



(51) International Patent Classification:

A61M 37/00 (2006.01) A61M 11/06 (2006.01)
A61M 11/04 (2006.01)

(21) International Application Number:

PCT/US2012/034314

(22) International Filing Date:

19 April 2012 (19.04.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

PCT/US2011/033060 19 April 2011 (19.04.2011) US
61/591,444 27 January 2012 (27.01.2012) US

(71) Applicant (for all designated States except US): **IN-VISIDERM, LLC** [US/US]; 790 E. Colorado Blvd., 9th Floor, Pasadena, CA 91101 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **KISS, Norbert** [US/US]; 3240 Fairesta Street, #4, La Crescenta, CA 91214 (US).

(74) Agents: **CULLMAN, Louis C.** et al.; K&L Gates LLP, 1900 Main Street, Suite 600, Irvine, CA 92614-7319 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

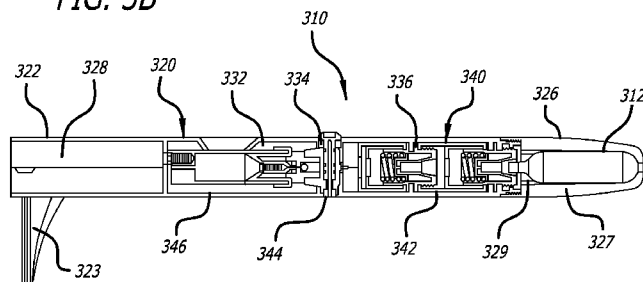
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

24 January 2013

(54) Title: METHOD OF PRODUCING SUBSTANCES WITH SUPERSATURATED GAS, TRANSDERMAL DELIVERY DEVICE THEREOF, AND USES THEREOF

FIG. 3B



(57) Abstract: The present specification disclosed a noninvasive transdermal delivery device that relates generally to a handheld mechanical apparatus for noninvasive transdermal administration of gas, small to large water- soluble (hydrophilic) pharmaceutical agents, vitamins, and other therapeutic agents. Components of such delivery devices, methods of producing a substance comprising a supersaturated amount of a dissolved gas, as well as, methods of administering a therapeutic agent using such delivery devices and methods of treating a disease or condition using such delivery devices are also disclosed.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/034314**A. CLASSIFICATION OF SUBJECT MATTER*****A61M 37/00(2006.01)i, A61M 11/04(2006.01)i, A61M 11/06(2006.01)i***

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)

A61M 37/00; A61F 13/00; A61K 7/48

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: transdermal, skin, gas, vapor, carbon dioxide, delivery

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004-0087916 A1 (PICKUP et al.) 06 May 2004 See claim 1; paragraph [0073]; and figs. 1 and 8.	1-3,8
A	US 2002-0040205 A1 (RASOR et al.) 04 April 2002 See the abstract; claim 5; paragrph [0064]; and figs. 1 and 11.	1-3,8
A	US 2008-0058709 A1 (DA SILVA FREITAS) 06 March 2008 See the abstract; claim 1; and fig. 1.	1-3,8
A	US 05851544 A (PENSKA et al.) 22 December 1998 See the abstract and claim 3.	1-3,8

☐ 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 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

13 NOVEMBER 2012 (13.11.2012)

Date of mailing of the international search report

26 NOVEMBER 2012 (26.11.2012)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

LEE, Cheol Soo

Telephone No. 82-42-481-8525



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/034314**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.: 5,10,14-15,19-20,27-28,32-33
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:

The above claims do not comply with PCT Article 6 because they are referring to unsearchable claims.
3. ☒ Claims Nos.: 4,6-7,9,11-13,16-18,21-26,29-31,34-35
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:

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 fee, this Authority did not invite payment of any additional fee.
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.:

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/034314

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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