

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION		See Form PCT/IPEA/416																								
International application No. PCT/US14/58369	International filing date (<i>day/month/year</i>) 30 September 2014 (30.09.2014)	Priority date (<i>day/month/year</i>)																									
International Patent Classification (IPC) or national classification and IPC IPC: A61K 9/08(2006.01);A61K 9/06(2006.01);A61K 31/194(2006.01);A61K 31/185(2006.01) CPC: A61K 9/08;A61K 9/06;A61K 31/194;A61K 31/185																											
Applicant KIMBERLY-CLARK WORLDWIDE, INC.																											
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (<i>sent to the applicant and to the International Bureau</i>) a total of <u>6</u> sheets, as follows: ☐ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4<i>bis</i>, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No.I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3<i>ter</i> of Annex C of the Administrative Instructions).																											
4. This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">☒</td> <td style="width: 20%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td>☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td>☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td>☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td>☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td>☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td>☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td>☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>				☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
☒	Box No. I	Basis of the report																									
☐	Box No. II	Priority																									
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																									
☐	Box No. IV	Lack of unity of invention																									
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement																									
☐	Box No. VI	Certain documents cited																									
☐	Box No. VII	Certain defects in the international application																									
☐	Box No. VIII	Certain observations on the international application																									
Date of submission of the demand 01 August 2016 (01.08.2016)		Date of completion of this report 18 October 2016 (18.10.2016)																									
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-8300		Authorized officer Sarah Alawadi Telephone No. 571-270-7678																									

Form PCT/IPEA/409 (cover sheet) (January 2015)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US14/58369

Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into English which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b)).
 - ☐ publication of the international application (Rule 12.4(a)).
 - ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a) and (b)).

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished
- ☒ the description:
 pages 1-15 as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* NONE received by this Authority on _____
- ☒ the claims:
 Nos. _____ as originally filed/furnished
 Nos.* 1-16-18 as amended (together with any statement) under Article 19
 Nos.* NONE received by this Authority on _____
- ☐ the drawings:
 pages NONE as originally filed/furnished
 pages* NONE received by this Authority on _____
 pages* NONE received by this Authority on _____
- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____

5. ☐ This report has been established:

- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
- ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.4bis) and 70.2(e)).

6. ☒ With regard to top-up searches (Rules 66.1ter and 70.2(f)):

- ☒ A top-up search was carried out by this Authority on 18 October 2016 (18.10.2016)
- ☒ Additional relevant documents have been discovered during the top-up search.
- ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.

7. ☐ Supplementary international search report(s) from Authority(ies) _____ has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US14/58369

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims <u>7-20</u>	YES
	Claims <u>1-6</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-20</u>	NO
Industrial Applicability (IA)	Claims <u>1-20</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and Explanations (Rule 70.7)

----- NEW CITATIONS -----

US PgPub 2015/0080826 (Ehmsperger et al.) 19 August 2001, see paragraphs [0016],[0050],[0052],[0063],[0103],[0105],[0117],[0123],[0126].

CN102370598 (Han et al.) 30 September 2011, see claims 1-2 and paragraphs [0001-0006], [0008-0014] and [0018].

US PgPub 2015/0209468 (Aviles et al.) 19 December 2014, see paragraphs [0039], [0097], and [0115].

Claims 1-8, 10-16 and 18-20 lack an inventive step under PCT Article 33(3) as being obvious over Ehmsperger et al. (US PgPub 2015/0080826) and Han et al. (CN102370598).

Claim 1 is to a prebiotic composition having about .01-5% an alpha-hydroxy acid and a solvent, wherein the formulation is a liquid, solid, or gel.

Ehmsperger et al. teach compositions having 1.5-10% oligosaccharides with solvents and encompass liquid (solutions) of water, see paragraphs [0016] and [0103]. The oligosaccharides function as prebiotics, paragraph [0052.] The formulation may further contain other prebiotics such as organic acids including lactic acid, see paragraph [0117]. The optimal pH of the skin is 5.5 and thus it is desirable to maintain the pH of the composition around the pH of the skin surface to which it is applied, see paragraph [0105]. Such prebiotics include galacto-oligosaccharides, see [paragraph 0050] and entire document. The composition can be used with wipe substrates which have a basis weight from 5-200 g/m², see paragraph [0063]. The composition of Ehmsperger can further comprise polyethylene glycol (a surfactant and solvent), see paragraph [0126]. The webs can be spunbonded, see paragraph [0146]. The composition can contain humectants, see [paragraph 0123].

Ehmsperger et al. does not expressly teach the amount of water solvent present, or composition having weight ratios of alpha-hydroxy acid to prebiotic from 1:1 to 1:1,000, 1:100 to 1:200, or from .1-10% prebiotic agent.

Han et al. teach prebiotic compositions which are capable of being used with wipe products, see claim 1. The composition has a surfactant, from 0.01-3% oligosaccharide (prebiotic), and from 0.01-3 parts additive, see claims 1-2. The balance is water, which is suggested at about 90%-99% by weight, see paragraphs [0008-0014]. Such additives are inclusive of citric acid, see paragraph [0018]. The composition provides an odor removing antibacterial composition, see paragraphs [0001-0006].

It would have been prima facie obvious to provide the water content of Ehmsperger ranging from 90-99% and the organic acid (lactic acid) content ranging from 0.01-3% by weight as Han et al teach suitable amounts of each component in a wipe product which provides for good antibacterial and deodorizing effects. Such amounts of prebiotic and alpha-hydroxy acids overlap the claimed ratios.

Claims 9 and 17 lack an inventive step under PCT Article 33(3) as being obvious over Ehmsperger et al. (US PgPub 2015/0080826) and Han et al. (CN102370598) as applied to claims 1 8 and 13 above, in view of Aviles et al. (US2015/0209468)

Regarding claims 9 and 17, neither Ehmsperger nor Han teach the presence of glucose, galactose or lactose. However, Aviles et al. teach wipe products having prebiotics inclusive of glucose and oligosaccharides, see paragraph [0097] and [0115]. Such agents help impart stability to the composition, see paragraph [0115].

It would have been prima facie obvious to add glucose to the wipe composition of Ehmsperger as in order to apart stabilizing to the composition as Aviles recognizes that such agents help mitigate dehydration of the microorganisms in the formulation, see paragraph [0039].

As to the ratio of prebiotic to alpha-hydroxy acid (i.e. lactic) the prior art teaches overlapping ranges which is rendered prima facie obvious.

WHAT IS CLAIMED IS:

1. A prebiotic formulation comprising a prebiotic agent selected from the group consisting of inulin, fructo-oligosaccharide (FOS), lactulose and galacto-oligosaccharide (GOS), from about 0.01 to about 1.0 percent, by weight of the formulation, α -hydroxy acid selected from the group consisting of citric acid, lactic acid, methylactic acid, phenyllactic acid, malic acid, mandelic acid, glycolic acid, tartronic acid, tartaric acid, and water, wherein the weight ratio of α -hydroxy acid to prebiotic agent is from about 1:100 to about 1:200 and the pH of the formulation is from about 4.0 to about 6.0.
2. The prebiotic formulation of claim 1 wherein the formulation is a liquid or a gel and further comprises a surfactant.
3. The prebiotic formulation of claim 1 wherein the formulation is a liquid and further comprises a surfactant selected from the group comprising sodium lauryl sulfate, polyoxyethylene sorbitan fatty acid esters (polysorbates), polyoxyethylene alkyl ethers, sorbitan fatty acid esters, polyethylene glycols, quaternary ammonium compounds and glycerides of fatty acids.
4. The prebiotic formulation of claim 1 wherein the formulation is a liquid and further comprises fatty acids, fatty alcohols, polyethylene glycol, glyceryl behenate, mineral oil, paraffines, hydrogenated vegetable oil, leucine, and polyethylene glycols (PEG).
5. The prebiotic formulation of claim 1 wherein the prebiotic formulation is a liquid having a pH from about 4.8 to about 5.0 and comprises from about 95 to about 99 percent, by weight of the prebiotic formulation, water, from about 0.5 to about 2.0 percent, by weight of the prebiotic formulation, inulin and from about 0.01 to about 0.5 percent, by weight of the prebiotic formulation, lactic acid.
6. A prebiotic wipe comprising a wiping substrate and a prebiotic composition disposed thereon, the prebiotic composition comprising from about 0.5 to about 2.0 percent, by weight of the prebiotic composition, a prebiotic agent selected from the group consisting of inulin, fructo-oligosaccharide (FOS), lactulose, galacto-oligosaccharide (GOS), raffinose, stachyose, isomalto-oligosaccharide, and xylo-oligosaccharide, from about 0.01 to about 1.0 percent, by weight of the prebiotic composition, α -hydroxy acid and water.

Int'l Appln. No. PCT/US14/58369
Replacement Claims

7. The prebiotic wipe of claim 6 wherein the weight ratio of α -hydroxy acid to prebiotic agent is from about 1:100 to about 1:200 and the pH of the prebiotic composition is from about 4.0 to about 6.0.
8. The prebiotic wipe of claim 6 wherein the α -hydroxy acid is selected from the group consisting of citric acid, lactic acid, methylactic acid, phenyllactic acid, malic acid, mandelic acid, glycolic acid, tartronic acid, tartaric acid and gluconic acid.
9. The prebiotic wipe of claim 6 further comprising a digestible saccharide selected from the group consisting of lactose, glucose and galactose.
10. The prebiotic wipe of claim 6 wherein the prebiotic composition comprises from about 0.1 to about 10 percent, by weight of the composition, prebiotic agent, from about 0.1 to about 1.0 percent, by weight of the composition, α -hydroxy acid, and from about 89 to about 99 percent, by weight of the composition, water and the composition has a pH from about 4.0 to about 6.0.
11. The prebiotic wipe of claim 6 wherein the wiping substrate is a nonwoven material selected from the group consisting of meltblown, coform, spunbond, airlaid, hydroentangled nonwovens, spunlace, bonded carded webs, and laminates thereof.
12. The prebiotic wipe of claim 6 wherein the wiping substrate is a tissue web having a basis weight greater than about 10 grams per square meter and a bulk greater than about 3 cubic centimeters per gram.
13. A prebiotic wet wipe comprising a wipe substrate and a liquid prebiotic composition disposed thereon, the prebiotic composition comprising:
 - (a) water,
 - (b) a prebiotic agent selected from the group consisting of inulin, fructo-oligosaccharide (FOS), lactulose, galacto-oligosaccharide (GOS), raffinose, stachyose, isomalto-oligosaccharide, and xylo-oligosaccharide,
 - (c) an α -hydroxy acid is selected from the group consisting of citric acid, lactic acid, methylactic acid, phenyllactic acid, malic acid, mandelic acid, glycolic acid, tartronic acid, tartaric acid and gluconic acid,
 - (d) a surfactant, and
 - (e) a humectant, wherein the weight ratio of α -hydroxy acid to prebiotic agent is from about 1:100 to about 1:200.

Int'l Appln. No. PCT/US14/58369
Replacement Claims

14. The prebiotic wipe of claim 13 comprising from about 500 to about 1,500 mg of prebiotic agent per square meter of wipe substrate and from about 10 to about 50 mg of α -hydroxy acid per square meter of wipe substrate.
15. The prebiotic wipe of claim 13 wherein the surfactant is non-ionic and the humectant is selected from the group consisting of propylene glycol, glycerin, dipropylene glycol, glyceryl polymethacrylate and glyceryl polymethacrylate.
16. The prebiotic wipe of claim 13 wherein the prebiotic composition comprises from about 0.1 to about 10 percent prebiotic agent, from about 0.01 to about 1 percent α -hydroxy acid, from about 0.1 to about 1 percent surfactant and from about 0.1 to about 2 percent humectant, where all percentages are weight percentages based upon the weight of the prebiotic composition.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: KIMBERLY-CLARK WORLDWIDE, INC.
Int'l. Appln. No.: PCT/US14/58369
Int'l. Filing Date: 30 September 2014
Title: SYNERGISTIC PREBIOTIC COMPOSITION
Docket No.: 64937264PC01
Date: 01 August 2016

RESPONSE TO WRITTEN OPINION AND AMENDMENT UNDER PCT ARTICLE 34

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

In response to the International Search Report and Written Opinion prepared by the International Searching Authority dated 29 May 2015, Applicant respectfully requests that the following amendments be entered into the above-referenced application pursuant to PCT Article 34.

Amendments to the Claims:

Original claims 1-7 and 15 have been cancelled without prejudice or disclaimer.

Claims 2-4, 8-9 and 11-12 remain unchanged.

Claims 1, 5, 7 and 10 have been amended to correct typographical errors.

Claim 6 has been amended to further specify the prebiotic agent and its relative weight percentage. Support for the instant amendment may be found in the specification, for example, at original claim 15 and page 4, lines 14-16.

New claims 13-16 have been added. Support for the newly added claims may be found in the specification, for example, at page 10, line 22 – page 11, line 7.

Applicant respectfully requests that the pending claims of the application be replaced with the clean set of enclosed claims. No new matter has been added in the replacement claims.

Remarks:

The following remarks are made in response to comments set forth in the Written Opinion of the International Searching Authority. The Search Authority indicated that original claims 8-20 lacked an inventive step over Chinese Patent Application No. 102871921 (D2). The Authority maintains that D2's

teaching of a hand lotion comprising three components in ratios of 1-15 (polysaccharide): 0.1-2 (preservative): 1-20 (surfactant) renders obvious the present claims because the reference also teaches modifying the pH with triethanolamine, NaOH, hydrochloric acid, citric acid or sodium citrate.

First, the Authority erred by ignoring D2's complete lack of disclosure regarding the ratio of components and the presently claimed ratio of prebiotic and α -hydroxy acid. This is not a case where the claimed ranges are so similar to those disclosed in D2 to warrant a finding of prima facie obviousness. To the contrary, D2 provides no disclosure regarding the amount of α -hydroxy acid to be added relative to prebiotic and as such provides no starting point for the skilled artisan to determine workable or optimized ranges of the same. Thus, in this case, the number of options presented in the reference is not "small or easily traversed," so as to make it "obvious to try." *Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1364 (Fed. Cir. 2008). In instances such as this, the "obvious to try" standard is inapplicable and there must be some clearly articulated motivation to modify the prior art to arrive at the claimed invention. *Bayer Schering Pharma AG v. Barr Labs., Inc.*, 575 F.3d 1341, 1347 (Fed. Cir. 2009); *see also In re O'Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988) (when "what would have been 'obvious to try' would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful" an invention would not have been obvious). No such motivation exists here and the claims cannot be said to lack an inventive step.

Second, the mere fact that a reference discloses the components of a formulation, albeit not in the claimed ratios or with the resulting pH, does not itself establish lack of an inventive step. In fact, in instances such as this where the prior art includes a lengthy list of possible formulation components and there are not a finite number of identified, predictable solutions a finding of inventive step is favored. The law of obviousness recognizes an important distinction between combining known options into "a finite number of identified, predictable solutions," *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007), and "merely throwing metaphorical darts at a board' in hopes of arriving at a successful result." *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litigation*, 676 F.3d 1063, 1071 (Fed.Cir.2012) (internal quotations omitted). While D2 suggests modifying the pH of the lotion, the reference gives no direction as to what pH is desirable, how much modifier to use, what pH modifier is most efficacious or what effect it may have on the prebiotic effect of the lotion. Without more specific guidance it cannot be said that the present claims lack an inventive step over D2.

Finally, the Authority erred when it overlooked the synergistic effect achieved when the formulation components are combined as claimed. Rather than yield a predictable result, the present inventors have demonstrated that the combination of a prebiotic and an α -hydroxy acid in the recited ratios, or in the

Int'l Appl. No. PCT/US14/58369

recited amounts, synergistically improves the efficacy of the prebiotic. This is compelling evidence of an inventive step and should not be overlooked. See *Crocs, Inc. v. Int'l Trade Comm'n*, 598 F.3d 1294, 1309 (Fed.Cir.2010) ("Even if the [patent at issue] were a combination of known elements according to their established functions ... it yields more than predictable results [and therefore is] non-obvious.").

Conclusion:

Applicant respectfully submits that all of the claims of the present application satisfy the requirements of novelty, inventive step, and industrial applicability. In light of the foregoing, issuance of a favorable International Preliminary Report on Patentability is respectfully requested.

Respectfully submitted,

KIMBERLY-CLARK WORLDWIDE, INC.

By: /Michael J. Sullivan/

Michael J. Sullivan, USPTO Reg. No. 54,479
2300 Winchester Road
Neenah, WI 54956
United States of America
Phone: (920) 721-3616

Enclosure: 3 Pages of Replacement Claims