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— with international search report

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28 August 2008

(54) Title: ANTIMICROBIAL SMOKE FLAVOR FOR ORAL MICROFLORA CONTROL

(57) Abstract: The presently disclosed subject matter provides compositions and methods for inhibiting the growth of oral microbes in a subject. Particularly, the methods include applying an oral composition comprising an oral care delivery agent and an antimicrobial agent comprising an effective amount of a low flavor antimicrobial liquid smoke derivative to the oral cavity of the subject for a time sufficient to inhibit growth of a microorganism in the oral cavity of the subject. Compositions that include low flavor antimicrobial liquid smoke derivatives that can be employed in the disclosed methods are also provided.



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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/04151

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61Q 11/00( 2006.01);A61K 9/68( 2006.01),8/00( 2006.01),36/00( 2006.01)

USPC: 424/48,49,725.1

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. : 424/48,49,725.1

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.
Y	KR 2002097073 A (LEE) 31 December 2002 (31.12.2002), especially abstract, page 3.	1-10
Y	US 5,043,174 (LINDNER) 27 August 1991 (27.08.1991), especially columns 2, lines 28-50 and column 5, lines 3-5.	1-10
Y	US 6,541,053 B2 (MOELLER) 01 April 2003 (01.04.2003), especially abstract; page 2 paragraph 7; Example I; Table I.	1-10
A	US 4,308,293 (TRIBBLE et al.) 29 December 1981 (29.12.1981), especially column 3, lines 50-52.	1



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

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/04151

## 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.: 1-10

### 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.

## 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. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-10 are drawn to an oral composition comprising oral delivery agent and antimicrobial agent.

Group II, claims 11-17 are drawn to a method for oral cleansing.

Group III, claims 18-26 are drawn to a method for inhibiting growth of a microorganism in the oral cavity of a subject.

The inventions are linked by the technical feature of an oral composition comprising an oral delivery and an antimicrobial agent comprising a low flavor antimicrobial liquid smoke derivative. However, this is not special because it does not constitute an advance over the prior art. Lee, HB (KR2002097073 A) teaches a functional toothpaste composition having the pharmacological action of active carbon and a pyroligneous acid solution (also known as liquid smoke) which has an effect on prevention of tooth decay, removal of mouth odor and prevention of periodontal disease (abstract).

Further, groups II and III involve methods not required by the other.

Group II, first method, requires a method for oral cleansing comprising applying an oral composition to the oral cavity.

Group III, second method, requires a method for inhibiting growth of a microorganism in the oral cavity of a subject comprising applying an oral composition for a time sufficient to inhibit growth of a microorganism.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/04151

Continuation of B. FIELDS SEARCHED Item 3:  
US-PGPUB, USPAT, DERWENT, EPO, JPO  
search terms: liquid smoke, pyroligneous acid, oral compositon.