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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,

HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(54) Title: A SYSTEM AND METHOD FOR COLOR IMAGE ACQUISITION

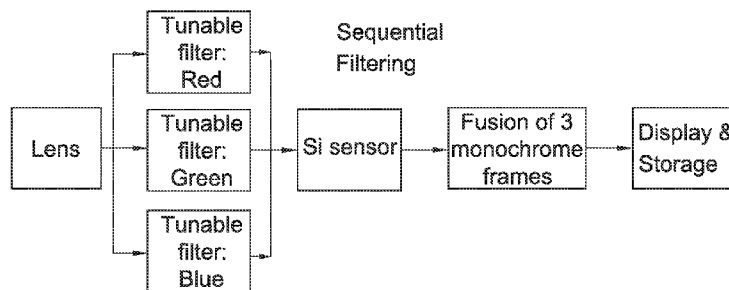


Fig. 2D

(57) Abstract: An imaging system color image acquisition including: an image sensor; a tunable spectral filter arranged in an optical path of light propagation towards the image sensor; and a controller connected to the image sensor and to the tunable spectral filter. The controller is configured and operable for generating a colored image by sequentially operating the tunable spectral filter for sequentially filtering light passing towards the image sensor with three or more different spectral filtering curves during three or more corresponding integration time durations. The tunable spectral filter is configured, as an etalon and includes a pair of reflective surfaces. At least one of the reflective surfaces includes a layer of high refractive index of at least $n=2.3$ or even higher than 3, or a layer of low refractive index, smaller than $n=1$. The configuration of the etalon provide wide transmission peaks of the spectral curves with full-width-half maximum (FWHM) in the range of about 50 to 80 nm, free spectral range (FSR) of at least 300nm, and thickness of the etalon in the order to 1mm or even less.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IL2014/050566

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N9/04 G01J3/26
ADD.
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)
H04N 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 practicable, 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.
X	US 2005/027166 A1 (MATSUMOTO SHINYA [JP] ET AL) 3 February 2005 (2005-02-03)	1,14-16, 23
Y	paragraph [0108]; figures 12,21a,29-30 paragraph [0114] paragraph [0168] - paragraph [0169] paragraph [0178] paragraph [0200] - paragraph [0209] paragraphs [0114] - [0116]	2,3,7-9, 24,25, 30-32
Y	JP 2009 033222 A (CASIO COMPUTER CO LTD) 12 February 2009 (2009-02-12) paragraph [0088] paragraph [0086]	2,3,7-9, 24,25, 30-32
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Further documents are listed in the continuation of Box C.

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 application or patent 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 1 October 2014	Date of mailing of the international search report 19/12/2014
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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, Fax: (+31-70) 340-3016	Authorized officer Zakharian, Andre
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INTERNATIONAL SEARCH REPORT

International application No
PCT/IL2014/050566

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 2011/064403 A1 (IMEC [BE]; TACK KLAAS [BE]; LAMBRECHTS ANDY [BE]; HASPELAGH LUC [BE]) 3 June 2011 (2011-06-03)</p> <p>page 15, line 22 - page 22, line 2; figures 2,3,4</p> <p style="text-align: center;">-----</p>	1-3,7-9, 14-16, 23-25, 30-32
A	<p>US 2009/236525 A1 (MITRA PRADIP [US] ET AL) 24 September 2009 (2009-09-24)</p> <p>paragraph [0023] - paragraph [0024] paragraph [0032]</p> <p style="text-align: center;">-----</p>	1-3,7-9, 14-16, 23-25, 30-32
A	<p>EP 0 693 683 A1 (VAISALA OY [FI] VAISALA OYJ [FI]) 24 January 1996 (1996-01-24)</p> <p>paragraph [0018]</p> <p style="text-align: center;">-----</p>	1-3,7-9, 14-16, 23-25, 30-32
A	<p>US 2005/029437 A1 (HASEGAWA AKIRA [JP] ET AL) 10 February 2005 (2005-02-10)</p> <p>paragraph [0083]; figure 4 paragraph [0093]; figure 13 paragraph [0075] - paragraph [0076]</p> <p style="text-align: center;">-----</p>	1-3,7-9, 14-16, 23-25, 30,31
A	<p>WO 01/28224 A2 (CAMBRIDGE RES & INSTRMNT INC [US]) 19 April 2001 (2001-04-19)</p> <p>abstract; figure 11 page 24, lines 20-29</p> <p style="text-align: center;">-----</p>	2,3,7-9, 24,25, 30-32

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2014/050566

Box No. 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 No. 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 fees, this Authority did not invite payment of additional fees.

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.:

1-3, 7-9, 14-16, 23-25, 30-32

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- 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: 1-3, 7-9, 14-16, 23-25, 30-32

Provide for one single colored image representative of the spectral sub-bands

2. claim: 4

Provide for adaptation of spectral band-pass parameters of the spectrometer of claim 1 to particular scene characteristics

3. claims: 5, 26-28

Provide for a calibrated spectrometer.

4. claims: 6, 29

Provide for reliable images for processing.

5. claims: 10-13, 20-22, 33-35

Provide for noise reduction and improving of a dynamic range

6. claims: 17, 18

Provide for an improved matching of the filter to the RGB sensitivity of the image sensor

7. claims: 19, 36, 37

Provide for an improved spatial uniformity of the filter.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/IL2014/050566

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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			US 5589689 A 31-12-1996

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