473	5664	A61N2005/0662.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L474	41417	L472 L473	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L475	50819	L451 L452 L453 L454 L455 L456 L457 L458 L459 L460 L474	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L476	1292	L475 and ((sens$6 detect$6) near5 (shape size))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:49 PM
L477	45	L475 and ((sens$6 detect$6) with (shape size) with (treatment adj (surface area)))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:51 PM
L478	54	L475 and ((sens$6	(US-PGPUB; USPAT;	OR	ON	ON	2021/10/20

		detect$6 measur$6) with (shape size) with (treatment adj (surface area)))	USOCR; FPRS; EPO; JPO; DERWENT)				01:54 PM
L479	162	L475 and ((sens$6 detect$6 measur$6 adjust adjusting adjusted adjustable "based on") with (shape size) with (treatment adj (surface area)))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:58 PM
L480	88	L479 and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 01:59 PM
L481	17	L448 and ("j/cm" "mw/cm" nm nanometer)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:47 PM
L482	0	L448 and ("j/cm" "mw/cm")	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:47 PM
L483	7	L475 and ("j/cm" "mw/cm" nm nanometer)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	AND	ON	ON	2021/10/20 03:47 PM
L484	46	L475 and ("j/cm" "mw/cm" (nm or nanometer))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	AND	ON	ON	2021/10/20 03:48 PM
L485	34	L484 and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:48 PM
L486	629	L475 and (intensity with red) and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:52 PM
L487	442	L475 and (intensity with red with light) and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:52 PM
L488	0	L475 and (intensity with red with "j/cm") and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:53 PM
L489	7	L475 and (intensity with "j/cm") and @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2021/10/20 03:53 PM
L490	32	(US-20070283655-$ or US-20130066405-$ or US-20120287671-$ or US-20060241726-$ or US-20160175609-$ or US-20160175610-$ or US-20140157511-$ or US-20170131693-$ or US-20170007844-$ or US-20180345034-$ or US-20180015297-$ or US-20180093107-$ or US-20010021812-$ or	(US-PGPUB; USPAT; FPRS; DERWENT)	OR	ON	ON	2022/01/24 10:45 AM

		US-20050075703-$ or US-20160310756-$ or US-20130190845-$ or US-20130066404-$ or US-20030216795-$).did. or (US-9533170-$ or US-9227082-$ or US-9017391-$ or US-4100415-$).did. or (EP-2016977-$ or WO-2018191356-$).did. or (US-20160175609-$ or US-20160175608-$ or GB-2501670-$ or US-20160175610-$ or US-20140157511-$ or US-20160310756-$).did.					
L491	20	L490 and intensity	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2022/01/24 10:45 AM
L492	3	("0000002" OR "0017487" OR "0017506").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L493	2	("0000001" OR "0000002").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L494	3	("0000001" OR "0000002" OR "20150290470").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:09 AM
L495	3	("11135293" "20100174222" "20150290470").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/23 11:17 AM
L496	53969	A61N5/062,06,0616.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:37 PM
L497	40946	A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2022/03/23 03:38 PM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L498	13206	A61B5/0064,0082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:38 PM
L499	85960	496 497 498	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:38 PM
L500	20151	499 AND (intensity WITH light)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:39 PM
L501	7575	499 AND (intensity WITH light WITH (more	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	OR	ON	ON	2022/03/23 03:40 PM

		less higher lower highest lowest greater))	AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L502	2876	499 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/03/23 03:47 PM
L503	4680	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/03/23 03:48 PM
L504	1777	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/03/23 03:48 PM
L505	4689	501 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/05/06 02:25 PM
L508	408	L505 AND hing$6	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY,	OR	ON	ON	2022/05/06 02:47 PM

			CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L509	116	((US-20130190845-A1 OR US-20120148975-A1 OR US-20130196284-A1 OR US-20120148976-A1 OR US-20100179622-A1 OR US-20130280671-A1 OR US-20140072932-A1 OR US-20050004632-A1 OR US-20070248930-A1 OR US-20150140502-A1 OR US-20110176326-A1 OR US-20070129776-A1 OR US-20020035386-A1 OR US-20020120312-A1 OR US-20070283655-A1 OR US-20120150265-A1 OR US-20160129279-A1 OR US-20140277291-A1 OR US-20130303972-A1 OR US-20020029071-A1 OR US-20070150031-A1 OR US-20130079759-A1 OR US-20130178919-A1 OR US-20160158485-A1 OR US-20160175609-A1 OR US-20100030013-A1 OR US-20090054953-A1 OR US-20040249423-A1 OR US-20160101295-A1 OR US-20030004499-A1 OR US-20120330386-A1 OR US-20090005839-A1 OR US-20140187998-A1 OR US-20160325109-A1	(US-PGPUB; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); USPAT; DERWENT)	OR	ON	ON	2022/05/06 02:53 PM

		OR US-20060241726-A1 OR US-20140100455-A1 OR US-20050075703-A1 OR US-20050234383-A1 OR US-20100100160-A1 OR US-20050237423-A1 OR US-20110178582-A1 OR US-20060064144-A1 OR US-20010021812-A1 OR US-20140315142-A1 OR US-20050131500-A1 OR US-20060007390-A1 OR US-20080269730-A1 OR US-20120203310-A1 OR US-20120215291-A1 OR US-20160096042-A1 OR US-20110290005-A1 OR US-20060047329-A1 OR US-20090005837-A1 OR US-20160066791-A1 OR US-20140060546-A1 OR US-20080027317-A1 OR US-20170238401-A1 OR US-20170105265-A1 OR US-20100211136-A1 OR US-20170231058-A1 OR US-20080245371-A1 OR US-20140350395-A1 OR US-20150265366-A1).did. AND PGPB.dbnm.) OR ((DE-102015107669-A1 OR KR-20150126087-A OR CN-88102683-A OR KR-20140058327-A OR KR-101350503-B1 OR WO-2015041919-A1 OR WO-2006028465-A1 OR DE-202012004264-U1 OR FR-2931685-A1 OR CN-102300605-A OR WO-2012086991-A2 OR DE-202006017153-U1 OR DK-201500153-A1 OR CN-102300606-A OR CN-102481456-A OR WO-9614792-A1 OR KR-20160041129-A				

		OR KR-20150124016-A OR CA-2638508-A1 OR RU-2483764-C2 OR KR-20120036564-A OR KR-20020088833-A OR EP-2502647-A1 OR CN-103930162-A OR EP-1839703-A1 OR FR-2601784-A1 OR CN-104640602-A OR DE-4015406-A1 OR WO-2014102791-A2 OR CA-2771517-A1 OR KR-20080094715-A OR EP-2749317-A1 OR CN-1039119-A OR CN-1602172-A OR CN-102883776-A OR WO-2014080103-A2 OR CN-105380745-B OR DE-102007018863-A1 OR CA-2551311-A1 OR DE-10326522-A1 OR GB-2415387-A OR CN-101646924-A OR DE-202007005751-U1 OR CN-1708261-A OR CN-104602638-A).did. AND FTDB.dbnm.) OR ((US-4612604-A OR US-4848323-A OR US-7033381-B1 OR US-8170657-B1 OR US-9808644-B2 OR US-10052393-B2 OR US-10194808-B1).did. AND USPT.dbnm.) OR ((WO-2012075584-A1).did. AND DWPI.dbnm.)					
L510	408	((US-20130190845-A1 OR US-20120148975-A1 OR US-20130196284-A1 OR US-20120148976-A1 OR US-20100179622-A1 OR US-20130280671-A1 OR US-20140072932-A1 OR US-20050004632-A1 OR US-20070248930-A1 OR US-20100318161-A1 OR US-20130253620-A1 OR US-20140121731-A1 OR US-20150079536-A1 OR US-20150140502-	(US-PGPUB; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); USPAT; DERWENT)	OR	ON	ON	2022/05/06 02:55 PM

		A1 OR US-20110176326-A1 OR US-20070129776-A1 OR US-20020035386-A1 OR US-20020120312-A1 OR US-20070283655-A1 OR US-20120150265-A1 OR US-20160129279-A1 OR US-20140277291-A1 OR US-20130303972-A1 OR US-20020029071-A1 OR US-20040127961-A1 OR US-20070233209-A1 OR US-20070150031-A1 OR US-20130079759-A1 OR US-20130178919-A1 OR US-20160158485-A1 OR US-20160175609-A1 OR US-20100030013-A1 OR US-20090054953-A1 OR US-20040249423-A1 OR US-20060009822-A1 OR US-20160101295-A1 OR US-20030004499-A1 OR US-20120330386-A1 OR US-20090005839-A1 OR US-20140187998-A1 OR US-20160325109-A1 OR US-20060241726-A1 OR US-20070038269-A1 OR US-20140100455-A1 OR US-20170035299-A9 OR US-20050075703-A1 OR US-20050234383-A1 OR US-20070129778-A1 OR US-20100100160-A1 OR US-20050237423-A1 OR US-20080079802-A1 OR US-20110178582-A1 OR US-20060064144-A1 OR US-20010021812-A1 OR US-20040143308-A1 OR US-20140315142-A1 OR US-20050131500-A1 OR					

		US-20060007390-A1 OR US-20080269730-A1 OR US-20120203310-A1 OR US-20130253619-A1 OR US-20120215291-A1 OR US-20160096042-A1 OR US-20110290005-A1 OR US-20130152670-A1 OR US-20130179120-A1 OR US-20130184846-A1 OR US-20130182882-A1 OR US-20130191084-A1 OR US-20130197888-A1 OR US-20060047329-A1 OR US-20100076526-A1 OR US-20090005837-A1 OR US-20160066791-A1 OR US-20140060546-A1 OR US-20080027317-A1 OR US-20080045841-A1 OR US-20080287806-A1 OR US-20130123640-A1 OR US-20140194751-A1 OR US-20150080745-A1 OR US-20170238401-A1 OR US-20170105265-A1 OR US-20100211136-A1 OR US-20170231058-A1 OR US-20080245371-A1 OR US-20140107404-A1 OR US-20140350395-A1 OR US-20150265366-A1 OR US-20150265353-A1).did. AND PGPB.dbnm.) OR ((WO-2010142031-A1 OR WO-2010142013-A1 OR KR-20120047227-A OR JP-2012529299-A OR CN-102802726-A OR JP-5705838-B2 OR KR-101670537-B1 OR CN-102802726-B OR WO-2012048423-A1 OR EP-2627283-B1 OR DE-102015107669-A1 OR WO-2012075584-					

		A1 OR EP-2648651-B1 OR WO-2009004412-A1 OR CN-101687099-A OR EP-2164566-B1 OR CN-101687099-B OR KR-20150126087-A OR CN-88102683-A OR DE-3814611-A1 OR NL-8801071-A OR IT-1217200-B OR WO-2013155632-A1 OR CN-104379087-A OR JP-2015515333-A OR JP-6007313-B2 OR CN-104379087-B OR CN-106621060-A OR EP-2838468-B1 OR EP-3263066-A1 OR CN-106621060-B OR EP-3626206-A1 OR KR-20140058327-A OR KR-101350503-B1 OR WO-2015041919-A1 OR WO-2015058284-A1 OR CN-105682603-A OR JP-2016538028-A OR JP-6484235-B2 OR CN-111330163-A OR EP-3845200-A1 OR WO-2011082420-A1 OR WO-2006028465-A1 OR CA-2579639-A1 OR DE-202012004264-U1 OR FR-2931685-A1 OR CN-102300605-A OR WO-2007047892-A1 OR CA-2343843-A1 OR GB-2361430-A OR EP-1147785-A2 OR JP-2002102364-A OR WO-2012086991-A2 OR KR-20120069588-A OR KR-20140072854-A OR KR-101845073-B1 OR DE-202006017153-U1 OR DE-102006008774-A1 OR WO-2007098883-A2 OR CA-2373594-C OR CA-2706642-C OR WO-2007112427-A2 OR CA-2664898-A1 OR WO-2012082739-A2 OR EP-0148144-A2 OR HU-189454-B OR SE-455837-B OR FI-79470-B OR FI-79470-C OR WO-2016007798-A2					

		OR DK-201500153-A1 OR DK-178588-B1 OR CN-102300606-A OR CA-2846344-A1 OR EP-2778752-A2 OR KR-20140113561-A OR JP-2014180565-A OR AU-2014201546-A1 OR SG-10201400483T-A OR BR-102014006370-A2 OR EP-2778752-B1 OR TW-I576092-B OR RU-2661020-C2 OR JP-6362885-B2 OR WO-2012176071-A2 OR CN-102481456-A OR JP-2012532643-A OR WO-9614792-A1 OR CN-1164180-A OR CN-1124822-C OR CA-2672092-A1 OR CA-2341951-A1 OR GB-2360461-A OR GB-2360460-A OR EP-1138349-A2 OR JP-2002065875-A OR EP-1457234-A2 OR JP-2005334670-A OR EP-1457234-B1 OR JP-4889247-B2 OR WO-2007000059-A1 OR CA-2613973-A1 OR CN-101242871-A OR KR-20160041129-A OR KR-101642839-B1 OR NL-8700329-A OR EP-0283062-A2 OR EP-0283062-B1 OR WO-2012010861-A1 OR CA-2842275-A1 OR NZ-607470-A OR KR-20150124016-A OR WO-2012040854-A1 OR CA-2812302-A1 OR CN-103237574-A OR JP-2013541977-A OR CA-2638508-A1 OR WO-2010015080-A1 OR CN-102143731-A OR RU-2483764-C2 OR WO-2006013390-A1 OR GB-2425481-A OR JP-2008508918-A OR EP-1824561-B1 OR WO-2004110305-A2 OR JP-2007526003-A OR WO-03001984-A2 OR KR-20040048881-A					

		OR CN-1578688-A OR JP-2005521432-A OR AU-2002320215-B2 OR CA-2452408-C OR CN-1578688-B OR KR-20120036564-A OR KR-101181054-B1 OR KR-20020088833-A OR KR-100848391-B1 OR WO-2011067603-A1 OR CA-2782496-A1 OR AU-2010326393-A1 OR CN-102711912-A OR WO-2007040691-A1 OR CA-2624668-A1 OR WO-2012174245-A1 OR WO-2015006872-A1 OR WO-2004075985-A2 OR WO-2004075984-A1 OR JP-2006519047-A OR JP-2011098207-A OR WO-02062420-A1 OR EP-1359977-B1 OR DE-60207202-T2 OR NO-331280-B1 OR WO-9919024-A1 OR EP-1021223-B1 OR DE-69827286-T2 OR JP-4257718-B2 OR CA-2304774-C OR WO-2010044879-A2 OR CA-2777481-A1 OR JP-2012505706-A OR WO-2006122229-A2 OR CA-2605346-A1 OR AU-2006243966-A1 OR JP-2008541092-A OR EP-1889470-B1 OR EP-2975834-A1 OR GB-2461806-A OR WO-2010007419-A1 OR EP-2339999-B1 OR WO-2006012123-A2 OR EP-2502647-A1 OR WO-2005049127-A1 OR AU-2004291100-A1 OR JP-2007511286-A OR CN-103930162-A OR EP-1839703-A1 OR WO-2012106541-A1 OR CA-2826245-A1 OR CN-103338818-A OR KR-20140044302-A OR EP-2670481-B1 OR DK-2670481-T3 OR RU-2600223-C2 OR CN-103338818-B OR					

		TW-I603754-B OR KR-101842423-B1 OR FR-2601784-A1 OR EP-0255426-A1 OR WO-2012106542-A1 OR CA-2826247-A1 OR KR-20140044300-A OR EP-2670482-B1 OR RU-2580983-C2 OR TW-I598127-B OR KR-101834155-B1 OR CN-104640602-A OR CN-104640602-B OR DE-4015406-A1 OR WO-2014102791-A2 OR WO-2016057729-A1 OR JP-2017534373-A OR CN-107427407-A OR JP-6608440-B2 OR CN-107427407-B OR CA-2771517-A1 OR KR-20080094715-A OR CN-101495182-A OR KR-101370160-B1 OR WO-2013002935-A1 OR CA-2840434-A1 OR JP-2014526166-A OR CA-2840434-C OR EP-2749317-A1 OR CN-1039119-A OR CN-1602172-A OR CA-2465906-C OR CN-102883776-A OR WO-2014080103-A2 OR EP-2922518-B1 OR ES-2828000-T3 OR CN-105380745-B OR DE-102007018863-A1 OR DE-102007018863-B4 OR CA-2551311-A1 OR DE-10326522-A1 OR EP-1486186-B1 OR WO-2008094252-A2 OR CA-2677217-A1 OR CA-2677217-C OR GB-2415387-A OR CA-2570919-A1 OR AU-2005256804-A1 OR KR-20070052742-A OR CN-1988932-A OR EP-1771225-B1 OR ES-2385991-T3 OR CN-101646924-A OR WO-2013112856-A2 OR EP-2807111-B1 OR WO-2015113003-A1 OR WO-2015184019-A1 OR DE-					

		202007005751-U1 OR EP-2489402-A2 OR EP-2489401-A2 OR EP-2489400-A2 OR WO-2016022612-A1 OR CN-1708261-A OR WO-2008124641-A2 OR CA-2858610-A1 OR CN-104080400-A OR EP-3466335-A1 OR BR-112014014781-A2 OR WO-2015143026-A1 OR CN-104602638-A OR CN-104602638-B OR CN-108113762-A).did. AND FTDB.dbnm.) OR ((US-9242118-B2 OR US-9463333-B2 OR US-8900282-B2 OR US-9308389-B2 OR US-9730780-B2 OR US-8702291-B2 OR US-6626932-B2 OR US-6796994-B2 OR US-7517101-B2 OR US-8425577-B2 OR US-4612604-A OR US-9289623-B2 OR US-8980174-B2 OR US-6645230-B2 OR US-4848323-A OR US-9533170-B2 OR US-8070669-B2 OR US-7033381-B1 OR US-9138595-B2 OR US-10252079-B2 OR US-10342991-B2 OR US-8170657-B1 OR US-9808644-B2 OR US-6663659-B2 OR US-9854977-B2 OR US-7311722-B2 OR US-7730893-B2 OR US-7298415-B2 OR US-8279334-B2 OR US-9079021-B2 OR US-6223071-B1 OR US-9320580-B2 OR US-7449026-B2 OR US-7147319-B2 OR US-10384070-B2 OR US-9248309-B2 OR US-10667990-B2 OR US-8384916-B2 OR US-8493574-B2 OR US-8743377-B2 OR US-8874404-B2 OR US-					

		9013701-B2 OR US-9175945-B2 OR US-9448061-B2 OR US-7544204-B2 OR US-10238294-B2 OR US-9907688-B2 OR US-8380291-B2 OR US-8391960-B2 OR US-8706200-B2 OR US-8838210-B2 OR US-9186063-B2 OR US-9226664-B2 OR US-10052393-B2 OR US-10357662-B2 OR US-10194808-B1 OR US-8528563-B2 OR US-9301770-B2 OR US-10165976-B2 OR US-9700342-B2).did. AND USPT.dbnm.) OR ((WO-2012075584-A1).did. AND DWPI.dbnm.)					
L511	408	L510 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/05/06 02:55 PM
L512	5	("0000001" OR "0000002" OR "20160030565" OR "5211938" OR "6559183").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:04 PM
L513	1	kennedy.in. AND @pd="19970708"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:05 PM
L514	1	("5211938").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:07 PM
L515	1	("5211938").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/19 12:07 PM
L516	5	("5211938").pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/08/19 12:07 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L517	1	5211938b1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/19 12:07 PM
L518	0	"5211938-b1"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/19 12:08 PM
L519	1	"5211938 b1"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/08/19 12:08 PM

			IBM_TDB)				
L520	2545	@pd="19970708"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:09 PM
L521	16	@pd="19970708" AND kennedy	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:09 PM
L522	0	kennedy.in. AND @pd="19970807"	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/19 12:11 PM
L523	20	kennedy.in. AND malignant.ti.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/08/30 02:23 PM
L524	39	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/11/07 09:16 AM
L525	41	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/07 09:17 AM
L526	103	524 525	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/07 09:17 AM
L527	82	("0000002" OR "0000081" OR "0017854" OR "0017876" OR "0017889" OR "9597150" OR "10357567" OR "11135293" OR "20010021812" OR "20030088296" OR "20030216795" OR "20040010299" OR "20040162596" OR "20040260365" OR "20050075703" OR "20050090877" OR "20060241726" OR "20060253175" OR "20060287696" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/07 11:33 AM

		"20070283655" OR "20080031924" OR "20080188558" OR "20090247932" OR "20090324727" OR "20100010591" OR "20100174222" OR "20100174223" OR "20100298758" OR "20110020441" OR "20110053965" OR "20110106222" OR "20110224598" OR "20110293528" OR "20120283328" OR "20120287671" OR "20130066404" OR "20130190845" OR "20130274834" OR "20130289089" OR "20130304019" OR "20130315999" OR "20140010761" OR "20140067024" OR "20150162109" OR "20150238776" OR "20150290028" OR "20150290470" OR "20160008623" OR "20160030565" OR "20160045757" OR "20160166846" OR "20160175609" OR "20160175610" OR "20160346392" OR "20190290763" OR "20200100997" OR "20200261580" OR "20200269063" OR "20200398071" OR "20220008538" OR "20220040494" OR "5211938" OR "5601838" OR "5686065" OR "5814008" OR "5849027" OR "6223071" OR "6559183" OR "6709446" OR "6897238" OR "7033381" OR "7156865" OR "7190109" OR "7723910" OR "7730893" OR "8030836" OR "8216289" OR					

		"8226289" OR "8758418" OR "9108045" OR "9227082" OR "9533170").pn.					
L528	43	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 0 Text Selections Text: (US-20170216616-A1 OR US-11446512-B2 OR US-7723910-B2 OR US-10603508-B2 OR CA-3057840-A1 OR AU-2018250595-A1 OR WO-2018191356-A2 OR US-20170106205-A1 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-10589122-B2 OR EP-3851161-A1 OR US-20200246630-A1 OR US-11179574-B2 OR EP-3362145-B1 OR US-20200398071-A1 OR ES-2860807-T3 OR US-20200269063-A1 OR US-20220040494-A1 OR EA-201590362-A1 OR BR-112015004114-A2 OR CA-2881614-A1 OR WO-2014033254-A1 OR EP-2890458-A1 OR US-20140067024-A1 OR ES-2685326-T3 OR US-20160367832-A1 OR EP-2890458-B1 OR JP-2015528338-A OR US-20160008623-A1 OR US-9399146-B2 OR US-20210353148-A1 OR US-20210046326-A1 OR WO-2022050963-A1 OR CN-114010954-A OR CN-114010955-A OR CN-110876836-B OR US-20210402211-A1 OR TW-202200233-A OR US-20220288411-A1 OR US-20180117355-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2022/11/10 09:04 AM

		CA-2984963-A1 OR EP-3294413-A1 OR WO-2016179705-A1 OR WO-2022078955-A1 OR US-11452883-B1 OR US-20120165716-A1 OR US-8372128-B2 OR WO-2018191356-A3).did.					
L529	39	(Artificial Intelligence) Similar to: 17/942,353 with 0 CPC Selections and 1 Text Selection Text: (US-20170216616-A1 OR US-7723910-B2 OR US-11446512-B2 OR WO-2018191356-A2 OR AU-2018250595-A1 OR CA-3057840-A1 OR US-10603508-B2 OR US-8372128-B2 OR US-20120165716-A1 OR US-20210353148-A1 OR WO-2011109628-A1 OR US-20200246630-A1 OR US-10589122-B2 OR US-10231942-B2 OR ES-2860807-T3 OR WO-2017066270-A1 OR WO-2017066270-A9 OR EP-3362145-A1 OR US-20170106205-A1 OR US-8758418-B2 OR EP-3362145-B1 OR EP-3851161-A1 OR US-20220249042-A1 OR JP-2013540554-A OR US-20200269063-A1 OR EP-4033980-A1 OR US-11118172-B2 OR US-11179574-B2 OR US-20160074669-A1 OR US-20200398071-A1 OR BR-PI0818453-A2 OR US-6709446-B2 OR US-20130211482-A1 OR WO-2012056397-A1 OR EP-2632549-A1 OR CN-114423481-A OR US-20210085386-A1 OR WO-2021053482-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2022/11/10 09:04 AM

		EP-4031007-A1 OR IL-139397-A OR IL-291143-A OR BR-112013009899-A2 OR CN-103180015-A OR RU-2013124017-A OR ES-2323073-T3 OR US-20220040494-A1 OR JP-2010540163-A OR MX-2010003658-A OR AU-2020103365-A4 OR AU-2021102111-A4).did.					
L530	1810	502 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L531	58003	A61N5/062,06,0616.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L532	45364	A61N2005/0626,0652,0633,0642,0663,0636,064,0658,0651,0662.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L533	14582	A61B5/0064,0082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2022/11/10 09:06 AM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L534	93358	531 532 533	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L535	8176	534 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L536	3118	534 AND (intensity WITH light WITH (more less higher lower highest lowest greater))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:06 AM
L537	1810	536 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:07 AM
L538	3415	534 AND ((uniform$6 consistan$8) WITH (light illuminat$6 irradiat$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:09 AM
L539	3680	534 AND ((uniform$6 consistan$8) WITH (light illuminat$6 irradiat$6 radiat$6))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB)	OR	ON	ON	2022/11/10 09:09 AM
L540	2294	539 AND @ad<="20151015"	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2022/11/10 09:09 AM

			JPO; IBM_TDB)				
L541	82	("0000002" OR "0000081" OR "0017854" OR "0017876" OR "0017889" OR "9597150" OR "10357567" OR "11135293" OR "20010021812" OR "20030088296" OR "20030216795" OR "20040010299" OR "20040162596" OR "20040260365" OR "20050075703" OR "20050090877" OR "20060241726" OR "20060253175" OR "20060287696" OR "20070283655" OR "20080031924" OR "20080188558" OR "20090247932" OR "20090324727" OR "20100010591" OR "20100174222" OR "20100174223" OR "20100298758" OR "20110020441" OR "20110053965" OR "20110106222" OR "20110224598" OR "20110293528" OR "20120283328" OR "20120287671" OR "20130066404" OR "20130190845" OR "20130274834" OR "20130289089" OR "20130304019" OR "20130315999" OR "20140010761" OR "20140067024" OR "20150162109" OR "20150238776" OR "20150290028" OR "20150290470" OR "20160008623" OR "20160030565" OR "20160045757" OR "20160166846" OR "20160175609" OR "20160175610" OR "20160346392" OR "20190290763" OR "20200100997" OR "20200261580" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/10 09:27 AM

		"20200269063" OR "20200398071" OR "20220008538" OR "20220040494" OR "5211938" OR "5601838" OR "5686065" OR "5814008" OR "5849027" OR "6223071" OR "6559183" OR "6709446" OR "6897238" OR "7033381" OR "7156865" OR "7190109" OR "7723910" OR "7730893" OR "8030836" OR "8216289" OR "8226289" OR "8758418" OR "9108045" OR "9227082" OR "9533170").pn.					
L542	32	((US-20030216795-A1 OR US-20130066405-A1 OR US-20120287671-A1 OR US-20060241726-A1 OR US-20160175609-A1 OR US-20160175610-A1 OR US-20140157511-A1 OR US-20170131693-A1 OR US-20170007844-A1 OR US-20130066404-A1 OR US-20160310756-A1 OR US-20050075703-A1 OR US-20010021812-A1 OR US-20180093107-A1 OR US-20180015297-A1 OR US-20180345034-A1 OR US-20070283655-A1 OR US-20040068305-A1 OR US-20130190845-A1 OR US-20040093043-A1).did. AND PGPB.dbnm.) OR ((US-9533170-B2 OR US-9017391-B2 OR US-9227082-B2 OR US-4100415-A).did. AND USPT.dbnm.) OR ((US-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:49 PM

		20160175609-A1 OR US-20160175608-A1 OR GB-2501670-A OR US-20160175610-A1 OR US-20140157511-A1 OR US-20160310756-A1).did. AND DWPI.dbnm.) OR ((EP-2016977-A1 OR WO-2018191356-A2).did. AND FPRS.dbnm.)					
L543	41	(542 541) AND fan	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:50 PM
L544	35	543 AND (uniform$6 constant$6 consisten$6)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/14 01:52 PM
L545	39	((("DUSA") near3 ("PHARMACEUTICALS") near3 ("INC"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/11/14 04:04 PM
L546	41	((("BOYAJIAN") near3 ("Thomas")) OR (("CAROTA") near3 ("Mark")) OR (("MAZEJKA") near3 ("Brian"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/11/14 04:04 PM
L547	19	(545 546) AND intensity.clm.	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	ON	ON	2022/11/14 04:05 PM

			DERWENT)				

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N119	882	(panel AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:19 AM
N120	882	(panel AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:20 AM
N121	189	(panel AND width AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:23 AM
N122	213	(panel AND (width wide wider) AND (light illuminat$6 led) AND ((sens$6 determin$6 detect$6 measur$6) near3 (size shape))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:23 AM
N123	3	(panel AND (width wide wider) AND (light illuminat$6 led) AND ((nest$6 near3 hing$6) (optical$6 near3 dead))).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2019/11/04 11:38 AM
N330	15	(panel AND (width wide wider) AND (light illuminat$6 led) AND (ala aminolevul$8)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2021/07/07 07:14 PM
N359	15	(panel AND (width wide wider) AND (light illuminat$6 led) AND (ala aminolevul$8)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2021/08/26 12:42 PM
N361	3	(panel AND (width wide wider longer long short shorter bigger) AND ((light illuminat$6 led) WITH intens$6) AND (nest$6 WITH hing$6)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/05/06 02:49 PM

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	17/942,353
Date Submitted: November 2, 2022				**Filing Date**	9/12/2022
				First Named Inventor	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	1	of	1	Attorney Docket Number	067286-0483

3U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	B1	8,759,396-B2	06-24-2014	WULF ET AL.	
	B2	9,597,150-B2	03-21-2017	LUNDAHL, SCOTT	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	B3	17/854,066	06-30-2022	WILLEY, ANDREA	
	B4	17/876,224	07-28-2022	LUNDAHL, SCOTT ET AL.	
	B5	17/889,115	08-16-2022	BOYAJIAN, THOMAS ET AL.	
	B6	17/942,353	09-12-2022	BOYAJIAN, THOMAS ET AL	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	B7	Maisch et al., "Fluorescent Induction of Protoporphyrin IX by a New 5-Aminolevulinic Acid Nanoemulsion Used for Photodynamic Therapy in a Full-Thickness *ex vivo* Skin Model," Experimental Dermatology, 19, © 2009, pp. e302-e305, July 2010.	
	B8	Notice of Allowance on US 17/487,698 DTD 10/04/2022, 6 pages	
	B9	USPTO Office Action on US 17/876,224 DTD 09/27/2022, 20 pages	
	B10	Office Action in Japanese Application No. 2019-555822 mailed November 1, 2022 and English translation thereof, 11 pages	√

Examiner Signature		Date Considered	

Electronic Acknowledgement Receipt

EFS ID:	46945601
Application Number:	17942353
International Application Number:	
Confirmation Number:	3138
Title of Invention:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
First Named Inventor/Applicant Name:	Thomas BOYAJIAN
Customer Number:	22428
Filer:	Kiri Lee Sharon/Effie Hale
Filer Authorized By:	Kiri Lee Sharon
Attorney Docket Number:	067286-0483
Receipt Date:	02-NOV-2022
Filing Date:	12-SEP-2022
Time Stamp:	14:54:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	067286-0483_IDSTransmittal.pdf	117685 66da358f922431e524acfd22d71da986190a2cf4	no	2

Warnings:

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	067286-0483_IDS_SB08.pdf	130422 92e29ae0e839b5016cee30dd8a201ba1fa65c4b3	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Non Patent Literature	NPL_MAISCHetal.pdf	1967089 defdcffe97ecc0dac6ade5a1fcd75887776aa12e	no	4
Warnings:					
Information:					
4	Non Patent Literature	NoA_0437_100422.pdf	801650 29e7c87a908df203264cb99c4ed3026cba0882b5	no	6
Warnings:					
Information:					
5	Non Patent Literature	OA_0478_092722.pdf	2323739 82dcd8747bcb8cf3ae255c3f77431bf4fd4ab720	no	20
Warnings:					
Information:					
6	Non Patent Literature	JPOA_0408_110122.pdf	3342577 735c9847a6bd1ad2f0760faf8b69af68cc042fd2	no	11
Warnings:					
Information:					
		Total Files Size (in bytes):	8683162		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Thomas BOYAJIAN
Title:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
Application No.:	17/942,353
Filing Date:	9/12/2022
Examiner:	Unassigned
Art Unit:	Unassigned
Confirmation No.:	3138

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicant respectfully requests that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

In accordance with MPEP 609.02(I), Applicant understands the Examiner will consider all information considered in the following applications to which this application claims a benefit under 35 U.S.C. § 120: U.S. Application No. 15/292,731, and filed 10/13/2016; Application No. 16/791,004, filed 2/14/2020.

In accordance with 37 CFR §1.98(d), copies of listed non-U.S. patent/application items previously submitted to, or cited by, the Office in the foregoing applications relied upon for an earlier effective filing date under 35 U.S.C. § 120, are not provided herewith. Nevertheless, Applicant would be pleased to provide copies of any such documents at the Examiner's request.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicant does not waive any rights to take any action, which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

CONCISE EXPLANATION OF RELEVANCE

Any document not in English and listed on the attached Form PTO/SB/08 has been cited in a communication from another patent office. An English abstract, English translation in full or in part, and/or an English-language counterpart is provided for each document not in English, as indicated on the Form PTO/SB/08 submitted herewith.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), within three (3) months of the filing date of the application.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account No. 19-0741.

Respectfully submitted,

Date 2 Nov 2022

By /Kiri Lee Sharon/

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4092
Facsimile: (202) 672-5399

Kiri Lee Sharon
Attorney for Applicant
Registration No. 71,828

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483	3138

22428 7590 10/25/2022

FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

EXAMINER	
CENTRAL, DOCKET	

ART UNIT	PAPER NUMBER
OPAP	

NOTIFICATION DATE	DELIVERY MODE
10/25/2022	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 17/942,353	**Applicant(s)** BOYAJIAN et al.	
	Examiner CHERYL P GIBSON BAYLOR	**Art Unit** OPET	**AIA (FITF) Status** Yes

1. THE REQUEST FILED 12 September 2022 IS **GRANTED** .

   The above-identified application has met the requirements for prioritized examination
   - A. ☑ for an original nonprovisional application (Track I).
   - B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination**. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:
   - A. filing a **petition for extension of time** to extend the time period for filing a reply;
   - B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims** , or a multiple dependent claim;
   - C. filing a **request for continued examination** ;
   - D. filing a notice of appeal;
   - E. filing a request for suspension of action;
   - F. mailing of a notice of allowance;
   - G. mailing of a final Office action;
   - H. completion of examination as defined in 37 CFR 41.102; or
   - I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to CHERYL GIBSON BAYLOR at (571)272-3213. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/CHERYL GIBSON BAYLOR/ Paralegal Specialist, OPET	

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/942,353	09/12/2022	OPAP	6360	067286-0483	22	3

CONFIRMATION NO. 3138

CORRECTED FILING RECEIPT

22428
FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

OC000000049788870

Date Mailed: 10/18/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Thomas BOYAJIAN, Wilmington, MA;
Mark CAROTA, Chelmsford, MA;
Brian MAZEJKA, Salem, NH;

Applicant(s)

DUSA Pharmaceuticals, Inc., Billerica, MA;

Assignment For Published Patent Application

DUSA Pharmaceuticals, Inc., Billerica, MA

Power of Attorney: The patent practitioners associated with Customer Number 22428

Domestic Priority data as claimed by applicant

This application is a CON of 16/791,004 02/14/2020 PAT 11,446,512
which is a DIV of 15/292,731 10/13/2016 PAT 10,589,122
which claims benefit of 62/241,902 10/15/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 09/27/2022
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/942,353**
Projected Publication Date: 01/05/2023
Non-Publication Request: No
Early Publication Request: No
Title

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Preliminary Class

604

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/942,353	09/12/2022	Thomas BOYAJIAN	067286-0483

CONFIRMATION NO. 3138

NEW OR REVISED PPD NOTICE

22428
FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

OC00000136450870

NOTICE OF NEW OR REVISED PROJECTED PUBLICATION DATE

The above-identified application has a new or revised projected publication date. The current projected publication date for this application is 01/05/2023. If this is a new projected publication date (there was no previous projected publication date), the application has been cleared by Licensing & Review or a secrecy order has been rescinded and the application is now in the publication queue.

If this is a revised projected publication date (one that is different from a previously communicated projected publication date), the publication date has been revised due to processing delays in the USPTO or the abandonment and subsequent revival of an application. The application is anticipated to be published on a date that is more than six weeks different from the originally-projected publication date.

More detailed publication information is available through the private side of Patent Application Information Retrieval (PAIR) System. The direct link to access PAIR is currently http://pair.uspto.gov. Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Questions relating to this Notice should be directed to the Office of Data Management, Application Assistance Unit at (571) 272-4000, or (571) 272-4200, or 1-888-786-0101.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 17/942,353

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	700
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(i))	22 minus 20 =	* 2			OR	x 100 =	200
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x =	0
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1820

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/942,353	09/12/2022	2875	2020	067286-0483	22	3

CONFIRMATION NO. 3138

FILING RECEIPT

22428
FOLEY & LARDNER LLP
3000 K STREET N.W.
SUITE 600
WASHINGTON, DC 20007-5109

OC00000004911433

Date Mailed: 09/29/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Thomas BOYAJIAN, Wilmington, MA;
Mark CAROTA, Chelmsford, MA;
Brian MAZEJKA, Salem, NH;

Applicant(s)

DUSA Pharmaceuticals, Inc., Billerica, MA;

Assignment For Published Patent Application

DUSA Pharmaceuticals, Inc., Billerica, MA

Power of Attorney: The patent practitioners associated with Customer Number 22428

Domestic Priority data as claimed by applicant

This application is a CON of 16/791,004 02/14/2020 PAT 11,446,512
which is a DIV of 15/292,731 10/13/2016 PAT 10,589,122
which claims benefit of 62/241,902 10/15/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Projected Publication Date: 01/05/2023

Non-Publication Request: No

Early Publication Request: No

Title

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

Preliminary Class

362

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	Unassigned
Filing Date	Herewith
First Named Inventor	Thomas BOYAJIAN
Title	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
Art Unit	Unassigned
Examiner Name	Unassigned
Attorney Docket Number	067286-0483

SIGNATURE of Applicant or Patent Practitioner

Signature	/Kiri Lee Sharon/	Date (Optional)	12 Sep 2022
Name	Kiri Lee Sharon	Registration Number	71,828
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	DUSA PHARMACEUTICALS, INC.		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 11/30/2014. OMB 0651-0051
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 22428

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☐ The address associated with the above-mentioned Customer Number

OR

☑ The address associated with Customer Number: 22428

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

DUSA PHARMACEUTICALS, INC.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	[signature]	Date (Optional)	
Name	Scott Lundell		
Title	VP, Regulatory Affairs + Intellectual Property		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Thomas BOYAJIAN
Title:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
Application No.:	Unassigned
Filing Date:	Herewith
Examiner:	Unassigned
Art Unit:	Unassigned
Confirmation No.:	Unassigned

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicant respectfully requests that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

In accordance with MPEP 609.02(I), Applicant understands the Examiner will consider all information considered in the following applications to which this application claims benefit under 35 U.S.C. § 120, namely, Application No. 15/292,731, filed 10/13/2016, and Application No. 16/791,004, filed 2/14/2020.

In accordance with 37 CFR §1.98(d), copies of listed non-U.S. patent/application items previously submitted to, or cited by, the Office in the foregoing applications relied upon for an earlier effective filing date under 35 U.S.C. § 120 are not provided herewith. Nevertheless, Applicant would be pleased to provide copies of any such documents at the Examiner's request.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicant does not waive any rights to take any action, which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

CONCISE EXPLANATION OF RELEVANCE

The relevance of the listed documents is set forth in the file of the parent application of the present application, namely, serial no. 16/791,004.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), within three (3) months of the filing date of the application.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account No. 19-0741.

Respectfully submitted,

Date 12 Sep 2022

By /Kiri Lee Sharon/

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4092
Facsimile: (202) 672-5399

Kiri Lee Sharon
Attorney for Applicant
Registration No. 71,828

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	1	of	8	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	5,032,400-A	07-16-1991	WIERSUM ET AL.	
	A2	5,211,938	05-18-1993	KENNEDY ET AL.	
	A3	5,601,838-A	02-11-1997	HIND, HARRY	
	A4	5,686,065-A	11-11-1997	HANEY, DAVID N.	
	A5	5,814,008	09-29-1998	CHEN ET AL.	
	A6	5,849,027	12-15-1998	GART ET AL.	
	A7	6,223,071-B1	04-24-2001	LUNDAHL ET AL.	
	A8	6,559,183-B1	05-06-2003	SCHMID ET AL.	
	A9	6,709,446-B2	03-23-2004	LUNDAHL ET AL.	
	A10	6,897,238-B2	05-24-2005	ANDERSON, RICHARD ROX	
	A11	7,033,381-B1	04-25-2006	LARSEN, ERIK	
	A12	7,156,865-B2	01-02-2007	WALDMANN, GERHARD	
	A13	7,190,109-B2	03-13-2007	LUNDAHL ET AL.	
	A14	7,723,910-B2	05-25-2010	LUNDAHL ET AL.	
	A15	7,730,893-B2	06-08-2010	DOUGAL, GORDON REX PATERSON	
	A16	8,030,836-B2	10-04-2011	LUNDAHL ET AL.	
	A17	8,216,289-B2	07-10-2012	LUNDAHL ET AL.	
	A18	8,226,289-B2	07-24-2012	LINDEBERG	
	A19	8,758,418-B2	06-24-2014	LUNDAHL ET AL.	
	A20	9,108,045-B2	08-18-2015	SAKAMOTO ET AL.	
	A21	9,227,082-B2	01-05-2016	MCDANIEL, DAVID H.	
	A22	9,533,170-B2	01-03-2017	DYE ET AL.	
	A23	10,357,567-B1	07-23-2019	LUNDAHL ET AL.	
	A24	11,135,293-B2	10-05-2021	LUNDAHL ET AL.	
	A25	2001/0021812-A1	09-13-2001	LUNDAHL ET AL.	
	A26	2003/0088296-A1	05-08-2003	WALDMANN, GERHARD	
	A27	2003/0216795-A1	11-20-2003	HARTH ET AL.	
	A28	2004/0010299-A1	01-15-2004	TOLKOFF ET AL.	
	A29	2004/0162596-A1	08-19-2004	ALTSHULER ET AL.	
	A30	2004/0260365-A1	12-23-2004	GROSETH ET AL.	
	A31	2005/0075703-A1	04-07-2005	LARSEN, ERIC	
	A32	2005/0090877-A1	04-28-2005	HARTH ET AL.	
	A33	2006/0241726-A1	10-26-2006	WHITEHURST, COLIN	
	A34	2006/0253175-A1	11-09-2006	FAN ET AL.	
	A35	2006/0287696-A1	12-21-2006	WRIGHT ET AL.	
	A36	2007/0283655-A1	12-13-2007	TOBIN, STEPHEN M.	
	A37	2008/0031924-A1	02-07-2008	GILSON ET AL.	
	A38	2008/0188558-A1	08-07-2008	GODAL ET AL.	
	A39	2009/0247932-A1	10-01-2009	BAROLET, DANIEL	
	A40	2009/0324727-A1	12-31-2009	FOGUET ROCA	
	A41	2010/0010591-A1	01-14-2010	DAFFER, STEVEN J.	
	A42	2010/0174222-A1	07-08-2010	MCDANIEL, DAVID H.	
	A43	2010/0174223-A1	07-08-2010	SAKAMOTO ET AL.	
	A44	2010/0298758-A1	11-25-2010	CHRISTIANSEN ET AL.	
	A45	2011/0020441-A1	01-27-2011	KLAVENESS ET AL.	
	A46	2011/0053965-A1	03-03-2011	TRIGIANTE, GIUSEPPE	
	A47	2011/0106222-A1	05-05-2011	WILSON ET AL.	
	A48	2011/0224598-A1	09-15-2011	BAROLET, DANIEL	
	A49	2011/0293528-A1	12-01-2011	GODAL ET AL.	
	A50	2012/0283328-A1	11-08-2012	MODI, PANKAJ	
	A51	2012/0287671-A1	11-15-2012	PARKER ET AL.	
	A52	2013/0066404-A1	03-14-2013	TAPPER ET AL.	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	2	of	8	Attorney Docket Number	067286-0483

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A53	2013/0066405-A1	03-14-2013	DOUGAL, GORDON REX PATERSON	
	A54	2013/0190845-A1	07-25-2013	LIU ET AL.	
	A55	2013/0274834-A1	10-17-2013	BAROLET ET AL.	
	A56	2013/0289089-A1	10-31-2013	MORRIS ET AL.	
	A57	2013/0304019-A1	11-14-2013	COOPER ET AL.	
	A58	2013/0315999-A1	11-28-2013	PAITHANKAR ET AL.	
	A59	2014/0010761-A1	01-09-2014	PARENT ET AL.	
	A60	2014/0067024-A1	03-06-2014	JONES ET AL.	
	A61	2015/0162109-A1	06-11-2015	NAGER, ZACHARY	
	A62	2015/0238776-A1	08-27-2015	SAKAMOTO ET AL.	
	A63	2015/0290028-A1	10-15-2015	ISSEROW ET AL.	
	A64	2015/0290470-A1	10-15-2015	TAPPER ET AL.	
	A65	2016/0008623-A1	01-14-2016	JONES ET AL.	
	A66	2016/0030565-A1	02-04-2016	WULF ET AL.	
	A67	2016/0045757-A1	02-18-2016	GROSETH, MORTEN	
	A68	2016/0166846-A1	06-16-2016	CHAE, HIUN SUK	
	A69	2016/0175609-A1	06-23-2016	DYE ET AL.	
	A70	2016/0175610-A1	06-23-2016	LIVINGSTON ET AL.	
	A71	2016/0346392-A1	12-01-2016	WULF, HANS CHRISTIAN	
	A72	2019/0290763-A1	09-26-2019	LUNDAHL ET AL.	
	A73	2020/0100997-A1	04-02-2020	SOLER ET AL.	
	A74	2020/0261580-A1	08-20-2020	WILLEY, ANDREA	
	A75	2020/0269063-A1	08-27-2020	BOYAJIAN ET AL.	
	A76	2020/0398071-A1	12-24-2020	BOYAJIAN ET AL.	
	A77	2022/0008538-A1	01-13-2022	LUNDAHL ET AL.	
	A78	2022/0040494-A1	02-10-2022	BOYAJIAN ET AL.	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A79	DE-69827286-T2	11-10-2005	VIRULITE LTD [GB]		
	A80	EP-1 238 652-A1	09-11-2002	COSMO OIL CO LTD		
	A81	JP-2002-529495-A	09-10-2002	ASAT AG APPLIED SCIENCE & TECHNOLOGY		ABS
	A82	JP-2010-515714-A	05-13-2010	PHOTOCURE ASA [NO]		ABS
	A83	JP-H04-500770A	02-13-1992	QUEENS UNIVERSITY		T
	A84	WO-02/13788-A1	02-21-2002	GEN HOSPITAL CORP		
	A85	WO-2007/112427-A2	10-04-2007	TOBIN, STEPHEN M.		
	A86	WO-2009/003173-A1	12-31-2008	THE GENERAL HOSPITAL CORPORATION		
	A87	WO-2011/124912-A1	10-13-2011	DOUGAL, GORDON REX, PATTERSON		

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	3	of	8	Attorney Docket Number	067286-0483

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A88	WO-2013/110021-A1	07-25-2013	HARVARD BIOSCIENCE INC, UNIV NEW YORK STATE RES FOUND		
	A89	WO-2014/131115-A1	09-04-2014	KLOX TECHNOLOGIES INC [CA]		
	A90	WO-2015/041919-A1	03-26-2015	D-REV: DESIGN FOR THE OTHER NINETY PERCENT		
	A91	WO-2019/018408-A1	01-24-2019	WILLEY, ANDREA		
	A92	WO-93/09847-A1	05-27-1993	LARSEN ERIK [CH]		
	A93	WO-96/06602-A1	03-07-1996	NOVEN PHARMA		
	A94	WO-99/22802-A1	05-14-1999	DUSA PHARMACEUTICALS INC [CA]		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A95	Affidavit of Duncan Hall, August 10, 2021	
	A96	Agostinis et al. Photodynamic therapy of cancer: an update. CA: A Cancer Journal for Clinicians. May 2011; 61(4):250-2	
	A97	Aktilite CL128 Operators Manual with Metvixia, Revised 2008	
	A98	Ameluz, Prescribing Information (2016)	
	A99	Australian Examination Report, Application No. 2020267186, 11/19/2021, 6 pages	
	A100	Australian Examination Report, Application No. 2020267186, 2/3/2022, 4 pages	
	A101	Australian Examination Report, Application No. 2021107564, 4/4/2022, 4 pages	
	A102	Australian Office Action, Application No. 2019200152, 11/11/2019, 9 pages	
	A103	Berardesca E, Vignoli GP, Fideli D, Maibach H. Effect of occlusive dressings on the stratum corneum water holding capacity. The American Journal of the Medical Sciences. 1992 Jul; 304(1):25-28	
	A104	Bissonnette R. Photodynamic therapy. In: Gold M.H., editor. Photodynamic Therapy in Dermatology. Springer Science and Business Media, LLC; New York, NY, USA: 2011, pp. 221-229	
	A105	Blu-U, Operating Manual (2006)	
	A106	BRAATHEN, LASSE R., ET AL. "Guidelines on the Use of Photodynamic Therapy for Nonmelanoma Skin Cancer: an International Consensus." Journal of the American Academy of Dermatology 56.1, January 2007, pages 125-143.	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: September 12, 2022				**First Named Inventor**	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	4	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A107	Britannica, The Editors of Encyclopaedia, "Gel: Physics and Chemistry", 4 pages, July 20, 1998, and "Gel: Additional Information", 1 page, Available on line at: https://www.britannica.com/science/gel and https://www.britannica.com/science/gel/additional-info#history	
	A108	Calderhead RG. Light-emitting diode phototherapy in dermatological practice in lasers in dermatology and medicine. Lasers in Dermatology and Medicine. 2011 Aug: 231-265	
	A109	CV of Dr. Howard Rogers MD, Ph.D.	
	A110	DANIEL BAROLET ET AL., Radiant Near Infrared Light Emitting Diode Exposure as Skin Preparation to Enhance Photodynamic Therapy Inflammatory Type Acne Treatment Outcome, Lasers in Surgery and Medicine Vol. 42, No. 2, February 1, 2010, pages 171-178	
	A111	Declaration of Dr. Howard Rogers MD, Ph.D., Oct. 19, 2021	
	A112	DRAGIEVA, G. ET AL., "A Randomized Controlled Clinical Trial of Topical Photodynamic Therapy with Methyl Aminolaevulinate in the Treatment of Actinic Keratoses in Transplant Recipients." British Journal of Dermatology 151.1, July 2004, pages 196-200.	
	A113	DUSA Levulan Press Release, December 6, 1999	
	A114	European Medicines Agency CHMP Assessment Report (excerpts), October 20, 2011	
	A115	European Office Action, Application No. 16787667.1, Sep. 24, 2019, 5 pages	
	A116	Extended European Search Report, Application No. 18835929.3, March 12, 2021, 10 pages	
	A117	Extended European Search Report, Application No. 20214586.8, June 2, 2021, 8 pages	
	A118	Fauteck Europe PMC Website Database Listing, Oct. 25, 2007	
	A119	Fauteck JD, Ackermann G, Birkel M, Breuer M, Moor AC, Ebeling A, Ortland C. Fluorescence characteristics and pharmacokinetic properties of a novel self-adhesive 5-ALA patch for photodynamic therapy of actinic keratoses, 2008.	
	A120	FEHR ET AL., Photodynamic Therapy of Vulvar and Vaginal Condyloma and Intraepithelial Neoplasia Using Topically Applied 5-Aminolevulinic Acid, Lasers in Surgery and Medicine, 2002, 30:273-279, 7 pages	
	A121	FEHR ET AL., Selective Photosensitizer Distribution in Vulvar Condyloma Acuminatum After Topical Application of 5-Aminolevulinic Acid, Am. J. Obstet. Gynecol., Volume 174(3), March 1996, pages 951-957	
	A122	GLAD.com.au: "GLAD History", 2012, [online] URL: http://www.glad.com.au/about-glad/glad-history/, retrieved online 8 November 2019	
	A123	Harris DR. Percutaneous absorption and the surface area of occluded skin: a scanning electron microscopic study. British Journal of Dermatology. 1974; 91(27-32)	
	A124	Hongcharu W., Taylor C., Chang, Y., Aghasi, D., Suthamjariya, K., Anderson, R. Topical ALA-photodynamic therapy for the treatment of acne vulgaris. J Invest Dermatol. 2000 Aug;115(2):183-92	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	5	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A125	HURLIMANN ET AL., Photodynamic Therapy of Superficial Basal Cell Carcinomas Using Topical 5-Aminolevulinic Acid in a Nanocolloid Lotion, Pharmacology and Treatment, Dermatology 197, 1998, pages 248-254	
	A126	International Patent Reviews, LLC review of U.S. Patent No. 10,357,567 dated July 26, 2021	
	A127	International Preliminary Report on Patentability, PCT/US2016/056572, April 26, 2018, 9 pages	
	A128	International Preliminary Report on Patentability, PCT/US2018/027070, 10/24/2019, 10 pages	
	A129	International Search Report and Written Opinion International Application No. PCT/US2018/027070, October 16, 2018, 18 pages	
	A130	International Search Report from PCT/US2018/042505, issued October 2, 2018.	
	A131	Japanese Office Action and English translation, Application No. 2019-555822, 1/11/2022, 13 pages	
	A132	Japanese Office Action and English Translation, Application No. JP 2020-503004, Dated 8/2/2022, 6 pages	
	A133	Jeffes E., McCullough J., Weinstein G., Fergin P., Nelson J., Shull T., Simpson K., Bukaty L., Hoffman W., Fong N. Photodynamic therapy of actinic keratosis with topical 5- aminolevulinic acid. A pilot dose-ranging study. Arch Dermatol. 1997	
	A134	JOHANNA T.H.M. VAN DEN AKKER ET AL., Effect of Elevating the Skin Temperature During Topical ALA Application on in vitro ALA penetration Through Mouse Skin and in vivo PpIX production in Human Skin, Photochemical and Photobiological Sciences, Royal Society of Chemistry, Cambridge, GB, Vol. 3, No. 3, March 1, 2004, pages 263-267	
	A135	KURWA, HABIB A., ET AL., "A Randomized Paired Comparison of Photodynamic Therapy and Topical 5-Fluorouracil in the Treatment of Actinic Keratoses." Journal of the American Academy of Dermatology 41.3, September 1999, pages 414-418.	
	A136	Letter to UVBiotek, LLC dated July 28, 2017 Re: K170187, Trade/Device Name: Photodynamic Therapy Device, available at https://www.accessdata.fda.gov/cdrh_docs/pdf17/K170187.pdf (accessed April 30, 2020)	
	A137	Levulan, Label (2002)	
	A138	Levulan, Label (2009)	
	A139	MACCORMACK, MOLLIE A., "Photodynamic Therapy in Dermatology: An Update on Applications and Outcomes." Seminars in Cutaneous Medicine and Surgery. Vol. 27, No. 1, WB Saunders, March 2008, pages 52-62.	
	A140	MAISCH ET AL., Fluorescence Induction of Protoporphyrin IX by a New 5-Aminolevulinic Acid Nanoemulsion Used for Photodynamic Therapy in a Full-Thickness ex vivo Skin Model, Experimental Dermatology, 19, 2009, pp. e302-e305	
	A141	McLaren G. Photodynamic therapy. In: Pfenninger and Fowler's procedures for primary care. Third Ed. Mosby Elsevier; Philadelphia, PA: 2011. pp 397-400	
	A142	News article entitled DUSA Pharmaceuticals To Pay U.S. $20.75 Million To Settle False Claims Act Allegations Relating To Promotion Of Unsupported Drug Administration Process, August 24, 2020	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	6	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A143	Notice of Allowance, 15/487,991 (067286-0398), 01/15/2020, 11 pages	
	A144	Notice of Allowance, 15/487,991 (067286-0398), 10/02/2019, 16 pages	
	A145	Notice of Allowance, 17/487,698 (067286-0437), 04/29/2022, 11 pages	
	A146	NUCCI ET AL., Treatment of Anogenital Condylomata Acuminata with Topical Photodynamic Therapy: Report of 14 Cases and Review, International Journal of Infectious Diseases, 14S, 2010, pp. e280-e282	
	A147	OZOG, DAVID M., ET AL., "Photodynamic Therapy: A Clinical Consensus Guide." Dermatologic Surgery 42.7, July 2016, pages 804-827.	
	A148	Palm M., Goldman PM. Aminolevulinic acid: actinic keratosis and photorejuvenation. In: Gold M.H., editor. Photodynamic Therapy in Dermatology. Springer Science and Business Media, LLC. 2011 Nov:5-30	
	A149	Partial International Search, Annex to Form PCT/ISA/206, International Application No. PCT/US2018/027070, July 19, 2018, 10 pages	
	A150	Petition for Inter Partes Review Under 35 U.S.C. 312, October 19, 2021	
	A151	PETRAS JUZENAS ET AL., Uptake of Topically Applied 5-Aminolevulinic Acid and Production of Protoporphyrin IX in Normal Mouse Skin: Dependence on Skin Temperature, Photochemistry and photobiology, Vol. 69, No. 4, April 1, 1999, pages 478-481	
	A152	REINHOLD ET AL., A Randomized, Double-Blind, Phase III, Multicentre Study to Evaluate the Safety and Efficacy of BF-200 ALA (Ameluz®) vs. Placebo in the Field-Directed Treatment of Mild-to-Moderate Actinic Keratosis with Photodynamic Therapy (PDT) When Using the BF-RhodoLED® Lamp, British Journal of Dermatology, 175(4): 696-705, February 27, 2016, 10 pages	
	A153	Rick K, Sroka R, Stepp H, Kriegmair M, Huber RM, Jacob K, Baumgartner R. Pharmacokinetics of 5-aminolevulinic acidinduced protoporphyrin IX in skin and blood. J Photochem Photobiol B. 1997 Oct;40(3):313-9	
	A154	Sakamoto FH, Torezan L, Anderson RR. Photodynamic therapy for acne vulgaris: a critical review from basics to clinical practice: part II. Understanding parameters for acne treatment with photodynamic therapy. J Am Acad Dermatol. 2010 Aug;63(2):195-211	
	A155	Sotiriou E, Apalla Z, Maliamani F, Zaparas N, Panagiotidou D, Ioannides D. Intraindividual, right-left comparison of topical 5- aminolevulinic acid photodynamic therapy vs. 5% imiquimod cream for actinic keratoses on the upper extremities, 2009.	
	A156	Sotiriou Pubmed Website Database Listing, 09/23/2009	
	A157	Third Party Submission filed in Application No. 17/109,311, June 21, 2021, 21 pages	
	A158	USPTO Advisory Action, 15/487,991, 5/15/2018 (067286-0398), 5 pages	
	A159	USPTO Interview Summary, 15/487,991 (067286-0398), 9/22/2017, 4 pages	
	A160	USPTO Non-Final Office Action, 16/631,205 (067286-0423), 03/03/2022, 31 pages	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
Date Submitted: September 12, 2022				**Filing Date**	Herewith
				First Named Inventor	Thomas BOYAJIAN
(use as many sheets as necessary)				Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	7	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A161	USPTO Notice of Allowance, 15/292,731 (067286-0395), 11/14/2019, 12 pages	
	A162	USPTO Notice of Allowance, 16/438,702 (067286-0405), 03/22/2021, 14 pages	
	A163	USPTO Notice of Allowance, 16/438,702 (067286-0405), 05/20/2021, 10 pages	
	A164	USPTO Notice of Allowance, 17/009,871 (067286-0411), 7/22/2021, 14 pages	
	A165	USPTO Notice of Allowance, 17/109,311 (067286-0419), 08/10/2021, 14 pages	
	A166	USPTO Office Action, 15/487,991 (067286-0398), 07/31/2018, 20 pages	
	A167	USPTO Office Action, 15/487,991 (067286-0398), 04/09/2019, 27 pages	
	A168	USPTO Office Action, 15/487,991 (067286-0398), 06/12/2017, 22 pages	
	A169	USPTO Office Action, 15/487991 (067286-0398), 2/6/2018, 19 pages	
	A170	USPTO Office Action, 16/438,702 (067286-0405), 10/13/2020, 17 pages	
	A171	USPTO Office Action, 16/791,004 (067286-0410), 10/25/2021, 26 pages	
	A172	USPTO Office Action, 16/808,631 (067286-0409), 1/21/2022, 28 pages	
	A173	USPTO Office Action, 17/009,871 (067286-0411), 12/02/2020, 15 pages	
	A174	USPTO Office Action, 17/109,311 (067286-0419), 07/20/2021, 17 pages	
	A175	USPTO Office Action, 17/487,698 (067286-0437), 12/17/2021, 21 pages	
	A176	USPTO Office Action, Serial No. 17/009,871 (067286-0411), 03/23/2021, 9 pages	
	A177	USPTO Office Action, Serial No. 17/109,311 (067286-0419), 3/2/2021, 16 pages	
	A178	Wachowska et al., Aminolevulinic acid (ALA) as a prodrug in photodynamic therapy of cancer. Molecules. 2011 May; 16(5): 4140-4164	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: September 12, 2022				**First Named Inventor**	Thomas BOYAJIAN
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	8	of	8	Attorney Docket Number	067286-0483

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A179	Webpage printout, Hill Laboratories Company, "Aklarus Phototherapy Treatment System with Red, Blue and Infrared Wavelengths by Hill Therapeutics," available at https://hilllabs.com/therapeutics/Aklarus-Photo-Therapy-System.php (accessed April 30, 2020)	
	A180	Willey A, Anderson RR, Sakamoto FH. Temperature-modulated photodynamic therapy for the treatment of actinic keratosis on the extremities. Dermatologic Surgery. 2014 Oct;40(10):1094- 1102	
	A181	WILLEY ET AL., American Society for Laser Medicine and Surgery Abstracts, #147, Ultra Fast Thermal PDT for Facial AKs: Proof of Concept Study, March 2017, 2 pages	
	A182	Willey Pubmed Website Database Listing, October 2014	
	A183	WOLF, PETER, ET AL., "Topical Photodynamic Therapy With Endogenous Porphyrins After Application of 5-Aminolevulinic Acid: An Alternative Treatment Modality for Solar Keratoses, Superficial Squamous Cell Carcinomas, and Basal Cell Carcinomas?" Journal of the American Academy of Dermatology 28.1, January 1993, pages 17-21.	
	A184	Zhang et al., "Topical 5-Aminolevulinic Photodynamic Therapy with Red Light vs Intense Pulsed Light for the Treatment of Acne Vulgaris _ A Spilit [sic] Face, Randomized, Prospective Study," DERMATO-ENDOCRINOLOGY, 2018, VOL. 9, NO. 1, e1375634 (9 pages)	

Examiner Signature		Date Considered	

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
First Named Inventor/Applicant Name:	Thomas BOYAJIAN
Filer:	Kiri Lee Sharon/Effie Hale
Attorney Docket Number:	067286-0483

Filed as Large Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	320	320
UTILITY SEARCH FEE	1111	1	700	700
UTILITY EXAMINATION FEE	1311	1	800	800
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4200	4200
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	2	100	200
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**6360**

Electronic Acknowledgement Receipt

EFS ID:	46593666
Application Number:	17942353
International Application Number:	
Confirmation Number:	3138
Title of Invention:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
First Named Inventor/Applicant Name:	Thomas BOYAJIAN
Customer Number:	22428
Filer:	Kiri Lee Sharon/Effie Hale
Filer Authorized By:	Kiri Lee Sharon
Attorney Docket Number:	067286-0483
Receipt Date:	12-SEP-2022
Filing Date:	
Time Stamp:	12:36:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$6360
RAM confirmation Number	E20229BC37444648
Deposit Account	190741
Authorized User	Effie Hale

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Track One Request	Track1Request.pdf	1005190 e02a6cda0c33e0943a992e7e96c89dabc5d051c7	no	2
Warnings:					
Information:					
2	Transmittal of New Application	ContTransmittal.pdf	126605 bd66717faa16c47e87782544bdbc9b66b33bfe79	no	3
Warnings:					
Information:					
3	Application Data Sheet	ADS.pdf	2225914 554c559db4ff07f8540c8367c88aab43f57fc848	no	9
Warnings:					
Information:					
4		ContinuationSpecification.pdf	139384 62c2675bcad9cfc057e262c26225819e99ab8d2e	yes	19

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	14
Claims	15	18
Abstract	19	19

Warnings:					
Information:					
5	Drawings-only black and white line drawings	Drawings.pdf	1273717 156cc32da790dc73107390eef6638200112d508e	no	8

Warnings:					
Information:					
6	Oath or Declaration filed	Declaration.pdf	4353771 ef1aae4ce3bdcdd1fc6e2308410096948121ad69	no	3
Warnings:					
Information:					
7	Power of Attorney	PoA.pdf	776818 2424e2034f5e229b1d628b6756c1d22e8f0fdcc0	no	2
Warnings:					
Information:					
8	Transmittal Letter	IDSTransmittal.pdf	117760 18ccf838364cacca8e98a667cc665cdf8da6c89d	no	2
Warnings:					
Information:					
9	Information Disclosure Statement (IDS) Form (SB08)	IDS_SB08.pdf	169903 cac12f2f703ba27a31ae6564bb544bdb238d4d33	no	8
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
10	Fee Worksheet (SB06)	fee-info.pdf	50800 fa37a592938e6c7a99e4b8ce10d47abf48d6841d	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	10239862	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Thomas BOYAJIAN	Nonprovisional Application Number (if known):	Unassigned
Title of Invention:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Kiri Lee Sharon/	Date 12 Sep 2022
Name (Print/Typed) Kiri Lee Sharon	Practitioner Registration Number 71,828

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Thomas BOYAJIAN
Title:	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS
Prior Appl. No.:	16/791,004
Prior Appl. Filing Date:	2/14/2020
Examiner:	Unassigned
Art Unit:	Unassigned

CONTINUING PATENT APPLICATION TRANSMITTAL LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Transmitted herewith for filing under 37 C.F.R. § 1.53(b) is a:

[**X**] Continuation [ ] Division [ ] Continuation-In-Part (CIP)

of the above-identified copending prior application in which no patenting, abandonment, or termination of proceedings has occurred. Priority to the above-identified prior application is hereby claimed under 35 U.S.C. § 120 for this continuing application. The entire disclosure of the above-identified prior application is considered as being part of the disclosure of the accompanying continuing application and is hereby incorporated by reference therein.

Enclosed are:

[**X**] Description, Claim(s), and Abstract (19 pages).

[**X**] Formal drawings (8 sheets, Figures 1-8).

[**X**] Executed Declaration (3 pages).

[**X**] Power of Attorney (2 pages).

[**X**] Information Disclosure Statement.

[**X**] Form PTO-SB08.

[**X**] Application Data Sheet (37 CFR 1.76).

[**X**] PTO/SB/424 - Request for Prioritized Examination.

The adjustment to the number of sheets for EFS-Web filing follows:

Number of Sheets		**EFS-Web Adjustment**	**Number of Sheets for EFS-Web**
27	x	75%	21

The filing fee is calculated below at the large entity rate:

	Number Filed		Included in Basic Fee		Extra		Rate		Fee Totals
Basic Filing Fee							$320.00	=	$320.00
Search Fee							$700.00		$700.00
Examination Fee							$800.00		$800.00
Sequence Listing fee									$0.00
Size Fee	21	-	100	=	0	x	$420.00		$0.00
Total Claims:	22	-	20	=	2	x	$100.00	=	$200.00
Independents:	3	-	3	=	0	x	$480.00	=	$0.00
If any Multiple Dependent Claim(s) present:						+	$860.00	=	$0.00
Surcharge under 37 CFR 1.16(e) for late filing of Executed Declaration or late payment of filing fee						+	$160.00	=	$0.00
Prioritized Examination fee (Track I) under 37 C.F.R. § 1.17 (c)									$4,200.00
Processing Fee (Track I) under 37 C.F.R. § 1.17 (i)									$140.00
TOTAL FILING FEE:								=	$6,360.00
Assignment Recordation Fee:						+	$50.00	=	$0.00
Processing Fee under 37 CFR 1.17(i) for Late Filing of English Translation of Application:						+	$140.00	=	$0.00
TOTAL FEE								=	$6,360.00

The above-identified fees of $6,360.00 are being paid by credit card via EFS-Web.

The Commissioner is hereby authorized to charge any fees required to secure a filing date and maintain pendency of this application to Deposit Account No. 19-0741.

Respectfully submitted,

Date 12 Sep 2022

By /Kiri Lee Sharon/

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4092
Facsimile: (202) 672-5399

Kiri Lee Sharon
Attorney for Applicant
Registration No. 71,828

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Thomas		BOYAJIAN	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Wilmington	MA	US

Mailing Address of Inventor:

Address 1	c/o DUSA Pharmaceuticals, Inc.
Address 2	29 Dunham Road

City	State/Province	Postal Code	Country
Billerica	MA	01821	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mark		CAROTA	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Chelmsford	MA	US

Mailing Address of Inventor:

Address 1	c/o DUSA Pharmaceuticals, Inc.
Address 2	29 Dunham Road

City	State/Province	Postal Code	Country
Billerica	MA	01821	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Brian		MAZEJKA	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

City	Salem	State/Province	NH	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o DUSA Pharmaceuticals, Inc.		
Address 2	29 Dunham Road		
City	Billerica	**State/Province**	MA
Postal Code	01821	**Country**	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	22428		
Email Address	IPDocketing@foley.com	Add Email	Remove Email

Application Information:

Title of the Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS		
Attorney Docket Number	067286-0483	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	22428		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	16/791004	2020-02-14
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/791004	Division of	15/292731	2016-10-13
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15/292731	Claims benefit of provisional	62/241902	2015-10-15

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	DUSA Pharmaceuticals, Inc.		
Mailing Address Information For Applicant:			
Address 1	29 Dunham Road		
Address 2			
City	Billerica	**State/Province**	MA
Country	US	Postal Code	01821
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	DUSA Pharmaceuticals, Inc.

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	29 Dunham Road		
Address 2			
City	Billerica	**State/Province**	MA
Country i	US	Postal Code	01821
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Kiri Lee Sharon/			Date (YYYY-MM-DD)	2022-09-12
First Name	Kiri Lee	Last Name	Sharon	Registration Number	71828

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	067286-0483
	Application Number	
Title of Invention	ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. application serial number 16/791,004, filed February 14, 2020, which is a divisional application of U.S. application serial number 15/292,731, filed October 13, 2016, now granted as U.S. Patent No. 10,589,122, which claims the benefit of priority to U.S. Provisional Application No. 62/241,902 filed on October 15, 2015, now expired, the entire contents of all of which are incorporated herein by reference.

FIELD

[0002] The invention relates generally to an adjustable illuminator that provides a uniform distribution of visible light in a number of configurations and is suitable for use in photodynamic therapy and diagnosis.

BACKGROUND

[0003] Photodynamic therapy (PDT), photodynamic diagnosis (PD), or photochemotherapy is generally used to treat and/or diagnose several types of ailments in or near the skin or other tissues, such as those in a body cavity. For example, PDT or PD may be used for treatment or diagnosis of actinic keratosis of the scalp or facial areas of a patient. In addition, PDT and PD may be used for treatment and diagnosis of other indications (e.g., acne, warts, psoriasis, photo-damaged skin, cancer) and other areas of the patient (e.g., arms, legs).

[0004] During one form of PDT or PD, a patient is first administered a photoactivatable agent or a precursor of a photoactivatable agent that accumulates in the tissue to be treated or diagnosed. The area in which the photoactivatable agent is administered is then exposed to visible light, which causes chemical and/or biological changes in the agent. These changes allow the agent to then selectively locate, destroy, or alter the target tissue while, at the same time, causing only mild and reversible damage to other tissues in the treatment area. One example of a precursor of a photoactivatable agent is 5-aminolevulinic acid ("ALA"), which is commonly

used in PDT of actinic keratosis. As they are used here, the terms ALA or 5-aminolevulinic acid refer to ALA itself, precursors thereof and pharmaceutically acceptable salts of the same.

[0005] For effective treatment, it is desirable to have a power output that is uniform in intensity and color. Illuminators, such as those disclosed in U.S. Patent Nos. 8,758,418; 8,216,289; 8,030,836; 7,723,910; 7,190,109; 6,709,446; 6,223,071, which are incorporated by reference in their entireties for the techniques, methods, compositions, and devices related to PDT and PD, are typically used to provide the proper uniformity of light for treatment purposes. These devices generally include a light source (e.g., a fluorescent tube), coupling elements that direct, filter or otherwise conduct emitted light so that it arrives at its intended target in a usable form, and a control system that starts and stops the production of light when necessary.

SUMMARY

[0006] Because PDT can be used to treat a variety of treatment areas, some illuminators utilize two or more panels, each panel having a light source to emit light at the intended target area. These panels are coupled together so as to be rotatable relative to each other. By incorporating multiple, rotatable panels, the overall size and shape of the area that is illuminated can be changed according to the intended treatment area.

[0007] In conventional adjustable illuminators, the panels are equally sized by width and length and are typically driven at the same power level. The panels are further joined at their edges by hinges so as to be rotatable to achieve a desired configuration. However, due to the edges of the panels and the presence of the hinges, the light source(s) of one panel does not immediately adjoin the light source(s) of an adjacent panel. As a result, light is not emitted from a "gap" between the light sources. The lack of light emitting from such areas, together with the uniform supply of power to the panels, can cause optical "dead space" in certain portions of the target treatment area. These portions, in turn, receive less overall light, resulting in a lower dose of treatment in those portions. In some instances, the dose of treatment can be lowered by as much as a factor of five when compared with those areas receiving an optimal amount of light.

[0008] Generally, these conventional illuminators are used for phototherapy of acne, which typically does not require the administration of a photoactivatable agent for effective treatment.

Thus, exposure to the light alone is generally sufficient treatment. Moreover, because multiple treatment sessions can be utilized to effectively treat the condition, uniformity of light across the target area during a given treatment is less of a concern in some situations. However, some forms of treatment involving PDT, such as the use of ALA to treat actinic keratosis, require specific and highly uniform intensity and color of light to achieve effectiveness. In these instances, successful PDT relies on the targeted delivery of both the correct quantity of the photoactivatable agent and the correct quantity (i.e., power and wavelength) of light to produce the desired photochemical reactions in the target cells. Thus, to achieve this, the light source must provide illumination to the target area and this illumination must be uniform with respect to both wavelength and power. The optical dead space that can occur at or near the hinges of conventional adjustable illuminators reduces the uniformity of the light along the treatment area, thereby reducing the effectiveness of PDT for these specific treatments. Moreover, these illuminators are also configured to adjust within a limited range, such that only a limited amount of surfaces on a patient's body may be treated, such as a patient's face and scalp. In addition, due to the various contours of a patient's body, the uniformity of light delivered by these conventional illuminators may vary substantially depending on the treatment area of the patient.

[0009] Therefore, it is an object of some embodiments of the present invention to reduce or eliminate these dead spaces and provide for a more uniform light distribution in an adjustable illuminator designed for PDT or PD of a variety of targeted areas. In addition, it is an object of some embodiments of the present invention to provide an infinitely adjustable illuminator that can effectively deliver a uniformity of light across various areas of a patient's body, such as a patient's extremities (e.g., arms and legs) or torso, in addition to a patient's face and scalp. Thus, a uniform light may be delivered to a targeted treatment area regardless of the shape and location of the contoured surface of the patient's body.

[0010] One embodiment of the present invention uses a plurality of panels, wherein at least one panel is of a different width than the other panels. This panel is positioned between two other panels and, in a way, acts as a "lighted hinge" to provide enough "fill-in" light to reduce or eliminate the optical dead spaces when the panels are bent into a certain configuration. Preferably, five panels in total are used to provide for an optimal increase in the total size of possible treatment areas. Two of the panels are preferably of a smaller width than the other three

larger panels. These panels are positioned in an alternating manner such that each of the smaller-width panels is situated in between two of the three larger panels to allow for both adjustability and increased uniformity. Furthermore, to further reduce or eliminate optical dead spaces, the panels are preferably coupled together using nested hinges, thereby reducing the area in which no light source is present on the illuminator. In order to even further reduce or eliminate optical dead spaces, it is preferable that the light sources on each of the panels are individually configurable to provide specific power output to certain areas of the light sources on the panels to compensate for decreased uniformity. For example, the power outputted to each individual diode in an array of light emitting diodes (LED) may be individually adjusted.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Features, aspects, and advantages of the present invention will become apparent from the following description and the accompanying exemplary embodiments shown in the drawings, which are briefly described below.

[0012] FIGS. 1A-1B show top views of a main body of an illuminator according to an exemplary embodiment.

[0013] FIGS. 2A-2B show perspective views of the main body of the illuminator of FIGS. 1A-1B.

[0014] FIGS. 3A-3B show detailed views of the nested hinges of the main body of the illuminator of FIGS. 1A-1B.

[0015] FIG. 4 shows a perspective view of the illuminator having the main body of FIGS. 1A-1B mounted to a stand.

[0016] FIG. 5 shows a schematic view illustrating an addressable configuration of LEDs mounted on the main body of the illuminator of FIGS. 1A-1B.

[0017] FIG. 6 shows a schematic view illustrating widths and lengths of individual panels of the main body of the illuminator of FIGS. 1A-1B.

[0018] FIG. 7 shows a graph illustrating light dosage across a treatment area according to a conventional paneled illuminator.

[0019] FIG. 8 shows a graph illustrating light dosage across the same treatment area as FIG. 7 using an illuminator according to one embodiment of the present invention.

DETAILED DESCRIPTION

[0020] FIGS. 1A-1B and 2A-2B illustrate one embodiment of a configurable illuminator according to the present invention. The illuminator includes a main body 100, which preferably has five individual panels 10a-10e, each of which are connected in a rotatable manner via nested hinges 50. Each panel contains an array of light emitting diodes (LED) 60, which may be configured in an evenly spaced pattern across the face of the panel. The number of individual LEDs arranged in a given array is not particularly limited. Alternatively, other types of light sources may be used, such as fluorescent or halogen lamps.

[0021] Preferably, each LED array 60 extends as far to the edges as possible. In addition, the LED arrays 60 are preferably dimensioned to provide an overall lighted area for a given treatment area based on a range from the 5th percentile of corresponding female sizes to the 95th percentile of corresponding male sizes for that particular treatment area. The LED arrays 60 emit light at an appropriate wavelength according to the intended treatment or to activate the particular photoactivatable agent used in treatment or diagnosis. For example, when ALA is used as a precursor of a photoactivatable agent for the treatment of actinic keratosis, the LED arrays 60 preferably emit blue light having wavelengths at or above 400 nanometers (nm), for example, about 430 nm, about 420 nm or, for example, 417 nm. However, the LED arrays 60 may also emit visible light in other ranges of the spectrum, such as in the green and/or red ranges between 400 and 700 nm, for example, about 625 nm to 640 nm or, for example, 635 nm. For example, the LED arrays 60 may also emit light having wavelengths of 510 nm, 540 nm, 575 nm, 630 nm, or 635 nm. In addition, the LED arrays 60 may be configured to emit light continuously or the LED arrays 60 may be configured to flash the diodes on and off based on a predetermined interval. Furthermore, the LED arrays 60 may be configured such that only one wavelength of light (e.g., blue) is emitted. Alternatively, the LED arrays 60 may be configured

such that two or more wavelengths of light are emitted from the arrays. For example, the LED arrays 60 may be configured to alternately emit blue light and red light for treatment purposes.

[0022] As shown in FIGS. 1A-1B and 2A-2B, the five panels 10a-10e are of different widths relative to one another. In particular, in certain embodiments, three panels 10a, 10c, 10e are configured to have wider widths, while two panels 10b, 10d have smaller, narrower widths, each of the narrower widths of the two panels 10b, 10d being less than each of the wider widths of the three panels 10a, 10c, 10e. In some embodiments, the wider widths of the three larger panels 10a, 10c, 10e are approximately equal. In other embodiments, the wider widths of the three larger panels 10a, 10c, 10e are different relative to one another. In addition, the narrower widths of the two panels 10b, 10d may be approximately equal or may be different relative to one another. The panels are further arranged in an alternating configuration, with the narrower panels (e.g., 10b) positioned in between two wider panels (e.g., 10a, 10c). As shown in FIG. 6, in some embodiments, the narrower panels 10b, 10d are configured to have a width that is about 30% to 60% less than the width of the wider panels 10a, 10c, 10e. In other embodiments, the narrower panels 10b, 10d are configured to have a width that is about 30% to 50% less than the width of the wider panels 10a, 10c, 10e.

[0023] As shown in FIGS. 1A-1B and 2A-2B, the panels 10a-10e are rotatably connected by hinges 50. The hinges 50 may take the form of nested hinges, which may include hinges that substantially reduce or eliminate optical dead spaces. As shown in FIGS. 2A-2B, on at least one side of a panel, a tab 23 may extend out from both the top and bottom of the panel. The tabs 23 are configured such that a side of an adjacent panel may be received between the tabs 23, as shown in FIG. 2A. Thus, as best seen in FIGS. 2A-2B and 6, the height of the adjacent panel (e.g., panel 10a) is slightly smaller than the height of the tabbed panel (e.g., panel 10b) into which the adjacent panel is received. As shown in FIG. 6, the middle panel (i.e., panel 10c) is preferably configured as having the largest height, such that it is tabbed on both sides and may receive the sides of adjacent panels on each side. As seen in FIGS. 1A-1B, each of the tabs 23 further includes an opening to receive a bolt to connect adjacent panels together.

[0024] As shown in further detail in FIGS. 3A-3B, between the tabs 23 are the nested hinges 50, which are mounted to the inner side surfaces of adjacent panels (e.g., 10a, 10b) to allow for

rotation of the panels. A flange 51 of the hinge 50 is mounted to the inner side surface of a panel via bolts 53. The inner side surface of a panel may include a recess in which the flange 51 may be placed. The inner side surface of the panel may also include an additional recess to accommodate the joint of the hinge 50 such that the joint of the hinge 50 becomes substantially flush with an outer front surface of the panel. Such configurations may allow for the outside vertical edges of adjoining panels to be positioned closer to one another. By spacing the vertical edges of adjoining panels closer, optical dead spaces may be further reduced or eliminated. In addition, the hinges 50 together with the tabs 23 may reduce the number of pinch points present in the system.

[0025] As shown in FIGS. 1A-1B, the main body 100 of the illuminator may include a mounting head 40. The mounting head 40 may allow for the main body 100 to be mounted to a movable stand 80, which is shown in FIG. 4, to allow a user to easily move the main body 100 to the appropriate treatment position. The stand 80 includes a base 81 and a vertical pillar 82. The base 81 may further include wheels 87 at its bottom in order to allow the user to horizontally move the illuminator to an appropriate position. The wheels 87 may include locks, such that the stand 80 is prevented from further horizontal movement once positioned. In addition, the vertical pillar 82 may be attached to the base 81 at a pivot point 83. The pivot point 83 allows the vertical pillar 82 to be rotated to increase the range of positioning for the illuminator. At a top end, the vertical pillar 82 includes a connecting arm 85, which may serve as a mounting structure for the main body 100. The connecting arm 85 includes a hinge point 86 such that the main body 100 can be moved vertically relative to the stand 80. The vertical pillar 82 may also be configured as a telescopic structure, such that the user can change the height of the vertical pillar 82. This allows for an increased range of vertical movement for the main body 100, which can allow the user to position the main body 100 at lower portions of a treatment area, such as a patient's legs or feet. The stand 80 may also include a stabilization arm 84. Once the stand 80 and main body 100 is positioned, the stabilization arm 84 may be attached to the main body 100 to prevent unwanted movement of the main body 100 during treatment. As further shown in FIG. 4, a controller and power supply 90 is mounted to the stand 80 in order to supply electrical power to the main body 100 and allow the user to control the main body 100 for treatment purposes. Alternatively, the controller and power supply 90 may be directly mounted to the

main body 100. In order to provide a cooling system for the LED arrays 60, one or more fans 70 may be mounted onto each of the panels, as shown in FIG. 4.

[0026] At least one control unit is also connected to the panels to regulate power to the lights to achieve the required uniformity and intensity for the target treatment. The control unit may be implemented as hardware, software, or a combination of both, such as a memory device storing a computer program and a processor to execute the program. Alternatively, each panel may have a dedicated control unit to regulate power to the individual LED array on a given panel to allow for more particular fine-tuning of the illuminator, which may further enhance uniformity and increase efficiency. For example, under Lambert's cosine law, light intensity at a given point on a "Lambertian" surface (such as skin) is directly proportional to the cosine of the angle between the incoming ray of light and the normal to the surface. Thus, a ray of light that is directed to the front of a curved surface (e.g., a head of a patient) will arrive in a substantially perpendicular manner to that area and will result in 100% absorbance. However, a ray of light that arrives at a side edge of the curved surface will arrive in a substantially parallel manner. According to Lambert's cosine law, the intensity, and thus absorption, of the light at the side edge will approach zero, making treatment at that area ineffective. Thus, a "fall off" of light exposure tends to occur at the edges of a curved surface. In addition, "fall off" increases as the distance between the light source and the point on the surface increases.

[0027] Configuring an illuminator to conform to the curved surface (e.g., a U-shaped configuration designed to "wrap around" the curvature of the surface) aids in reducing this effect and increases overall uniformity. However, to sufficiently increase uniformity, the light source should be larger relative to the target treatment area in order to fully encompass the body part to be treated and also provide light from all angles to any target point on the treatment area. In order to increase the uniformity of light exposure to the treatment area while maintaining a practical size of the illuminator, the LED arrays 60 may be individually configured to increase the intensity of light emitting from certain diodes to compensate for this fall-off effect.

[0028] An example in which the LED arrays 60 may be individually configured is shown in FIG. 5. Here, the LED arrays 60 are divided into three general areas, which may be described as "addressable strings." Areas 1, 3, and 5 correspond to an addressable string configuration that

may be included in the wider panels 10a, 10c, and 10e, while areas 2, 4, and 6 correspond to an addressable string configuration that may be included in the narrower panels 10b and 10d. The current to each area is adjusted in order to adjust the intensity of light emitting from each of the areas. For example, a higher current may be supplied to areas 1 and 2 than the current supplied to areas 3 and 4 such that areas 1 and 2 emit a higher intensity of light than areas 3 and 4. Similarly, a higher current may be supplied to areas 3 and 4 than the current supplied to areas 5 and 6. Thus, a higher intensity of light is emitted overall from the edges, which may allow for a reduction in any fall-off effect. Alternatively, the illuminator may be configured to adjust each individual diode present in a given LED array 60, allowing for an even greater fine-tuning effect. Furthermore, by using either pre-programmed settings or sensors to detect the curvature of the surface to be treated, the LED arrays 60 can be individually configured to emit more intense light to only those areas that require it. This allows for an increase in uniformity of light exposure in an efficient manner as power output and/or light intensity is increased to only certain diodes, in accordance with need.

[0029] The addressable strings of the LED arrays 60 may also include varying amounts of individual diodes mounted within the particular area. For example, for the wider panels 10a, 10c, and 10e, 12 diodes may be mounted in each of areas 1, while 9 diodes may be mounted in each of areas 3 and 41 diodes may be mounted in area 5, resulting in a total of 83 individual diodes included within each of the wider panels 10a, 10c, and 10e. For the narrower panels 10b and 10d, 8 diodes may be mounted in each of areas 2, while 9 diodes may be mounted in each of areas 4, and 23 diodes may be mounted in area 6, resulting in a total of 57 individual diodes included within each of the narrower panels 10b and 10d. However, the number and arrangement of diodes included within each of the LED arrays 60 is not particularly limited. For example, the wider panels 10a, 10c, and 10e may each contain a total amount of diodes that ranges from about 80 diodes to about 350 diodes. Similarly, the narrower panels 10b and 10d may each contain a total amount of diodes that ranges from about 50 diodes to about 250 diodes. By varying the arrangement of the diodes within each of the addressable strings of the LED arrays 60, power output and/or the intensity of light emitted from a given array may be better controlled and fine-tuned.

[0030] In addition, individually regulating power to the LED arrays 60 can also contribute to the reduction or elimination of the optical dead spaces that may otherwise occur at the hinge points. Specifically, power output and/or the emitted light intensity may be increased close to the edges of the array that are closest to the nested hinges to compensate for the lack of light emitting from the meeting point of panels. The narrower panels 10b, 10d are also preferably operated at a higher power level and/or at a higher emitted light intensity compared to the wider panels 10a, 10c, 10e in order to provide additional fill-in light. Furthermore, individual power regulation may aid in compensating for manufacturing variance that can occur in individual diodes. Finally, by fine-tuning each array 60, the panels can be easily deployed for other applications as each array is specifically configurable to address the lighting needs of the specific application.

[0031] The illuminator may further include a timer, which can indicate to the user the appropriate length of exposure time for the particular treatment. The illuminator may also be programmed with pre-stored light dosing parameters to allow the user to select a desired treatment type. The pre-stored parameters may include, for example, pre-stored settings for exposure time, light intensity, and outputted wavelength. Based on the selected treatment, the illuminator is automatically configured to provide the correct lighting dosage by being supplied with the appropriate power output to achieve the required uniformity for the treatment. Alternatively, the illuminator can be provided with sensors that detect the size of the treatment area positioned in front of the illuminator. The sensors then determine the correct light dosing parameters based on the sensed treatment area. The illuminator may also further include actuators and may be programmed to be moved automatically depending on the selected treatment. Once a treatment is selected, the illuminator may be automatically positioned into the proper configuration by the actuators without requiring the user to move the system by hand. Alternatively, the sensors may detect the adjusted position of the illuminator manually set by the user. The detected position of the illuminator may then be used to indicate the intended treatment area. Correct light dosing parameters for the specific treatment area may then be provided based on the detected position set by the user.

[0032] The adjustable illuminator of the present invention allows for an infinite amount of configurations that can be adapted for the targeted treatment area. The configurations may range

from a flat-plane emitter (as shown in FIGS. 1B and 2B) to a substantially U-shaped configuration (as shown in FIGS. 1A and 2A). The adjustable illuminator may also be configured such that the two end panels 10a, 10e can be pulled back relative to the three middle panels 10b, 10c, 10d, such that a smaller U-shaped configuration may be created by the middle panels. Thus, the adjustable illuminator allows for the treatment of additional areas of a patient's body. In other words, not only can the adjustable illuminator effectively deliver a uniform light intensity to traditional surfaces such as the face or scalp, but the adjustable illuminator can also provide a device that can easily be configured to treat other portions of a patient's body, in particular, those having smaller curved surfaces, such as the arms and legs. Moreover, the adjustable illuminator may also be easily positioned to deliver a uniform light intensity to larger treatment areas, such as the back or chest.

[0033] As described above, the narrower panels 10b, 10d are dimensioned such that the panels act as "lighted hinges." Thus, when the wider panels 10a, 10c, 10e are adjusted into the desired form, the illuminator "bends" at the narrower panels 10b, 10d, where traditionally the "bend" would occur substantially at the hinge itself. Thus, instead of an unlighted "bent" portion as would occur in the conventional illuminator, the present illuminator provides a "bent" portion that is also configured to emit light, thereby helping to reduce optical dead space without requiring large amounts of power differentiation among the light sources of each panel to provide the required fill-in light. The effects of this configuration can be best seen in a comparison of FIGS. 7 and 8. FIG. 7 illustrates the light uniformity produced by a conventional illuminator, measured with a cosine response detector, which mimics the response of a patient's skin to the incident of light as described above, at a distance of two inches. Total light dose, in terms of J/cm^2, was measured based on emitted irradiance (W/cm^2) over time (in seconds). The targeted treatment area shown is a patient's head, where height is shown as the y-axis and rotation angle from the center of the emitting surface is shown as the x-axis. As can be seen in FIG. 7, higher light doses of about 10 J/cm^2 occur at the center of the face (for example, at region A), near the patient's nose, where the patient is facing closest to, and substantially perpendicular to, the middle-most panel. Total light dose then begins to drop as movement away from the center of the face occurs where the effects of cosine "fall-off" and optical dead spaces are more prevalent. For example, light dose is reduced by about 20% at the patient's cheek areas (for example, at region B), and by about 80% toward the outer boundaries of the patient's face (for

example, at region E), such as the ears and forehead. Thus, as shown in FIG. 7, conventional adjustable illuminators utilizing equally-sized panels operating at the same power output level produce a varying field of light uniformity, making it undesirable and ineffective for those treatments requiring highly specific light uniformity.

[0034] FIG. 8, on the other hand, illustrates the light uniformity produced by an embodiment of the present invention. The targeted treatment area is the same as that measured in FIG. 7. However, compared to FIG. 7, the light output uniformity produced by the illuminator is greatly enhanced across the patient's face and exhibits little to no deviation from the light output measured in the center of the patient's face to the light output measured at the edges of the patient's face. For example, as shown in FIG. 8, total light doses of about 10 J/cm^2 (for example, at region A') occur across all regions of the face, including the center of the face (for example, the patient's nose), the patient's check areas, and the outer boundaries of the patient's cheek areas, such as the ears and forehead. Moreover, total light dose drops off minimally (for example, at region B') at the extreme outer boundaries of the patient's face. In one embodiment, the measured output over the active emitting area (over the entire active emitting area) is within 60% of the measured maximum (over the entire active emitting area) measured with a cosine response detector over all operation distances. More preferably, the measured output over the emitting area is within 70% of the measured maximum over a distance of two and four inches. Even more preferably, the measured output over the emitting area is within 80% of the measured maximum over a distance of two and four inches.

[0035] One example of a treatment method for precancerous lesions, such as actinic keratosis, by PDT utilizing an adjustable illuminator described above in conjunction with ALA will now be described.

[0036] Essentially anhydrous ALA is admixed with a liquid diluent just prior to its use. The ALA admixture is topically applied to the lesions using a point applicator to control dispersion of the ALA admixture. After the initial application of the ALA admixture has dried, one or more subsequent applications may be similarly applied. Approximately 2 mg/cm^2 of ALA is administered. Formation of photosensitive porphyrin and photosensitization of the treated lesions occurs over the next 14-18 hours, during which time exposure to direct sunlight or other

bright light sources should be minimized. Between 14 and 18 hours after administration of the ALA, the lesions are irradiated by the adjustable illuminator according to the present invention. The illuminator irradiates the lesions with a uniform blue light for a prescribed period. According to a preferred treatment, the visible light has a nominal wavelength of 417 nm. The illuminator may irradiate the lesions with a uniform red light for a prescribed period. In certain embodiments, the illuminator irradiates the lesions with a uniform blue light for a first prescribed period and then irradiates the lesions with a uniform red light for a second prescribed period. For example, in some embodiments, the illuminator is configured to irradiate the lesions with a uniform blue light (e.g., 417 nm) at a low intensity (e.g., about 0.1 J/cm^2 to about 2 J/cm^2) to photobleach, for example, protoporphyrin IX (PpIX) present at the surface of the patient's skin, and irradiate the lesions with a uniform red light (e.g., 635 nm) at a high intensity (e.g., about 30 J/cm^2 to about 150 J/cm^2) to activate PpIX present at deeper layers of the patient's skin, thus avoiding potential damage to the upper layers of the patient's skin. The illuminator may be configured to simultaneously irradiate the patient's skin with the low intensity blue light and the high intensity red light or sequentially irradiate the patient's skin with the low intensity blue light and the high intensity red light. In certain embodiments, the illuminator is configured to irradiate the patient's skin with the low intensity blue light for about one hour to about three hours and irradiate the patient's skin with the high intensity red light for about 20 minutes to about 30 or 40 minutes, either at the same time the patient's skin is irradiated with the low intensity blue light or after the patient's skin has been irradiated with the low intensity blue light.

[0037] The invention thus provides a method for photodynamically diagnosing or treating a contoured surface of a patient, which includes providing the adjustable illuminator described above, placing the patient in the illuminator, and illuminating the patient to diagnose or treat the patient. The patient may be illuminated to treat actinic keratosis, acne, photo-damaged skin, cancer, warts, psoriasis, or other dermatological conditions. The method may also be used to remove hair and diagnose cancer.

[0038] Since the total light dose (J/cm^2) is equal to irradiance (W/cm^2) multiplied by time (sec), the only additional parameter that needs to be controlled for delivery of the correct treatment light dose is exposure time. This may be accomplished by the timer described above, which can control the electrical power supplied to the LED arrays 60 appropriately, and which

can be set by the physician. Data has shown that 10 J/cm^2 delivered from a source with an irradiance density of 10 mW/cm^2, or an irradiance density of about 9.3 to about 10.7 mW/cm^2, produces clinically acceptable results for desired treatment areas (e.g., face, scalp, extremities). From the equation above, this light dose will require an exposure time of 1000 seconds (16 min. 40 sec). In addition, due to the addressable nature of the adjustable illuminator, the illuminator may be used to treat a patient at higher power such that less time is required for effective treatment. For example, the adjustable illuminator may deliver an irradiance density of 20 mW/cm^2 for an exposure time of 500 seconds (8 min. 20 sec) to deliver a clinically acceptable light dose of 10 J/cm^2. Alternatively, the adjustable illuminator may include higher power ranges, such as 30 mW/cm^2, over an exposure time resulting in a light dose of 10 J/cm^2. A selected light dose may also be administered by additionally or alternatively varying the irradiance density over treatment time.

[0039] Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details and representative devices and methods, shown and described herein. Accordingly, various modifications may be made without departing from the spirit and scope of the general inventive concept as defined by the appended claims and their equivalents.

WHAT IS CLAIMED IS:

1. A system for photodynamically diagnosing or treating a patient, comprising:

an illuminator comprising at least five panels connected by hinged structures on inner side surfaces of adjacent panels; and

light sources disposed on surfaces of the at least five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources,

one of the at least five panels being positioned as a center panel configured to face the treatment surface, and two or more of the at least five panels being configured to be angled relative to the center panel,

wherein the at least five panels are positioned to allow treatment within approximately four inches of the treatment surface, and

wherein each of the at least five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

2. The system of claim 1, wherein the illuminator is configured to output red light at a dose of about 30 J/cm^2 to about 150 J/cm^2.

3. The system of claim 1, wherein the illuminator is configured to output light at a variable irradiance density during treatment.

4. The system of claim 1, wherein the illuminator is configured to output light at an irradiance density of 10 mW/cm^2 to 30 mW/cm^2.

5. The system of claim 1, wherein a plurality of the light sources are configured to emit light having a wavelength in a range of 400 nm to 700 nm.

6. The system of claim 1, wherein the at least five panels are individually configurable to control illumination from each of the at least five panels.

7. A method of photodynamically diagnosing or treating a patient, comprising:

administering 5-aminolevulinic acid (ALA) to the patient;

positioning an illuminator proximate to the patient, the illuminator comprising at least five panels connected by hinged structures on inner side surfaces of adjacent panels; and

uniformly illuminating a treatment surface of the patient with light sources disposed on the at least five panels of the illuminator, the at least five panels being positioned to allow treatment within approximately four inches of the treatment surface,

wherein each of the at least five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

8. The method of claim 7, wherein the illuminating comprises outputting red light during at least part of the time when the treatment surface is illuminated.

9. The method of claim 7, wherein the illuminating comprises outputting blue light during at least part of the time when the treatment surface is illuminated.

10. The method of claim 7, further comprising changing intensities of the light sources of the illuminator with a controller in accordance with information received from at least one sensor relating to a curvature of the treatment surface.

11. The method of claim 7, wherein:

the illuminator comprises at least three first panels having first widths, at least two second panels having second widths, wherein each of the second widths of the at least two second panels is narrower than each of the first widths of the at least three first panels; and

the at least three first panels and the at least two second panels are connected in an alternating manner such that each of the at least two second panels has a first lateral side connected to a respective one of the at least three first panels and a second lateral side connected to another respective one of the at least three first panels.

12. The method of claim 7, further comprising determining a size of the treatment surface of the patient using a sensor.

13. The method of claim 7, further comprising determining a shape of the treatment surface of the patient using a sensor.

14. The method of claim 12, further comprising adjusting an overall light dose with a controller based on the determined size of the treatment surface.

15. The method of claim 12, further comprising adjusting positioning of panels with at least one actuator based on the determined size of the treatment surface.

16. The method of claim 13, further comprising adjusting an overall light dose with a controller based on the determined shape of the treatment surface.

17. The method of claim 13, further comprising adjusting positioning of panels with at least one actuator based on the determined shape of the treatment surface.

18. A system for photodynamically diagnosing or treating a patient, comprising:

a mobile base supported by at least four wheels;

a pillar perpendicular to the base;

a controller disposed to be supported by the pillar;

an arm mounted to a top portion of the pillar; and

an illuminator connected at an end of the arm, the arm being hinged to allow adjustment of a position of the illuminator relative to the base, the illuminator comprising:

at least five panels connected by hinged structures to allow continuous illumination across the at least five panels, wherein the at least five panels are individually configurable to control illumination from each of the at least five panels,

light sources disposed on surfaces of the at least five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources, the light sources being configured to output light uniformly during at least part of a time when the treatment surface is illuminated, and

one or more fans mounted to at least one of the panels.

19. The system of claim 18, wherein each of the at least five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

20. The system of claim 18, wherein one of the at least five panels is positioned as a center panel configured to face the treatment surface, and two or more of the at least five panels are configured to be angled relative to the center panel.

21. The system of claim 18, wherein the light sources are configured to output blue light during at least part of the time when the treatment surface is illuminated.

22. The system of claim 18, wherein the light sources are configured to output red light during at least part of the time when the treatment surface is illuminated.

ABSTRACT

An adjustable illuminator for photodynamically diagnosing or treating a surface includes a plurality of first panels and at least one second panel. The plurality of first panels have wider widths and the at least one second panel has a narrower width. The narrower width is less than the wider widths. The illuminator further includes a plurality of light sources, each mounted to one of the plurality of first panels or the at least one second panel and configured to irradiate the surface with substantially uniform intensity visible light. The plurality of first panels and the at least one second panel are rotatably connected. The at least one second panel is connected on each side to one of the plurality of first panels. The second panel acts as a "lighted hinge" to reduce or eliminate optical dead spaces between adjacent panels when the illuminator is bent into a certain configuration.

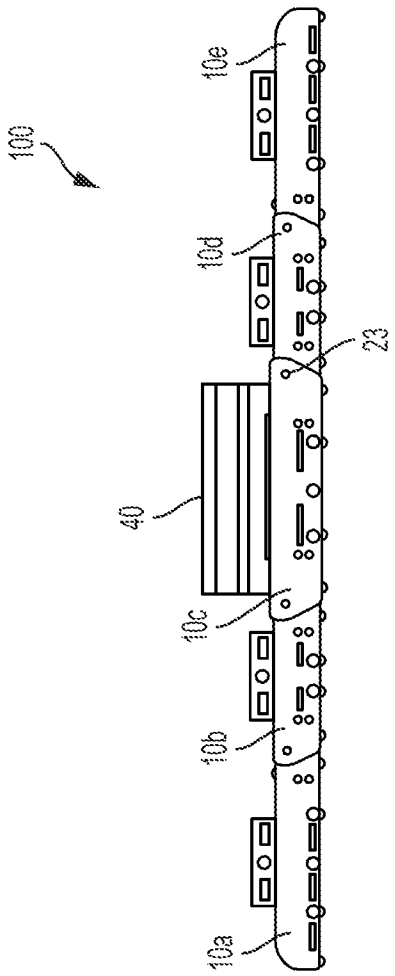


FIG. 1B

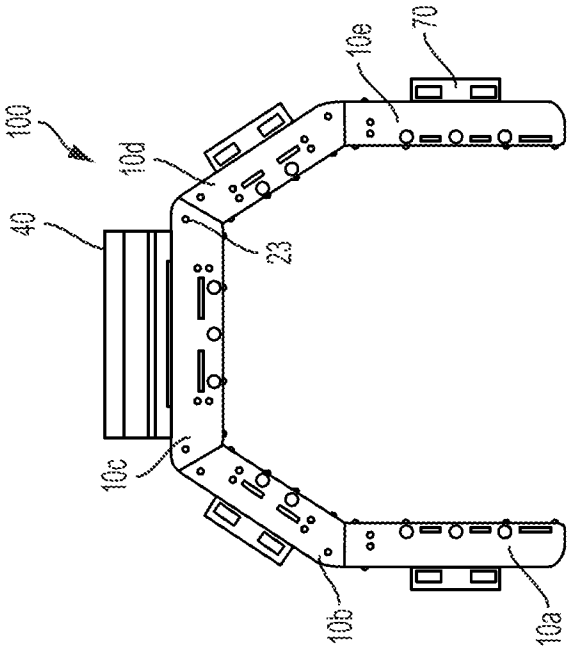


FIG. 1A

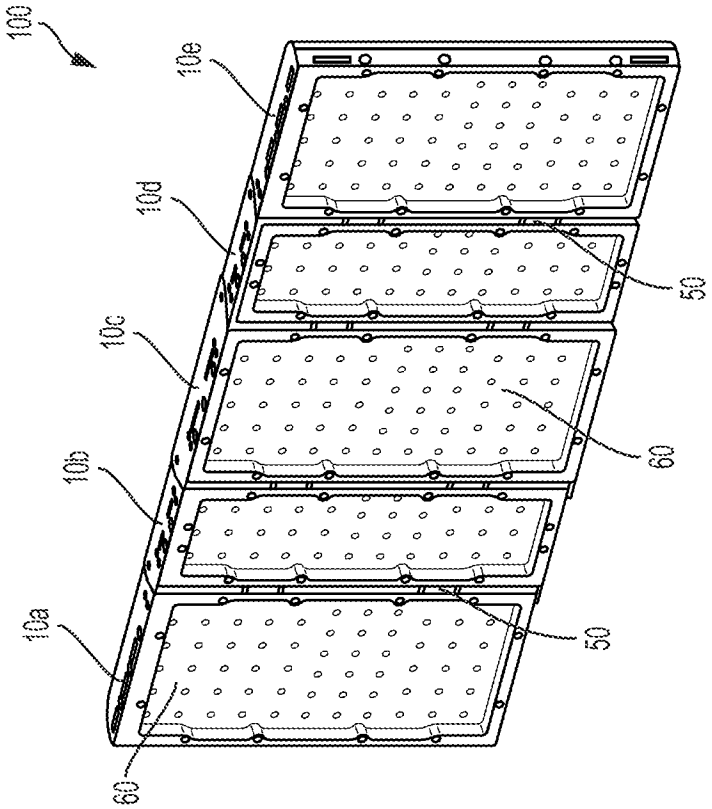

100
10e
10d
10c
10b
10a
50
60
50
60

FIG. 2B

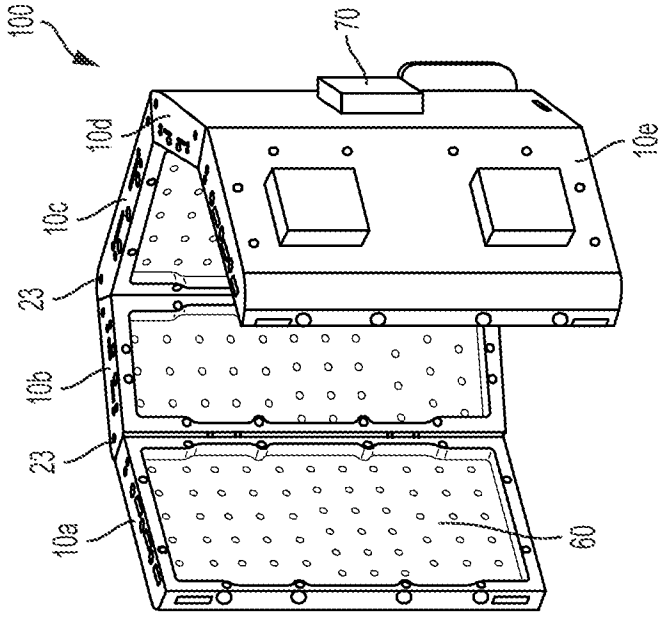

100
70
10d
10e
10c
23
10b
23
10a
60

FIG. 2A

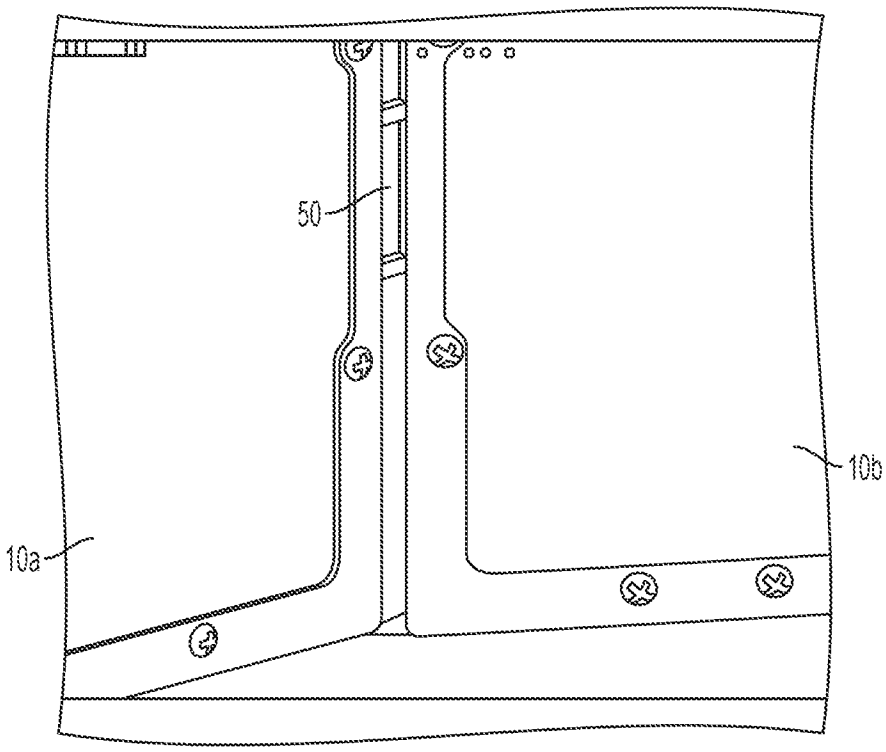


FIG. 3A

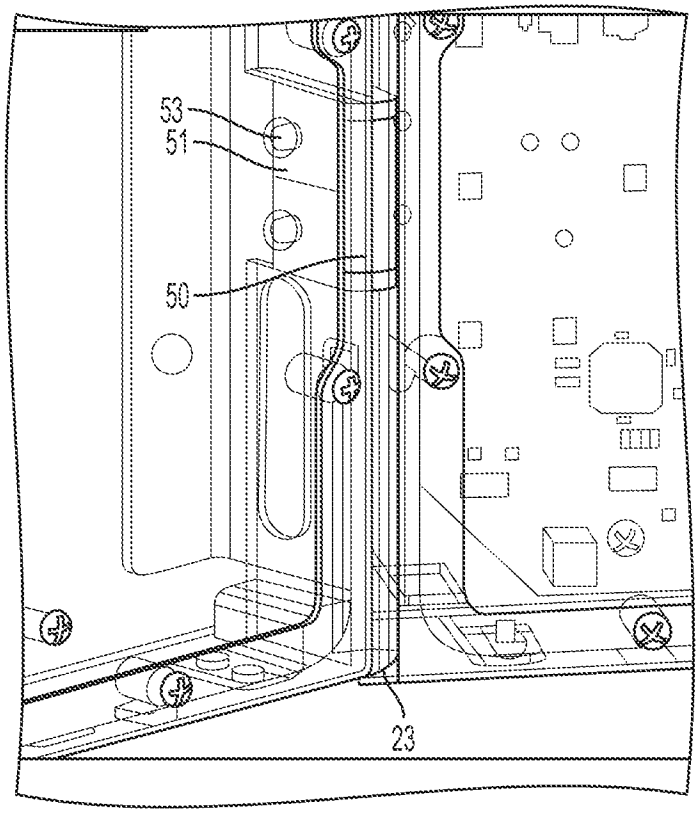


FIG. 3B

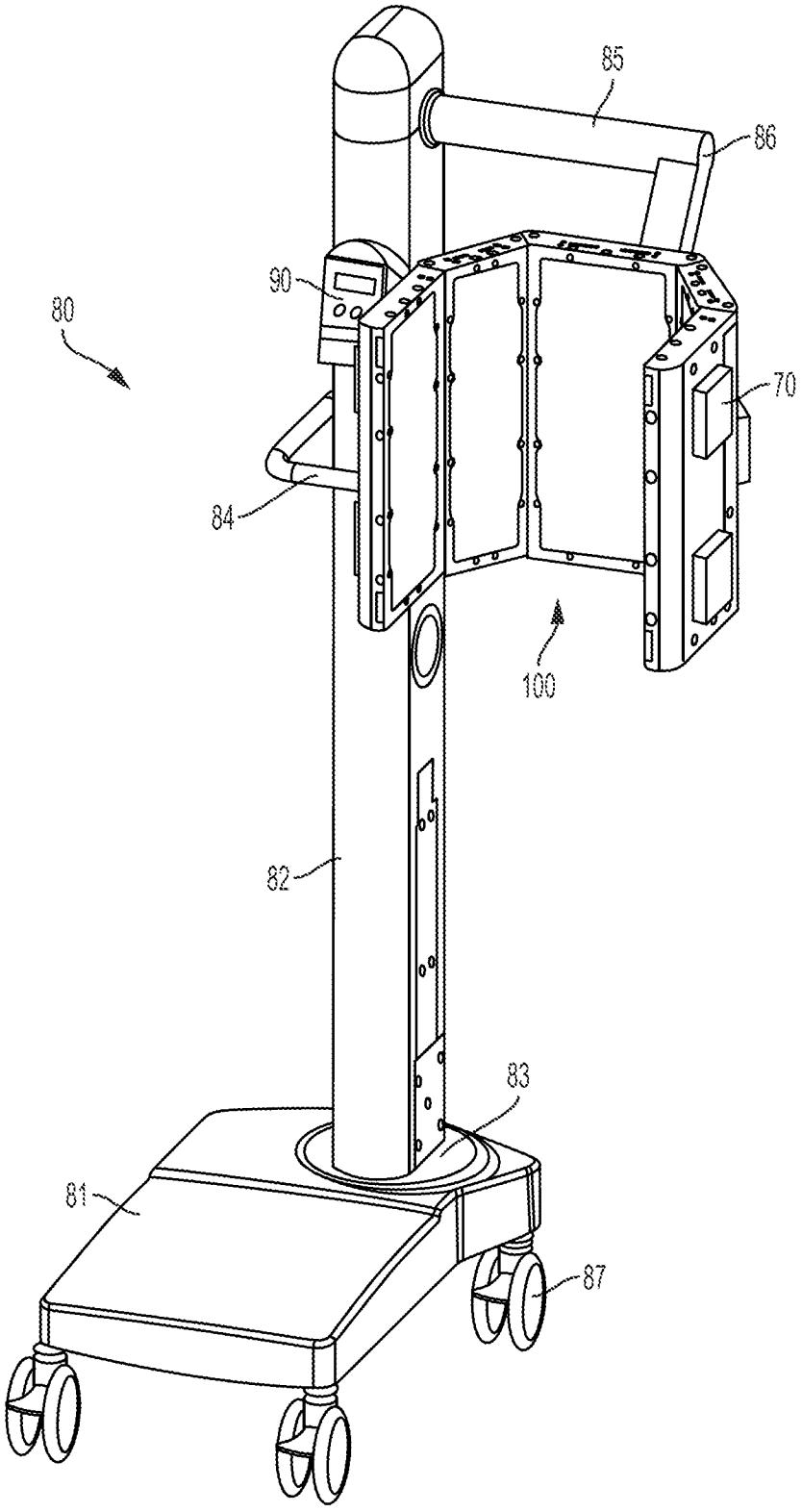


FIG. 4

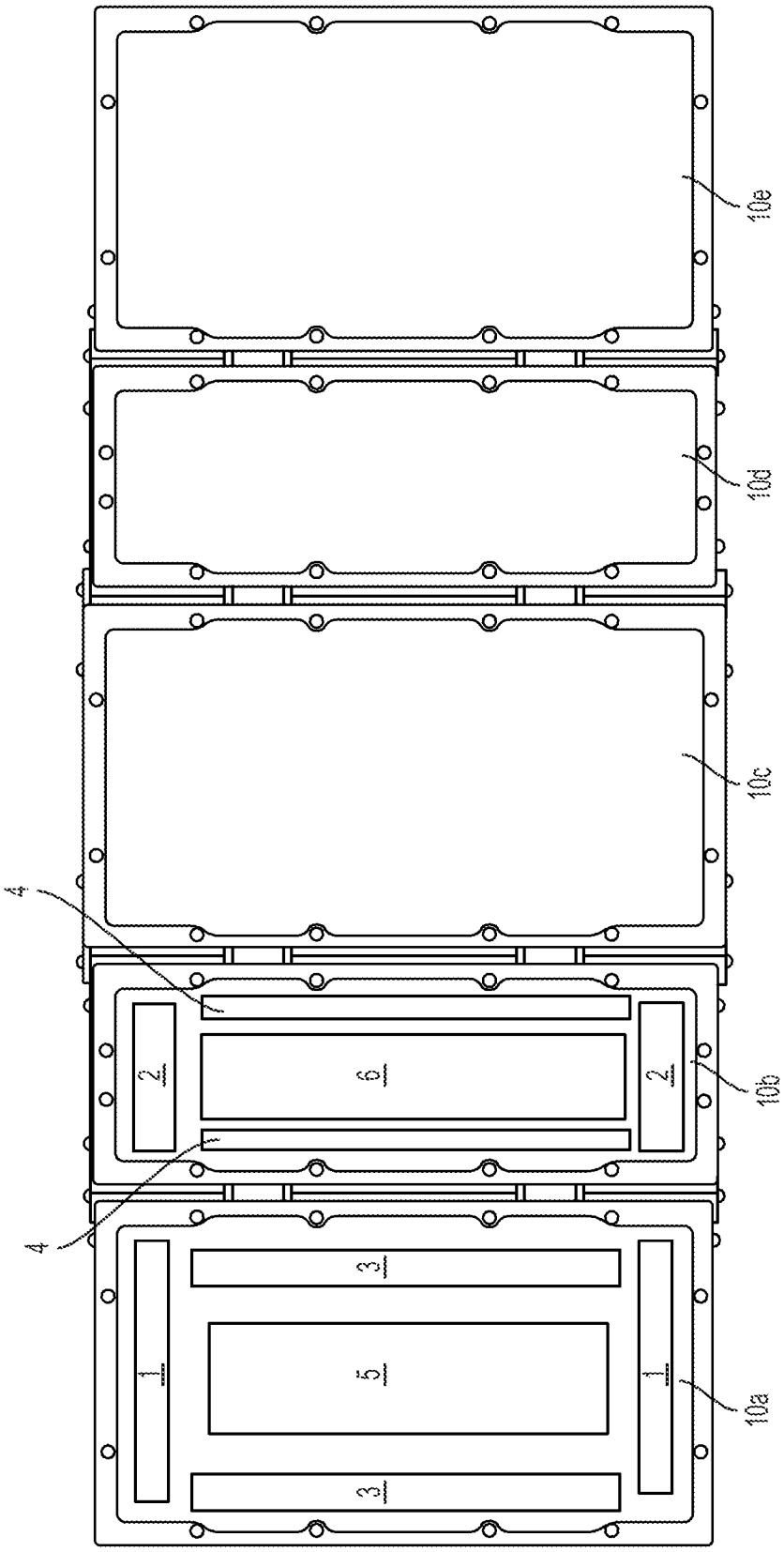


FIG. 5

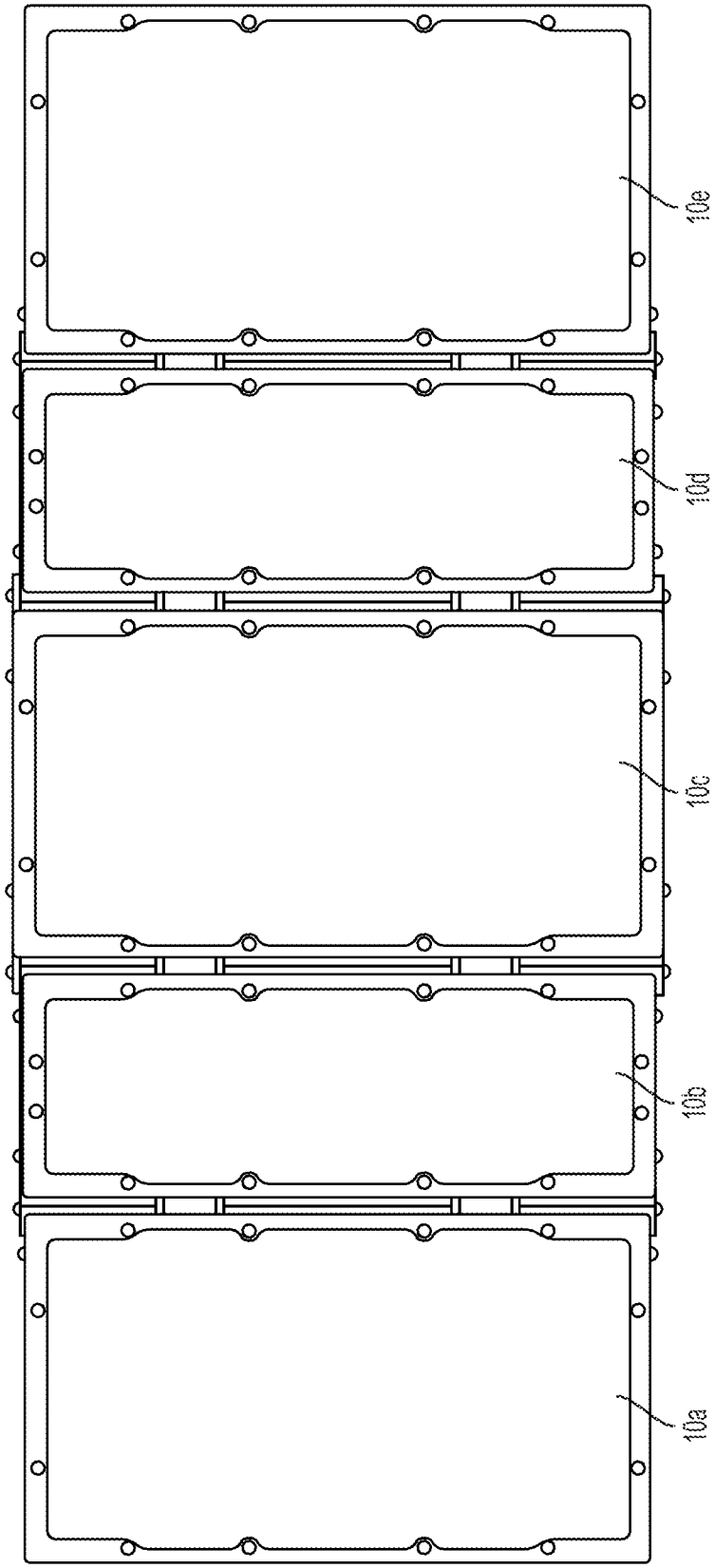


FIG. 6

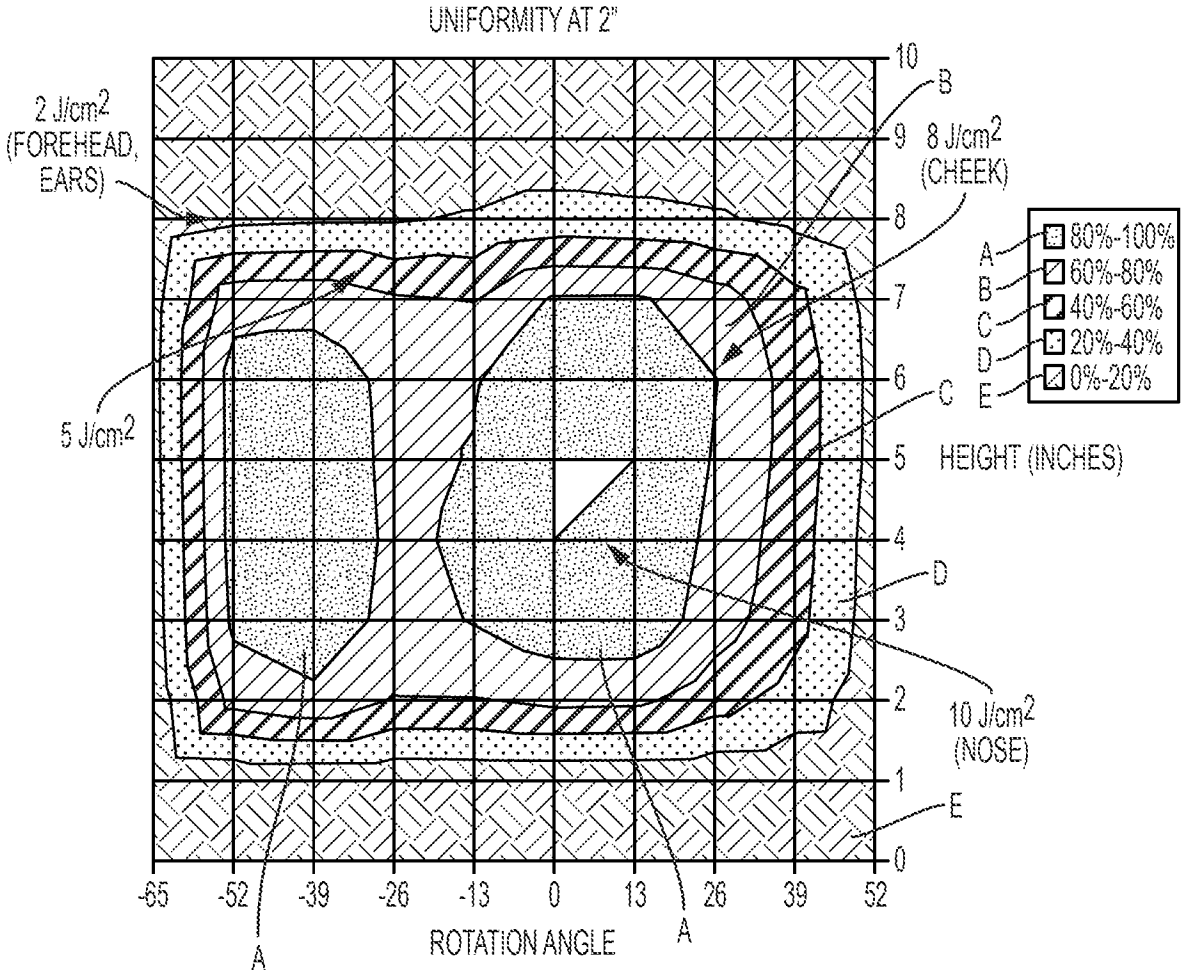

UNIFORMITY AT 2"
2 J/cm2 (FOREHEAD, EARS)
8 J/cm2 (CHEEK)
5 J/cm2
10 J/cm2 (NOSE)
A
B
C
D
E
80%-100%
60%-80%
40%-60%
20%-40%
0%-20%
HEIGHT (INCHES)
ROTATION ANGLE
10
9
8
7
6
5
4
3
2
1
0
-65
-52
-39
-26
-13
0
13
26
39
52

FIG. 7

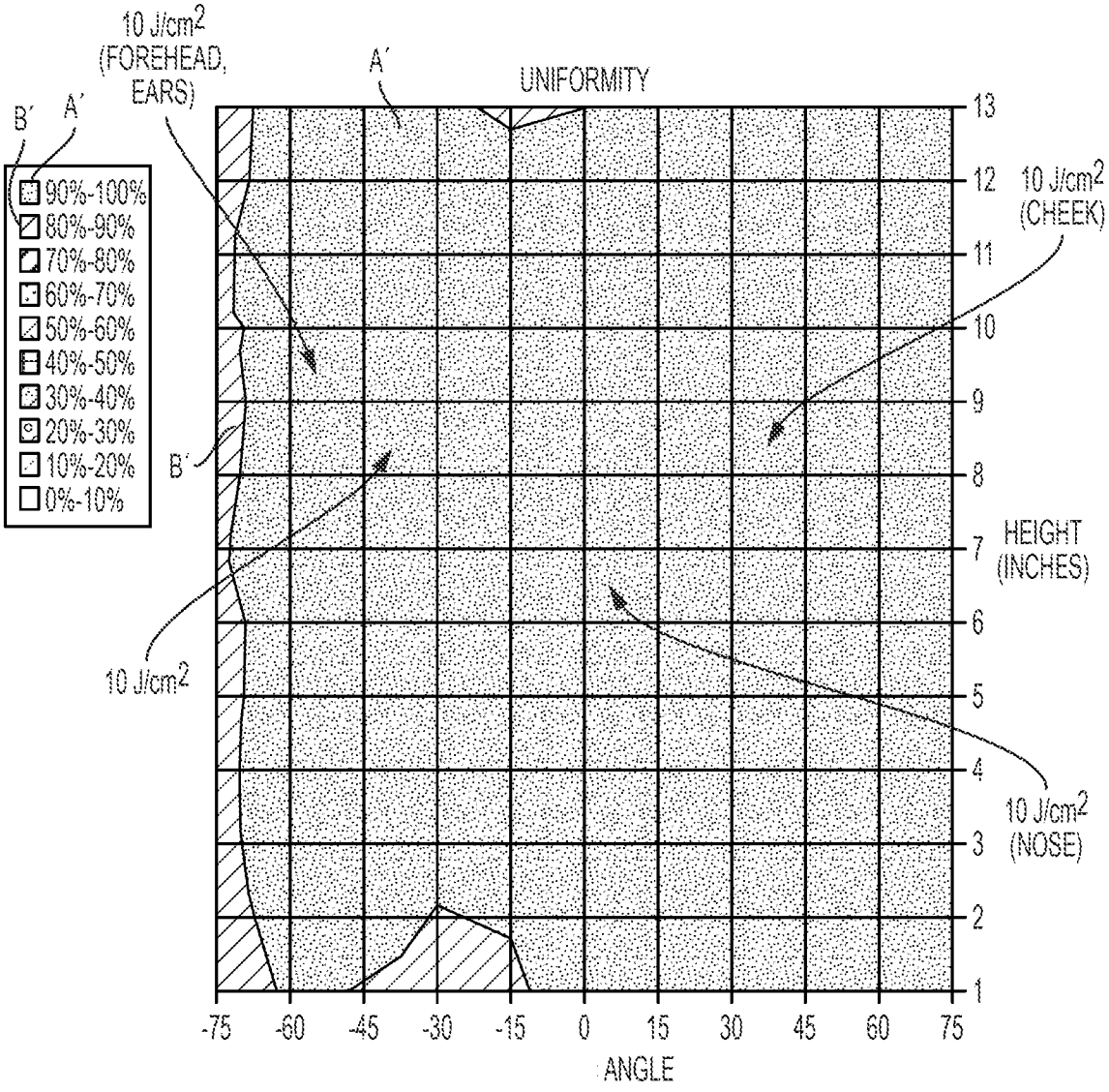

10 J/cm2 (FOREHEAD, EARS)
A´
UNIFORMITY
B´
A´
90%-100%
80%-90%
70%-80%
60%-70%
50%-60%
40%-50%
30%-40%
20%-30%
10%-20%
0%-10%
B´
10 J/cm2 (CHEEK)
HEIGHT (INCHES)
10 J/cm2
10 J/cm2 (NOSE)
13
12
11
10
9
8
7
6
5
4
3
2
1
-75
-60
-45
-30
-15
0
15
30
45
60
75
ANGLE

FIG. 8

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

___ Declaration Submitted With Initial Filing

OR

_X_ Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f)) required)

Attorney Docket Number	067286-0395
First Named Inventor	Thomas BOYAJIAN
COMPLETE IF KNOWN	
Application Number	15/292,731
Filing Date	10/13/2016
Art Unit	Unassigned
Examiner Name	Unassigned

ADJUSTABLE ILLUMINATOR FOR PHOTODYNAMIC THERAPY AND DIAGNOSIS

(Title of the Invention)

As a below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application,

OR

☒ United States Application Number or PCT International application number 15/292,731 filed on 10/13/2016.

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

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.

Authorization To Permit Access To Application by Participating Office

☐ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified patent application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the above-identified patent application is filed to have access to the above-identified patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the above-identified patent application with respect to: 1) the above-identified patent application-as-filed; 2) any foreign application to which the above-identified patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified patent application; and 3) any U.S. application-as-filed from which benefit is sought in the above-identified patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

DECLARATION — Utility or Design Patent Application

Docket Number: 067286-0395 Application No: 15/292,731

Direct all correspondence to:	☒	The address associated with Customer Number:	22428	OR ☐ Correspondence address below

Name		
Address		
City	State	Zip
Country	Telephone	Email

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. Petitioner/applicant is advised that documents which form the record of a patent application (such as the PTO/SB/01) are placed into the Privacy Act system of records DEPARTMENT OF COMMERCE, COMMERCE-PAT-7, System name: *Patent Application Files* . Documents not retained in an application file (such as the PTO-2038) are placed into the Privacy Act system of COMMERCE/PAT-TM-10, System name: *Deposit Accounts and Electronic Funds Transfer Profiles* .

LEGAL NAME OF SOLE OR FIRST INVENTOR:

(*E.g.*,Given Name (first and middle (if any)) and Family Name or Surname)

Thomas BOYAJIAN

Inventor's Signature	Date (optional)

Residence: City Wilmington	State MA	Country U.S.A.

Mailing Address

c/o DUSA Pharmaceuticals, Inc., 25 Upton Drive

City Wilmington	State Massachusetts	Zip 01887	Country United States of America

☒ Additional inventors are being named on the _____ supplemental sheet(s) PTO/AIA/10 attached hereto

SUPPLEMENTAL SHEET FOR DECLARATION	ADDITIONAL INVENTOR(S) Supplemental Sheet (for PTO/AIA/08,09) Page __of __

Legal Name of Additional Joint Inventor, if any:			
(*E.g.*,Given Name (first and middle (if any)) and Family Name or Surname)			
Mark CAROTA			
Inventor's Signature		Date (optional)	
Residence: City Chelmsford	State MA	Country U.S.A.	
Mailing Address C/o DUSA Pharmaceuticals, Inc. 25 Upton Drive			
City Wilmington	State Massachusetts	Zip 01887	Country United States of America

Legal Name of Additional Joint Inventor, if any:			
(*E.g.*,Given Name (first and middle (if any)) and Family Name or Surname)			
Brian MAZEJKA			
Inventor's Signature		Date (optional)	
Residence: City Salem	State NH	Country U.S.A.	
Mailing Address c/o DUSA Pharmaceuticals, Inc., 25 Upton Drive			
City Wilmington	State Massachusetts	Zip 01887	Country United States of America