

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
1 July 2004 (01.07.2004)

PCT

(10) International Publication Number  
**WO 2004/054487 A3**

(51) International Patent Classification<sup>7</sup>: **A61F 9/013**,  
9/007, A61B 17/02, 1/07

(21) International Application Number:  
PCT/US2003/039616

(22) International Filing Date:  
12 December 2003 (12.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/433,119 13 December 2002 (13.12.2002) US  
60/466,630 30 April 2003 (30.04.2003) US

(71) Applicant (for all designated States except US): **RE-  
GENTS OF THE UNIVERSITY OF MINNESOTA**  
[US/US]; 450 McNamara Alumni Center, 200 Oak Street  
S.E., Minneapolis, MN 55455-2070 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **OLSEN, Timothy,**

W. [US/US]; 6561 Beach Road, Eden Prairie, MN 55344  
(US). **LOFTNESS, Paul, E.** [US/US]; 32443 651st Av-  
enue, Gibbon, MN 55335 (US). **ERDMAN, Arthur, G.**  
[US/US]; 1957 3rd Street S.W., New Brighton, MN 55112  
(US).

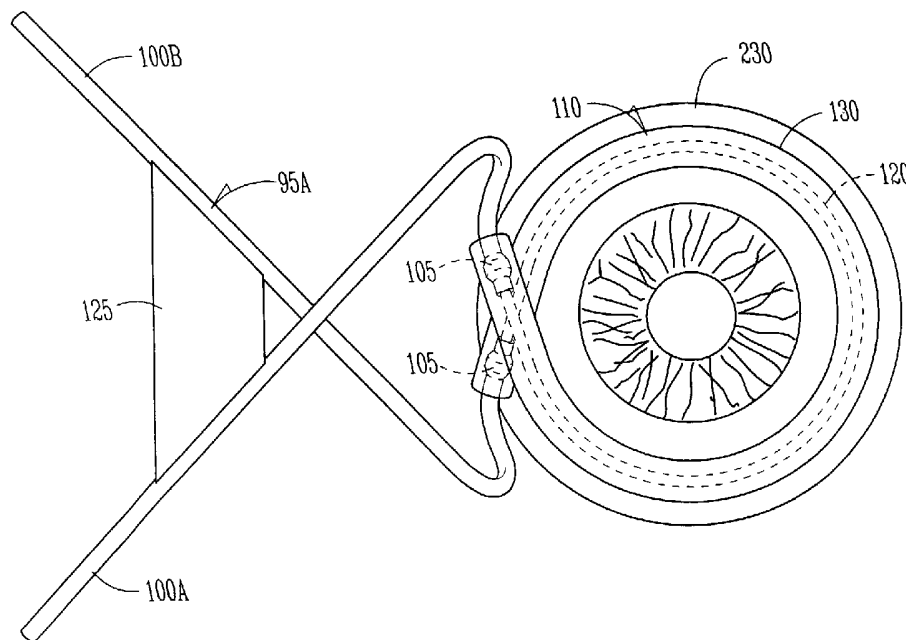
(74) Agents: **STEFFEY, Charles, E.** et al.; Schwegman, Lund-  
berg, Woessner & Kluth, P.A., P.O. Box 2938, Minneapolis,  
MN 55402 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,  
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,  
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,  
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,  
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,  
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

[Continued on next page]

(54) Title: SCLERAL DEPRESSOR



(57) Abstract: A remotely controllable system and method for positioning and operating a scleral depressor. A track (110) is positioned to encircle at least a portion of the eye (230). One or more independent thrusters, or actuators, are radially positionable about the eye. An actuator is selectively deployable and selectively retractable by remote control. Thrusters may be mechanically operated and include pneumatic, hydraulic, electrical, chemical or other power supply forces. Remote control is provided by hand-operated controls, foot-operated switches or voice-operated control. A light source is positioned about at least a portion of the eye to provide transcleral illumination.



SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**(88) Date of publication of the international search report:**

16 September 2004

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 03/39616

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61F9/013 A61F9/007 A61B17/02 A61B1/07

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 7 A61F A61B

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

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 453 546 A (PRZYBYLA JR VINCENT A ET AL) 12 June 1984 (1984-06-12) column 1, line 10 - column 1, line 16 column 1, line 55 - column 2, line 2 column 3, line 3 - column 4, line 27; figures 2-5 -----	1,6,7
A	US 6 440 065 B1 (HERED ROBERT W) 27 August 2002 (2002-08-27) column 4, line 30 - column 5, line 4; figures 3,4 -----	1,3,6
A	US 5 947 958 A (OLSEN PHILLIP M ET AL) 7 September 1999 (1999-09-07) column 1, line 6 - column 1, line 11 column 2, line 15 - column 2, line 65; figure 1 ----- -/--	8-11,13

☒ 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

Date of the actual completion of the international search

11 May 2004

Date of mailing of the international search report

23.07.2004

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

Merté, B

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/39616

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2 885 537 A (WOOD JR ELWOOD S) 5 May 1959 (1959-05-05) column 1, line 15 - column 1, line 17; figures 1,14	8,11,13
A	US 6 309 374 B1 (BOWMAN LYLE M ET AL) 30 October 2001 (2001-10-30) figure 6D	4

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 03/39616

## 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.: 34-40  
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 surgery because of the step "actuating the thruster to exert a force on the eye"
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 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.:  
1-13

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

Continuation of Box I.1

Claims Nos.: 34-40

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery because of the step "actuating the thruster to exert a force on the eye"

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-13

A curvilinear guide system comprising a thruster adapted for selectively positioning along it (claims 1-13).

---

2. claims: 14-26

ophthalmic apparatus comprising first and second tubular legs adapted to couple with a track (claims 14-21; 22-26)

---

3. claims: 22-26

ophthalmic apparatus comprising first and second tubular legs adapted to couple with a track and a light coupled to the track (claims 22-26)

---

4. claims: 27-33

a system comprising a guide tube, a balloon, and a sheath (claims 27-33)

---

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/39616

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4453546	A	12-06-1984	NONE	
US 6440065	B1	27-08-2002	WO 03030709 A2	17-04-2003
US 5947958	A	07-09-1999	AU 6968796 A WO 9709937 A1	01-04-1997 20-03-1997
US 2885537	A	05-05-1959	NONE	
US 6309374	B1	30-10-2001	AU 760684 B2 AU 5248199 A CA 2339243 A1 EP 1100420 A2 JP 2002522116 T NO 20010557 A WO 0007530 A2 US 6299603 B1 US 2001008961 A1	22-05-2003 28-02-2000 17-02-2000 23-05-2001 23-07-2002 26-03-2001 17-02-2000 09-10-2001 19-07-2001