



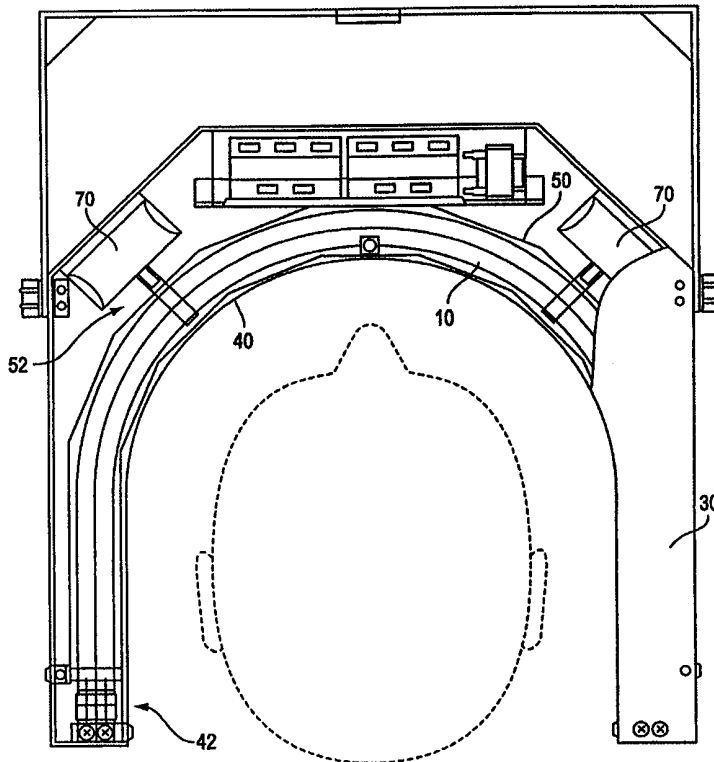
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : <b>A61N 5/06</b></p>	<p><b>A3</b></p>	<p>(11) International Publication Number: <b>WO 99/56827</b> (43) International Publication Date: 11 November 1999 (11.11.99)</p>
<p>(21) International Application Number: PCT/US99/06550 (22) International Filing Date: 26 April 1999 (26.04.99) (30) Priority Data: 09/070,772 1 May 1998 (01.05.98) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 09/070,772 (CON) Filed on 1 May 1998 (01.05.98) (71) Applicant (for all designated States except US): DUSA PHARMACEUTICALS, INC. [CA/CA]; Suite 1208, 181 University Avenue, Toronto, Ontario M5H 3M7 (CA). (72) Inventors; and (75) Inventors/Applicants (for US only): LUNDAHL, Scott [US/US]; Suite D-14, 77 Accord Park Drive, Norwell, MA 02061 (US). KOZODOY, Rebecca [US/US]; Suite D-14, 77 Accord Park Drive, Norwell, MA 02061 (US). CARROLL, Ronald [US/US]; Suite D-14, 77 Accord Park, Norwell, MA 02061 (US). LEPPELMEIER, Elton [US/US]; 1024 Stanwell Drive, Highland Height, OH 44143 (US).</p>	<p>(74) Agents: LAW, Glenn et al.; Foley &amp; Lardner, Suite 500, 3000 K Street, N.W., Washington, DC 20007-5109 (US). (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 9 March 2000 (09.03.00)</p>	

(54) Title: ILLUMINATOR FOR PHOTODYNAMIC THERAPY

(57) Abstract

An apparatus and method for photodynamic therapy or photodynamic diagnosis using an illuminator comprising a plurality of light sources generally conforming to a contoured surface and irradiating the contoured surface with substantially uniform intensity visible light. The light sources may comprise generally U-shaped fluorescent tubes that are driven by electronic ballasts. Adjustment of the ballast voltage controls the output power of the tubes. The tubes are supported by a sheet-metal or plastic housing and are covered by a polycarbonate shield which directs cooling airflow within the unit and prevents glass-patient contact in the event of tube breakage. An aluminum reflector located behind the tubes increases both the output irradiance and the uniformity of the output distribution. The spacing of the U-shaped tubes is varied to increase the output at the edges of the illuminator to make the output more uniform. Also, different portions of the tubes are cooled at different amounts, to improve uniformity. A light sensor monitors output from the U-shaped tubes to provide a signal for adjusting the output from the tubes.



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# INTERNATIONAL SEARCH REPORT

Inte onal Application No PCT/US 99/06550
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**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 6 A61N5/06

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)  
 IPC 6 A61N G01J

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)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 100 415 A (HOUGH HAROLD L ET AL) 11 July 1978 (1978-07-11) column 3, line 10 - line 28 column 4, line 32 - line 47 column 4, line 58 - column 5, line 16 column 6, line 7 - line 24 ---	1
A	US 4 103 175 A (LEVIN ROBERT E) 25 July 1978 (1978-07-25) column 2, line 13 - line 38 column 4, line 11 - line 65 ---	1
A	WO 93 21842 A (QUADRA LOGIC TECH INC ;AMERICAN CYANAMID CO (US)) 11 November 1993 (1993-11-11) page 19, line 8 - line 20; figure 14A page 15, line 29 - page 16, line 22 --- -/--	1

Further documents are listed in the continuation of box C.       Patent family members are listed in 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
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Date of the actual completion of the international search  <b>6 January 2000</b>	Date of mailing of the international search report  <b>25. 01 2000</b>
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Name and mailing address of the ISA 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	Authorized officer  <p style="text-align: center; font-size: 1.2em;">Petter, E</p>
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**INTERNATIONAL SEARCH REPORT**

International Application No  
PCT/US 99/06550

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 300 253 A (HAZLITT NOMINEES LIMITED) 30 October 1996 (1996-10-30) page 3, line 11 -page 7, line 11 -----	5,16,23, 37,39
A	US 5 079 262 A (POTTIER ROY H ET AL) 7 January 1992 (1992-01-07) cited in the application abstract -----	1
X	DE 36 30 060 A (PHILIPS PATENTVERWALTUNG) 17 March 1988 (1988-03-17) column 2, line 42 - line 45 column 3, line 16 - line 21 -----	41,42
X	GB 2 149 490 A (PHILIPS NV) 12 June 1985 (1985-06-12) page 1, line 89 - line 95 page 2, line 42 - line 48 -----	41,42
A	MOUNTFORD: "A UVA meter for monitoring the irradiance within a photochemotherapy unit" PHYSICS IN MEDICINE AND BIOLOGY, vol. 28, no. 2, February 1983 (1983-02), pages 177-184, XP002126949 the whole document -----	44
A	DE 90 00 705 U (WALDMANN GMBH) 29 March 1990 (1990-03-29) page 6, line 9 - line 19 -----	44

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 99/06550

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.  Claims Nos.: 32-36  
because they relate to subject matter not required to be searched by this Authority, namely:  
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
2.  Claims Nos.: 45  
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:  
The subject matter of claim 45 is not defined since it relates to features of light instead of features of an apparatus for generating the light. Hence, it is not clear what should be searched.
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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers 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.
- No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-31, 37-40

Illuminator for photodynamic therapy/diagnosis having light sources that conform to the surface of the object (patient) to be treated.

2. Claims: 41-43

An illuminator having a plurality of light sources having variable lateral spacing

3. Claim : 44

A monitoring system for an illuminator

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 45

The subject matter of claim 45 is not defined since it relates to features of light instead of features of an apparatus for generating the light. Hence, it is not clear what should be searched.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

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International Application No

PCT/US 99/06550

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