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(71) Applicant: **T2 Biosystems, Inc.**  
**Lexington, Massachusetts 02421 (US)**

(72) Inventors:  
• **LOWERY, Thomas, Jay, Jr.**  
**Belmont, MA 02478 (US)**  
• **AUDEH, Mark, John**  
**Brighton, MA 02135 (US)**  
• **BLANCO, Matthew**  
**Brookline, MA 02446 (US)**  
• **CHEPIN, James, Franklin**  
**San Diego, CA 92129 (US)**

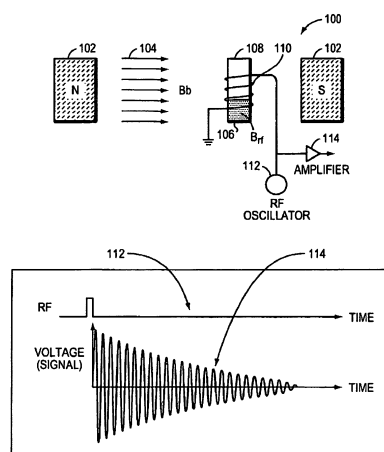
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**Arlington, MA 02476 (US)**
- **DHANDA, Rahul**  
**Needham, MA 02492 (US)**
- **FRITZEMEIER, Marilyn, Lee**  
**Lexington, MA 02420 (US)**
- **KOH, Isaac**  
**Arlington, MA 02474 (US)**
- **KUMAR, Sonia**  
**Brookline, MA 02445 (US)**
- **NEELY, Lori, Anne**  
**Reading, MA 01867 (US)**
- **MOZELESKI, Brian**  
**Knox, ME 04986 (US)**
- **PLOURDE, Daniella, Lynn**  
**Arlington, MA 02474 (US)**
- **RITTERSHAUS, Charles, William**  
**Malden, MA 02418 (US)**
- **WELLMAN, Parris**  
**Reading, MA 01867 (US)**

(74) Representative: **Bösl, Raphael Konrad**  
**Isenbruck Bösl Hörschler LLP**  
**Patentanwälte**  
**Prinzregentenstraße 68**  
**81675 München (DE)**

(54) **NMR SYSTEMS AND METHODS FOR THE RAPID DETECTION OF ANALYTES**

(57) This invention features magnetic sensor based systems and methods for the detection of analytes, such as nucleic acids and pathogens. In particular systems employing an RF pulse in combination with a bias magnetic field methods are featured. Magnetic particles used have a mean particle diameter between 700 and 950 nm, leading to an increased sensitivity as a consequence of increased size aggregates with an increased T2 relaxivity. A removable cartridge for insertion and removal from the system is also described.

Figure 1A





## EUROPEAN SEARCH REPORT

Application Number  
EP 15 00 2772

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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	US 2009/134869 A1 (LEE W DAVID [US]) 28 May 2009 (2009-05-28) * the whole document * * in particular: * * paragraphs [0012], [0013], [0014], [0047], [0054], [0125], [0126] * * paragraph [0052] - paragraph [0077] *	1-10	INV. G01V3/00 G01N33/543 G01R33/12
A	AKIRA TSUKAMOTO ET AL: "Development of a SQUID System Using Field Reversal for Rapidly Detecting Bacteria", IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY, IEEE SERVICE CENTER, LOS ALAMITOS, CA, US, vol. 19, no. 3, 1 June 2009 (2009-06-01), pages 853-856, XP011262781, ISSN: 1051-8223 * the whole document * * abstract * * page 854, paragraph B *	1-10	
A,D	WO 2009/026164 A1 (GEN HOSPITAL CORP [US]; MASSACHUETTS INST OF TECHNOLOG [US]; JOSEPHSON) 26 February 2009 (2009-02-26) * the whole document *	1-10	TECHNICAL FIELDS SEARCHED (IPC) G01N G01R
A	WO 2009/045551 A1 (GEN HOSPITAL CORP [US]; HARVARD COLLEGE [US]; WEISSLEDER RALPH [US]; L) 9 April 2009 (2009-04-09) * the whole document * * in particular: * * examples 3-5 * * figures 6A, 6B * * page 21, line 19 - line 25 *	1-10	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 October 2015	Examiner Tuynman, Antonin
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

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**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:

1-10

☐ 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 15 00 2772

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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: 1-10

Detection systems and cartridges involving an RF coil  
(claims 1-10)

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2. claims: 11-15

Pathogen detection method

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

EP 15 00 2772

5 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.

28-10-2015

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