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(54) Title: IMPROVED STABILITY OF PEROXIDE IN ORAL CARE COMPOSITIONS

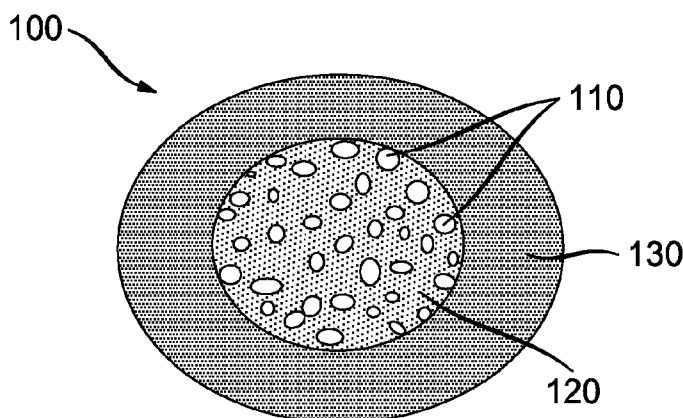


FIG. 6

(57) Abstract: The present invention is directed to a product and method for providing tooth whitening to a user. In particular, the invention is directed to a chewing gum product including an encapsulated solid peroxide composition.



WO 2012/145611 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/34427

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A23G 4/20; A23G 3/54; A23G 4/00; A23G 4/12 (2012.01)

USPC - 426/5; 424/43; 426/531; 426/533; 426/534

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)

USPC - 426/5; 424/43; 426/531; 426/533; 426/534

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 424/49, 424/43, 424/472; 426/3, 426/5, 426/531, 426/533, 426/534 (keyword delimited)

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

*** Databases: WEST (PGPB, USPT, USOC, EPAB, JPAB); Google, Google Scholar

*** Search Terms Used: Kraft, Gebreselassie, Gaonkar, Calahan, Boghani, chewing gum, active, component, composition, agent, ingredient, peroxide, encapsulated, encapsulating, coated, coating, ethyl cellulose, whitener, whitening,

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 2010/0104689 A1 (Thorengaard) 29 April 2010 (29.04.2010), especially para [0008], [0017], [0034], [0039], [0064], [0066], [0099], [0218], [0267], [0276], [0284], [0354], [0391]-[0395],	1-11, 23-25 ----- 12-21
X	US 2006/0177383 A1 (Gebreselassie et al.) 10 August 2006 (10.08.2006), especially para [0034], [0066], [0121]-[0122];	1-4, 8, 10, 11, 22
Y	US 2006/0204613 A1 (Castro et al.) 14 September 2006 (14.09.2006), especially para [0004], [0005], [0019], [0028], [0030],	12-21
A	US 2008/0063747 A1 (Boghani et al.) 13 May 2008 (13.05.2008), especially para [0008], [0036], [0043], [0087]-[0088], [0502], [0504], [0516], [0518]	1-25

☐ Further documents are listed in the continuation of Box C. ☐

* 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 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/US 12/34427

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:

The following claim groups were found:

Group I: Claims 1-25

Group II: Claims 26-53

Group III: Claims 54-56

Group IV: Claims 57-59

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.

*** Please see extra 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 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.:
Group I: Claims 1-25

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.

PCT/US 12/34427

Continuation of Box No III – Observations where unity of invention is lacking

Group I: is drawn to a tooth whitening chewing gum composition comprising: (a) a chewing gum base; and (b) a plurality of active-containing particles, each of said active-containing particles comprising an inner region comprising a solid peroxide composition and an outer region comprising an encapsulating material.

Group II: is drawn to a method of whitening the teeth of a user, comprising the steps of: (a) preparing a tooth whitening chewing gum composition comprising: (i) a chewing gum base; and (ii) a plurality of active-containing particles, each of said active-containing particles comprising an inner region comprising a solid peroxide composition and an outer region comprising an encapsulating material; (b) providing said chewing gum composition to a user; and (c) said user chewing said chewing gum composition, wherein said chewing breaks said outer region and release said inner region into the mouth, thereby exposing said user's teeth to said peroxide composition.

Group III: is drawn to a tooth whitening chewing gum composition comprising: (a) a chewing gum base; and (b) a plurality of active-containing particles, each of said active-containing particles comprising a solid peroxide composition within a polymeric encapsulation matrix.

Group IV: is drawn to a method of whitening the teeth of a user, comprising the steps of: (a) preparing a tooth whitening chewing gum composition comprising the steps of: (i) providing a chewing gum base; (ii) separately providing a plurality of active-containing particles prepared by the steps of: (1) mixing a polymeric material and a solid peroxide composition to provide a mixture; (2) extruding said mixture; (3) cooling said mixture; and (4) grinding said cooled mixture to provide a plurality of active-containing particles; (iii) combining said chewing gum base and said plurality of active-containing particles to provide a resulting chewing gum composition; (b) providing said chewing gum composition to a user; and (c) said user chewing said chewing gum composition, wherein said chewing releases said solid peroxide composition, thereby exposing said user's teeth to said peroxide composition.

The inventions listed in the abovementioned groups 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:

Groups I-IV lack unity of invention, because even though the inventions of these groups require the technical features of a chewing gum base and a plurality of active-containing particles comprising an inner region comprising a solid peroxide composition and an outer region comprising an encapsulating material, these technical features are not special technical features as they do not make a contribution over the prior art in view of US 2008/0063747 A1 to Boghani et al., which discloses a chewing gum base (para [0008]) and a plurality of active-containing particles (para [0036], [0043], [0087]) comprising an inner region comprising a solid peroxide composition and an outer region comprising an encapsulating material (para [0088], [0502], [0504], [0516], [0518]).

Groups II and IV lack unity of invention, because even though the inventions of these groups require the technical feature of providing said chewing gum composition to a user and the user chewing the chewing gum composition, wherein said chewing releases the solid peroxide composition, thereby exposing said user's teeth to the peroxide composition, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2008/0063747 A1 to Boghani et al., which discloses providing said chewing gum composition to a user (para [0092], [0278]), and the user chewing the chewing gum composition, wherein said chewing releases the solid peroxide composition, thereby exposing said user's teeth to the peroxide composition (para [0237], [0278], [0087], wherein it would have been obvious to one of skill in the art wherein chewing/mastication of the chewing gum would expose the user's teeth to the released solid peroxide composition).

Groups I-IV therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.