



(11) **EP 2 281 503 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**29.06.2011 Bulletin 2011/26**

(51) Int Cl.:  
**A61B 5/00 (2006.01)**

(43) Date of publication A2:  
**09.02.2011 Bulletin 2011/06**

(21) Application number: **10186218.3**

(22) Date of filing: **11.08.2000**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE**  
Designated Extension States:  
**AL LT LV MK RO SI**

(72) Inventors:  

- **Doherty, John C.**  
**Winnipeg Manitoba R3J 2G2 (CA)**
- **Hewko, Mark**  
**Winnipeg Manitoba R3M 1A4 (CA)**
- **Mangat, Gurpreet**  
**Richmond Hill Ontario L4C 8N5 (CA)**
- **Flower, Robert W.**  
**Hunt Valley, MD 21030 (US)**
- **Chari, Seshadri M.**  
**Toronto Ontario M9B 6H5 (CA)**

(30) Priority: **24.09.1999 US 155652 P**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:  
**07015007.3 / 1 852 063**  
**00955472.6 / 1 143 852**

(74) Representative: **Jansen, Cornelis Marinus et al**  
**VEREENIGDE**  
**Johan de Wittlaan 7**  
**2517 JR Den Haag (NL)**

(71) Applicant: **National Research Council of Canada**  
**Ottawa, ON K1A 0R6 (CA)**

(54) **Method and apparatus for performing intra-operative angiography**

(57) The device is provided with a laser (1) for exciting the fluorescent imaging agent which emits radiation at a wavelength that causes any of the agent located within the vasculature or tissue of interest (3) irradiated thereby to emit radiation of a particular wavelength. Advantageously, a camera capable of obtaining multiple images over a period of time, such as a CCD camera (2) may be used to capture the emissions from the imaging agent. A band-pass filter (6) prevents the capture of radiation other than that emitted by the imaging agent. A distance sensor (9) incorporates a visual display (9a) providing feedback to the physician saying that the laser be located at a distance from the vessel of interest that is optimal for the capture of high quality images.

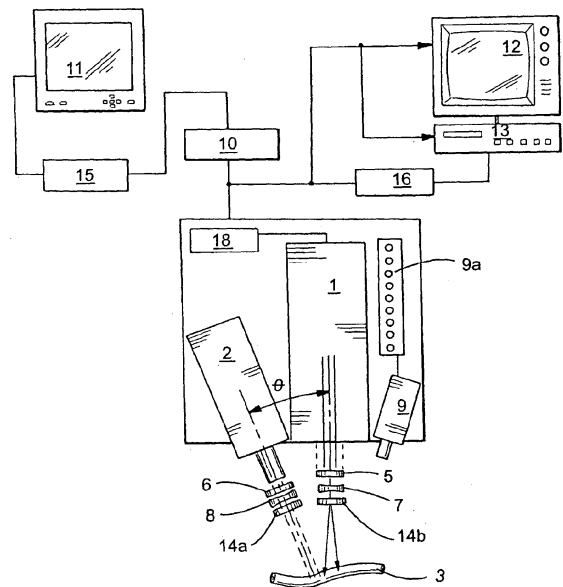


Fig. 1



EUROPEAN SEARCH REPORT

Application Number  
EP 10 18 6218

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	RÜBBEN A ET AL: "Infrared videoangiography of the skin with indocyanine green--rat random cutaneous flap model and results in man.", MICROVASCULAR RESEARCH. UNITED STATES MAR 1994, vol. 47, no. 2, March 1994 (1994-03), pages 240-251, XP002285463, ISSN: 0026-2862 * page 242, lines 1 - 15 * -----	1,9	INV. A61B5/00
A,P	SIEMERS B M ET AL: "The acoustic advantage of hunting at low heights above water: behavioural experiments on the European 'trawling' bats Myotis capaccinii, M. dasycneme and M. daubentonii.", THE JOURNAL OF EXPERIMENTAL BIOLOGY NOV 2001 LNKD- PUBMED:11807102, vol. 204, no. Pt 22, November 2001 (2001-11), pages 3843-3854, XP002612470, ISSN: 0022-0949 * page 3845, column 1, lines 19 - 23 * -----	1,9	TECHNICAL FIELDS SEARCHED (IPC) A61B
A	LUND F ET AL: "Video fluorescein imaging of the skin: Description of an overviewing technique for functional evaluation of regional cutaneous blood perfusion in occlusive arterial disease of the limbs", CLINICAL PHYSIOLOGY (OXFORD), vol. 17, no. 6, November 1997 (1997-11), pages 619-633, XP008032024, ISSN: 0144-5979 * page 622, line 4 - 17 * * page 623, lines 1 - 3 * * page 624, section "Digital evaluation of the fluorescence pattern" * ----- -/--	1,9	
<del>The present search report has been drawn up for all claims</del>			
Place of search The Hague		Date of completion of the search 2 December 2010	Examiner Knüpling, Moritz
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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                      .....                      &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number  
EP 10 18 6218

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	STILL J ET AL: "EVALUATION OF THE CIRCULATION OF RECONSTRUCTIVE FLAPS USING LASER-INDUCED FLUORESCENCE OF INDOCYANINE GREEN", ANNALS OF PLASTIC SURGERY, LITTLE, BROWN AND CO, US, vol. 42, no. 42, March 1999 (1999-03), pages 266-274, XP001063252, ISSN: 0148-7043 * abstract * * page 268, column 1, lines 3 - 10 * -----	1,9	TECHNICAL FIELDS SEARCHED (IPC)
A	WOLLERT H G ET AL: "INTRAOPERATIVE VISUALIZATION OF CORONARY ARTERY FISTULA USING MEDICAL DYE", THORACIC AND CARDIOVASCULAR SURGEON, THIEME MED. PUB., NEW YORK, NY,, US, vol. 46, no. 6, December 1998 (1998-12), pages 382-383, XP008032022, ISSN: 0171-6425 * figure 1; figure caption * -----	1,9	
A	PHILLIPS R P ET AL: "QUANTIFICATION OF DIABETIC MACULOPATHY BY DIGITAL IMAGING OF THE FUNDUS", EYE, ROYAL COLLEGE OF OPHTHALMOLOGISTS, LONDON, GB, vol. 5, no. 1, 1991, pages 130-137, XP008083980, * Fig. 1, figure caption * * page 135, column 2, lines 19 - 24 * -----	1,9	
A	WO 99/00053 A1 (TOA MEDICAL ELECTRONICS [JP]; KIMURA ROKUSABURO [JP]; ASANO KAORU [JP]) 7 January 1999 (1999-01-07) * abstract * & US 6 353 750 B1 (KIMURA ROKUSABURO [JP] ET AL) 5 March 2002 (2002-03-05) * column 8, line 38 - line 44 * -----	1,9	
<del>The present search report has been drawn up for all claims</del>			
Place of search The Hague		Date of completion of the search 2 December 2010	Examiner Knüpling, Moritz
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)



Application Number

EP 10 18 6218

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- 1-14
- The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number  
EP 10 18 6218

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-14

Device for visualizing movement of a fluorescent dye carried in the bloodstream of a coronary artery bypass graft comprising processing means for determining the relative contrast of images and choosing images with the greatest relative contrast for analysis, and corresponding method.  
---

2. claims: 15, 16

Use of a fluorescent dye for the assessment of the patency of or blood flow in a portion of a blood vessel in an animal  
---

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 18 6218

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.

02-12-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9900053	A1	07-01-1999	AU 7934498 A
			US 6353750 B1
-----			

专利名称(译)	用于执行术中血管造影的方法和设备		
公开(公告)号	<a href="#">EP2281503A3</a>	公开(公告)日	2011-06-29
申请号	EP2010186218	申请日	2000-08-11
[标]申请(专利权)人(译)	加拿大国家研究委员会		
申请(专利权)人(译)	加拿大国家研究委员会的		
当前申请(专利权)人(译)	加拿大国家研究委员会的		
[标]发明人	DOHERTY JOHN C HEWKO MARK MANGAT GURPREET FLOWER ROBERT W CHARI SESHADRI M		
发明人	DOHERTY, JOHN C. HEWKO, MARK MANGAT, GURPREET FLOWER, ROBERT W. CHARI, SESHADRI M.		
IPC分类号	A61B5/00 A61B1/00 A61B5/026 A61B5/0275 A61B10/00		
CPC分类号	A61B5/0261 A61B5/0275		
代理机构(译)	严实, CORNELIS MARINUS		
优先权	60/155652 1999-09-24 US		
其他公开文献	EP2281503B1 EP2281503A2		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

该装置具有激光器 (1)，用于激发荧光成像剂，该荧光成像剂发射波长的辐射，该波长使得位于脉冲系统或被照射的感兴趣组织 (3) 内的任何药剂发射特定波长的辐射。有利地，能够在一段时间内获得多个图像的相机，例如 CCD 相机 (2) 可以用于捕获来自成像剂的发射。带通滤波器 (6) 防止捕获除成像剂发射的辐射之外的辐射。距离传感器 (9) 包括视觉显示器 (9a)，其向医师提供反馈，称激光器位于距离感兴趣的血管一定距离处，该距离对于捕获高质量图像是最佳的。

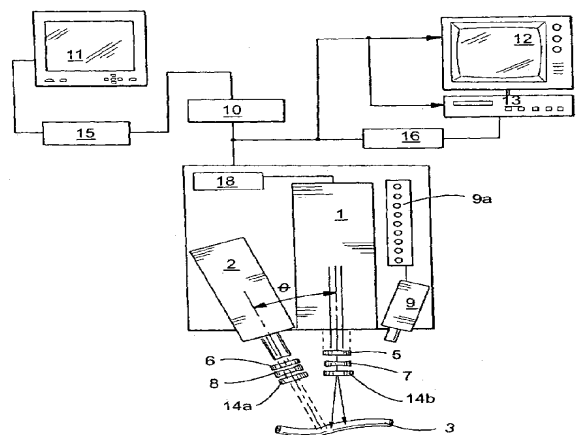


Fig. 1