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AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
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MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
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ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a
patent (Rule 4.17(ii))— as to the applicant's entitlement to claim the priority of the
earlier application (Rule 4.17(iii))

Published:

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: OPTICAL ANGULAR MOMENTUM INDUCED HYPERPOLARISATION IN INTERVENTIONAL APPLICATIONS

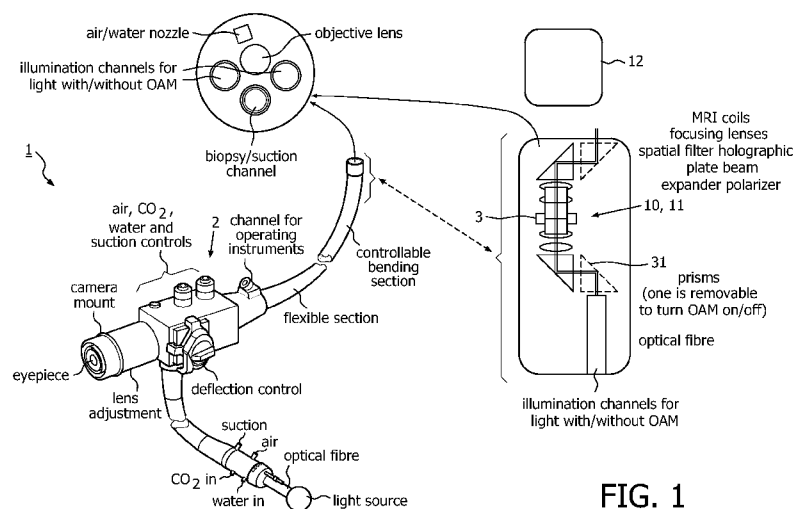


FIG. 1

(57) **Abstract:** A magnetic resonance spectroscopy assembly includes a magnet to generate a steady magnetic field, an RF transmit/receive antenna to transmit an RF excitation field into an examination region and acquire magnetic resonance signals from the examination region and a magnetic resonance spectrometer coupled to the RF transmit/receive antenna to collect magnetic resonance spectroscopy data from the magnetic resonance signals. An interventional instrument is provided with the assembly. The interventional instrument carries an optical module to generate photonic radiation endowed with orbital optical momentum (OAM).



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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2012/052935

A. CLASSIFICATION OF SUBJECT MATTER
INV. G01N24/08 G01R33/28 G01R33/465
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)
G01N G01R

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)

EP0-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	WO 2009/081360 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; ELGORT DANIEL R [US]; ALBU LUCIAN) 2 July 2009 (2009-07-02) cited in the application page 8, line 13 - page 12, line 11; figures 6,7	1,4-6
A	US 2007/229080 A1 (WEISS STEFFEN [DE] ET AL) 4 October 2007 (2007-10-04) the whole document	1,4-6
A	US 2004/019273 A1 (HELPER JEFFREY L [US] ET AL) 29 January 2004 (2004-01-29) the whole document	1,4-6
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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

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"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

20 September 2012

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02/01/2013

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2012/052935

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BEZABEH T ET AL: "THE USE OF 1H MAGNETIC RESONANCE SPECTROSCOPY IN INFLAMMATORY BOWELDISEASES: DISTINGUISHING ULCERATIVE COLITIS FROM CROHN'S DISEASE", AMERICAN JOURNAL OF GASTROENTEROLOGY, ELSEVIER SCIENCE INC, US, vol. 96, no. 2, 1 February 2001 (2001-02-01), pages 442-448, XP001031816, ISSN: 0002-9270, DOI: 10.1111/J.1572-0241.2001.03523.X cited in the application the whole document -----	1,4-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2012/052935

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009081360 A1	02-07-2009	CN 101971011 A EP 2225551 A1 WO 2009081360 A1	09-02-2011 08-09-2010 02-07-2009
US 2007229080 A1	04-10-2007	AT 482406 T CN 1947027 A EP 1743185 A1 JP 5054515 B2 JP 2007534412 A US 2007229080 A1 WO 2005103747 A1	15-10-2010 11-04-2007 17-01-2007 24-10-2012 29-11-2007 04-10-2007 03-11-2005
US 2004019273 A1	29-01-2004	AU 2003259255 A1 EP 1585559 A2 JP 2006517416 A US 2004019273 A1 US 2005197563 A1 US 2005203378 A1 WO 2004011059 A2	16-02-2004 19-10-2005 27-07-2006 29-01-2004 08-09-2005 15-09-2005 05-02-2004

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2012/052935

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, 4-6

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, 4-6

A magnetic resonance spectroscopy assembly including a magnet, an RF transmit/receive antenna, a magnetic resonance spectrometer and an interventional instrument carrying an optical module to generate photonic radiation endowed with orbital optical momentum (OAM), said assembly being suitable for acquiring magnetic resonance signals from an examination region and collecting magnetic resonance spectroscopy data from the magnetic resonance signals.

2. claims: 2, 3

A magnetic resonance spectroscopy assembly including a magnet, an RF transmit/receive antenna, a magnetic resonance spectrometer and an interventional instrument carrying an optical module to generate photonic radiation endowed with orbital optical momentum (OAM), said assembly being suitable for acquiring magnetic resonance signals from an examination region and collecting magnetic resonance spectroscopy data from the magnetic resonance signals, and said optical module being suitable for optical imaging of a field of view around the interventional instrument's distal end.
