US 20110171754A1

(19) **United States**

(12) **Patent Application Publication**

Redmond et al.

(10) **Pub. No.: US 2011/0171754 A1**

(43) **Pub. Date: Jul. 14, 2011**

(54) **ANALYSIS SYSTEM**

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(21) Appl. No.: **12/678,016**

(22) PCT Filed: **Sep. 15, 2008**

(86) PCT No.: **PCT/IE2008/000087**

§ 371 (c)(1),
(2), (4) Date: **Sep. 27, 2010**

Related U.S. Application Data

(60) Provisional application No. 60/960,069, filed on Sep. 14, 2007, provisional application No. 61/006,059, filed on Dec. 17, 2007.

Publication Classification

(51) **Int. Cl.**

G01N 33/543	(2006.01)
G01N 33/48	(2006.01)
B01L 3/00	(2006.01)
G01N 21/00	(2006.01)

(52) **U.S. Cl.** **436/518**; 422/68.1; 422/502; 422/82.05

(57) **ABSTRACT**

An analysis system comprises a sampling cartridge (**11**) comprising a housing (**21**, **22**) having an inlet (**23**) for receiving a fluid sample, a sensor (**26**, **45**), and a guide (**40**, **42**) extending between the inlet and the sensor for guiding sample into contact with the sensor. The system also has an optical detection reader (**13**) for optically inspecting the sensor. The cartridge housing has an inspection window (**34**) and the reader (**13**) comprises a socket to receive the cartridge (**11**), and an optical system (**1183**, **1186**) for inspecting the sensor through the window. The cartridge comprises parallel microfluidic channel (**42**) for flow of sample from the inlet into contact with the sensor. The sensor comprises discrete sensor pads (**45**) in at least one channel, with an antibody, an antigen, or molecular imprinted polymer. The channels are of microfluidic size, having a cross-sectional area in the range of about 0.3 mm^2 to about 5 mm^2. At least one channel comprises a reagent pad (**43**) upstream of the sensor (**45**). The inlet of the cartridge comprises an extraction chamber (**23**) communicating with a draining chamber having a top reservoir (**61**) and a bottom reservoir (**63**), in turn communicating with a distribution chamber (**40**). Together, these chambers and the interfaces between them guide sample flow in a uniform manner between the channels and also remove impurity particles and bubbles.