

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DR. SQUATCH, LLC
Petitioner

v.

THE PROCTER & GAMBLE COMPANY
Patent Owner

IPR2024-01173
Patent No. 10,905,647

**PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 10,905,647**

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PETITIONER’S EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 10,905,647 (“the ’647 Patent”)
1002	Declaration of Bozena B. Michniak-Kohn, Ph.D.
1003	U.S. Patent No. 11,433,018 (“Lesniak”)
1004	U.S. Patent No. 9,314,412 (“Phinney”)
1005	John H. Lamb, Sodium Bicarbonate: An Excellent Deodorant, 7(3) J. INVESTIGATIVE DERMATOLOGY 131-33 (1946) (“Lamb”)
1006	U.S. Patent No. 6,048,518 (“Bianchi ’518”)
1007	Native Wayback Machine archives, captured May 26, 2016, November 23, 2016, November 1, 2015 respectively for: https://www.nativecos.com https://www.nativecos.com/product/deodorant/ https://www.nativecos.com (“Native”)
1008	U.S. Patent App. Pub. No. 2007/0166254 (“Bianchi ’254”)
1009	Wayback Machine archive, captured January 26, 2017, for http://soapdelinews.com/2016/11/easy-homemade-deodorant-recipe.html (“Easy Homemade”)
1010	Angelica Peebles, <i>P&G Has Acquired Native Natural Deodorant Brand</i> , CNBC (Nov. 15, 2017, 5:34 P.M.), https://www.cnbc.com/2017/11/15/pg-has-acquired-native-natural-deodorant-brand.html (last visited May 28, 2024)

1011	Rachel Lapidos, <i>P&G Has Acquired Cult-Fave Deodorant Brand Native</i> , WELL+GOOD (Nov. 17, 2017), https://www.wellandgood.com/pg-acquired-natural-deodorant-brand-native/ (last visited May 29, 2024)
1012	Alex Bitter, <i>P&G Buys Deodorant Brand Native for Undisclosed Sum</i> , S&P GLOBAL (Nov. 15, 2017, 5:31 PM) https://www.spglobal.com/marketintelligence/en/news-insights/trending/DWXgoreaSsTDRfJ0RDSMEg2 (last visited May 29, 2024)
1013	KARL LADEN ET AL., ANTIPERSPIRANTS AND DEODORANTS (Karl Laden ed., 2nd ed. 1999)
1014	U.S. Patent App. Pub. No. 2005/0142085
1015	English Translation of Int'l Patent App. Pub. No. WO 2012/098189
1016	SoapDeliNews Wayback Machine archive, captured April 17, 2013, for https://soapdelinews.com/2013/03/natural-handmade-lavender-patchouli-deodorant-recipe-with-printable-labels.html
1017	SoapDeliNews Wayback Machine archive, captured July 23, 2016, for http://soapdelinews.com/2016/07/natural-neem-oil-deodorant-recipe.html
1018	SoapDeliNews Wayback Machine archive, captured October 19, 2012, for http://soapdelinews.com/2012/10/diy-natural-homemade-deodorant-recipe.html
1019	LORRAINE WHITE, HOMEMADE DEODORANT 32 EASY TO MAKE ALL NATURAL & ORGANIC DEODORANT & BODY SPRAY RECIPES (2014)
1020	<i>Homemade Deodorant</i> , THE CRUNCHY URBANITE (Nov. 24, 2013) https://thecrunchyurbanite.com/2013/11/24/homemade-deodorant/ (last visited May 29, 2024)
1021	Piyatip Khuntayaporn & Jiraphong Suksiriworapong, <i>Efficacy of Essential Oil Formulations Against Malodor Causing Bacteria</i> , 44(4) PHARM. SCIS. ASIA 209-16 (2017)
1022	Laura G. Corral, et al., <i>A Research Note Antimicrobial Activity of Sodium Bicarbonate</i> , 53(3) J. FOOD SCI. 981-82 (1988)

1023	Pamela Emanoil, <i>Customers Itching for Personal Care Alternatives</i> , Apr. 2006 NAT. FOODS MERCHANDISER 40-42 (2006)
1024	Mohammed A. Shahtalebi et al., <i>Deodorant Effects of a Sage Extract Stick: Antibacterial Activity and Sensory Evaluation of Axillary Deodorancy</i> , 18(10) J. RSCH. MED. SCI. 833-39 (2013)
1025	U.S. Patent No. 5,585,092
1026	U.S. Patent No. 9,610,237
1027	U.S. Patent App. Pub. No. 2014/0199252
1028	James Lambert, <i>Silicone Safety and the Cosmetic Industry</i> , 126(11) <i>Cosms. & Toiletries</i> 810-15 (2011)
1029	Julia Pasquet et al., <i>The Contribution of Zinc Ions to the Antimicrobial Activity of Zinc Oxide</i> , 457 COLLOIDS & SURFACES: PHYSICOCHEMICAL & ENG'G ASPECTS 263-74 (2014)
1030	Rodrigo Carvalho, <i>Hydroxyisohexyl 3-Cyclohexene Carboxaldehyde (Lyrall®) as Allergen: Experience from a Contact Dermatitis Unit</i> , 30(3) CUTANEOUS & OCULAR TOXICOLOGY 249-50 (2011)
1031	Maria V. Heisterberg, et al., <i>Deodorants are the Leading Cause of Allergic Contact Dermatitis to Fragrance Ingredients</i> , 64 CONTACT DERMATITIS 258-64 (2011)
1032	J. Handley & D. Burrows, <i>Allergic Contact Dermatitis from the Synthetic Fragrances Lyrall and Acetyl Cedrene in Separate Underarm Deodorant Preparations</i> , 31 CONTACT DERMATITIS 288-90 (1994)
1033	Prosecution History Excerpts of U.S. Patent Application No. 16/021,931 ('647 file history)
1034	Prosecution History Excerpts of U.S. Patent Application No. 17/961,089
1035	Prosecution History Excerpts of U.S. Provisional Patent Application No. 62/527,180

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1039	Compendium of Food Additive Specifications, FNP 52 Add 13 (2005)
1040	Complaint For Patent Infringement (ECF No.1) from The Procter & Gamble Co. v. Dr. Squatch, LLC, Case No. 2:24-cv-04711 (C.D. Cal.)
1041	U.S. Patent No. 4,049,792
1042	JOHN A. DEAN, LANGE’S HANDBOOK OF CHEMISTRY (John A. Dean ed., 15th ed. 1999)
1043	U.S. Patent No. 4,919,934
1044	Reserved
1045	U.S. Patent No. 10,966,915
1046	21 C.F.R. § 720.4(d) (1992)
1047	U.S. Patent No. 6,123,932
1048	Curriculum Vitae of Bozena B. Michniak-Kohn, Ph.D.
1049	Int’l Patent App. Pub. No. WO 2012/098189

1050	SAMUEL P. SADTLER ET AL., A TEXT-BOOK OF CHEMISTRY INTENDED FOR THE USE OF PHARMACEUTICAL AND MEDICAL STUDENTS (5th ed. 1918)
1051	Reserved
1052	KHALID HADDI, ET AL., GREEN PESTICIDES HANDBOOK ESSENTIAL OILS FOR PEST CONTROL, CHAPTER 7 CINNAMON OIL (Leo M.L Nollet & Hamir Singh Rathore eds. 2017)
1053	Reserved
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1067	Seyed Fazel Nabavi, et al., <i>Antibacterial Effects of Cinnamon: From Farm to Food, Cosmetic and Pharmaceutical Industries</i> , 7 NUTRIENTS 7729-48 (2015) (“Nabavi”)
1068	Reserved
1069	IFSCC Monograph Number 6, Antiperspirants and Deodorants: Principles of Underarm Technology (1998)
1070	M. Abendrot et al., <i>Zinc-containing Compounds for Personal Care Applications</i> , 40 INT’L J. COSMETIC SCI. 319-27 (2018)
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CLAIM LISTING

1. A deodorant stick comprising:

a. at least 25% by weight liquid triglyceride;

b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25° C.;

c. a fragrance composition comprising at least about 50% by weight of natural oils, essential oils, or a combination thereof; and

d. a primary structurant with a melting point of at least 50° C.;

said deodorant stick being free of an aluminum salt; and

said deodorant stick having a hardness from about 70 mm*10 to about 140 mm*10, as measured by penetration with ASTM D-1321 needle.

2. The deodorant stick of claim 1, wherein the primary antimicrobial is selected from the group consisting of beryllium carbonate, magnesium carbonate, calcium carbonate, magnesium hydroxide, magnesium carbonate hydroxide, magnesium hydroxide and magnesium carbonate hydroxide, partially carbonated magnesium hydroxide, and piroctone olamine.

3. The deodorant stick of claim 1, further comprising at least one additional antimicrobial different from the primary antimicrobial, selected from the group

consisting of beryllium carbonate, magnesium carbonate, calcium carbonate, magnesium hydroxide, magnesium hydroxide and magnesium carbonate hydroxide, partially carbonated magnesium hydroxide, piroctone olamine, potassium carbonate, potassium bicarbonate, sodium carbonate, sodium sesquicarbonate, baking soda, hexamidine, zinc carbonate, thymol, polyvinyl formate, salicylic acid, niacinamide, magnesium carbonate hydroxide, cinnamon essential oil, cinnamon bark essential oil, cinnamic aldehyde, and combinations thereof.

4. The deodorant stick of claim 1, wherein the primary antimicrobial is a powder.
5. The deodorant stick of claim 1, wherein the deodorant stick is substantially free of baking soda.
6. The deodorant stick of claim 1, wherein the deodorant stick is substantially free of a synthetic fragrance.
7. The deodorant stick of claim 1, wherein the deodorant stick has a hardness from about 90 mm*10 to about 110 mm*10, as measured by penetration with ASTM D-1321 needle.

9. The deodorant stick of claim 1, wherein the primary structurant has a melting point from 50° C. to 80° C.
10. The deodorant stick of claim 1, comprising at least about 40% by weight liquid triglyceride.
11. The deodorant stick of claim 1, comprising at least about 50% by weight liquid triglyceride.
12. The deodorant stick of claim 1, wherein the primary antimicrobial has a water solubility of at most about 50 g/L at 25° C.
13. The deodorant stick of claim 3, wherein all antimicrobials have a water solubility of at most about 90 g/L at 25° C.
14. A deodorant stick comprising:
- a. at least 50% by weight liquid triglyceride;
 - b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25° C.;

- c. a fragrance composition comprising at least about 50% of natural oils, essential oils, or a combination thereof; and
- d. a primary structurant with a melting point of at least 50° C.

15. The deodorant stick of claim 14, comprising at least about 60% by weight liquid triglyceride.

16. A deodorant stick comprising:

- a. at least 60% by weight liquid triglyceride;
 - b. at least one antimicrobial;
 - c. a fragrance composition comprising at least about 50% by weight of natural oils, essential oils, or a combination thereof; and
- said deodorant stick being free of an aluminum salt.

17. The deodorant stick of claim 16, further comprising a primary structurant having a melting point from about 50° C. to about 80° C.

18. A deodorant stick comprising:

- a. at least 50% by weight of a liquid triglyceride;

b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25°

C.; and

said deodorant stick having a hardness from about 70 mm*10 to about 140

mm*10, as measured by penetration with ASTM D-1321 needle.

19. The deodorant stick of claim 18, comprising at least about 60% by weight of a liquid triglyceride.

Pursuant to 35 U.S.C. §§ 311-19 and 37 C.F.R. § 42.1 *et seq.*, Dr. Squatch, LLC (“Dr. Squatch”) requests *inter partes* review (“IPR”) of claims 1-7 and 9-19 of U.S. Patent No. 10,905,647 (“the ’647 Patent”) (Ex. 1001) pursuant to 35 U.S.C. §§ 311-19 and 37 C.F.R. § 42.1 *et seq.* The ’647 Patent is subject to AIA 35 U.S.C. §§ 102 and 103.

MANDATORY NOTICES

A. Real Party-In-Interest (37 C.F.R. § 42.8 (b)(1))

Petitioner certifies that Dr. Squatch, LLC is the real party-in-interest.

B. Related Matters (37 C.F.R. § 42.8 (b)(2))

The ’647 Patent is currently involved in the following proceeding: *The Procter & Gamble Co. v. Dr. Squatch, LLC*, Case No. 2:24-cv-04711 (C.D. Cal.).

Related patents are currently involved in the following proceedings: IPR2024-1104, IPR2024-1105, and IPR2024-01174.

C. Counsel and Service Information (37 C.F.R. § 42.8(b)(3) and (4))

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Petitioner consents to electronic service of documents by email at:

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D. Payment of Fees Under 37 C.F.R. §§ 42.15(a) & 42.103

The required fees are submitted herewith in accordance with 37 C.F.R. §§ 42.103(a) and 42.15(a). If any additional fees are due during this proceeding, the Office is authorized to charge such fees to Deposit Account No. 22-0261. Any overpayment or refund of fees may also be deposited in this Deposit Account.

I. INTRODUCTION

The '647 Patent simply claims known deodorant stick compositions to capture the basic concepts used in preexisting “natural” deodorants. Its independent claims merely recite deodorant sticks with common ingredients including, in part: (1) “at least about 25% of a liquid triglyceride”; (2) “at least one antimicrobial”; and (3) “a primary structurant with a melting point of at least about 50° Celsius.” As Patent Owner admitted in related patents, deodorant sticks with this very basic ingredient combination were actually on the market before the priority date of the '647 Patent. In particular, Patent Owner’s own U.S. Patent No. 10,966,915 (“the '915 Patent”) states that a then-“currently marketed” aluminum-free deodorant stick (described as a “comparative” example in the specification) contained most of the ingredients set forth in the '647 Patent’s claims. The '915 Patent’s comparative example substantially matches the prior art published ingredient list for the prior art Native deodorant, now owned by Patent Owner, as discussed below.

The independent claims of the '647 patent further recite a hardness range for the deodorant stick. But the claimed hardness range was known since at least the 1990’s to be the “typical” hardness used for stick deodorants to achieve “consumer acceptance.” Ex. 1006, 2:56-58, 6:23-29. Moreover, as a person of ordinary skill in the art (“POSA”) long understood, the “typical” hardness range for a stick deodorant

could be obtained simply by adjusting the amount of structurant used in the composition, making a stick's hardness a mere issue of routine optimization.

The independent claims of the '647 Patent also recite components excluded from the composition, such as aluminum salts. As was appreciated by a POSA, the concept of more health-conscious ingredient lists (e.g., excluding aluminum salts, synthetic fragrance, etc.) had been known and disclosed in the field (and preferred by many consumers) before the critical date of the '647 Patent.

The prior art applied below exposes the claimed subject matter's lack of inventiveness. U.S. Patent No. 11,433,018 ("Lesniak") teaches and/or suggests all the elements of the '647 Patent's claims. Indeed, in a later application in the same patent family as the '647 Patent, the examiner applied Lesniak as an anticipatory reference against claims that recite the many of the same features as those recited in claims of the '647 Patent.

This Petition also relies on an ingredient list for a stick deodorant, which published before the critical date. That deodorant is from a company—Native—that Patent Owner acquired after the publication of the ingredient list, but before the critical date. *See* Ex. 1007, 11; Ex. 1010, 1-2. Patent Owner stated that the reason for the acquisition was, in part, to reach customers who are "deliberate about what they put on their bodies." Ex. 1011, 2-3; Ex. 1012, 1 ("[C]onsumers who have preferences to avoid certain ingredients such as parabens and aluminum."). The

published ingredient list substantially matches a comparative example that the '915 Patent admits was “currently marketed” at the time of the filing. The published Native ingredient list renders obvious all claims of the '647 Patent when combined with U.S. Patent App. Pub. No. 2007/0166254 (“Bianchi '254”). Specifically, while the Native ingredient sets forth the ingredients in order of relative concentration, without quantitative amounts thereof, Bianchi '254: (1) provides preferred quantified amounts of those ingredients to be used in typical deodorant sticks; and (2) teaches the claimed hardness range was known and preferred.

Thus, as established in more detail below, the '647 Patent claims nothing more than well-known characteristics of deodorant sticks.

II. GROUNDS FOR STANDING UNDER 37 C.F.R. § 42.104(a)

Petitioner certifies that the '647 Patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR. This petition is being filed within one year of Petitioner being served with the above-identified infringement complaint.

III. IDENTIFICATION OF CHALLENGES UNDER 37 C.F.R. § 42.104(b) AND RELIEF REQUESTED

A. Grounds for the Challenged Claims

Petitioner requests (i) review of claims 1-7 and 9-19 of the '647 Patent on the grounds set forth below and (ii) that those claims be found unpatentable.

Ground	Claim(s)	Basis for Unpatentability
1	14-17	Anticipated by and/or Obvious over Lesniak
2	1, 4-7, 9-12, 18-19	Obvious over Lesniak in view of Bianchi '518
3	2	Obvious over Lesniak in view of Bianchi '518 and Phinney
4	3, 13	Obvious over Lesniak in view of Bianchi '518, Phinney and Nabavi
5	16-17	Obvious Over Native in view of Bianchi '254
6	1-2, 4-7, 9-12, 14-15, 18-19	Obvious Over Native in view of Bianchi '254 and Easy Homemade
7	3, 13	Obvious Over Native in view of Bianchi '254, Easy Homemade, and Nabavi

B. The Challenges Presented Are Not Cumulative

The grounds for unpatentability presented in this petition are neither cumulative nor redundant to prosecution of the '647 Patent. Lesniak was of record during prosecution of the underlying application,¹ but not applied by the examiner in the rejection of any claims. As discussed in more detail below, Lesniak was subsequently applied by the same examiner in prosecution of a later application in

¹ Lesniak's specification also published as U.S. Patent Pub. No. 2017/0252288 and WO 2016/048425. References to Lesniak encompass the application of the specification published in other forms.

the family in a manner consistent with the application in this Petition. All other applied references were not considered during prosecution.

IV. BACKGROUND OF THE TECHNOLOGY

A. Deodorants vs. Antiperspirants

Deodorants form a category of cosmetic products that were developed to mask and/or counteract the buildup of unwanted human body odor. Ex. 1013, 169-83, 189-95. Deodorants typically contain antimicrobials and/or fragrances to inhibit the formation and perception of malodor. *Id.*, 201.

Antiperspirants are a subcategory of deodorants. Like deodorants, they were known to contain fragrances and/or antimicrobials, but they also included additional active ingredients such as aluminum or zinc salts that may block sweat pores in the skin. Ex. 1006, 3:5-11; Ex. 1014, ¶¶[0020]-[0026]; Ex. 1003, 3:39-4:21, 8:46-48, 10:27; Ex. 1015, 5; Ex. 1049, 3-4; Ex. 1008, ¶[0064] Ex. 1013, 73, 215. The blocking of sweat pores was known to reduce moisture and nutrients from glandular secretion, and ultimately curb the bacterial growth and metabolism responsible for malodorous compounds. Ex. 1013, 73; Ex. 1002, ¶¶33-34.

B. Basics of Deodorants

By the time of the purported invention, it was understood that anhydrous stick compositions were versatile and could be utilized in the development of deodorants (including antiperspirants). Ex. 1014, ¶[0008]; Anhydrous stick compositions were

known to contain a wide range of ingredients, they typically contained a few well-established components, described below. Ex. 1002, ¶¶35-37.

i. Carrier Oils

Liquid carriers were known components of stick deodorant and antiperspirant compositions prior to the purported invention. These materials could (1) function as emollients (skin conditioning agents that help maintain hydration); (2) help reduce undesirable visible residue (whitening) upon application of the composition to the skin; and/or (3) solubilize or disperse active ingredients such as the astringent metallic salts in antiperspirants. Ex. 1014, ¶¶[0002], [0037], [0050]; Ex. 1008, ¶¶[0046], [0050]; Ex. 1006, 4:22-26; Ex. 1013, 330-31. It was known that existing anhydrous liquids (used in personal care applications) could be used as carriers in stick compositions. Ex. 1014, ¶¶[0037], [0044]. While silicone oils (synthetic polymers) were often used as liquid carriers in traditional stick compositions (Ex. 1006, 4:9-15; Ex. 1014, ¶¶[0038]-[0043], [0046]), non-silicone oils had also been identified as useful. Ex. 1008, ¶¶[0015], [0017], [0043]-[0054]. Triglycerides such as capric/caprylic triglycerides, had specifically been recognized as suitable (non-silicone) carrier oils of natural origin. Ex. 1008, ¶[0050]; Ex. 1003, 2:38-39, 9:45-46.

It was known that the carrier oil component of a stick deodorant could be a silicone oil, natural oil, and combinations thereof. *E.g.*, Ex. 1008, ¶¶[0013]-[0020],

[0038]-[0054]; Ex. 1007, 11; Ex. 1016, 6-7; Ex. 1017, 5-7; Ex. 1018, 5-6. The total amount of carrier oil could be, for example, about 40-80% by weight of the stick composition and, where mixtures of silicone and natural oils, each could comprise, e.g., 20-40% by weight of the total stick composition. Ex. 1008, ¶¶[0013]-[0020], [0038]-[0054]. Whether to use a silicone oil or natural oil (or a combination)—and what oil amount to use—was simply a design choice. Ex. 1002, ¶¶38-39.

ii. Structurants

Typically, structurants were known to be materials solid at ambient conditions that were added to stick compositions to solidify the carrier oil. Ex. 1008, ¶[0057]; Ex. 1014, ¶¶[0028]-[0029]; Ex. 1001, 15:46-67.

Structurants with different melting point temperatures were used, often in combination, to adjust hardness. Ex. 1014, ¶[0029]; Ex. 1015, 19-24; Ex. 1049; Ex. 1013, 331. Known examples of structurants included waxes (waxy materials), organic solids, modified silicone solids, crystalline or other gellants, and combinations thereof. Ex. 1014, ¶[0029]. Long chain fatty alcohols such as stearyl alcohol had been recognized and used as preferred structurants. *Id.* ¶[0030]; Ex. 1007, 11; Ex. 1008, ¶¶[0001], [0019], [0058]-[0059], [0071]; Ex. 1013, 247. Arrowroot powder was also known to thicken stick compositions.² Ex. 1019, 5, 11-

² From its infringement complaint, Petitioner understands Patent Owner's position to be that arrowroot powder, listed in Native's ingredient list, does not count as a structurant. Ex. 1040, 4 (identifying stearyl alcohol, but not arrowroot powder, as a

15, 17-19, 23; Ex. 1020, 2-5. Structurants were known to comprise, for example, 3-35% by weight of the total stick composition. Ex. 1014, ¶[0028]; Ex. 1002, ¶¶40-42.

iii. Fragrances

Fragrances were commonly incorporated into deodorants and antiperspirants to mask axillary malodors or odors from the product base. Ex. 1013, 194-201, 250-51. Some natural or essential oil fragrances had also been known to possess antimicrobial activity. Ex. 1013, 196; Ex. 1021, 209, 211-12. Ex. 1002, ¶43.

iv. Antimicrobials

Numerous antimicrobials were included as active ingredients in deodorants and antiperspirants to prevent axillary odor by eliminating the bacteria responsible for formation of odorous compounds. Ex. 1013, 171-83. Sodium bicarbonate (i.e., baking soda), in particular, had long been used in deodorants and antiperspirants and was thought to deodorize via chemical modification of odorous compounds, i.e., reacting with the acidic compounds responsible for malodor to form non-volatile salts. *Id.*, 190, 347; Ex. 1005, 133. It was also understood that baking soda had antimicrobial and/or adsorptive properties as well. Ex. 1013, 190; Ex. 1022, 981-

structurant). Thus, Petitioner relies upon Patent Owner's position in this regard for purposes of the IPR only. Petitioner reserves the right to present positions in any related litigation on this point that may differ from Patent Owner's position on the "primary structurant" (i.e., Petitioner may argue in the alternative, in litigation, that arrowroot powder does count as a structurant).

82; Ex. 1005, 133. Some users reported that baking soda in deodorant sticks irritated their skin. Ex. 1017, 5-6; Ex. 1009, 6. Magnesium hydroxide, another antimicrobial, had been used as a substitute for baking soda and was not found to cause the same type of skin irritation. Ex. 1017, 5-8; Ex. 1009, 6, 9; Ex. 1004, 5:52-60, 6:9-12, 6:31-34, 8:40-44; Ex. 1002, ¶44.

v. Hardness of Anhydrous Stick Compositions

Hardness was a known physical parameter affecting consumer acceptance that was measured and controlled during the development of stick compositions. Ex. 1006, 6:23-25; Ex. 1014, ¶[0003]. Hardness was known to be closely related to other product attributes such as strength against breakage, storage stability, and product aesthetics (e.g., smooth application/gliding on the skin, and drier skin feel after use). Ex. 1014, ¶[0003]. Formulators endeavored to develop compositions that had “satisfactory strength and hardness while exhibiting aesthetically pleasing attributes.” *Id.*, ¶¶[0003]-[0005]. Since long before the ’647 Patent, it was known that formulations that contained too large an amount of structurant(s) could result in overly hard structures that were “too brittle” and/or “cosmetically unacceptable.” *Id.*, ¶[0003].

One test that was used to measure hardness of a stick composition was the needle penetration test. Ex. 1006, 2:56-58, 6:23-29; Ex. 1008, ¶[0026]. A higher value corresponds to a softer stick. Ex. 1008, ¶[0026]. Well before the ’647 Patent,

it was known that the hardness of “typical” stick compositions using an ASTM D-1321 needle penetration test ranged from about 7.0 mm to about 14.0 mm,³ and that products with hardness that fell outside that range would “typically generate low consumer acceptance ratings.” Ex. 1006, 2:56-58, 6:23-29.

Formulators were aware that the hardness of a stick composition could be controlled by adjusting the concentration or type of liquid carrier and/or structurant (e.g., more structurant, balancing waxes with high and low melting points, etc.). Ex. 1014, ¶[0037] (“Such [liquid carrier] concentration will vary depending upon variables such as desired product hardness”). For example, U.S. Patent 4,049,792, a patent assigned to Patent Owner that is incorporated by reference in the ’647 Patent (Ex. 1001, 19:44-47), states:

The low melting point wax can be used as an adjunct to the high melting point wax to provide structure and as an emollient. The low melting point wax can also be used to adjust the feel of the stick. ***One skilled in the art will easily be able*** to make a product which feels more brittle, soft, slippery, sticky, rough, etc., by blending various suitable high melting point and low melting point waxes.

Ex. 1041, 4:37-44 (emphasis added). A greater amount of structurants was known to result in harder sticks, while a lesser amount was known to result in softer sticks. Ex. 1014, ¶¶[0003], [0028]-[0029]. Ex. 1002, ¶¶45-47.

³ This range is the same as from about 70 mm*10 to about 140 mm*10 stated in the ’647 Patent. Ex. 1001, 24:9-11 (explaining that 80 mm*10 is the same as 8 mm).

C. The Move to Natural Deodorants

i. Aluminum-Free

By the time of the purported invention, it was known that many consumers were seeking cosmetic products that were natural or otherwise free of potentially harmful ingredients. Ex. 1010, 2; Ex. 1012, 1; Ex. 1023, 40-41. As a result of the connection with safety and health, the term “natural” in the deodorant category became associated not only with the inclusion of natural ingredients, but also the absence of aluminum, which some believed was correlated to an increased risk of Alzheimer’s disease, breast cancer, and/or prostate cancer. Ex. 1024, 833; Ex. 1013, 215, 332; Ex. 1023, 40; Ex. 1007, 5, 8, 11.

Aluminum-free deodorant sticks were well documented before the filing of the ’647 Patent. In fact, independent formulators had publicly shared recipes online for homemade deodorants that were natural and free of aluminum. *See* Ex. 1020; Ex. 1018; Ex. 1016; Ex. 1017. In response to the trend, cosmetic companies had also launched deodorant products addressing those consumer preferences. For example, the deodorant company Native had developed and marketed natural, aluminum-free deodorant sticks as early as 2016.⁴ Ex. 1007, 5, 11; Ex. 1002, ¶¶48-49.

⁴ Comparative Formula 1 in Patent Owner’s related U.S. Patent No. 10,966,915, which is described in the specification as a “currently marked product,” contains the same nine most predominant ingredients by weight as Native’s 2016 natural,

ii. Silicone-free

The move to natural deodorant formulations also involved the removal of certain synthetic ingredients, such as silicones, from stick compositions. Consumers preferred silicone-free formulations due to real or perceived health and environmental risks related to silicones. Ex. 1026, 1:41-57. For example, silicone and its degradants had potential links to autoimmune system deficiencies in women with silicone breast implants as well as other disorders. *Id.* Some publications suggested that silicones could cause environmental harms, such as bioaccumulation and environmental toxicity. *Id.*; Ex. 1027, ¶¶[0003]-[0004]; Ex. 1028, 814-15.

As discussed in Section IV.B.i, the liquid carrier in traditional stick compositions could be comprised of both synthetic silicone oils and natural, non-silicone oils, like triglycerides. Natural deodorant stick formulations, including Native's 2016 deodorant and others, were known to contain only natural oils. Ex. 1007, 11; Ex. 1017, 6; Ex. 1016, 6; Ex. 1002, ¶¶50-51.

iii. Natural Antimicrobials

Developing natural deodorant formulations also involved replacing synthetic antimicrobials, like triclosan, with natural alternatives. Natural antimicrobials such

aluminum-free deodorant stick. Ex. 1007, 11; Ex. 1045, 3:1-45, Table 1; 5:18-19 (indicating "hydrogenated castor oil" and "castor wax" are interchangeable and refer to the same material). Patent Owner acquired Native after the commercial introduction of the Native deodorants but before the effective filing date of the '647 Patent. *See* Ex. 1007, 11; Ex. 1010, 1-2.

as sodium bicarbonate (i.e., baking soda) and zinc oxide were known to have been incorporated into deodorant compositions. Ex. 1018, 5-6; Ex. 1016, 6; Ex. 1007, 11; Ex. 1004, 5:52-60, 6:9-12, 6:31-34, 8:40-44; Ex. 1003, 3:50-4:21; Ex. 1029, 264; Ex. 1013, 2, 170, 373-74. As mentioned above, formulators (including even those making homemade sticks) were aware that using baking soda in natural deodorant stick formulations could result in unwanted skin irritation for some users. Ex. 1017, 5-7 (“[T]he absence of baking soda means no itchy, red pits . . . for those of us with sensitive skin.”); Ex. 1009, 6, 9 (discussing the “rash you get after using deodorant with baking soda.”). Magnesium hydroxide had been used as a natural antimicrobial alternative that did not cause the same type of skin irritation. Ex. 1009, 6; Ex. 1004, 5:52-60, 6:9-12, 6:31-34, 8:40-44; Ex. 1002, ¶52.

iv. Natural Fragrances

The push towards natural deodorant formulations also involved replacing synthetic fragrances with natural alternatives like essential oils. Ex. 1007, 11; Ex. 1030; Ex. 1031; Ex. 1032; Ex. 1023. Natural fragrances were desired by some consumers, over synthetic fragrances, based on their perceived relative safety and/or lower allergy incidence rates. Ex. 1023, 40. In addition, many natural essential oils possessed antimicrobial activity, a property particularly well-suited for deodorants. Ex. 1013, 196; Ex. 1021, 209, 211-12; Ex. 1002, ¶53.

V. SUMMARY OF THE '647 PATENT

The '647 Patent acknowledges a preexisting consumer preference for natural (e.g., essential oil-based), aluminum-free deodorant sticks that did not cause irritation associated with baking soda. Ex. 1001, 1:20-40. The '647 Patent describes its “invention” as compositions comprising a specific antimicrobial, piroctone olamine, “in combination with [other] appropriate antimicrobials” and “a chelating agent—“in particular ratios” and “at particular particle sizes.” *Id.*, 1:45-2:8. The '647 Patent attributes to this combination “significantly higher levels of anti-fungal activity.” *Id.*, 1:62.

None of the challenged claims, however, recites these purportedly inventive features. They do not even require piroctone olamine or any chelating agents, much less specify particle sizes and ratios of those ingredients. Nor do the challenged claims require any specific level of anti-fungal activity. Ex. 1002, ¶¶54-55.

A. The Claimed Subject Matter

The '647 Patent contains nineteen claims. Independent claim 1 is directed to a deodorant stick comprising:

- at least about 25% of a liquid triglyceride;
- at least one antimicrobial having a water solubility of at most about 90 g/L at 25° C;
- a primary structurant with a melting point of at least about 50° C;

- a fragrance composition comprising at least about 50% by weight of natural or essential oils; and
- wherein said stick is free of an aluminum salt and has a hardness from about 70 mm*10 to about 140 mm*10, as measured by penetration with ASTM D-1321 needle.

Independent claims 14, 16, and 18 recite subsets of those limitations with a higher liquid triglyceride content (50/60%). Dependent claims 10-11, 15, and 19 likewise recite higher triglyceride contents. Dependent claims 2-4 and 12-13 limit the antimicrobial to specific materials, or those having certain properties (e.g., powder form, water solubility). Dependent claims 5-6 contain negative limitations providing that the deodorant stick is substantially free of certain materials, such as baking soda, synthetic fragrance, or silicones. Dependent claims 9 and 17 further limit the melting point of the structurant. Finally, dependent claim 7 limits the deodorant stick to a hardness range that overlaps with the range known in the field to be the consumers' preferred range.

B. Prosecution History

U.S. Patent Application No. 16/021,931 ("the '931 Application"), which issued as the '647 Patent, claims priority to Provisional Application No. 62/647,111,

filed on March 23, 2018, and Provisional Application No. 62/527,180, filed on June 30, 2017.⁵

In an Office Action dated March 13, 2020, the Examiner rejected claims 1-19 on the basis of nonstatutory double patenting. Ex. 1033, 1-10. The Applicant filed a terminal disclaimer to obviate the rejection and the application was allowed. *Id.*, 11-33.

Although a version of Lesniak was of record during prosecution of the '931 Application, the examiner did not apply the reference to reject any claims. And Patent Owner presented no arguments concerning Lesniak. However, unprompted, the Notice of Allowance mentioned Lesniak and erroneously suggested (Ex. 1033, 31-32) that a POSA would not consider zinc oxide to be an antimicrobial. That was an error for reasons discussed throughout this Petition⁶ and an error that the examiner corrected in subsequent prosecution. Specifically, during the prosecution of a subsequent application in the patent family, pending U.S. Patent Application No. 17/961,089 ("the '089 Application"), *the same examiner later recognized the applicability of Lesniak*. In an Office Action dated July 3, 2023, the examiner

⁵ The 2017 provisional does not disclose the hardness range measured with an ASTM D-1321 needle. The hardness information was added in the 2018 provisional application, which was filed after Patent Owner's acquisition of Native.

⁶ Zinc oxide was a known antimicrobial, and the '647 Patent's list of exemplary antimicrobials expressly identifies another zinc salt, zinc carbonate. Ex. 1001, 10:31-37.

rejected claims of the '089 Application over Lesniak on both anticipation and obviousness grounds. Ex. 1034, 5-15. In doing so, the examiner concluded that Lesniak disclosed many features found in the claims of the '647 Patent. *Id.*, 1-15. For example, the Examiner found Lesniak disclosed a deodorant stick comprising (i) at least 25% liquid triglyceride, (ii) a structurant having a melting point greater than about 50°C., (iii) natural fragrances, including essential oils, and (iv) an ***antimicrobial, zinc oxide, having a water solubility of at most about 90 g/L at 25°C.*** *Id.* Thus, the same examiner ultimately corrected the misstatement on Lesniak.

Also of note, in response to the rejection, the Applicant amended the claims of the '089 Application to recite that the deodorant stick (i) is substantially free of synthetic fragrance, (ii) is anhydrous, (iii) is substantially free of silicones, and (iv) has a hardness from about 70 mm*10 to about 140 mm*10 as measured by penetration with ASTM D-1321 needle. *Id.*, 20-23. Despite the amendments—including, notably, a limitation requiring a hardness range that is identical to the range in claim 1 of the '647 Patent—the examiner still found the claims to be unpatentable in view of Lesniak. *Id.*, 20-33. The examiner expressly found the substitution of magnesium hydroxide for Lesniak's zinc oxide obvious. *Id.*, 30.

Also, in the '089 Application, following a double-patenting rejection, the Applicant filed a terminal disclaimer over the '647 Patent. *Id.*, 16-19.

For the reasons discussed in this section, the application of Lesniak does not implicate 35 U.S.C. § 325(d). The Board uses a two-step framework in determining whether discretionary denial under § 325(d) is appropriate. The Board considers whether the same or substantially the same art or arguments were presented to the Office, and if so, “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of the challenged claims.” *Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). Here, no arguments were made on Lesniak and, in any event, the examiner has acknowledged in subsequent prosecution the error.

VI. PRIOR ART

A. Effective Prior Art Dates

The '647 Patent is not entitled to a priority date of June, 30, 2017, the filing date of Provisional Application No. 62/527,180. Specifically, the 2017 provisional application fails to disclose a deodorant stick composition (i) comprising 25% liquid triglyceride (required in all claims) or (ii) having a hardness of from about 80 mm*10 to about 140 mm*10 as measured with an ASTM D-1321 needle. Ex. 1035, 1-54. The earliest date the '647 Patent can claim priority is therefore March 23, 2018, the filing date of Provisional Application No. 62/647,111. Nevertheless, the references addressed below are prior art regardless of which priority date is used.

U.S. Patent No. 11,433,018 (“Lesniak”) (Ex. 1003), a patent issued under Section 151 and which names another inventor, was effectively filed on June 18, 2015 (PCT/US2015/036498). It is therefore prior art under AIA 35 U.S.C. § 102(a)(2). As discussed in Section V.B, Lesniak was not applied during prosecution.

U.S. Patent No. 9,314,412 (“Phinney”) (Ex. 1004) issued on April 19, 2016, making it prior art under AIA 35 U.S.C. § 102(a)(1). Phinney was not of record during prosecution.

U.S. Patent No. 6,048,518 (“Bianchi ’518”) (Ex. 1006) issued on April 11, 2000, making it prior art under AIA 35 U.S.C. § 102(a)(1). Bianchi ’518 was not of record during prosecution.

Native (Ex. 1007) is a website page that was published and available to the public on at least November 23, 2016, making it prior art under AIA 35 U.S.C. § 102(a)(1). Native was not of record during prosecution.

U.S. Patent App. Pub. No. 2007/0166254 (“Bianchi ’254”) (Ex. 1008) was published on July 19, 2007, making it prior art under AIA 35 U.S.C. § 102(a)(1). Bianchi ’254 was not of record during prosecution.

Easy Homemade (Ex. 1009) is a website page that was published and available to the public on at least January 26, 2017, making it prior art under AIA 35 U.S.C. § 102(a)(1). Easy Homemade was not of record during prosecution.

Nabavi (Ex. 1067) is an article published in *Nutrients* in 2015, making it prior art under AIA 35 U.S.C. § 102(a)(1). Nabavi was not of record during prosecution.

VII. ARGUMENTS

A. Statement of the Law

“To anticipate a claim, a prior art reference must disclose each and every element of the claim, either explicitly or inherently.” *Adasa Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 910 (Fed. Cir. 2022) (citation omitted). “While those elements must be arranged or combined in the same way as in the claim, the reference need not disclose the elements in the very same terms used by the patent.” *Id.* (“[T]he reference need not satisfy an *ipsissimis verbis* test.”).

“When a patent claims a range . . . that range is anticipated by a prior art reference if the reference discloses a point within the range.” *Ineos USA LLC v. Berry Plastics Corp.*, 783 F.3d 865, 869 (Fed. Cir. 2015). When the prior art reference discloses its own range, “patentee [must] establish[] that the claimed range is critical to the operability of the claimed invention” to avoid anticipation. *Id.*, 871; *Genentech, Inc. v. Hospira, Inc.*, 946 F.3d 1333, 1337-38 (Fed. Cir. 2020)

A claim is obvious when “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the filing date of the claimed invention to a person having ordinary skill in

the art to which the claimed invention pertains.” 35 U.S.C. § 103; *see KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007).

“[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *EI DuPont de Nemours & Co. v. Synvina CV*, 904 F.3d 996, 1006 (Fed. Cir. 2018). Thus, “[n]ormally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification.” *Id.* “A more specific application of this general principle is that ‘[a] prima facie case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art.’” *Id.* “[S]uch overlap creates a presumption of obviousness.” *Id.* Patentees can rebut that presumption by showing the claimed range “produce[s] a new and unexpected result which is ***different in kind and not merely in degree*** from the results of the prior art.” *Id.* (emphasis added). “A claimed range that demonstrates such unexpected results is referred to as a ‘critical’ range, and the patentee has the burden of proving criticality.” *Id.*; *see also Almirall, LLC v. Amneal Pharms. LLC*, 28 F.4th 265, 268-73 (Fed. Cir. 2022) (affirming the Board’s determination of obviousness where one reference disclosed a concentration of a thickening agent that overlapped with the claimed concentration and another reference disclosed a concentration of a solvent that overlapped with the claimed concentration).

In addition, “[w]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.” *Id.*, 274-75 (citation omitted) (affirming Board’s reliance on known “interchangeability” of gelling agents in finding substitution obvious).

Finally, a “reference need not state a feature’s absence in order to disclose a negative limitation.” *Id.*, 273.

B. Level of Ordinary Skill in the Art

A person of ordinary skill in the art would have (1) at least a B.S. or equivalent degree; and (2) at least two years of experience in cosmetics formulations. Ex. 1002, ¶¶27-28.

C. Grounds of Unpatentability

i. Ground 1 – Claims 14-17 are Anticipated by and/or Obvious over Lesniak

Claims 14-17 are anticipated by or rendered obvious over Lesniak. Lesniak is directed to “personal care compositions which are formed from natural ingredients,” including, *inter alia*, a deodorant stick in the form of an antiperspirant stick.⁷ Ex. 1003, 1:16-35, 4:22, 4:61-67, 5:5-32, 10:27, 10:31-33. Lesniak seeks to

⁷ See Ex. 1036, 2 (“[A]ll antiperspirants are deodorants....”); Ex. 1037, 246 (“Antiperspirants are deodorants....”). Lesniak also describes how to make the compositions in stick form. Ex. 1003, 15:9-45.

make these natural compositions more palatable to consumers and more “robust[] against antimicrobial attack.” *Id.*, 1:16-35.

Lesniak explains that such compositions may comprise, e.g.:

- at least about 25 wt% of a liquid triglyceride, such as caprylic/capric triglyceride (*id.*, 2:38-39, 9:45-46);
- about 8 to 19 wt% of a primary structurant, such as beeswax (*id.*, 1:39-54, 2:5-7, 2:24-25); and
- at least one antimicrobial, such as zinc oxide (*id.*, 3:39-4:21, 8:31-9:59).

Lesniak’s compositions do not contain aluminum salts or synthetic fragrances. *Id.*, 3:50-4:21, 8:37-42.

Lesniak is in the same field as the ’647 Patent, and both relate to personal care compositions, including deodorant and/or antiperspirant sticks.⁸ *Id.*, Abstract, 3:39, 4:22, 8:43-46, 9:45, 10:27; Ex. 1001, Abstract, 18:65-26:36.

As discussed above, Lesniak has been applied in the prosecution of a later application in the patent family of the ’647 Patent to teach features relied upon below. Lesniak specifically applies as shown in the chart below. Ex. 1002, ¶¶56-60.

⁸ Lesniak’s discussion of other personal care compositions, such as sunscreens, does not make it any less applicable to the formulation of deodorant and/or antiperspirant sticks. A POSA would have understood that topical formulations could have multiple applications, including as sunscreens, antiperspirants, and/or deodorants. Indeed, Patent Owner has other patents directed to “wax based cosmetic stick compositions” with applications in “sun care, moisturizing or analgesic sticks and antiperspirants/ deodorant sticks.” Ex. 1043, Abstract, 1:5-9.

'647 Patent Claims	Anticipation / Obviousness Based on Lesniak
14. A deodorant stick comprising:	To the extent the preamble is limiting, Lesniak discloses a deodorant stick in the form of an antiperspirant stick. Ex. 1003, 4:22, 9:45, 10:27 (“Optionally, the composition is a stick The composition can also be an antiperspirant.”). ⁹ Ex. 1002, ¶61.
a. at least 50% by weight liquid triglyceride;	Lesniak describes formulating a deodorant stick with at least about 50% of a liquid triglyceride (in particular, up to 60% liquid triglyceride), such as as caprylic/capric triglyceride, which the '647 Patent identifies as an exemplary liquid triglyceride, as a POSA would have known (Ex. 1001, 15:1-5). Ex. 1003, 9:45-59 (“In certain embodiments, the stick comprises 46 to 56% by weight of the ester . . . In certain embodiments for the stick, the ester comprises caprylic/capric triglyceride.”); 1:39-63, 2:31-41, 3:43-4:21 (disclosing examples of points within the claimed range, e.g., 60% caprylic/capric triglyceride), 6:30-43, 8:57-9:44. At a minimum, the overlap between the claimed liquid triglyceride range and the ranges in Lesniak renders the

⁹ Patent Owner may argue, due to FDA regulations for antiperspirant active ingredients, Lesniak’s compositions must include an aluminum salt to be considered antiperspirants. But the standards for anticipation and obviousness are distinct from FDA regulatory requirements. *See Persion Pharms. LLC v. Alvogen Malta Operations Ltd.*, 945 F.3d 1184, 1193 (Fed. Cir. 2019) (affirming “conclusion that the FDA’s approval requirements do not undermine the force of the evidence as to obviousness”). Moreover, the '647 Patent expressly identifies “antiperspirant actives” that do not include aluminum, such as zinc salts and “any of the antimicrobial[s] discussed above”—a list of more than twenty-five non-aluminum compounds. Ex. 1001, 10:34-46, 17:1-8. Thus, even assuming a POSA were interpreting Lesniak in connection with FDA Regulations (which, again, is unnecessary), a POSA would nevertheless understand Lesniak’s antiperspirants to be antiperspirants based on the use of zinc salt (notwithstanding the absence of aluminum). In any event, a POSA would understand those compositions to be deodorants that do not include aluminum, regardless of whether they would be considered an antiperspirant.

	claim presumptively anticipated and/or obvious. The '647 Patent discloses nothing critical or unexpected regarding the claimed range relative to the prior art ranges, as would be required to overcome this presumption. Ex. 1002, ¶¶62-63. ¹⁰
b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25° C.;	Lesniak describes formulating a deodorant stick with zinc oxide, which, as a POSA would have known, is an antimicrobial having a water solubility of at most about 90 g/L at 25° C. Ex. 1003, 3:39-4:21, 8:31-9:59. ¹¹ Ex. 1002, ¶64 (citing Ex. 1069, 19; Ex. 1070, 323-24). A POSA would have been motivated to include an antimicrobial such as zinc oxide in Lesniak's compositions to combat the bacteria that cause odor and/or product degradation. Ex. 1003, 1:16-35; Ex. 1002, ¶64. Indeed, a POSA would have understood that an antimicrobial like zinc oxide would further Lesniak's goal of addressing natural personal care compositions' "lack [of] robustness against microbial attack." <i>Id.</i>
c. a fragrance composition comprising at least about 50% of	Lesniak describes formulating a deodorant stick with a fragrance composition in the form of "essential oils," which are natural oils. <i>See</i> Ex. 1003, 8:31-41. The fragrance compositions in Lesniak are essential oils and

¹⁰ While prior art that discloses a range that overlaps with a claimed range raises presumptions of both anticipation and obviousness, which can be overcome only with evidence of "criticality" of the claimed range, the threshold for criticality may differ under § 102 and § 103. *UCB, Inc. v. Actavis Labs. UT, Inc.*, 65 F.4th 679, 688 (Fed. Cir. 2023); *Ineos*, 783 F.3d, 871. At the very least, the overlapping ranges discussed herein render the claims obvious because the claimed ranges produce no "unexpected result which is different in kind and not merely in degree from the results of the prior art." *DuPont*, 904 F.3d, 1006; Ex. 1002, ¶¶26, 63, 67, 92, 132, 158, 166.

¹¹ *See* Ex. 1029, 264 ("Zinc oxide (ZnO) is an efficient antimicrobial agent that acts by means of several mechanisms involving different chemical species."); Ex. 1038, 47335 ("The reported water solubility of zinc oxide ranges from 1.6 milligrams per liter (mg/L) (29 deg.C) to 5 mg/L (25 deg.C)."); Ex. 1069, 19; Ex. 1070, 323-24; Ex. 1072, 2:1-3:5, 3:50-57. Zinc oxide is the "primary" antimicrobial because it is the antimicrobial in the greatest amount. Ex. 1001, 10:55-57.

natural oils, essential oils, or a combination thereof; and	thus comprise at least about 50% (in particular, 100%) natural oils and essential oils. A POSA would have been motivated to include an essential oil in Lesniak's compositions to provide a pleasant fragrance and to combat bacteria that cause odor and/or product degradation. ¹² See Section IV.B.iii; Ex. 1003, 1:16-35; Ex. 1002, ¶65.
d. a primary structurant with a melting point of at least 50° C.	Lesniak describes formulating a deodorant stick with a primary structurant ("first wax"), such as beeswax, having a melting point of at least about 50° Celsius.¹³ Ex. 1003, 1:39-2:30, 3:43-4:21, 5:32-6:23, 8:57-9:59. A POSA would have understood beeswax to be a suitable structurant for deodorant sticks and would have been motivated to use beeswax as a primary structurant based on the use of beeswax as the primary structurant throughout Lesniak. <i>Id.</i> At a minimum, the overlap between the claimed melting point range and the ranges in Lesniak renders the claim presumptively anticipated and/or obvious. Ex. 1003, 2:20-21 ("In certain embodiments, the first wax has a melting point of 38° C. to 65° C., optionally 45° C. to 65° C. or 60° C. to 65° C."). The '647 Patent discloses nothing critical or unexpected regarding the claimed range relative to the prior art ranges, as would be required to overcome this presumption. Ex. 1002, ¶¶66-67.
15. The deodorant stick of claim 14, comprising at least about 60% by weight liquid triglyceride.	See claim 14 analysis above, which applies equally to claim 15 at least because Lesniak's range of liquid triglyceride extends to 60%. Ex. 1002, ¶68.

¹² See Ex. 1067, 7.

¹³ Beeswax is the "primary" structurant because it is the structurant in the greatest amount. Ex. 1001, 15:51-54; *see also* Ex. 1039, 11 (reporting melting point of 62 - 65° C. for beeswax).

16. A deodorant stick comprising:	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶¶69.
a. at least 60% by weight liquid triglyceride;	<i>See</i> claim 15 analysis, above. Ex. 1002, ¶¶70.
b. at least one antimicrobial;	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶¶71.
c. a fragrance composition comprising at least about 50% by weight of natural oils, essential oils, or a combination thereof; and	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶¶72.
said deodorant stick being free of an aluminum salt.	Lesniak describes formulating a deodorant stick that is free of an aluminum salt. Ex. 1003, 1:39-2:30, 3:43-4:21, 5:32-6:23, 8:31-9:59. To the extent that Patent Owner argues that Lesniak does not explicitly articulate the negative limitation, a POSA would have understood Lesniak’s formulations to be complete deodorant sticks that did not require additional ingredients such as an aluminum salt. <i>Id.</i> Indeed, Lesniak’s formulations include zinc oxide, which was a known alternative to aluminum. <i>Id.</i>¹⁴ Moreover, a POSA would have understood Lesniak’s preference for “natural” ingredients to militate against inclusion of ingredients such as aluminum that were thought to be unsafe. <i>Id.</i>, 1:16-31, 4:61-67, 5:5-32, 10:31-33; Ex. 1002, ¶¶73-74.
17. The deodorant stick of claim 16,	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶¶75.

¹⁴ *See* Ex. 1014, ¶¶[0018] (“[A]ntiperspirant actives include astringent metallic salts, particularly inorganic and organic salts of aluminum, zirconium, and zinc, as well as mixtures thereof.”).

further comprising a primary structurant having a melting point from about 50° C. to about 80° C.	
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ii. Ground 2 – Claims 1, 4-7, 9-12, and 18-19 are Obvious Over Lesniak in view of Bianchi ’518

Overview of the Combination

The combination of Lesniak in view of Bianchi ’518 renders claims 1, 4-7, 9-12, and 18-19 obvious. As explained above, Lesniak discloses and/or suggests all of the limitations of independent claim 14. *Supra* § VII.C.i. Lesniak does not expressly teach hardness as measured by penetration with an ASTM-D 1321 needle. However, Bianchi ’518 teaches that the claimed hardness range of about 7.0 mm to about 14.0 mm (equivalent to about 70 mm*10 to about 140 mm*10)¹⁵, as measured by penetration with an ASTM-D 1321 needle, was “typical[,]” and products outside of the range were known to generate low consumer acceptance ratings. Ex. 1006, 2:56-58, 6:23-29. Accordingly, it would be obvious to formulate Lesniak’s deodorant stick to be within the claimed hardness range inasmuch as Bianchi ’518

¹⁵ See n.3, above.

teaches that the range was long known to be needed for consumer acceptance of deodorant sticks.¹⁶ Ex. 1002, ¶76.

Petitioner is not aware of any secondary considerations that would rebut obviousness.

Motivation Supporting the Combination

By the time of the filing of the '647 Patent, a POSA would have known that hardness was an “important physical parameter affecting consumer acceptance,” and would have looked to achieve hardness levels that were taught in the field to achieve consumer acceptance. Ex. 1006, 6:23-25. Bianchi '518 informs the knowledge in the field on this point.

Bianchi '518 is a patent in the field that generally discloses low residue “antiperspirant sticks, substantially free of water and long chain fatty alcohols” and methods related thereto. Ex. 1006, 1:8-14, 1:53-2:2. Bianchi '518 explains that a hardness from about 7.0 mm to about 14.0 mm (equivalent to about 70 mm*10 to about 140 mm*10)¹⁷ was “typical” for stick compositions, and that products falling outside that hardness range typically generated low consumer acceptance ratings. *Id.*, 2:57-58; 6:28-29. Moreover, Lesniak is directed to formulating deodorant sticks

¹⁶ In addition, in a patent filed in 1995, Patent Owner described deodorant hardness ranges “of preferably from about 65-200, more preferably from about 70 to about 160, most preferably from about 75 to about 120,” as measured by a “penetration needle as specified in ASTM Method D 1321-DIN 51 579.” Ex. 1025, 12:41-55.

¹⁷ See n.3, above.

that have the “skin feel” desired by consumers. Ex. 1003, 1:16-35. Thus, a POSA would have looked at publications, like Bianchi ’518, to find consumer acceptable hardness ranges in formulating a stick composition acceptable to consumers. Ex. 1002, ¶¶77-79.

Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success to formulate a deodorant stick such as the stick disclosed by Lesniak to have a hardness within the claimed range because others, such as the inventors in Bianchi ’518, had successfully formulated antiperspirants to have a hardness within that range. Ex. 1006, 2:56-58, 6:23-29. A POSA would have readily understood how to adjust the hardness of the stick, using Lesniak’s ingredients, inasmuch as a POSA would have known that adjusting the amount of structurant (using less if the deodorant was too hard, and vice-versa) could achieve the target hardness.¹⁸ For instance, Lesniak describes formulating a deodorant stick with 8% to 19% of a primary structurant, such as beeswax, and also optionally including 3% to 15% of a secondary structurant, such as sunflower seed wax and/or hydrogenated castor oil. Ex. 1003, 9:45-54, 1:39-2:30,

¹⁸ See Ex. 1014, ¶¶[0028]-[0029] (defining structurant in the same manner as the ’647 Patent and stating that the “structurant material contributes to the stick form with the desired . . . hardness”); see also *id.*, ¶[0003] (“Using a large amount of waxy structurant may not be necessarily effective since it may result in an overly hard structure.”).

3:43-4:21, 5:32-48. A POSA would have understood that the hardness could be adjusted by altering the amount of the primary structurant and/or by incorporating secondary structurants. Ex. 1002, ¶80.

Analogous Art

Lesniak and Bianchi '518 are in the same field as the '647 Patent, and all relate to personal care compositions, including deodorant and antiperspirant sticks.¹⁹ *See* Ex. 1001, Abstract, 18:65-26:36; Ex. 1003, Abstract, 3:39, 4:22, 8:43-46, 9:45, 10:27; Ex. 1006, Abstract, 1:8-35. They all discuss hardness as a relevant and measurable parameter for stick compositions. *See* Ex. 1001, Abstract, 15:6-44; Ex 1003, 9:60-62, 10:17-26, 15:41-42; Ex 1006, 2:56-58, 6:23-29. Ex. 1002, ¶81.

'647 Patent Claims	Obviousness Based on Lesniak in view of Bianchi '518
1. A deodorant stick comprising:	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶82.
a. at least 25% by weight liquid triglyceride;	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶83.
b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25° C.;	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶84.
c. a fragrance composition comprising at least	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶85.

¹⁹ *See* n.7,8, above.

about 50% by weight of natural oils, essential oils, or a combination thereof; and	
d. a primary structurant with a melting point of at least 50° C.;	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶86.
said deodorant stick being free of an aluminum salt; and	<i>See</i> claim 16 analysis, above. Ex. 1002, ¶87.
said deodorant stick having a hardness from about 70 mm*10 to about 140 mm*10, as measured by penetration with ASTM D-1321 needle.	The hardness range of about 7.0 mm to about 14.0 mm (equivalent to about 70 mm*10 to about 140 mm*10)²⁰, as measured by penetration with an ASTM-D 1321 needle, was “typical[,]” and products outside of this range were known to generate low consumer acceptance ratings. Ex. 1006, 2:56-58, 6:23-29. A POSA therefore would have been motivated to formulate Lesniak’s deodorant stick to have a hardness within the claimed range, and would have had a reasonable expectation of success in doing so for reasons discussed above. Also, a POSA would have understood that the adjustment of the hardness of the stick was an issue of routine optimization, making the claimed range obvious even without Bianchi ’518. Indeed, an examiner found just that in applying Lesniak in a related application discussed above in the prosecution history section. Ex. 1002, ¶88.
4. The deodorant stick of claim 1, wherein the primary antimicrobial is a powder.	<i>See</i> claim 14 analysis, above. Lesniak describes formulating a deodorant stick with a primary antimicrobial in the form zinc oxide “as a powder.” Ex. 1003, 8:46-48; Ex. 1002, ¶89.

²⁰ *See* n.3, above.

5. The deodorant stick of claim 1, wherein the deodorant stick is substantially free of baking soda.	Lesniak describes formulating a deodorant stick with zinc oxide, an antimicrobial, and without baking soda (another antimicrobial). <i>See</i> claim 1 analysis, above; <i>see, e.g.</i>, Ex. 1003, 1:39-2:30, 3:43-4:21, 5:32-6:23, 8:31-9:59. A POSA would have understood Lesniak’s formulations to be complete deodorant sticks that did not require additional ingredients such as baking soda. <i>See id.</i>; Ex. 1002, ¶90.
6. The deodorant stick of claim 1, wherein the deodorant stick is substantially free of a synthetic fragrance.	Lesniak describes formulating a deodorant stick without synthetic fragrance and, in particular, describes the use of natural fragrances. <i>See</i> Ex. 1003, 8:31-41 (“Examples of essential oils which may be used as natural fragrances include ...”). A POSA would have understood Lesniak’s formulations to be complete deodorant sticks that did not require additional ingredients such as synthetic fragrance. <i>See, id.</i>, 1:39-2:30, 3:43-4:21, 5:32-6:23, 8:31-9:59. Moreover, a POSA would have understood Lesniak’s preference for “natural” ingredients to militate against inclusion of synthetic fragrance. <i>Id.</i>, 1:16-31, 4:61-67, 5:5-32, 10:31-33. Ex. 1002, ¶91.
7. The deodorant stick of claim 1, wherein the deodorant stick has a hardness from about 90 mm*10 to about 110 mm*10, as measured by penetration with ASTM D-1321 needle.	<i>See</i> claim 1 analysis, above. At a minimum, the overlap between the claimed hardness range and the range in the prior art renders the claim presumptively obvious. The ’647 Patent discloses nothing critical or unexpected regarding the claimed range. Ex. 1002, ¶92.
9. The deodorant stick of claim 1, wherein the primary structurant has a melting point from 50° C. to 80° C.	<i>See</i> claim 14 analysis, above. Ex. 1002, ¶93.

10. The deodorant stick of claim 1, comprising at least about 40% by weight liquid triglyceride.	<i>See claim 15 analysis, above. Ex. 1002, ¶94.</i>
11. The deodorant stick of claim 1, comprising at least about 50% by weight liquid triglyceride.	<i>See claim 15 analysis, above. Ex. 1002, ¶95.</i>
12. The deodorant stick of claim 1, wherein the primary antimicrobial has a water solubility of at most about 50 g/L at 25° C.	<i>See claim 14 analysis, above. Ex. 1002, ¶96.</i>
18. A deodorant stick comprising:	<i>See claim 14 analysis, above. Ex. 1002, ¶97.</i>
a. at least 50% by weight of a liquid triglyceride;	<i>See claim 15 analysis, above. Ex. 1002, ¶98.</i>
b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25° C.; and	<i>See claim 14 analysis, above. Ex. 1002, ¶99.</i>
said deodorant stick having a hardness from about 70 mm*10 to about 140 mm*10, as	<i>See claim 1 analysis, above. Ex. 1002, ¶100.</i>

measured by penetration with ASTM D-1321 needle.	
19. The deodorant stick of claim 18, comprising at least about 60% by weight of a liquid triglyceride.	<i>See</i> claim 15 analysis, above. Ex. 1002, ¶101.

iii. Ground 3 - Claim 2 is Obvious Over Lesniak in view of Bianchi '518 and Phinney

Overview of the Combination

The combination of Lesniak in view of Bianchi '518 and Phinney renders claim 2 obvious. As explained above, Lesniak and Bianchi '518 disclose and/or suggest all of the limitations of independent claim 1. *Supra* § VII.C.ii. While Lesniak teaches deodorant stick compositions that may contain zinc oxide (a known antimicrobial), it does not expressly teach the use of magnesium hydroxide. However, in view of Phinney, a POSA would have found it obvious to add magnesium hydroxide to the composition of Lesniak. Phinney states that metal oxides, such as zinc oxide, are not particularly efficacious antimicrobials in deodorants when used alone. Ex. 1004, 2:33-37. Consequently, Phinney describes using magnesium hydroxide as an antimicrobial in a deodorant stick, in addition to zinc oxide. *Id.*, 5:52-60, 6:9-12, 6:31-34, 8:40-44. Phinney acknowledges that prior

publications described magnesium hydroxide as an “effective deodorant” and touts its enhanced effectiveness in preventing odor when used in combination with zinc oxide. Ex. 1004, 1:12-22, 2:33-37, 5:64-66; Ex. 1002, ¶102.

Petitioner is not aware of any secondary considerations that would rebut obviousness.

Motivation Supporting the Combination

It would have been obvious to combine Lesniak’s and Bianchi ’518’s teachings for the reasons discussed above. *Supra* § VII.C.ii. It also would have been obvious to combine Lesniak’s and Phinney’s teachings. Both Lesniak and Phinney are directed to deodorants with “natural ingredients.” Ex. 1004, 1:5-9; Ex. 1003, 4:61-5:31, 9:45, 10:27, 10:31-33. Both describe using known antimicrobials. Ex. 1004, 1:15-19, 5:52-67, 6:31-34, 8:40-44; Ex. 1003, 3:39-4:21, 8:31-9:59. Because Lesniak teaches using zinc oxide (a known antimicrobial) and Phinney teaches that using magnesium hydroxide in combination with zinc oxide improves antimicrobial properties, a POSA would have had a reason to follow Phinney’s teaching and add magnesium hydroxide to Lesniak’s composition. A POSA would have been motivated to incorporate known improvements to odor protection, particularly where the known improvement also was known to maintain the “natural” composition intended by Lesniak. Ex. 1002, ¶¶103-104.

Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in using magnesium hydroxide as an antimicrobial in Lesniak's composition because Phinney described it as an "effective antimicrobial" and showed it had been successfully formulated into deodorant compositions containing zinc oxide where it provided long lasting odor protection. Moreover, a POSA would have appreciated that deodorant compositions could be formed through various combinations of known ingredients, such as antimicrobials, as simple design choices. Ex. 1002, ¶105.

Analogous Art

Lesniak, Bianchi '518 and Phinney are in the same field as the '647 Patent, and all relate to personal care compositions, including deodorant and/or antiperspirant sticks.²¹ See Ex. 1001, Abstract, Title, 18:65-26:36; Ex. 1003, Abstract, Title, 3:39, 4:22, 8:43-46, 9:45, 10:27; Ex. 1004, Abstract, Title, 5:52-60, 6:9-12, 6:31-34, 8:40-44. Further, Phinney's magnesium hydroxide was known to be an ingredient suitable for "natural" products, like those described in Lesniak. Ex. 1003, 1:16-35, 4:61-67, 5:5-31, 10:31-33; Ex. 1004, Abstract, 1:5-9, 6:1-23; Ex. 1002, ¶106.

- a) **[2] The deodorant stick of claim 1, wherein the primary antimicrobial is selected from the group consisting of ... magnesium hydroxide**

²¹ See n.7,8, above.

Lesniak teaches deodorant stick compositions containing zinc oxide (a known antimicrobial), but it does not expressly teach including magnesium hydroxide as an antimicrobial. Phinney discloses a deodorant stick that comprises magnesium hydroxide as an antimicrobial, in addition to zinc oxide (which is converted to zinc hydroxide in Phinney's formulations). Ex. 1004, 5:52-60, 6:9-12, 6:31-34, 8:40-44.

A POSA would have been motivated to add magnesium hydroxide to Lesniak's stick compositions because it was known that "a mixture of the hydroxides of zinc and magnesium could provide long lasting protection against odour due to perspiration," whereas zinc oxide alone was less effective "due to insolubility and low hydrolysis rate to a hydroxide form that could show some activity." *Id.*, 1:12-22, 2:33-37, 5:64-66 (discussing the "previously recognized synergy between the zinc and magnesium compounds"), 5:48-49 (explaining that magnesium hydroxide "has low solubility and therefore does not 'wash away' under heavy perspiration"). Ex. 1002, ¶108 (citing Ex. 1072, 2:1-3:5, 3:50-57). Phinney teaches that the "magnesium oxide and zinc oxide ratio has been found to be effective at 3:1 molar." *Id.*, 8:43-44, 9:9-10. A POSA therefore would have used magnesium hydroxide as the primary antimicrobial (present in a greater amount than zinc oxide) when formulating a deodorant stick based on the teachings of Lesniak, Bianchi '518, and Phinney.

Alternatively, a POSA would have been motivated to replace the zinc oxide in Lesniak's deodorant stick with magnesium hydroxide, as both were known to have been used as antimicrobials in natural deodorant sticks, but zinc oxide was thought to have lower efficacy in combatting odor. *See id.*; Ex. 1002, ¶¶107-109.

iv. Ground 4 – Claims 3 and 13 are Obvious Over Lesniak in View of Bianchi '518, Phinney and Nabavi

Overview of the Combination

The combination of Lesniak in view of Bianchi '518, Phinney and Nabavi renders claims 3 and 13 obvious. As explained above, Lesniak and Bianchi '518 disclose and/or suggest all of the limitations of independent claim 1. *Supra* § VII.C.ii. While Lesniak teaches deodorant stick compositions that may contain zinc oxide (a known antimicrobial), it does not expressly teach deodorant stick compositions containing at least one additional antimicrobial. As discussed above, it was known that zinc oxide was not a strong antimicrobial in deodorant formulations when used alone, whereas in combination with magnesium hydroxide it was thought to provide “long lasting protection against odour.” *Supra* § VII.C.iii. Accordingly, it would be obvious to use magnesium hydroxide as an additional antimicrobial in Lesniak's deodorants. Alternatively, it would have been obvious to include another antimicrobial such as the cinnamon essential oil taught by Nabavi for both its aromatic and antibacterial effects. Ex. 1002, ¶110.

Petitioner is not aware of any secondary considerations that would rebut obviousness.

Motivation Supporting the Combination

It would have been obvious to combine Lesniak's, Bianchi '518, and Phinney's teachings for the reasons discussed above. *Supra* § VII.C.iii. It also would have been obvious to use Nabavi's teaching of cinnamon essential oil as an antimicrobial in Lesniak's deodorant stick compositions. While Lesniak discloses natural deodorant compositions comprising zinc oxide (a known antimicrobial) and essential oils, it does not expressly disclose cinnamon oil as an antimicrobial. By the time of the filing of the '647 Patent, a POSA would have known that zinc oxide was not a strong antimicrobial when used alone in deodorant formulations. Also, a POSA would have understood that deodorant compositions often use multiple antimicrobials. A POSA would have found it obvious to use additional or alternative antimicrobials in Lesniak's deodorant compositions to enhance odor protection.

Nabavi is an article that was published in *Nutrition*. The article describes studies demonstrating that cinnamon essential oil "possesses very good antibacterial activity against several contaminants" in cosmetic compositions. Ex. 1067, 7739. Nabavi further provides that "[c]innamon essential oil could be also used in aromatherapy." *Id.*, 7733. And Nabavi concludes that cinnamon use in "cosmetics could be a good strategy to reduce or avoid bacterial degradation." *Id.*, 7742.

A POSA would have looked at scientific publications, like Nabavi, in evaluating options for antimicrobials in deodorants. Ex. 1002, ¶¶91-93. And a POSA would have been motivated to incorporate Nabavi's cinnamon essential oil into Lesniak's deodorant stick to enhance its aromatic and antibacterial effects in combatting odor and preventing product degradation, and because cinnamon essential oil would serve multiple purposes. Not only was it a known antimicrobial, but it was also a known fragrance. Moreover, Lesniak calls for essential oils to be used in its composition. Ex. 1003, 8:31-34; Ex. 1002, ¶¶111-114.

Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in using cinnamon essential oil as an antimicrobial in Lesniak's composition because Nabavi described that cinnamon essential oil had been successfully formulated into cosmetic products. Ex. 1067, 7739, 7742. In addition, Lesniak describes the use of essential oils in its compositions, so a POSA would have expected that cinnamon essential oil could be used successfully in those compositions. Ex. 1003, 8:31-41. Moreover, a POSA would have appreciated that deodorant compositions could be formed through various combinations of known ingredients, such as antimicrobials, as simple design choices. Ex. 1002, ¶115.

Analogous Art

Lesniak, Bianchi '518, Phinney, and Nabavi are in the same field as the '647 Patent, and all relate to personal care compositions that contain known antimicrobials.²² See Ex. 1001, 1:20-2:7, 10:33-46; Ex. 1003, 1:16-35, 4:61-67, 5:5-31, 10:31-33; Ex. 1004, Abstract, 1:5-9, 6:1-23; Ex. 1002, ¶86; Ex 1006, 2:56-58; Ex. 1067, 7729, 7739, 7742. Further, Nabavi's cinnamon essential oil was known to be an ingredient suitable for "natural" products, like those described in Lesniak. Ex. 1003, 1:16-35, 4:61-67, 5:5-31, 10:31-33; Ex. 1067, 7729; Ex. 1002, ¶116.

- a) **[3] The deodorant stick of claim 1, further comprising at least one additional antimicrobial different from the primary antimicrobial, selected from the group consisting of ... magnesium hydroxide, ... cinnamon essential oil, ... and combinations thereof.**

Lesniak teaches deodorant stick compositions containing zinc oxide (a known antimicrobial) and essential oils, but it does not expressly teach deodorant stick compositions containing magnesium hydroxide or cinnamon oil as an antimicrobial. A POSA would have been motivated to add magnesium hydroxide to the deodorant sticks disclosed by Lesniak for the reasons discussed above (Section VII.C.iii), and it would have been a simple design choice to use zinc oxide as the primary antimicrobial, present in a greater amount by weight than magnesium hydroxide. Alternatively, if, as discussed above, a POSA used magnesium hydroxide as the primary antimicrobial in Lesniak's deodorant stick, it would have been obvious to

²² See n.7,8, above.

include an additional antimicrobial such as cinnamon essential oil taught by Nabavi, to combat bacteria thought to cause odor and product degradation, as well as to provide a pleasant fragrance. Ex. 1067, 7733, 7739, 7742. A POSA would have used cinnamon essential oil in a lower amount than the primary antimicrobial because it was thought to cause skin irritation. *Id.*, 7742; Ex. 1002, ¶117.

b) [13] The deodorant stick of claim 3, wherein all antimicrobials have a water solubility of at most about 90 g/L at 25° C.

See claim 3 analysis, above. Zinc oxide, magnesium hydroxide, and cinnamon essential oil have a water solubility of at most about 90 g/L at 25° C, as a POSA would have known.²³ Ex. 1002, ¶118.

v. Ground 5 – Claims 16-17 are Obvious Over Native in view of Bianchi '254

Overview of the Combination

The combination of Native in view of Bianchi '254 renders claims 16-17 of the '647 Patent obvious. Native is a printed publication from a website for the Native deodorant product, which publication sets forth the ingredients for a natural, aluminum-free deodorant stick, which was being marketed and sold in 2016. Ex. 1007, 5, 11. A POSA looking to formulate new deodorant compositions would have

²³ *See* Ex. 1042, 14, 39 (indicating the aqueous solubility of magnesium hydroxide is 0.00125 g/100 mL, which is equivalent to 0.0125 g/L); Ex. 1052, 126 (indicating that the water solubilities of the major constituents of cinnamon oil are below 2.5 g/L at 25° C).

looked to existing formulations and would have understood that commercial deodorant brands typically provided ingredient lists of their products on their websites. Native, in particular, was a website that would have been well known to a POSA, inasmuch as Native was a well-known deodorant. Attesting to the fact that Native was a known leader in the field, Patent Owner acquired Native in 2017. Ex. 1010, 3 (“Native reached internet fame”).

Native discloses features of deodorant stick compositions claimed in the ’647 Patent; however, it does not expressly teach the percentage of each ingredient used, including the percentage of liquid triglyceride (carrier oil). Accordingly, it would be obvious to formulate a deodorant stick such as the stick disclosed by Native using ingredient concentrations as taught by Bianchi ’254. Ex. 1002, ¶¶119-120.

Petitioner is not aware of any secondary considerations that would rebut obviousness.

Motivation Supporting the Combination

In making a natural, aluminum-free deodorant stick composition, a POSA would have looked to existing compositions, such as Native. Native sets forth the ingredients in a natural, aluminum-free deodorant stick that was being marketed and sold in at least 2016. Ex. 1007, 5, 11. The deodorant stick composition is comprised of caprylic/capric triglyceride, baking soda, stearyl alcohol, hydrogenated castor oil, polyglycerol-3 beeswax, and jojoba esters. *Id.* Aluminum salts, and synthetic

fragrances are not included in the composition. *Id.* As a POSA would have understood, Native lists its deodorant stick ingredients in order from greatest to least concentration (Ex. 1002, ¶¶121 (citing Ex. 1046, 164)); however, it does not expressly teach the percentage of each ingredient used, including the percentage of liquid triglyceride (i.e., carrier oil). In the absence of express teachings on these points, a POSA would have looked to other publications in the field with suitable weight percentage examples.

Bianchi '254 is a publication in the field which describes “fatty-alcohol containing antiperspirant stick compositions” and methods related thereto. Ex. 1008, Abstract, ¶¶[0010]-[0012], [0021]. Native’s primary structurant—stearyl alcohol—is a fatty alcohol. Thus, Bianchi '254 would have been of particular use for a POSA looking for percentages to use for Native’s formulation.

Bianchi '254 describes antiperspirant stick compositions including the percentages of liquid triglyceride (carrier oil). *Id.*, ¶¶[0015]-[0019], [0131], [0060]-[0061], Table 5. When formulating a natural, aluminum-free deodorant stick based on the composition in Native, a POSA would have looked at publications describing other stick compositions, like Bianchi '254, for information regarding amount of ingredients. Ex. 1002, ¶¶121-124.

Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in formulating a deodorant stick such as the stick disclosed by Native with percentages of liquid triglyceride within the claimed ranges, because others, such as the inventors of Bianchi '254, had successfully formulated antiperspirant sticks within those claimed ranges. Ex. 1008, ¶¶[0001], [0015]-[0019], [0023], [0026], [0050], [0058], [0060]-[0061], [0117], [0131], Table 5. Moreover, Native identifies the specific ingredient to use, but lacks the weight percents, where Bianchi '254 teaches the conventional weight percentages to be used for the various components such that the combination would aid the POSA in making a deodorant similar to Native's. A POSA would have further appreciated that deodorant compositions could be formed through various combinations of known ingredients, such as structurants and carrier oils, as simple design choices. Ex. 1002, ¶125.

Analogous Art

Native and Bianchi '254 are in the same field as the '647 Patent, and all relate to personal care compositions, including deodorants and/or antiperspirants.²⁴ See Ex. 1001, Abstract, 18:65-26:36; Ex. 1007, 5-8, 11; Ex. 1008, Abstract, ¶¶[0010]-[0021]; Ex. 1002, ¶126.

'647 Patent Claims	Obviousness Based on Native in view of Bianchi '254
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²⁴ See n.7, above.

16. A deodorant stick comprising:	To the extent the preamble is limiting, Native teaches a deodorant stick.  Ex. 1007, 11; Ex. 1002, ¶127.
a. at least 60% by weight liquid triglyceride;	Native describes a deodorant stick that comprised, as its first ingredient, caprylic/capric triglyceride, which the '647 Patent describes as an exemplary liquid triglyceride. Ex. 1001, 15:1-5 (“[T]he triglycerides of the present invention are liquid An example may be caprylic/capric triglyceride.”). Ingredients Caprylic/capric triglyceride (which is a fancy way of saying fractionated coconut oil), arrowroot powder, stearyl alcohol, baking soda, shea butter, coconut oil, hydrogenated castor oil, polyglycerol-3 beeswax (which is a fancy way of saying cera bellina wax), jojoba esters, tocopherol (which is a fancy way of saying Vitamin E), L. acidophilus (which is a natural bacteria found in your body already), dextrose, glyceryl caprylate, glyceryl undecylenate. Our scented deodorants include oils. Lavender & Rose is made with Lavender Oil and Geranium Oil. Eucalyptus & Mint is made with Eucalyptus Oil and Spearmint Oil. Due to FDA recommendations, we use the term “fragrance” to refer to these oils. Ex. 1007, 11. A POSA would have known that Native listed each ingredient in descending order of amount. Ex. 1002, ¶¶121,129 (citing Ex. 1046 (“in descending order of predominance by weight”)). Thus, a POSA would have understood the Native deodorant stick to comprise a substantial amount of liquid triglyceride, since caprylic/capric triglyceride is the most predominant ingredient.

	Bianchi '254 describes an antiperspirant stick with 40-80% oil. In Bianchi '254, part of the oil carrier (20-40% of the total) is a natural oil such as a liquid triglyceride. Ex. 1008, ¶¶[0017], [0050]. Bianchi '254 also describes that the antiperspirant stick further comprised 20-40% of silicone oil. <i>Id.</i>, ¶[0016]. A POSA would have understood that silicone oil and liquid triglyceride both functioned as “carrier oils” that, among other things, solubilize and disperse other ingredients (<i>id.</i>, ¶¶[0015], [0023], cl. 17, 18), and therefore would have been motivated to use even more liquid triglyceride (up to 80%) when formulating a natural deodorant stick (like in Native) that did not include, e.g., 20-40% silicone oil, to meet what the '647 Patent admits was an existing consumer preference for “more natural products.” (Ex. 1001, 1:25-26). Thus, a POSA would have been motivated to use at least about 60% of a liquid triglyceride in a deodorant stick, and would have had a reasonable expectation of success in doing so, inasmuch as (i) Bianchi '254 already suggests a 40% amount, and (ii) a POSA would have, based on Bianchi '254's overall oil teachings, used even more of the liquid triglyceride (up to 80%) when making a stick with only that oil carrier (as taught by Native). The overlap between the claimed liquid triglyceride range and the ranges in the prior art renders the claim presumptively obvious. The '647 Patent discloses nothing critical or unexpected regarding the claimed range relative to the prior art ranges. Ex. 1002, ¶¶128-132.
b. at least one antimicrobial	Native's deodorant stick comprised baking soda, which the '647 Patent describes as (and was known to be) an exemplary antimicrobial. Ex. 1001, 10:43.

	Caprylic/capric triglyceride (which is a fancy way of saying fractionated coconut oil), arrowroot powder, stearyl alcohol, baking soda, shea butter, coconut oil, hydrogenated castor oil, polyglycerol-3 beeswax (which is a fancy way of saying cera bellina wax), jojoba esters, tocopherol (which is a fancy way of saying Vitamin E), L. acidophilus (which is a natural bacteria found in your body already), dextrose, glyceryl caprylate, glyceryl undecylenate. Our scented deodorants include oils. Lavender & Rose is made with Lavender Oil and Geranium Oil. Eucalyptus & Mint is made with Eucalyptus Oil and Spearmint Oil. Due to FDA recommendations, we use the term “fragrance” to refer to these oils. Ex. 1007, 11; Ex. 1002, ¶133.
c. a fragrance composition comprising at least about 50% by weight of natural oils, essential oils, or a combination thereof; and	Native discloses a deodorant stick with a fragrance composition comprising at least about 50% by weight (in particular, 100%) of natural oils or essential oils, as its “fragrance” referred to natural essential oils such as eucalyptus oil and spearmint oil. Caprylic/capric triglyceride (which is a fancy way of saying fractionated coconut oil), arrowroot powder, stearyl alcohol, baking soda, shea butter, coconut oil, hydrogenated castor oil, polyglycerol-3 beeswax (which is a fancy way of saying cera bellina wax), jojoba esters, tocopherol (which is a fancy way of saying Vitamin E), L. acidophilus (which is a natural bacteria found in your body already), dextrose, glyceryl caprylate, glyceryl undecylenate. Our scented deodorants include oils. Lavender & Rose is made with Lavender Oil and Geranium Oil. Eucalyptus & Mint is made with Eucalyptus Oil and Spearmint Oil. Due to FDA recommendations, we use the term “fragrance” to refer to these oils. Ex. 1007, 11; Ex. 1002, ¶134.
said deodorant stick being free of an aluminum salt.	Native describes an “Aluminum Free” deodorant stick, which a POSA would have understood to mean that the formulation did not contain an aluminum salt. The listed ingredients, discussed above, confirm this. NATIVE DEODORANT Free Shipping Aluminum Free No Commitment Ex. 1007, 11.

	In addition, Native touted its “NATURAL INGREDIENTS”, which a POSA would have understood to militate against inclusion of ingredients such as aluminum that were thought to be unsafe. <i>Id.</i>, 5; Ex. 1002, ¶¶135-136.
17. The deodorant stick of claim 16, further comprising a primary structurant having a melting point from about 50° C. to about 80° C.	Native’s deodorant stick comprised stearyl alcohol, which is a structurant that melts between 50° C. and 80° C, as generally known in the field. Ex. 1008, Tables 1, 5. Ingredients Caprylic/capric triglyceride (which is a fancy way of saying fractionated coconut oil), arrowroot powder, stearyl alcohol, baking soda, shea butter, coconut oil, hydrogenated castor oil, polyglycerol-3 beeswax (which is a fancy way of saying cera bellina wax), jojoba esters, tocopherol (which is a fancy way of saying Vitamin E), L. acidophilus (which is a natural bacteria found in your body already), dextrose, glyceryl caprylate, glyceryl undecylenate. Our scented deodorants include oils. Lavender & Rose is made with Lavender Oil and Geranium Oil. Eucalyptus & Mint is made with Eucalyptus Oil and Spearmint Oil. Due to FDA recommendations, we use the term “fragrance” to refer to these oils. Ex. 1007, 11. Stearyl alcohol is the “primary” structurant because it is the first structurant listed in the ingredient list and, thus, the structurant in the greatest amount.²⁵ Ex. 1001, 15:51-54. Also, Bianchi ’254 singles out stearyl alcohol as a “widely used” structurant “of particular interest” for antiperspirants. Ex. 1008, ¶¶[0001], [0058]. Bianchi ’254 describes antiperspirant formulations comprising 12-25% of a fatty alcohol, such as stearyl alcohol, as the structurant present in the greatest amount. Ex. 1008, ¶¶[0018]-[0019], [0131] (showing formulations with 18% stearyl alcohol as primary structurant and 3.5% castor wax as secondary structurant). Thus, a POSA would have been motivated to use a primary structurant with a melting point of from about 50°C. to about 80°C., such as stearyl alcohol, in a

²⁵ See n.2, above.

	deodorant stick, inasmuch as both Native and Bianchi '254 describe doing so. Ex. 1002, ¶¶137-140.
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vi. Ground 6 – Claims 1-2, 4-7, 9-12, 14-15, and 18-19 are Obvious Over Native in view of Bianchi '254 and Easy Homemade

Overview of the Combination

The combination of Native in view of Bianchi '254 and Easy Homemade renders claims 1-2, 4-7, 9-12, 14-15, and 18-19 obvious. As explained above, Native in view of Bianchi '254 renders obvious all of the limitations of claims 16-17. *Supra* § VII.C.v. Neither Native nor Bianchi '254 expressly teach a deodorant stick composition (1) substantially free of baking soda; (2) comprising an antimicrobial a powder with a water solubility of at most about 50 or 90 g/L at 25°C; or (3) comprising magnesium hydroxide as the antimicrobial.

While Native teaches a deodorant stick composition comprising an antimicrobial, a POSA would have known that deodorants containing baking soda (Native's antimicrobial) could cause skin irritation for some users. Ex. 1009, 6. Easy Homemade explains that magnesium hydroxide, which the '647 Patent indicates is a powder with a water solubility below 50 g/L at 25°C,²⁶ could be used to replace baking soda as an antimicrobial in deodorant compositions, and it works just as well.

²⁶ See also n.23, above; Ex. 1002, ¶142 (citing Ex. 1050, 395).

Id., 6, 9. Accordingly, it would be obvious to use magnesium hydroxide as a substitute to baking soda in the composition of Native, as taught by Bianchi '254 and Easy Homemade.

Easy Homemade is a printed publication from a website dedicated to natural deodorant formulations. It describes a formulation strategy that had been successfully implemented by an independent formulator to avoid baking soda and the associated skin irritation. A POSA looking to address the potential irritation caused by baking soda would have known that many natural formulations, with alternative ingredients, were published online by independent formulators, and that such existing ingredient lists for natural formulations would be a resource in formulating new compositions, making Easy Homemade relevant to a POSA. Further, a POSA would have appreciated that such websites from independent formulators striving for more natural options present an indication of consumer preferences, which a POSA would desire to meet in formulating new commercial products. Easy Homemade was widely accessible, being part of a series of related “Soap Deli News” articles dedicated to deodorant formulations with significant engagement from individuals globally. Ex. 1009; Ex. 1016; Ex. 1017; Ex. 1018.

Native also does not disclose the hardness of the deodorant stick. Bianchi '254 describes antiperspirant stick compositions, which establish the claimed hardness range was standard. Accordingly, it would be obvious to formulate a

deodorant stick such as the stick disclosed by Native using hardnesses as taught by Bianchi '254. Ex. 1002, ¶¶141-144.

Petitioner is not aware of any secondary considerations that would rebut obviousness.

Motivation Supporting the Combination

It would have been obvious to use the teachings of Bianchi '254 and Easy Homemade in Native's deodorant stick composition. A POSA would have been motivated to combine Native and Bianchi '254 for the reasons stated in Section VII.C.v, above. While Native teaches a deodorant stick composition comprising an antimicrobial (baking soda), neither Native nor Bianchi '254 expressly teach a deodorant stick composition wherein the antimicrobial is a powder with a water solubility of at most about 50 g/L at 25°C. As discussed above, a POSA would have known that deodorants containing baking soda could cause skin irritation for some users and Easy Homemade confirms what a POSA would have known—namely, that magnesium hydroxide was a known substitute for baking soda that avoided skin irritation. Ex. 1009, 6, 9. A POSA would have looked to publications in the field of deodorants describing known and, preferably, natural antimicrobials that were effective and which were not known to cause skin irritation. And a POSA would seek to understand consumer demands in the field (not being suitably met by existing offerings) for guidance on new products.

Easy Homemade is a website page that sets forth the ingredients for and method of making a natural deodorant. *Id.*, 5-9. Easy Homemade explains that magnesium hydroxide could be used to replace baking soda as an antimicrobial in deodorant compositions, and it works just as well. *Id.*, 6, 9.

Moreover, Bianchi '254 describes antiperspirant sticks having, e.g., “hardness values of from 8 to 15 mm, preferably 8 to 10 mm, measured pursuant to” a test with a DIN 51-579 needle (*id.*, ¶¶[0026], [0117]), which the '647 Patent admits is an ASTM-D 1321 needle (Ex. 1001, 23:1-15) and would have been understood by a POSA as such. When formulating a natural, aluminum-free deodorant stick based on the composition in Native, a POSA would have looked at publications describing other stick compositions, like Bianchi '254, for information regarding preferred hardnesses. Ex. 1002, ¶¶145-148.

Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in formulating a deodorant stick, using the teachings of Native and Bianchi '254, and further adopting Easy Homemade's baking soda alternative. Specifically, Easy Homemade shows that the simple substitution was achievable even by people formulating deodorants at home (with less skill than a POSA). Ex. 1009, 6, 9. Moreover, a POSA would have appreciated that deodorant compositions could be formed through

various combinations of known ingredients, such as antimicrobials, as simple design choices.

With respect to hardness, a POSA would have had a reasonable expectation of success in achieving the same for reasons already discussed above.²⁷ Ex. 1002, ¶149.

Analogous Art

Native, Bianchi '254, and Easy Homemade are in the same field as the '647 Patent, and all four relate to personal care compositions, including deodorants and/or antiperspirants.²⁸ *See* Ex. 1001, Abstract, 18:65-26:36; Ex. 1007, 5-8, 11; Ex. 1008, Abstract, ¶¶[0010]-[0021]; Ex. 1009, 5-9; Ex. 1002, ¶150.

'647 Patent Claims	Obviousness Based on Native in view of Bianchi '254 and Easy Homemade
1. A deodorant stick comprising:	<i>See</i> claim 16 analysis of ground 5, above. Ex. 1002, ¶151.
a. at least 25% by weight liquid triglyceride;	<i>See</i> claim 16 analysis of ground 5, above. Ex. 1002, ¶152.
b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25° C.;	Native teaches a deodorant stick composition comprising baking soda as the primary antimicrobial. A POSA would have known that deodorants containing baking soda could cause skin irritation for some users (or at the very least the alternative was a preference for some consumers). Easy Homemade discloses the substitution of magnesium hydroxide powder as a non-skin irritating antimicrobial

²⁷ *See* n.18, above.

²⁸ *See* n.7, above.

	substitute for baking soda in deodorant sticks. Ex. 1009, 6 (“I fell victim to the . . . rash you get after using deodorant with baking soda. Eventually I discovered that I could swap the baking soda with magnesium hydroxide . . . and it worked just as well.”). With that simple substitution of one known option for another, Native’s composition would match the claim requirement, as magnesium hydroxide has a water solubility below 90 g/L, as a POSA would have known. ²⁹ Ex. 1002, ¶153.
c. a fragrance composition comprising at least about 50% by weight of natural oils, essential oils, or a combination thereof; and	<i>See</i> claim 16 analysis of ground 5, above. Ex. 1002, ¶154.
d. a primary structurant with a melting point of at least 50° C.;	<i>See</i> claim 17 analysis of ground 5, above. Ex. 1002, ¶155.
said deodorant stick being free of an aluminum salt; and	<i>See</i> claim 16 analysis of ground 5, above. Ex. 1002, ¶156.
said deodorant stick having a hardness from about 70 mm*10 to about 140 mm*10, as measured by penetration with ASTM D-1321 needle.	Native does not state the hardness of the deodorant stick. Bianchi ’254, however, describes that its antiperspirant sticks have “hardness values of from 8 to 15 mm, preferably 8 to 10 mm, measured pursuant to” a test with a DIN 51-579 needle (Ex. 1008, ¶¶[0026], [0117]), which is an ASTM-D 1321 needle according to the ’647 Patent (Ex. 1001, 23:1-15), and as would have been understood by a POSA. Ex. 1002, ¶157 (citing Ex. 1047, 8:59-9:13).

²⁹ *See* n.23, above.

	A POSA would have been motivated to formulate a deodorant stick, such as Native’s deodorant stick, to have a hardness within Bianchi ’254’s preferred ranges because a POSA would have (i) looked to other references for preferred hardness ranges in the absence of any explicit teaching on this point in Native and (ii) known that customer preferred hardness levels within the claimed range and the ranges stated in Bianchi ’254. Ex. 1002, ¶159 (citing Ex. 1006, 2:56-58, 6:23-29). And a POSA would have had a reasonable expectation of success in doing so for reasons addressed above. At a minimum, the overlap between the claimed hardness range and the ranges in the prior art renders the claim presumptively obvious (even without Bianchi ’254, as an examiner found in related prosecution discussed above that the hardness would have been obvious to achieve). The ’647 Patent discloses nothing critical or unexpected regarding the claimed range relative to the prior art ranges. A POSA would have understood that the adjustment of the hardness of the stick was an issue of routine optimization, making the claimed range obvious even without Bianchi ’254. Ex. 1002, ¶¶157-160.
2. The deodorant stick of claim 1, wherein the primary antimicrobial is selected from the group consisting of ... magnesium hydroxide....	See claim 1 analysis of ground 6, above. Ex. 1002, ¶161.
4. The deodorant stick of claim 1, wherein the primary	See claim 1 analysis of ground 6, above. ³⁰ Ex. 1002, ¶162.

³⁰ Ex. 1050, 395 (“Magnesium hydroxide is a white, nearly insoluble powder.”).

antimicrobial is a powder.	
5. The deodorant stick of claim 1, wherein the deodorant stick is substantially free of baking soda.	See claim 1 analysis of ground 6, above. Ex. 1002, ¶163.
6. The deodorant stick of claim 1, wherein the deodorant stick is substantially free of a synthetic fragrance.	The Native website discloses and/or suggests a deodorant stick free from synthetic fragrance, as its “fragrance” referred to natural essential oils. Ingredients Caprylic/capric triglyceride (which is a fancy way of saying fractionated coconut oil), arrowroot powder, stearyl alcohol, baking soda, shea butter, coconut oil, hydrogenated castor oil, polyglycerol-3 beeswax (which is a fancy way of saying cera bellina wax), jojoba esters, tocopherol (which is a fancy way of saying Vitamin E), L. acidophilus (which is a natural bacteria found in your body already), dextrose, glyceryl caprylate, glyceryl undecylenate. Our scented deodorants include oils. Lavender & Rose is made with Lavender Oil and Geranium Oil. Eucalyptus & Mint is made with Eucalyptus Oil and Spearmint Oil. Due to FDA recommendations, we use the term “fragrance” to refer to these oils. Ex. 1007, 11. In addition, Native touted its “NATURAL INGREDIENTS”, which a POSA would have understood to exclude synthetic fragrances. <i>Id.</i>, 5. Ex. 1002, ¶¶164-165.
7. The deodorant stick of claim 1, wherein the deodorant stick has a hardness from about 90 mm*10 to about 110 mm*10, as measured by penetration with	See claim 1 analysis of ground 6, above. At a minimum, the overlap between the claimed hardness range and the range in the prior art renders the claim presumptively obvious. The '647 Patent discloses nothing critical or unexpected regarding the claimed range. Ex. 1002, ¶166.

ASTM D-1321 needle.	
9. The deodorant stick of claim 1, wherein the primary structurant has a melting point from 50° C. to 80° C.	<i>See claim 17 analysis of ground 5, above. Ex. 1002, ¶167.</i>
10. The deodorant stick of claim 1, comprising at least about 40% by weight liquid triglyceride.	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶168.</i>
11. The deodorant stick of claim 1, comprising at least about 50% by weight liquid triglyceride.	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶169.</i>
12. The deodorant stick of claim 1, wherein the primary antimicrobial has a water solubility of at most about 50 g/L at 25° C.	<i>See claim 1 analysis of ground 6, above. Magnesium hydroxide has a water solubility of at most about 50 g/L at 25° C, as a POSA would have known.³¹ Ex. 1002, ¶170.</i>
14. A deodorant stick comprising:	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶171.</i>
a. at least 50% by weight liquid triglyceride;	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶172.</i>

³¹ *See n.23, above.*

b. a primary antimicrobial having a water solubility of at most about 90 g/L at 25° C.;	<i>See claim 1 analysis of ground 6, above. Ex. 1002, ¶173.</i>
c. a fragrance composition comprising at least about 50% of natural oils, essential oils, or a combination thereof; and	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶174.</i>
d. a primary structurant with a melting point of at least 50° C.	<i>See claim 17 analysis of ground 5, above. Ex. 1002, ¶175.</i>
15. The deodorant stick of claim 14, comprising at least about 60% by weight liquid triglyceride.	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶176.</i>
18. A deodorant stick comprising:	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶177.</i>
a. at least 50% by weight of a liquid triglyceride;	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶178.</i>
b. a primary antimicrobial having a water solubility of at most	<i>See claim 1 analysis of ground 6, above. Ex. 1002, ¶179.</i>

about 90 g/L at 25° C.; and	
said deodorant stick having a hardness from about 70 mm*10 to about 140 mm*10, as measured by penetration with ASTM D-1321 needle.	<i>See claim 1 analysis of ground 6, above. Ex. 1002, ¶180.</i>
19. The deodorant stick of claim 18, comprising at least about 60% by weight of a liquid triglyceride.	<i>See claim 16 analysis of ground 5, above. Ex. 1002, ¶181.</i>

vii. Ground 7 – Claims 3 and 13 are Obvious Over Native in view of Bianchi '254, Easy Homemade, and Nabavi

Overview of the Combination

The combination of Native in view of Bianchi '254, Easy Homemade, and Nabavi renders claims 3 and 13 obvious. As explained above, Native in view of Bianchi '254 and Easy Homemade renders obvious all of the limitations of claim 1. *Supra* § VII.C.vi. Neither Native nor Bianchi '254, nor Easy Homemade expressly teach a deodorant stick with cinnamon essential oil. As discussed above, Nabavi discloses the use of cinnamon essential oil as an antimicrobial in cosmetic

compositions, and it would have been obvious to add cinnamon essential oil to Native's deodorant stick based on Nabavi's teachings. Ex. 1002, ¶182.

Petitioner is not aware of any secondary considerations that would rebut obviousness.

Motivation Supporting the Combination

A POSA would have been motivated to incorporate Nabavi's teachings on cinnamon essential oil into Native's deodorant stick for similar reasons to those discussed above with respect to Lesniak and Nabavi. Native discloses a deodorant stick with an antimicrobial, baking soda, which had known skin irritation issues, and essential oils. A POSA would have looked for other antimicrobials, such as Nabavi's cinnamon essential oil, that could be incorporated into Native's deodorant stick to enhance its aromatic and antibacterial effects. *Supra* § VII.C.iv; Ex. 1002, ¶¶183-184.

Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in formulating a deodorant stick, using the teachings of Native, Bianchi '254, and Easy Homemade and further adopting Nabavi's cinnamon essential oil, for the reasons discussed in Grounds 4 and 6, above. Ex. 1002, ¶185.

Analogous Art

Native, Bianchi '254, Easy Homemade, and Nabavi are in the same field as the '647 Patent, and all relate to personal care compositions.³² See Ex. 1001, Abstract, 18:65-26:36; Ex. 1007, 5-8, 11; Ex. 1008, Abstract, ¶¶[0010]-[0021]; Ex. 1009, 5-9; Ex. 1067, 7729, 7739, 7742; Ex. 1002, ¶186.

- a) **[3] The deodorant stick of claim 1, further comprising at least one additional antimicrobial different from the primary antimicrobial, selected from the group consisting of beryllium carbonate ... magnesium hydroxide, ... cinnamon essential oil, ... and combinations thereof.**

Native teaches deodorant stick compositions containing baking soda (a known antimicrobial) and essential oils, but it does not expressly teach deodorant stick compositions containing magnesium hydroxide or cinnamon oil as an antimicrobial. As discussed above, it would have been obvious to substitute magnesium hydroxide for baking soda as Native's primary antimicrobial. It also would have been obvious to include an additional antimicrobial such as cinnamon essential oil taught by Nabavi, to combat bacteria thought to cause odor and product degradation, as well as to provide a pleasant fragrance. Ex. 1067, 7733, 7739, 7742. A POSA would have used cinnamon essential oil in a lower amount than the primary antimicrobial because it was thought to cause skin irritation. *Id.*, 7742. Ex. 1002, ¶187.

³² See n.7, above.

- b) [13] The deodorant stick of claim 3, wherein all antimicrobials have a water solubility of at most about 90 g/L at 25° C.

See claim 3 analysis of ground 7, above. Magnesium hydroxide and cinnamon essential oil have a water solubility of at most about 90 g/L at 25° C, as a POSA would have known.³³ Ex. 1002, ¶188.

VIII. CONCLUSION

Petitioner submits that claims 1-7 and 9-19 of the '647 Patent are unpatentable and requests institution of *Inter Partes* Review.

DATED: July 17, 2024

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³³ See n.23, above.

CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

I hereby certify that this petition complies with the word count limitation of 37 C.F.R. § 42.24(a)(1)(i) because the petition contains a total of 13,972 words. This total excludes the cover page, signature block, and the parts of the petition exempted by 37 C.F.R. § 42.24(a)(1).

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CERTIFICATE OF SERVICE

The undersigned certifies that a complete copy of this Petition for *Inter Partes* Review of U.S. Patent No. 10,905,647 and all Exhibits and other documents filed together with this Petition were served on the official correspondence address for the patent shown in PAIR via FEDERAL EXPRESS next business day delivery, on this date:

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