

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
13 September 2001 (13.09.2001)

PCT

(10) International Publication Number
WO 01/67154 A3

(51) International Patent Classification⁷: **G02B 21/24**

Jan, René [BE/BE]; Kortestraat 28, B-2610 Wilrijk (BE).
VAN DONINCK, Philip, Arthur [BE/BE]; Chaussee de Louvain 77, B-1410 Waterloo (BE).

(21) International Application Number: PCT/EP01/02807

(22) International Filing Date: 8 March 2001 (08.03.2001)

(74) **Agent: DAELEMANS, Frank**; Tibotec N.V., Intellectual Property Department, Generaal De Wittelaan L11B3, B-2800 Mechelen (BE).

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/521,618 8 March 2000 (08.03.2000) US

(71) Applicant (for all designated States except US): **TI-BOTEC N.V.** [BE/BE]; Frank Daelemans, Intellectual Property Department, Generaal De Wittelaan L11B3, B-2800 Mechelen (BE).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, 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, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

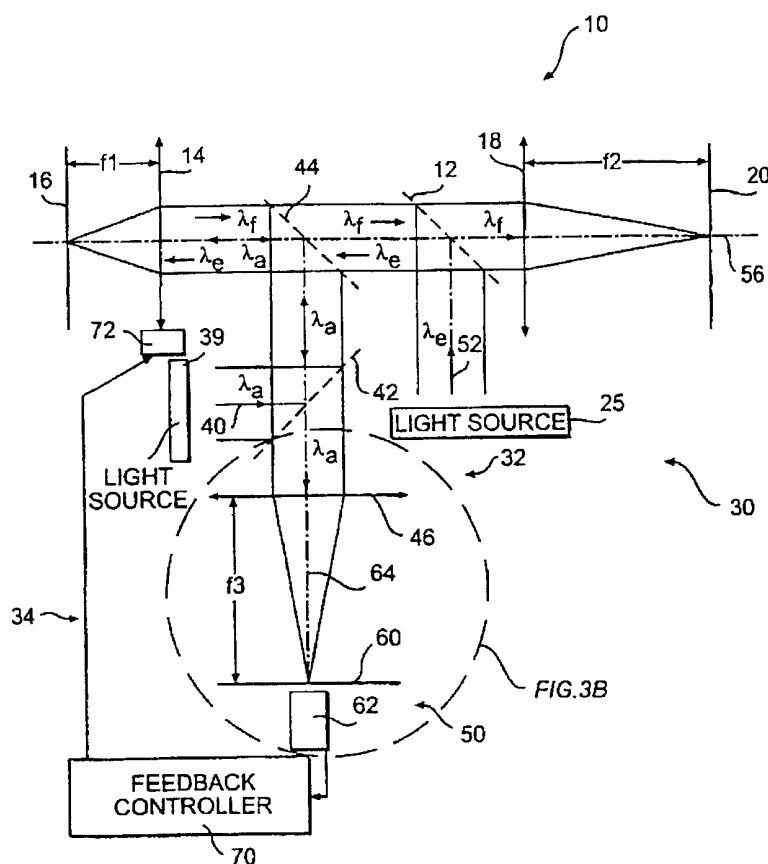
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LEBLANS, Marc**,

[Continued on next page]

(54) Title: A MICROSCOPE SUITABLE FOR HIGH-THROUGHPUT SCREENING HAVING AN AUTOFOCUSING APPARATUS



(57) Abstract: The apparatus for automatically focusing an image in a microscope includes onto an object plane includes an optical system configured to form an optical image of a sample plane to be observed, an autofocusing detection system, and a focus correction system. The autofocusing system includes an autofocusing light beam source for generating autofocusing light beams. The autofocusing system further includes a detection system lens for directing autofocusing light beams to an autofocusing detection device, and an autofocusing detection device for determining the amount of displacement of the image of the object plane from a desired focused reference plane. The focusing correction system includes a feedback controller and focus adjusting device for automatically adjusting the distance between an objective lens and the sample plane in order to properly focus the image in the optical system. A related method of automatically focusing an image of an object plane in a microscope.

WO 01/67154 A3



IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
10 January 2002

Published:

— with international search report

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.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/02807

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B21/24

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 G02B

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, PAJ, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 34 46 727 A (ZEISS CARL FA) 3 July 1986 (1986-07-03) cited in the application page 6, line 12 -page 11, line 5; figures 1A-2C ---	1-55
X	DE 33 28 821 A (ZEISS CARL FA) 28 February 1985 (1985-02-28) cited in the application page 8, line 4 -page 12, line 9; figures 1-5 ---	1-55
X	US 5 530 237 A (SATO MANABU ET AL) 25 June 1996 (1996-06-25) column 4, line 19 -column 5, line 31; figure 1 --- -/--	1-55

☒ 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

18 October 2001

Date of mailing of the international search report

25/10/2001

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

Sarneel, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/02807

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 076 176 A (VICKERS LTD) 25 November 1981 (1981-11-25) page 1, line 72 -page 2, line 47; figure 1 ---	1-55
X	US 4 686 360 A (GORGON GEORG) 11 August 1987 (1987-08-11) column 5, line 22 -column 9, line 16; figures 1-6 -----	1-55

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 01/02807

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 3446727	A	03-07-1986	DE 3328821 A1	28-02-1985
			DE 3446727 A1	03-07-1986
DE 3328821	A	28-02-1985	DE 3328821 A1	28-02-1985
			DE 3446727 A1	03-07-1986
US 5530237	A	25-06-1996	JP 7072378 A	17-03-1995
GB 2076176	A	25-11-1981	US 4406526 A	27-09-1983
US 4686360	A	11-08-1987	DE 3339970 A1	15-05-1985
			AT 43920 T	15-06-1989
			DE 3478644 D1	13-07-1989
			EP 0144732 A2	19-06-1985
			JP 1898430 C	23-01-1995
			JP 6023808 B	30-03-1994
			JP 60115907 A	22-06-1985