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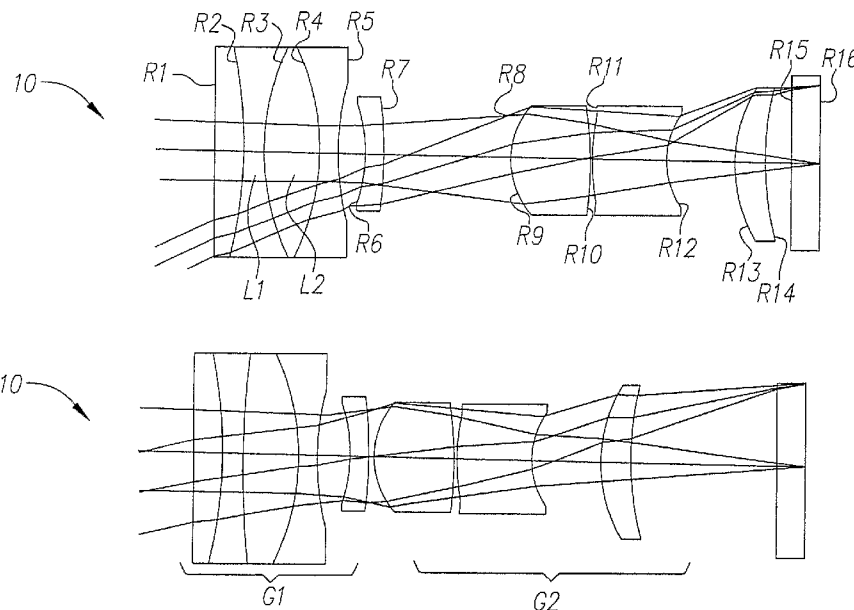
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ,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

(54) Title: ZOOM LENS SYSTEM HAVING VARIABLE POWER ELEMENT



(57) Abstract: A multiple group variable focal length lens is provided. The lens has a first lens group including a variable power lens element and is positioned in a stationary manner along an optical axis. The lens also has a second lens group moveably positioned along the optical axis. The variable power lens element can be an electrically controllable liquid lens having a surface with a variable radius of curvature created by two liquids having distinct indices of refraction with one of the liquids having an index of refraction greater than 1.60. Alternatively or additionally, at least one of the liquids used in the liquid lens can include nanoscale particles.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER INV. G02B3/14 G02B15/177		
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) 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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2001/017985 A1 (TSUBOI TAKAYUKI [JP] ET AL) 30 August 2001 (2001-08-30) paragraph [0120] - paragraph [0121] paragraph [0139] - paragraph [0140] figures 3a-3c figure 15 figures 23a,23b	1-5,9, 10,12-16 11
X Y	----- US 2002/118464 A1 (NISHIOKA KIMIHIKO [JP] ET AL) 29 August 2002 (2002-08-29) paragraph [0339] figure 17 figure 36 -----	1,4-8, 14-19 11
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		<input checked="" type="checkbox"/> 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 <p style="text-align: center;">21 November 2006</p>	Date of mailing of the international search report <p style="text-align: center;">20. 02. 2007</p>	
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;">von Hentig, Roger</p>	

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/030964

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2005/073762 A (KONINKL PHILIPS ELECTRONICS NV [NL]; HENDRIKS BERNARDUS H W [NL]; KUIP) 11 August 2005 (2005-08-11) page 7, line 21 - line 25 figure 1 -----	1-20
X	BERGE B ET AL: "Variable focal lens controlled by an external voltage: an application of electrowetting" EUROPEAN PHYSICAL JOURNAL E. SOFT MATTER, EDP SCIENCES, IT, vol. 3, no. 2, October 2000 (2000-10), pages 159-163, XP002285977 ISSN: 1292-8941 -----	20
Y	page 160, right-hand column, paragraph 2 figures 1a,1b figure 3 -----	11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/030964

Box 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. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

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 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:

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.:

1-20

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: 1-20

refer to a lens system having a stationary positioned first lens group having variable optical power and a second, moveably positioned lens group.

2. claims: 21-29

refer to a liquid lens comprising a first and a second liquid, wherein one of the liquids comprises nanoscale particles.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/030964

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2001017985	A1	30-08-2001	NONE
US 2002118464	A1	29-08-2002	NONE
WO 2005073762	A	11-08-2005	NONE