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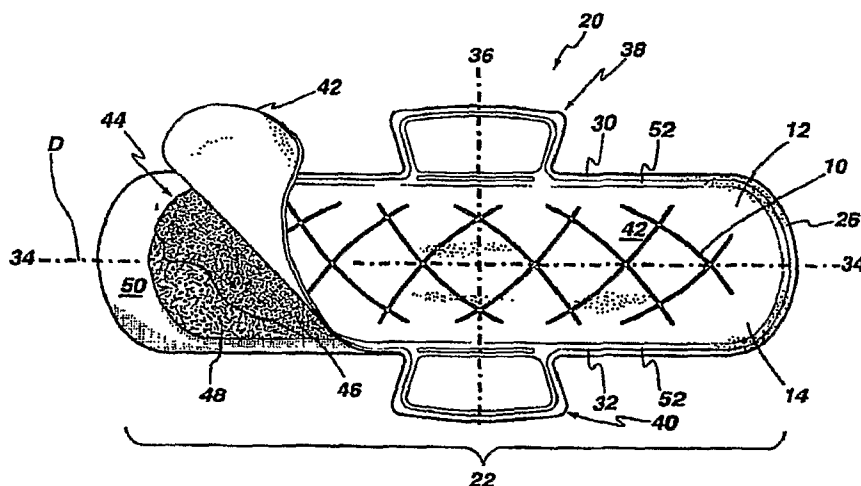
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30 October 2008

(54) Title: NANOSILVER-CONTAINING ABSORBENT ARTICLES



(57) Abstract: The present invention provides hygienic absorbent articles, such as feminine sanitary napkins, tampons and disposable diapers, having antimicrobial activity that can minimize odors caused by body fluids. The articles of the invention include an absorbent member such as an elongated absorbent portion or pad that contains an antibacterial amount of substantially immobilized nanosilver particles or particles containing silver ions, preferably encased in a granule of a soluble carrier such as dextran, and the like, or a water-insoluble, but water- swellable superabsorbent polymer (SAP).

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/18613

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61K 9/14(2006.01),9/70(2006.01),33/38(2006.01);A61L 15/20(2006.01),15/46(2006.01),15/60(2006.01)

USPC: 424/402,411,431,443;604/359,360,367,904

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. : 424/402, 411, 431, 443; 604/359, 360, 367, 904

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)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---------------|--|---------------------------------------|
| X --- Y | Database DERWENT on EAST, 2001, London: Derwent Publications Ltd., Accession No. 2001-515668, DE 19958697 A (BASF AG), abstract. | 1-3, 7-9, 11-13 ----- 1-3, 6-13 |
| X --- Y | Database DERWENT on EAST, 2002, London: Derwent Publications Ltd., Accession No. 2002-039883, KR 2001068147 A (KIM J I), abstract. | 1-2, 8, 10 ----- 1-13 |
| X --- Y | Database DERWENT on EAST, 2002, London: Derwent Publications Ltd., Accession No. 2002-039881, KR 2001068145 A (KIM J I), abstract. | 1-2, 8, 12 ----- 1-13 |
| Y | US 2004/0138362 A1 (KIM) 15 July 2004 (15.07.2004), paragraph 65. | 1-3, 6-13 |



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 | "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 |
| "E" earlier application or patent published on or after the international filing date | "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 |
| "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) | "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 |
| "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 | "&" document member of the same patent family |

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INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US07/18613**C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| Y | US 6,716,895 B1 (TERRY) 06 April 2004 (06.04.2004), claims 22 and 27. | 1-5, 7-13 |
| Y | US 2005/0025798 A1 (MOULIS) 03 February 2005 (03.02.2005), paragraph 29. | 1-5, 7-13 |

INTERNATIONAL SEARCH REPORT

International application No.

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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.:
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:
3. ☐ Claims Nos.:
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:
Please See Continuation Sheet

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 additional fees, this Authority did not invite payment of any additional fees.
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

International application No.

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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

Group I, claims 1-5, 7-13, drawn to an absorbent hygienic article comprising an absorbent member and nanosilver particles encased in granules of water soluble carrier.

Group II, claims 1-3, 6-13, drawn to an absorbent hygienic article comprising an absorbent member and nanosilver particles encased in granules of water-insoluble, but water-swellaable superabsorbent polymer.

Group III, claims 1-3, 7-13, drawn to an absorbent hygienic article comprising an absorbent member and nanosilver particles with no claim-recited granular encasement feature.

The inventions listed as Groups I, II, III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons.

Under lack of unity rules, unity of invention exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" is defined as meaning those technical features that define a contribution which each of the inventions, considered as a whole, makes over the prior art. The "contribution over the prior art" is considered with respect to novelty and inventive step.

Here, the only potential same or corresponding special technical feature is nanosilver particles or silver ions. However, such particles or ions are well known for their antimicrobial use in hygienic articles. See Derwent abstracts 2002-039883 and 2002-039881. Therefore, the only potential same or corresponding special technical feature does not define a contribution which each of the inventions makes over the prior art. Additionally, it is noted that absorbent members with nanosilver is quite well known, as established by the aforementioned Derwent abstracts, so the only way of making a contribution over the prior art is to provide special technical features that define distinct combinations of silver and absorbent features. Present claims are clearly drawn to three such separate, non-corresponding technologies, and for these reasons, the claims are found to lack unity of invention.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/18613

Continuation of B. FIELDS SEARCHED Item 3:

EAST, Files PGPUB, USPAT, DERWENT. Search terms: (feminine adj2 (pad or napkin)), tampon, diaper, colloidal silver, nanocrystalline silver, nanosilver, dextran, superabsorbent polymer. STN Online, Files HCAPLUS. Search Terms: colloidal silver, nanosilver, nanocrystalline silver, (silver (2a) nano?), silver, dextran.