(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 March 2006 (02.03.2006)

PCT

(10) International Publication Number
WO 2006/022933 A3

(51) International Patent Classification:
A61M 31/00 (2006.01)

(21) International Application Number:
PCT/US2005/017627

(22) International Filing Date: 20 May 2005 (20.05.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/598,831 5 August 2004 (05.08.2004) US

(71) Applicant *(for all designated States except US)*: **APOGEE TECHNOLOGIES, INC.** [US/US]; 129 Morgan Drive, Norwood, MA 02062 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **GOLUBOVIC-LIAKOPOULOS, Nevenka** [HR/US]; 1606 Vroom Drive, Bridgewater, NJ 08807 (US). **FRICANO, Glenn** [US/US]; 3500 Sunrise Highway, Suite T 210-H, Great River, NY 11739 (US). **DANIELSON, Michael, Stephen** [US/US]; 26 Arnold Street, Wrentham, MA 02093 (US).

(74) Agent: **KAUFMAN, Marc, S.**; Nixon Peabody LLP, 401 9th Street, NW, Suite 900, Washington, DC 20004 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

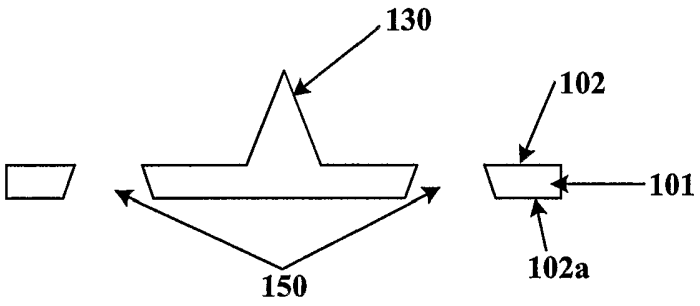
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
5 October 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM AND METHOD FOR DRUG DELIVERY AND MICROFLUIDIC APPLICATIONS USING MICRONEEDLES



(57) Abstract: The invention relates to a method of fabricating a microneedle array in a substrate, a drug delivery device comprising one or more microneedles extending upwards from the front surface of the substrate, the microneedles having a generally conical-shaped body defined by a plurality of surfaces sloping upwards from a relatively broad base to a tip, and one or more substances coating the microneedles, the one or more substances being operable to be administered to a patient, wherein the tips of the one or more microneedles are sufficiently sharp to penetrate an outer layer of the skin of the patient, and a method of administering one or more substances to a patient using the device.

WO 2006/022933 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/17627

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **A61M 31/00**(2006.01)

USPC: 604/500
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)
U.S. : 604/500, 506, 22; 439/66; 216/10, 11, 41

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,406,638 B1 (Stoeber et al) 18 June 2002 (18.06.2002), see whole document	1-3, 46-48
---		---
Y		4-25, 49-69, 71, 73
X	US 6,589,202 B1 (Powell) 08 July 2003 (08.07.2003), see whole document	26, 34-35, 42-43, 70
---		---
Y		27-33, 36-41, 44-45, 72

☐ 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 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
22 June 2006 (22.06.2006)

Date of mailing of the international search report
21 JUL 2006

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
For Nicholas Lucchesi J. Libby

Telephone No. 571-272-7230

Form PCT/ISA/210 (second sheet) (April 2005)