METHOD OF PRODUCING SUBSTANCES WITH SUPERSATURATED GAS, TRANSDERMAL DELIVERY DEVICE THEREOF, AND USES THEREOF

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

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

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>A</td>
<td>US 2004-0087916 A1 (PICKUP et al.) 06 May 2004</td>
<td>1-3, 8</td>
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<td>A</td>
<td>US 2008-0058709 A1 (DA SILVA FREITAS) 06 March 2008</td>
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<td>A</td>
<td>US 05851544 A (PENSKA et al.) 22 December 1998</td>
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* 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 (13.1.1.2012)

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
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Facsimile No. 82-42-472-7140

Authorized officer

LEE, Cheol Soo

Telephone No. 82-42-481-8525

Form PCT/ISA/210 (second sheet) (My 2009)
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. 4,6-7,9,1 11-13,16-18,21-26,29-31 1,34-35 because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

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.:
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