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61/013,238 12 December 2007 (12.12.2007) US(71) Applicant (for all designated States except US): **THE BOARD OF TRUSTEES OF THE LELAND STANFORD JUNIOR UNIVERSITY** [US/US]; 1705 El Camino Real, Palo Alto, CA 94306-1106 (US).

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(54) Title: METHOD AND APPARATUS FOR MAGNETIC SEPARATION OF CELLS

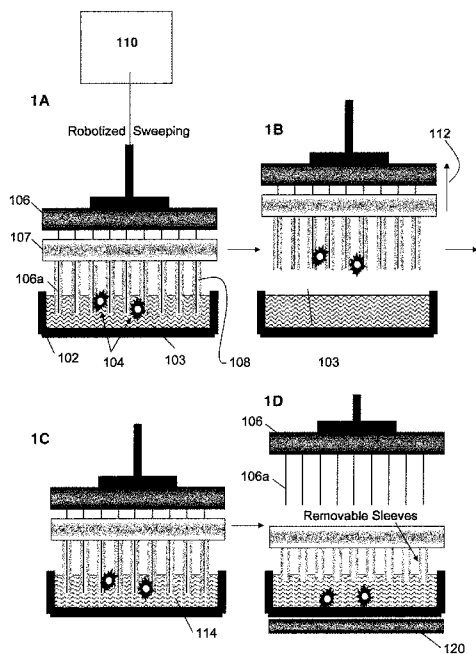


Fig. 1A-D

(57) Abstract: Described here is an automated robotic device that isolates circulating tumor cells (CTCs) or other biological structures with extremely high purity. The device uses powerful magnetic rods covered in removable plastic sleeves. These rods sweep through blood samples, capturing, e.g., cancer cells labeled with antibodies linked to magnetically responsive particles such as superparamagnetic beads. Upon completion of the capturing protocol, the magnetic rods undergo several rounds of washing, thereby removing all contaminating blood cells. The captured target cells are released into a final capture solution by removing the magnetic rods from the sleeves. Additionally, cells captured by this device show no reduced viability when cultured after capture. Cells are captured in a state suitable for genetic analysis. Also disclosed are methods for single cell analysis. Being robotic allows the device to be operated with high throughput.



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B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) USPC -- 435/173.9 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC -- 435/2, 302.1 (see search terms below) Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST(USPT,PGPB,EPAB,JPAB); DialogPRO(Engineering); Google Scholar Search Terms: magnetic separation, cells, tumor, cancer, target, label, sleeve, polymer		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,500,343 B2 (Siddiqi) 31 Dec 2002 (31.12.2002) Abstract; col 3, ln 53-65; col 6, ln 35-60; col 8, ln 10-45; col 10, ln 1-20; col 19, ln 45-55; col 21, ln 25-35	1-61
Y	US 5,837,144 A (Bienhaus et al.) 17 Nov 1998 (17.11.1998) col 3, ln 20, ln 30-32, ln 55-60; col 4, ln 1-20, ln 25-55	1-61
A	US 6,468,432 B1 (Miltényi et al.) 22 Oct 2002 (22.10.2002) entire document	1-61
A	US 2001/0000751 A1 (Schmitz et al.) 03 May 2001 (03.05.2001) entire document	1-61
A	US 6,190,870 B1 (Schmitz et al.) 20 Feb 2001 (20.02.2001) entire document	1-61
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774