

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Dr. Squatch LLC

Petitioner

v.

The Procter & Gamble Company

Patent Owner

Case IPR2024-01173

U.S. Patent No. 10,905,647

PATENT OWNER'S RESPONSE

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EXHIBIT LIST

Exhibit No.	Description
Ex. 2001	Full File History of the '647 Patent
Ex. 2002	<i>Reserved</i>
Ex. 2003	Mayo Clinic, Zinc Oxide (Topical Application Route), https://www.mayoclinic.org/drugs-supplements/zinc-oxide-topical-application-route/description/drg-20075525
Ex. 2004	Wayback Machine, Mayo Clinic, Zinc Oxide (Topical Application Route), https://web.archive.org/web/20150102193922/https://www.mayoclinic.org/drugs-supplements/zinc-oxide-topical-application-route/side-effects/drg-20075525?p=1 (archived Jan. 2, 2015)
Ex. 2005	<i>Reserved</i>
Ex. 2006	<i>Reserved</i>
Ex. 2007	International Publ. No. WO 99/21528
Ex. 2008	<i>Reserved</i>
Ex. 2009	<i>Reserved</i>
Ex. 2010	<i>Reserved</i>
Ex. 2011	Declaration of Robert Lochhead, Ph.D.
Ex. 2012	Deposition Transcript of Dr. Michniak-Kohn (April 17, 2025)
Ex. 2013	CeraVe, Products Formulated with Zinc Oxide, available at https://www.cerave.com/skincare/zinc-oxide#:~:text=Zinc%20oxide%20sunscreen%20works%20by,active%20ingredients%20in%20chemical%20sunscreens (last accessed May 1, 2025).

Ex. 2014	Nivea, Deodorants vs. Antiperspirant: What's the Difference?, available at https://www.nivea.in/advice/deodorant-vs-antiperspirant (last accessed May 1, 2025).
Ex. 2015	Dove, What's The Difference Between Deodorant & Antiperspirant?, available at https://www.dove.com/us/en/stories/tips-and-how-to/sweating-tips/antiperspirant-vs-deodorant-what-is-the-difference.html#:~:text=The%20key%20difference%20is%20the,you%20fresh%20throughout%20the%20day (last accessed May 1, 2025).
Ex. 2016	Secret, What is the difference between an antiperspirant and a deodorant?, available at https://secret.com/en-us/articles/antiperspirants-vs-deodorants-whats-the-difference (last accessed May 1, 2025).
Ex. 2017	Dr. Squatch, WTF Is The Difference Between Antiperspirant and Deodorant?, available at https://www.drsquatch.com/blogs/all-blog-posts/antiperspirant-and-deodorant (last accessed May 1, 2025).
Ex. 2018	ASTM D-1321 Needle Penetration Test Standard (1996)
Ex. 2019	DIN 51 579 Needle Penetration Test Standard (1965)
Ex. 2020	<i>Curriculum vitae</i> of Dr. Robert Lochhead
Ex. 2021	Statutory Disclaimer

All emphasis has been added and all internal citations have been omitted unless otherwise indicated.

I. INTRODUCTION

P&G identified a gap in the market: Modern consumers sought natural, aluminum-free, silicone-free deodorants with an underarm-friendly feel. However, then-available, natural deodorants were too hard, too brittle, and/or too greasy, leading to consumer discomfort and frustration. P&G spent years carefully developing its aluminum-free formulations to meet consumer-desired properties as to drag, glide, hardness, skin-feel, and irritation, ultimately inventing and creating the deodorant stick described and claimed in U.S. Patent No. 10,905,647 (“the ’647 Patent”).

Petitioner Dr. Squatch seeks to cash in on P&G’s success at meeting consumer needs in the natural aluminum-free deodorant space, advancing two tracks of invalidity challenges centered around deficient and non-enabling primary references Lesniak and Native.

Petitioner’s Lesniak-based grounds suffer from numerous defects:

- *First*, Lesniak does not disclose the “deodorant stick” required by the limiting preamble of all claims because the reference is explicitly tailored to high zinc-oxide concentration sunscreens and diaper creams; its passing reference to an “antiperspirant” would have been of no moment to a POSA.

- *Second*, to the extent Lesniak’s “antiperspirant” is considered, it dooms Petitioner’s Lesniak-based challenges because a POSA would have understood an “antiperspirant” to contain aluminum and aluminum is explicitly excluded from the compositions of the ’647 Patent.
- *Third*, Lesniak cannot enable *any* purported deodorant stick due to its conceded stability issues.
- *Fourth*, Petitioner does not provide sufficient reasoning as to why a POSA would have been motivated to combine the teachings of Lesniak regarding natural compositions with the teachings of Bianchi-518 relating to non-natural compositions containing 30-50% volatile silicones (such as cyclomethicone or siloxanes), which are not natural ingredients.
- *Fifth*, as to claims reciting hardness limitations, Petitioner neglects to provide *any reference whatsoever* that discloses any stick composition—sunscreen, antiperspirant, deodorant, or otherwise—within the hardness ranges claimed by the ’647 Patent. Petitioner’s attempt to rely on Bianchi-518 for this limitation is based on a fundamental misapprehension of the different hardness test used in Bianchi-518 (using a 100-g needle penetration weight) as compared

to that used in the '647 Patent (using a 50-g needle penetration weight); in fact, Bianchi-518's disclosed hardness range is *significantly harder* than the claimed hardness ranges of the '647 Patent. This utter failing is compounded because Petitioner does not provide any reason why a POSA would reformulate Lesniak's compositions to incorporate Bianchi-518's (wholly inapt) hardness values to reach the limitations of the claims, in view of the fact that Bianchi-518's much harder stick is specific to aluminum- and silicone-based sticks.

- And, *sixth*, Petitioner does not provide a sufficient motivation to pluck magnesium hydroxide out of Phinney's multi-ingredient invention and combine it with Lesniak, and further does not provide a sufficient motivation to include cinnamon essential oil as an additional antimicrobial, particularly in light of the lack of a teaching in the prior art.

Petitioner's Native-based grounds fare no better:

- Petitioner admits that Native is a list of ingredients for a natural, aluminum-free deodorant stick that received rave reviews and offers no reason a POSA would seek to modify Native at all, at all, let alone combine Native with any (or all) of the secondary

references upon which Petitioner relies. As one example, Petitioner fails to meet its burden to show that a POSA seeking to modify Native's natural ingredients (for some reason that has not been shown) would look to Bianchi-254's aluminum-containing and volatile silicone-based antiperspirant with up to 40% of volatile silicones.

- Petitioner again fails to provide *any reference* that discloses the claimed hardness ranges: Native does not mention hardness, and Petitioner's combination with secondary reference Bianchi-254 suffers from the same deficiencies as its Bianchi-518 counterpart used in Petitioner's Lesniak-based combinations, including that Bianchi-254's hardness values are *significantly harder* than those of the '647 Patent's claims, given the use of a 100-g needle assembly testing method in Bianchi-254, versus the '647 Patent's 50-g needle assembly testing method.
- Petitioner does not provide sufficient motivation to combine Native with the teachings of the Easy Homemade blog, neglecting to explain *why* a POSA would have looked to, or even found, the informal blogpost in the first instance to completely reformulate Native's successful commercial deodorant product, or *how* a POSA

would have actually done so with any reasonable expectation of success.

- And Petitioner’s Native combination involving cinnamon essential oil evidence the same cherry-picking and hindsight bias as its Lesniak-based challenge.

For all of the these reasons, explained in greater detail below, P&G respectfully requests a determination that the claims of the ’647 Patent are not unpatentable.

II. THE ’647 PATENT

A. Overview of the ’647 Patent

The ’647 Patent is directed to novel and inventive “antiperspirant and deodorant compositions and methods relating thereto.” (’647 at 1:15-16.) The inventors discovered that then-available aluminum-free, natural deodorant sticks had significant drawbacks, namely that they were too hard, too greasy, and did not provide the desired consistency and feel sought by consumers. The patent notes that “[m]any antiperspirant and deodorants use actives that are astringent metallic salts, or in particular, aluminum salts.” (*Id.* at 1:20-21.) And while aluminum “is highly effective as an active,” consumers have been increasingly interested in more natural formulations “that do not contain aluminum.” (*Id.* at 1:22-24.) Some products use baking soda as an alternative to aluminum, but the patent explains consumers may

seek “products with lower irritation than they have experienced with baking soda based products.” (*Id.* at 1:25-29.) The move to more natural ingredients extends to fragrances as well, with the patent acknowledging consumers are also looking for “more natural products complete with fragrances that are mostly natural or essential oil based.” (*Id.* at 1:25-27.)

Formulating a product with these consumer preferences is difficult because “natural and essential oil fragrances... can be less stable in the presence of heat and extreme pH.” (*Id.* at 1:29-31.) And products utilizing highly water-soluble alkaline powders instead of aluminum as actives “contribute negatively towards natural or essential oil stability as well, especially in a hot process needed to melt waxes” into sticks. (*Id.* at 1:35-37.) “[H]igh water solubility powders can also lead to gritty products, as the water soluble powders can agglomerate when exposed to moisture released from powders during the hot batch process.” (*Id.* at 1:37-40.) Accordingly, “there is a continuing challenge to formulate a non-aluminum, natural fragrance deodorant that provides low irritation while maintaining sufficient odor protection.” (*Id.* at 1:41-43.)

Deodorant compositions described and claimed in the '647 Patent have a stick hardness “from about 70 mm*10 to about 140 mm*10, as measured by penetration with ASTM D-1321 needle.” (*Id.* at cl. 1; *see also* cl. 7 (claiming range “from about 90 mm*10 to about 110 mm*10.”)) The specification explains that generally, “the

greater amount of liquid in the formulation, the softer the deodorant stick may be.” (*Id.* at 15:14–15.) So “[r]ather than using waxes or other high melting structurants,” the claimed compositions of the ’647 Patent “comprise [certain] levels of liquid triglycerides,” *e.g.*, “at least about 25% by weight” or more. (*Id.* at 15:21–24; *id.* at cls. 1, 14, 16, 18.)

The patent further outlines the process for testing the hardness of the stick, explaining “[t]he penetration test is a physical test method that provides a measure of the firmness of waxy solids and extremely thick creams and pastes with penetration values not greater than 250 when using a needle for D1321.” (*Id.* at 22:10–13.) The patent’s hardness test is “based on”—but not identical to—the American Society for Testing and Materials Methods D-5, D1321 and D217 and DIN 51 579. (*Id.* at 22:14-15.) Specifically, a test method that “[e]nsure[s] the total weight of the shaft and needle is 50 ± 0.2 grams when the shaft is in free fall.” (*Id.* at 23:25-26.)

The inventors discovered that “[p]roviding a deodorant stick having at least 25% of a liquid triglyceride and structurants having a melting point greater than about 50 degrees C. can result in a deodorant stick with a hardness from about 70 mm*10 to about 140 mm*10.” With these specific features, “[s]uch a deodorant stick is able to comprise consumer-perceived natural ingredients, while offering a

pleasant consumer experience in terms of its hardness.” (*Id.* at 15:7-13; *see also* Ex. 2011 at ¶¶ 22-28.)

B. Claim Construction

Claim terms are to be construed in accordance with the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). But “[o]nly terms which are in controversy need to be construed, and then only to the extent necessary to resolve the controversy and material to the decision.” *Facebook, Inc. v. Sound View Innovations, LLC*, IPR2017-01005, Paper No. 13 at 6 (PTAB Sept. 1, 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Here, the preamble of the independent claims reciting “[a] deodorant stick” is limiting. While each of Petitioner’s challenges are deficient for other independent reasons, Petitioner’s Lesniak-based challenges also fail because Lesniak does not adequately disclose a “deodorant stick” for the reasons discussed in more detail below.

A preamble limits the invention if “it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002). A preamble may “act as a necessary component of the claimed invention” where, as here, “limitations in the body of the claim rely upon and derive antecedent basis from the preamble.”

Eaton Corp. v. Rockwell Int’l Corp., 323 F.3d 1332, 1339 (Fed. Cir. 2003); *see also Bio-Rad Lab’ys., Inc. v. 10X Genomics Inc.*, 967 F.3d 1353, 1371 (Fed. Cir. 2020). The Federal Circuit “ha[s] repeatedly held a preamble limiting when it serves as antecedent basis for a term appearing in the body of a claim.” *In re Fought*, 941 F.3d 1175, 1178 (Fed. Cir. 2019) (citing cases).

The preambles of independent claims 1,16, and 18 of the ’647 Patent¹ recite “A deodorant stick comprising.” Later limitations in those claims rely on the preamble’s recitation of “a deodorant stick” for antecedent basis, claiming “said deodorant stick being free of an aluminum salt” and/or “said deodorant stick having a hardness from about 70 mm*10 to about 140 mm*10”:

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.

¹ Patent Owner has filed a statutory disclaimer of independent claim 14 and dependent claim 15 under 37 C.F.R. 1.321(a), and as such, those claims are no longer at issue in this proceeding. (Ex. 2021.)

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.

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.

Dependent claims also rely on the preamble of independent claims to define the invention and provide antecedent basis, reciting for example in the body of dependent claim 5 “*the deodorant stick* is substantially free of baking soda,” in dependent claim 6 “*the deodorant stick* is substantially free of a synthetic fragrance,” in dependent claim 7 “*the deodorant stick* has a [claimed] hardness,” and in dependent claim 8 “*the deodorant stick* comprises piroctone olamine and magnesium hydroxide and magnesium carbonate hydroxide.” (’647 Patent.)

The Board and the Federal Circuit have found the preamble limiting in similar situations. *See, e.g., Shoes by Firebug LLC v. Stride Rite Children’s Group, LLC*, 962 F.3d 1362, 1365 (Fed. Cir. 2020) (finding the preamble, “[a]n internally illuminated textile footwear comprises,” limited the invention to “textile footwear” where the claim later relied on the preamble’s use of “footwear” for antecedent basis, reciting “the illumination system being housed within the footwear”); *C.W. Zumbiel Co. v. Kappos*, 702 F.3d 1371, 1385 (Fed. Cir. 2012) (“containers” are a limitation

where claim body relied on preamble’s recitation of “a plurality of containers,” stating “the preamble constitutes a limitation when the claim(s) depend on it for antecedent basis”); *Palo Alto Networks, Inc. v. BT Ams., Inc.*, 2024 WL 4709942, at *8-9 (P.T.A.B. 2024) (preamble reciting “a probe” was limiting because claim limitation recited “the probe”). So too here. Accordingly, each claim’s preamble “deodorant stick” should be construed as a limitation of the claim.

C. Person of Ordinary Skill in The Art

Petitioner states that a person having ordinary skill in the art (“POSA”) as of the claimed priority date “would have (1) at least a B.S. or equivalent degree; and (2) at least two years of experience in cosmetics formulations.” (Petition at 24.) For purposes of this IPR proceeding only, P&G does not dispute this definition. (Ex. 2011 at ¶¶ 29-31.)

III. BRIEF OVERVIEW OF THE ASSERTED PRIOR ART

A. Lesniak-Based Grounds (Grounds 1-4)

In Ground 1, Petitioner contends that Lesniak (Ex. 1003) anticipates or renders obvious claims 14-17. For Ground 2, Petitioner adds Bianchi-518 (Ex. 1006) to Lesniak. For Ground 3, Petitioner adds Phinney (Ex. 1004) to the combination of Lesniak and Bianchi-518. In Ground 4, Petitioner adds Nabavi (Ex. 1067) to the combination of Ground 3. None of these references, together or apart, disclose the claims of the ’647 Patent. Further, there is no motivation to combine the cited references as suggested by Petitioner

Lesniak. Lesniak describes and claims “natural” compositions relating to “a sunscreen or a diaper cream” with high zinc oxide content (up to 20% or higher). (See, e.g., Ex. 1003 at cl. 1.) As a POSA would have appreciated, the compositions disclosed in Lesniak are anhydrous, structured, natural compositions comprising a network of crystals which physically trap liquid in their interstices. (Ex. 2011 at ¶ 35.) A POSA would have understood that the liquid carrier system in Lesniak, as relied on by the Petitioner, is primarily triglyceride-based. (*Id.*) Lesniak does not disclose deodorant sticks, and mentions antiperspirants only in passing without specifying any form. The reference contains just one example of a composition in the form of a stick (Example 6), and it is a sunscreen stick. (See Ex. 1003 at 15:7-45, Table 7.) Notably, nearly all of the compositions disclosed and formulated in Lesniak failed stability testing. (See *id.* at Table 2.)

Phinney. Phinney describes deodorant formulations comprising zinc hydroxide, magnesium hydroxide, and potassium chloride and/or potassium sulfate. (E.g., Ex. 1004 at 4:45-51.) Phinney’s stick differs from Lesniak’s not only because Phinney is a deodorant whereas Lesniak’s is a sunscreen, but also because it employs a different stick technology and different active ingredients than Lesniak’s. Phinney is not an anhydrous semisolid with a liquid triglyceride carrier, but rather is a polyol-based sodium stearate gel stick comprising up to 20% water. (See Ex. 2011 at ¶ 36.) Phinney offers no guidance to a POSA on how to adapt any of its teachings to an

anhydrous stick with a triglyceride-carrier system. (*Id.*) Additionally, whereas Lesniak's active ingredients comprise zinc oxide, Phinney's active ingredients comprise zinc hydroxide and magnesium hydroxide. (Ex. 1004 at 4:48-51, cl. 1, cl. 7.)

Bianchi-518. Bianchi-518 describes and claims aluminum-based antiperspirant compositions with about 30-50% volatile silicones and about 5-30% of an antiperspirant active comprising aluminum salts or complexes. (Ex. 1006 at 5:10-6:15 (Examples A-U), cl. 1., 2:59-4:7) Hence, the stick technology employed by Bianchi-518 is yet a third type, different from both Lesniak and Phinney. It is an anhydrous, aluminum-containing, silicone-based composition, substantially free of long chain fatty alcohols and including primarily non-natural ingredients. (Ex. 1006 at Abstract, 1:9, 1:26, 1:54-55, 2:12-14, 4:8-15, 4:24, 5:15-6:14, 7:50-64, cl. 1, cl. 7; Ex. 2011 at ¶ 37.) Bianchi-518 discloses a hardness range specific to its particular stick of "7.0 to about 14.0 mm," based on penetration results as measured using a 100-g weight penetration needle in accordance with the ASTM D-1321 standard test method. (*Id.* at 2:58, 6:23-28; Ex. 2011 at ¶ 37.) This method is significantly different than the 50-g weight needle penetration method defined in the '647 Patent. (Ex. 2011 at ¶ 37.) As explained below, the use of different weight needles (100 g v. 50 g) means that the Bianchi-518 compositions are significantly harder than the hardness range claimed in the '647 Patent. Additionally, Bianchi-518 is silent as to

any hardness range appropriate for aluminum-free natural deodorants, particularly those with different carrier systems and structurants like Lesniak and Phinney. (*Id.*)

Lamb. Lamb is an article titled “Sodium Bicarbonate: An Excellent Deodorant” from The Journal of Investigative Dermatology in 1946. (Ex. 1005 at 131.) It describes a survey and study of medical students, the author’s family and friends, and the author’s patients where the participants used plain sodium bicarbonate as a single-ingredient deodorant. (*Id.* at 131.) From this small group study, Lamb concludes that “the possible mechanism of the deodorant action of bicarbonate of soda is mentioned as requiring further study.” (*Id.* at 133; *see also* Ex. 2011 at ¶ 38.)

Nabavi. Nabavi is an article titled “Antibacterial Effects of Cinnamon: From Farm to Food, Cosmetic and Pharmaceutical Industries,” seemingly published online in 2015 in *Nutrients*. (Ex. 1067.) Nabavi purports to “review[] the literature published over the last five years regarding the antibacterial effects of cinnamon.” (*Id.* at 7729.) Nabavi does not disclose the use of cinnamon essential oil as an antimicrobial in deodorants or antiperspirants, and to the contrary warns of “contact dermatitis” and “alteration of the surface epidermis” after topical use of products containing cinnamon, and therefore states “long standing excessive use is not recommended.” (*Id.* at 7742; Ex. 2011 at ¶ 42.)

B. Native-Based Grounds (Grounds 5-7)

Petitioner's Ground 5 is based on Exhibit 1007 ("Native") in view of Bianchi-254 (Ex. 1008). Ground 6 adds Easy Homemade (Ex. 1009) to the combination of Ground 5. Ground 7 adds Nabavi (described above) to the combination of Ground 6.

Native. Petitioner's Native exhibit is a Wayback Machine printout of the former website for the Native company, purporting to describe a list of ingredients contained in the Native's aluminum-free, natural deodorant formula from 2016. (Ex. 1007.) Native shows several positive reviews, and no negative reviews, of the Native deodorant product as it existed at that time. (*Id.* at 8, 17; Ex. 2011 at ¶ 40.)

Bianchi-254. Similar to Bianchi-518, Bianchi-254 describes antiperspirant compositions including from about 20% to about 40% volatile silicone and from 15% to 30% aluminum salts or complexes. (*See* Ex. 1008 at [0028], cl. 1.) The stick technology is thus the same as that of Bianchi-518: It is an anhydrous, silicone- and aluminum-containing composition that is substantially free of long-chain fatty alcohols; it is chemically and structurally different from the systems of Lesniak, Phinney, and Native. Like its Bianchi-518 counterpart, Bianchi-254 discloses hardness values for its compositions as measured using a 100-g weight needle penetration testing method, rendering its compositions significantly harder than the

claimed compositions of the '647 Patent, which utilizes a 50-g needle penetration testing method for hardness. (Ex. 1008 at [0117], Table 6; Ex. 2011 at ¶ 39.)

Easy Homemade. Easy Homemade is a printout of a blog post by an apparent deodorant amateur/hobbyist from the Wayback Machine, with no indicia of reliability or significance to a POSA. (*See* Ex. 1009; Ex. 2011 at ¶ 41.) The blogger purports to melt premade, baking-soda-free deodorants and then add arrowroot powder and magnesium hydroxide. The blogpost does not disclose the base deodorant composition ingredients.

IV. PETITIONER'S LESNIAK-BASED GROUNDS ARE UNCONVINCING

Petitioner's Lesniak-based grounds fail to anticipate or render obvious claims 1-13 and 16-19. Claims 14-15 are no longer at issue. (Ex. 2021.)

A. Lesniak Does Not Disclose a “Deodorant Stick.” ***(Grounds 1-4: All Claims 1-13, 16-19)***

Lesniak does not disclose a “deodorant stick,” as required by the preamble of the independent claims. Rather, Lesniak embodies sunscreen and diaper cream compositions containing high concentrations of zinc oxide. Petitioner attempts to bridge this gap by focusing on a single fleeting reference to “antiperspirant” in Lesniak, contending that the mere mention of an “antiperspirant” amounts to a disclosure of the '647 Patent's claimed “deodorant stick.” Not so. A POSA would not have credited Lesniak as an “antiperspirant” reference with this limited

disclosure that is entirely out of place—and contradicted (“antiperspirant”; “not an antiperspirant”)—in the reference as a whole. And in any event, Lesniak fails to enable any purported deodorant stick in view of the potential instability of the sunscreen and diaper cream compositions it does disclose.

1. *Lesniak Discloses Sunscreens and Diaper Creams, Not Deodorant Sticks.*

Lesniak is a laundry-list reference disclosing numerous and varied combinations and concentrations of ingredients for “natural” sunscreen and diaper cream compositions.

Lesniak describes twelve different compositions of sunscreens (Compositions 1–12), ten of which Lesniak treats as comparative examples:

TABLE 2											
Sunscreens.											
	Composition#										
	1*	2*	3*	4*	5*	6*	7*	8	9*	10*	11
	Weight %										
Zinc Oxide	20	20	20	20	20	20	20	20	20	20	20
Sunflower oil	57	30	10	10	10	10	10	10	10	10	12.5
Caprylic/Capric Triglyceride	5	35	55	53	53	54	54	53	53	50	52
Beeswax	13	15	15	17	17	15	15	15	15	15	13.5
Shea butter	5	0	0	0	0	0	0	0	0	0	0
CastorWax MP80	0	0	0	0	0	0	0	2	0	0	2
hydrogenated castor oil											
Tapioca starch	0	0	0	0	0	0	1	0	0	0	0
Cetyl Alcohol	0	0	0	0	0	0	0	0	2	0	0
Thickener silica	0	0	0	0	0	1	0	0	0	0	0
Natural jelly	0	0	0	0	0	0	0	0	0	5	0
SP511											
Total	100	100	100	100	100	100	100	100	100	100	100
Freeze/thaw stability	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3
	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
High temp. stability (49° C.)	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Pass	Fail	Fail	Pass
“Whitening” acceptability	No	No	Yes	Yes	Yes	No	No	Yes	No	No	Yes
Dispensing acceptability	No	No	No	No	No	No	No	Yes	No	No	Yes
Greasiness/after-feel acceptability	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

*denotes comparative composition.

TABLE 3		
Water activity of sunscreen compositions		
	Composition#	
	11	12
	(weight %)	(weight %)
Zinc Oxide	20	20
Sunflower oil	12.5	12.1
Caprylic/Capric Triglyceride	52	52
Beeswax	13.5	13.5
TABLE 3-continued		
Water activity of sunscreen compositions		
	Composition#	
	11	12
	(weight %)	(weight %)
CastorWax MP80 hydrogenated castor oil	2	2
Fragrance (natural lavender vanilla fragrance)	0	0.40
Total	100	100
Water activity		
Sample #1	0.262	0.306
Sample #2	0.265	0.309
Sample #3	0.268	0.304

(*Id.* at Tables 2, 3.) Among other things, Lesniak analyzes the Sun Protective Factor (SPF) of its inventive Composition 12, and compares its water resistance to five different commercially available sunscreens. (*Id.* at 13:23-45, Tables 4, 6; Ex. 2011 at ¶ 44.)

As to diaper creams, Lesniak discloses and analyzes six different diaper cream formulations (Compositions A–F):

TABLE 5						
Diaper cream formulations						
Composition#	A	B	C	D	E	F
	Weight %					
Zinc Oxide	12	12	12	12	12	12
Sunflower oil	12.5	12.5	12.5	12.5	12.49	20.49
Caprylic/Capric Triglyceride	60	55	55	52	52	52
Coconut oil	0	0	5	5	5	0
Beeswax	13.5	13.5	13.5	13.5	13.5	13.5
Shea butter	0	5	0	3	3	0
CastorWax MP80 hydrogenated castor oil	2	2	2	2	2	2
Vitamin E	0	0	0	0	0.01	0.01
Total	100	100	100	100	100	100

(*Id.* at Table 5.) And Lesniak’s claims recite a “personal care composition selected from a sunscreen or a diaper cream,” with later claims also limiting the invention to sunscreens and diaper creams. (*Id.* at cls. 1, 12, 14, 19.)

Each of the Lesniak compositions contain large amounts of zinc oxide (*e.g.*, up to 20%), which serves as a protective barrier to protect the skin from the sun or other irritants. (*See, e.g.*, Ex. 1003 at Tables 2-3, cl. 13 (“[W]herein the composition

comprises *a sun-protective level of zinc oxide particles*”).) As both a POSA and the common consumer would have understood, zinc oxide is an active ingredient commonly found in sunscreens to prevent sun damage. (*Id.*; *see also* Ex. 2011 at ¶ 46; Ex. 2013; 21 C.F.R. 352 (FDA Sunscreen Monograph).)) And in the case of diaper cream, any POSA, parent, babysitter, or caregiver would have understood and appreciated that zinc oxide is present in those products to prevent diaper rash. (*See* Ex. 2011 at ¶ 46; Ex. 2003 (“Zinc oxide topical cream is used to treat and prevent diaper rash. It is also used to protect skin from being irritated and wet caused by diaper use.”); Ex. 2004.)

A POSA would have understood and appreciated that zinc oxide, particularly in the high amounts present in Lesniak, is not commonly used or useful in deodorants. (Ex. 2011 at ¶ 47.) Petitioner’s Phinney reference confirms this, explaining “zinc oxide... [is] *very unreactive against perspiration odour.*” (Ex. 1004 at 2:33-36; *see also id.* at 3:20-21 (noting “the low activity of zinc oxide as a deodorant agent”).) And Petitioner’s expert could not identify a single deodorant that contains the 20% zinc oxide that Lesniak discloses. (Ex. 2012 at 66:21-67:1.)

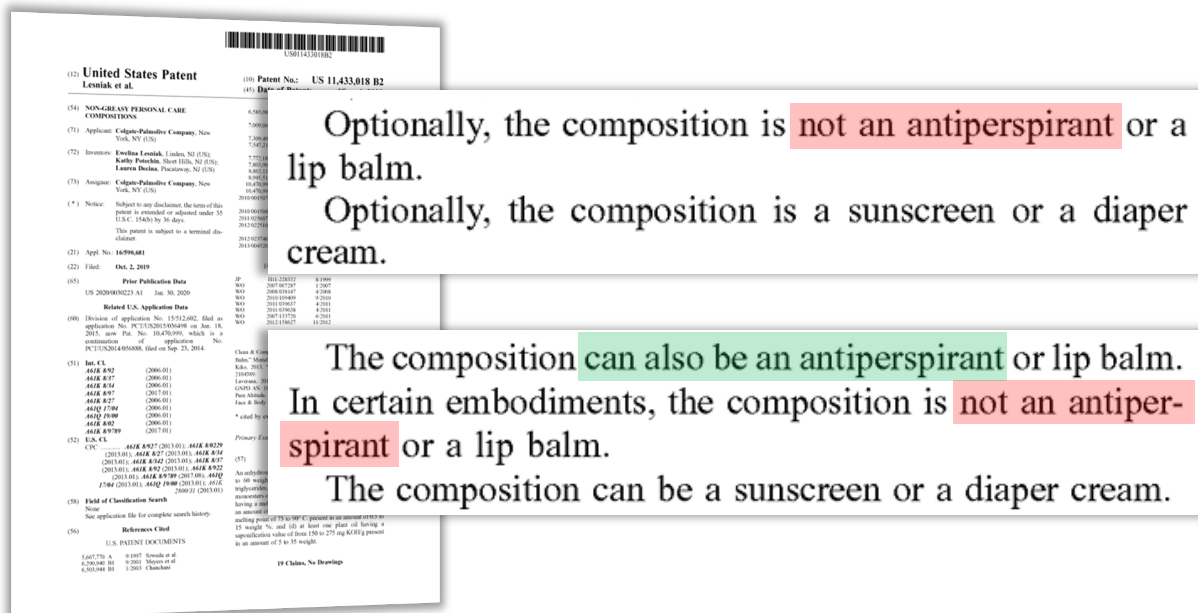
Lesniak’s stated goals, specification, ingredients, and claims all show that a POSA would have viewed Lesniak as relevant to natural, high zinc oxide concentration sunscreens or diaper cream compositions, not to deodorant sticks as required by the ’647 Patent claims. (Ex. 2011 at ¶ 48.) Lesniak does not mention a

“deodorant stick” or “deodorant” even once. Petitioner’s Lesniak-based grounds do not invalidate claims 1-13 and 16-19. (Ex. 2011 at ¶¶ 44-48.)

2. *Any Alleged Disclosure of an “Antiperspirant” Dooms Petitioner’s Argument*

Acknowledging the lack of an express “deodorant stick” disclosure in Lesniak, Petitioner jumps through hoops to argue that Lesniak’s throwaway sentence regarding an “antiperspirant” teaches the claim limitation. This argument lacks merit.

As an initial matter, Lesniak uses the word “antiperspirant” in just three instances, and in two of those three instances, Lesniak explicitly states that the composition is “*not* an antiperspirant”:



(Ex. 1003 at 4:23-26, 10:27-29.) Lesniak further does not specify any form of antiperspirant, which can come in a variety of forms, including aerosol sprays,

creams, liquids, and gels. These passing references to “antiperspirant” fail to convert Lesniak into something other than a reference about the embodied sunscreens and diaper creams.

Moreover, to the extent a POSA would have considered these words at all, they would understand any such “antiperspirant” to contain aluminum. (Ex. 2011 at ¶¶ 49-51.) To a POSA, the term “antiperspirant” means a composition containing an aluminum salt or complex—the only antiperspirant actives approved by the FDA.² *See* 37 C.F.R. 350. As Dr. Lochhead explains, a POSA would have understood that the U.S. Food and Drug Administration regulates antiperspirants as drugs and regards deodorants as cosmetics. (Ex. 2011 at ¶ 51.) A POSA would have further understood Lesniak’s disclosure of “antiperspirant” as requiring the use of an antiperspirant active, and the only antiperspirant actives approved by the FDA all contain aluminum. (*Id.*) The FDA lists the 18 approved antiperspirant actives in its

² Sensitive to this reality, Petitioner attempts to argue that Lesniak precludes the use of aluminum. (Petition at 32.) This is untrue. Lesniak itself defines the terms “natural composition” and “natural ingredients” as used in its patent to refer to the use of “ingredients which are extracted from the earth or sea, derived from plants, or synthesized by other organisms.” (Ex. 1003 at 4:61-67.) Aluminum is necessarily included in this definition, as aluminum is “extracted from the earth,” and, in fact, is one of the most abundant elements in the earth’s crust. (*See* Ex. 2011 at ¶ 52.)

monograph “Antiperspirant Drug Products for Over-the-Counter Human Use,” and every single one comprises an aluminum compound or complex:

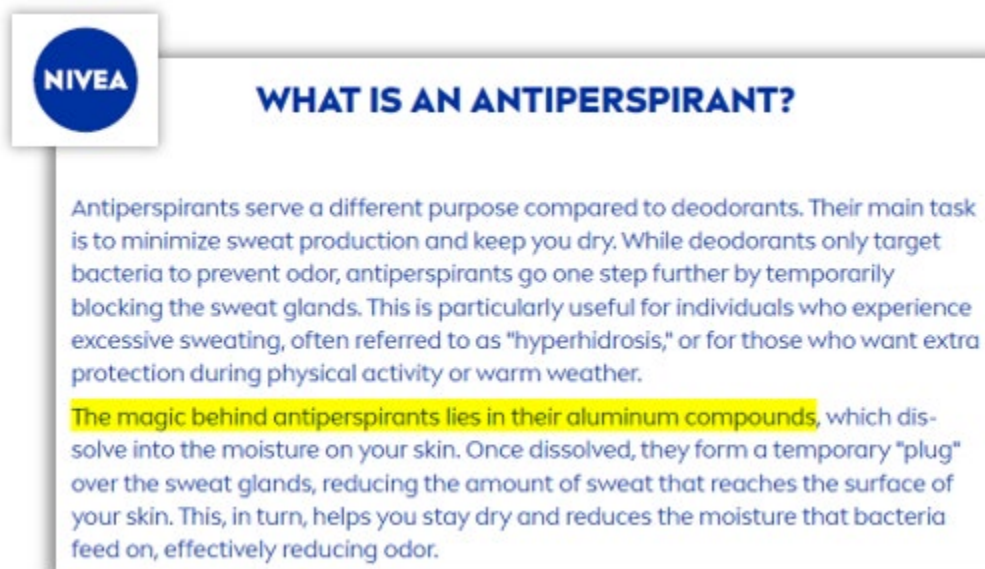
- (a) Aluminum chloride up to 15 percent, calculated on the hexahydrate form, in an aqueous solution nonaerosol dosage form.
- (b) Aluminum chlorohydrate up to 25 percent.
- (c) Aluminum chlorohydrate polyethylene glycol up to 25 percent.
- (d) Aluminum chlorohydrate propylene glycol up to 25 percent.
- (e) Aluminum dichlorohydrate up to 25 percent.
- (f) Aluminum dichlorohydrate polyethylene glycol up to 25 percent.
- (g) Aluminum dichlorohydrate propylene glycol up to 25 percent.
- (h) Aluminum sesquichlorohydrate up to 25 percent.
- (i) Aluminum sesquichlorohydrate polyethylene glycol up to 25 percent.
- (j) Aluminum sesquichlorohydrate propylene glycol up to 25 percent.
- (k) Aluminum zirconium octachlorohydrate up to 20 percent.
- (l) Aluminum zirconium octachlorohydrate gly up to 20 percent.
- (m) Aluminum zirconium pentachlorohydrate up to 20 percent.
- (n) Aluminum zirconium pentachlorohydrate gly up to 20 percent.
- (o) Aluminum zirconium tetrachlorohydrate up to 20 percent.
- (p) Aluminum zirconium tetrachlorohydrate gly up to 20 percent.
- (q) Aluminum zirconium trichlorohydrate up to 20 percent.
- (r) Aluminum zirconium trichlorohydrate gly up to 20 percent.

21 C.F.R. 350.10.

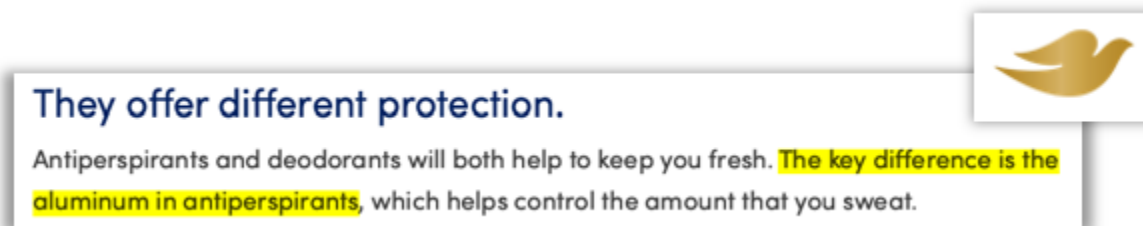
Petitioner urges the Board in a footnote to disregard this fact, citing the Federal Circuit’s *Persion* decision and arguing “the standards for anticipation and obviousness are distinct from FDA regulatory requirements.” (Petition at 26 (quoting *Persion Pharms. LLC v. Alvogen Malta Ops. Ltd.*, 945 F.3d 1184, 1193 (Fed. Cir. 2019).) But *Persion* does not support Petitioner. The issue there was whether it was proper for the district court to consider FDA safety data and other statements when evaluating a POSA’s motivation to combine, and the Federal

Circuit ultimately declined to find error with the district court's analysis. *Id.* at 1192-94.

Here, the FDA-approved antiperspirant actives inform the POSA's knowledge about the scope of Lesniak's disclosure. (Ex. 2011 at ¶ 53.) A POSA would have understood, based on both FDA requirements and as a matter of common knowledge in the field, that Lesniak's "antiperspirant" contains aluminum. (*Id.*) This is standard across the industry:



(Ex. 2014 (Nivea).)



(Ex. 2015 (Dove).)

Secret.

What is the difference between an antiperspirant and a deodorant?

The short answer is the aluminum active ingredient.* Simply put, antiperspirants have it, and deodorants don't. That's the difference...and if that's all you wanted to know—then you have your answer. But if you'd like to learn more, let's dive a little deeper so you can find the protection that's right for you.

(Ex. 2016 (Secret).)

Furthermore, the most important difference between antiperspirant is actually one specific ingredient, aluminum. If that stink stick contains aluminum, the product is an antiperspirant. Aluminum is the sweat blocking active ingredient in antiperspirant products, which aims to control or prevent sweat entirely. Metallic salts and aluminum chloride are the active ingredients in antiperspirants. The aluminum in your antiperspirant is activated when you start to sweat. It then gets absorbed into your sweat glands, and forms a plug that blocks sweat from leaving your body. So even though your body is producing sweat it isn't able to reach the surface of the skin.



(Ex. 2017 (Petitioner Dr. Squatch's website).)

The POSA's understanding of "antiperspirant" to include aluminum is fatal to Petitioner's obviousness argument. (Ex. 2011 at ¶ 54.) Even if the Board were to accept Petitioner's argument that Lesniak teaches a "deodorant stick" through its single-instance "antiperspirant" disclosure—notwithstanding Lesniak's teachings as a whole directed to high zinc oxide concentration sunscreens and diaper creams, and its mere passing and contradictory use of the term "antiperspirant"—Petitioner's claim mapping would fail as to the aluminum-free requirement of the challenged claims. Put differently, if Lesniak sufficiently discloses "a deodorant stick in the

form of an antiperspirant stick” as Petitioner contends (and Lesniak does not), then that Lesniak stick contains aluminum. (*See* Petition at 26.) Either way, Petitioner does not establish that the Lesniak-based grounds disclose each and every element of the challenged claims.³ (Ex. 2011 at ¶¶ 49-54.)

3. *Lesniak’s Purported Disclosure of a Deodorant Stick is Non-Enabling.*

For yet an additional reason, Lesniak fails to render obvious the “deodorant stick” limitation of all claims: its disclosure is decidedly non-enabling. Petitioner contends “Lesniak discloses a deodorant stick in the form of an antiperspirant stick.” (Petition at 26.) But Lesniak fails to enable an antiperspirant stick, and certainly fails to enable a deodorant stick.

³ To the extent Petitioner contends Lesniak’s sunscreen and diaper cream formulations do not need to be modified before serving as an antiperspirant or deodorant, and in that scenario, would be aluminum-free, that is wrong. For the reasons already discussed above, a POSA would not have considered Lesniak’s upwards of 20% zinc oxide formulas to be an antiperspirant or the claimed “deodorant stick.” And Petitioner’s expert could not identify which of Lesniak’s formulations would indeed work as a deodorant or form a deodorant stick. (*See* Ex. 2012 at 65:2-66:20.)

Lesniak never mentions an antiperspirant *stick*,⁴ and of course never discloses a *deodorant stick*. (Ex. 2011 at ¶¶ 55-56.) In fact, the only “stick” formulation Lesniak expressly teaches is a sunscreen stick:

TABLE 7	
Sunscreen Stick Formulation	
Material	Weight %
Caprylic/capric triglyceride	51
Zinc oxide	20
Beeswax	13.5
Sunflower seed oil	7.4
Sunflower seed wax	5
Hydrogenated castor oil (Castor Wax MP80)	3
Vitamin E Acetate	0.1

(Ex. 1003 at Table 7; *see also* Ex. 2012 at 75:5-10 (Petitioner’s expert confirming that Table 7 “is the only one that contains the ingredients that Lesniak discloses as creating [a] stick”).

For an alleged anticipatory reference to be enabling, that reference alone must “enable one of ordinary skill in the art to make the invention without undue experimentation.” *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assoc., Inc.*, 670 F.3d 1171, 1184 (Fed. Cir. 2012) (quoting *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 975 (Fed. Cir. 2010)). “To render a claim obvious, the prior art, taken

⁴Note that at the time of the invention, antiperspirants and deodorants were available in different forms, including sprays, creams, liquids, and gels. (Ex. 2011 at ¶ __; Ex. 1002 at ¶ 34.)

as a whole, must enable a skilled artisan to make and use the claimed invention.” *Raytheon Techs. Corp. v. Gen. Elec. Co.*, 993 F.3d 1374, 1380 (Fed. Cir. 2021); *see also In re Kumar*, 418 F.3d 1361, 1368 (Fed. Cir. 2005). “In the absence of such other supporting evidence to enable a skilled artisan to make the claimed invention, a standalone § 103 reference must enable the portions of its disclosure being relied upon.” *Raytheon*, 999 F.3d at 1381. Lesniak cannot satisfy these standards in either Petitioner’s standalone Lesniak ground or its combinations, because Lesniak’s compositions are riddled with instability problems, and there is no indication that a POSA could have derived from Lesniak *any* stable cosmetic stick (including a sunscreen stick); there is certainly no indication that a POSA could have derived from Lesniak a stable *deodorant* stick. (Ex. 2011 at ¶ 58.)

Lesniak describes a test to assess “[t]he physical stability of each composition,” and presents the results of that testing in Table 2. (Ex. 1003 at 11:8-26.) Lesniak explains that out of the eleven (non-stick) sunscreen compositions evaluated, *only two* were physically stable when stored at 49°C and did not exhibit “separation”:

TABLE 2											
Sunscreens.											
	Composition#										
	1*	2*	3*	4*	5*	6*	7*	8	9*	10*	11
	Weight %										
Zinc Oxide	20	20	20	20	20	20	20	20	20	20	20
Sunflower oil	57	30	10	10	10	10	10	10	10	10	12.5
Caprylic/Capric Triglyceride	5	35	55	53	53	54	54	53	53	50	52
Beeswax	13	15	15	17	17	15	15	15	15	15	13.5
Shea butter	5	0	0	0	0	0	0	0	0	0	0
CastorWax MP80 hydrogenated castor oil	0	0	0	0	0	0	0	2	0	0	2
Tapioca starch	0	0	0	0	0	0	1	0	0	0	0
Cetyl Alcohol	0	0	0	0	0	0	0	0	2	0	0
Thickener silica	0	0	0	0	0	1	0	0	0	0	0
Natural jelly SP511	0	0	0	0	0	0	0	0	0	5	0
Total	100	100	100	100	100	100	100	100	100	100	100
Freeze/thaw stability	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3	F/T 3
	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
High temp. stability (49° C.)	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Pass	Fail	Fail	Pass
“Whitening” acceptability	No	No	Yes	Yes	Yes	No	No	Yes	No	No	Yes
Dispensing acceptability	No	No	No	No	No	No	No	Yes	No	No	Yes
Greasiness/after-feel acceptability	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

*denotes comparative composition.

(*Id.* at Table 2; *see also id.* at 11:17-19 (explaining a “fail” in physical stability “indicat[es] separation into two bulk phases”). As to its only stick formulation—the sunscreen stick taught in Table 7—Lesniak is silent as to stability. (*See id.* at Table 7; Ex. 2011 at ¶¶ 59-60.)

As explained by Dr. Lochhead, the instability of Lesniak’s formulas is consistent with a POSA’s understanding of the complex interactions involved in crystalline semisolids. (Ex. 2011 at ¶ 61.) As a POSA would have understood, Lesniak’s structured compositions comprise a network of crystals that physically

trap liquid in their interstices. (*Id.*) The texture, stability, and bulk properties of these compositions depend upon their microcrystal morphology—the size, shape, and strength of interaction between the crystals in the fractal network—which varies with the amount and type of liquid component(s) used as the carrier system. (*Id.*) A POSA would have recognized Lesniak utilizes a triglyceride-based carrier system. (*Id.*; Ex, 1003 at Tables 2-3, 5, 7.)

A POSA would have appreciated and been aware of the morphological crystal changes that could result from any alteration in the structured composition, such that even the slightest variation in ingredients as to the carrier system or structurants could yield an unstable composition, and if in the form of a stick, an unusable stick. (Ex. 2011 at ¶ 62.) Lesniak itself acknowledges this, as its disclosure evidences the inventors’ struggle to find compositions that pass stability tests. (*E.g.*, Ex. 1003 at Table 2.) As the POSA would have known and appreciated, physical stability upon storage is a widely recognized requirement for cosmetic products, including deodorant and antiperspirant sticks. (Ex. 2011 at ¶ 62.)

Importantly, Lesniak reveals only *slight differences* in a composition can cause it to go from stable to unstable, exemplifying the fragility of these crystal-network-structured semisolids. (Ex. 2011 at ¶ 63; *see also* Ex. 1003 at 12:1-5.) Comparing a few of Lesniak’s Table 2 compositions is instructive:

Ingredient	Unstable Comp. 4	Unstable Comp. 5	Unstable Comp. 7	Stable Comp. 8	Stable Comp. 11
Zinc Oxide	20	20	20	20	20
Sunflower Oil	10	10	10	10	12.5
Caprylic / Capric Triglyceride	53	53	54	53	52
Beeswax	17	17	15	15	13.5
Castor Wax <u>MP80</u>	0	0	0	2	2
Tapioca Starch	0	0	1	0	0
Total	100	100	100	100	100

(See Ex. 1003 at Table 2.)

Only Compositions 8 and 11 passed Lesniak’s stability tests, though their formulations contain only slight deviations from comparative non-stable compositions. (Ex. 1003 at 12:1-5.) For example, the only difference between unstable Compositions 4 and 5, and stable Composition 8, is that 2 percent of the beeswax was replaced by the same weight percent of castor wax. (See Ex. 2011 at ¶ 64.) Unstable Composition 7 also has nearly identical ingredients, except it includes an extra percent by weight of the triglyceride and 1% tapioca starch. A POSA would thus have understood from Lesniak that very small changes any of its compositions could yield an unstable and separated composition. (*Id.* at ¶¶ 64-66.)

In light of Lesniak’s conceded stability issues and failure to disclose a stable “stick” composition, Lesniak would not have enabled a POSA to create an operative, solid deodorant stick with the ingredients Lesniak discloses, without undue experimentation. (Ex. 2011 at ¶ 67.) This is “strong evidence” that the reference is

non-enabling. *In re Kumar*, 418 F.3d at 1369 (“[I]f it were shown that the Rostoker product could not be produced by the Rostoker method, that would be relevant evidence concerning whether Rostoker rendered obvious the Kumar product.”); *cf.* *In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985) (POSA’s inability to re-create compound based on reference would be “strong evidence” that the reference is non-enabling). In some cases, a reference’s “self-enablement (or lack thereof) is not only relevant to the enablement analysis, ... it is dispositive.” *Raytheon Techs. Corp. v. Gen. Elec. Co.*, 993 F.3d 1374, 1382 (Fed. Cir. 2021).

In sum, Lesniak provides no teaching of a stable “deodorant stick,” no teaching of a stable “antiperspirant stick,” and at least nine different sunscreen formulas with slight variations that are all unstable. (Ex. 2011 at ¶ 68.) Among all of this is one example *sunscreen* “stick” as to which stability is unknown. A POSA armed with Lesniak’s disclosure on the fragility of its crystal-network-structured compositions—which lacks guidance as to how to formulate a stable deodorant or antiperspirant stick—would not have been enabled to make and use the claimed “deodorant stick.” (Ex. 2011 at ¶¶ 55-69.) None of Petitioner’s other references remedy this deficiency; Petitioner does not attempt to argue that they do.

Petitioner’s Lesniak-based grounds fail to invalidate claims 1-13 and 16-19 for this additional, independent reason.

B. Petitioner Admits A POSA Would Have Had No Reason to Modify Lesniak.
(Grounds 1-4: All Claims 1-13, 16-19)

Turning to Petitioner's combinations, first, Petitioner does not identify any deficiencies of the (few) stable compositions of Lesniak that would have provided a POSA motivation to modify it, aside from what Petitioner gleans from hindsight. (Ex. 2011 at ¶ 70.) In fact, in numerous places throughout the Petition, Petitioner and its expert argue *against* any modification of Lesniak, asserting a POSA "would have understood Lesniak's formulations *to be complete deodorant sticks that did not require additional ingredients.*" (Petition at 29, 35; *see also* Ex. 1002 at ¶ 76 (Petitioner's expert stating in her declaration: "[I]n my opinion, a POSA would have understood Lesniak's formulations to be complete deodorant sticks that did not require additional ingredients....").) Petitioner's expert doubled down on the standalone sufficiency of Lesniak at her deposition. When asked whether "the formulations in Lesniak require a modification in order to be turned into a deodorant," she answered: "No. They are deodorants." (Ex. 2012 at 59:4-7.)

Yet Petitioner *also* contends that a POSA *would have* sought to modify Lesniak by adding and changing a host of different ingredients and their amounts. (See Petition at 24-37.) These inconsistent arguments undermine the strength of the Petition, and in any event, the notion of completely reformulating Lesniak is unfounded. Petitioner fails to explain why a POSA would have been motivated to

reformulate Lesniak in any of these ways, and how a POSA could have had a reasonable expectation of success of making the deodorant stick of the '647 Patent claims through these modifications. In fact, given the POSA's understanding of Lesniak's high zinc oxide concentrations and instability challenges—with only two of twelve proposed formulations passing stability testing—the POSA would have been dissuaded from even attempting to use Lesniak as a starting point or modifying any of Lesniak's formulations. (Ex. 2011 at ¶¶ 71-72.)

Patent Owner addresses in more detail below Petitioner's specific motivation to combine arguments as to Phinney, Bianchi-518, and Nabavi, but each combination suffers from this threshold deficiency.

**C. The Lesniak and Bianchi-518 Combination Does Not Support a *Prima Facie* Case of Obviousness.
(Grounds 2-4: Claims 1-7, 9-13, 18-19)**

Next, the combination of Lesniak with Bianchi-518 is improper and does not support a *prima facie* case of obviousness. As discussed, Lesniak discloses anhydrous, natural compositions and touts a desire “to formulate such compositions from all-natural ingredients (i.e. ‘100% natural’ compositions),” “which are extracted from the earth or sea, derived from plants, or synthesized by other organisms.” (Ex. 1003 at 4:61-64, 5:29-31.) In stark contrast, the antiperspirant compositions of Bianchi-518 require 30-50% of volatile silicone, which is not a natural ingredient. (Ex. 1006 at 1:56, 2:14, 4:9-12.) The POSA would not have been

motivated to consider the teachings of Bianchi-518 in combination with Lesniak, as the Bianchi compositions require large amounts of non-natural ingredients (volatile silicones), and using such non-natural ingredients would defeat the core objective of Lesniak to provide natural compositions. *See In re Fritch*, 972 F.2d 1260, 1265 (Fed. Cir. 1992); *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). (Ex. 2011 at ¶ 73.)

D. Petitioner’s References Do Not Disclose or Render Obvious the Hardness Limitation of Claims 1-13 and 18-19.
(Grounds 2-4: Claims 1-13, 18-19)

Turning to Petitioner’s combinations, Petitioner does not show that its proposed combination of Lesniak and Bianchi-518 discloses the stick hardness range “from about 70 mm*10 to about 140 mm*10, as measured by penetration with [a 50-g total force] ASTM D-1321 needle,” as required by claims 1-6, 8-13, and 18-19, or “from about 90 mm*10 to about 110 mm*10,” as required by dependent claim 7.

1. Neither Lesniak nor Bianchi-518 Disclose a Stick of the Claimed Hardness.

Petitioner does not identify a *single reference* that discloses or even suggests the claimed hardness ranges. Petitioner admits its key reference Lesniak “does not expressly teach” the hardness limitations. (Petition at 30.) Lesniak states its stick embodiments “can have a hardness of 300 to 550 g,” as measured using a texture analyzer, with its only formulated stick having a desired hardness of 432 g. (Ex. 1003 at 9:60-61, 15:41-42.) Neither Petitioner nor its expert attempt to convert this hardness to the metric claimed in the ’647 Patent, and Petitioner’s expert cannot say

whether Lesniak's range is too soft, too hard, or overlapping at all with the '647 Patent. (*See* Ex. 2012 at 76:21-78:6.)

Petitioner thus contends a POSA would have been motivated to combine Lesniak with Bianchi-518, which allegedly discloses the claimed hardness range. (Petition at 30-33.) Not so. Petitioner fails to provide a *prima facie* case of obviousness for the reasons discussed above, but further, Petitioner's argument is premised on a false equivalency between the hardness measurements disclosed in Bianchi-518 and those claimed in the '647 Patent (100 grams vs. 50 grams). (*See* Ex. 2011 at ¶¶ 74-78.) In fact, the Bianchi hardness test uses a needle and shaft with *double the weight* of the needle and shaft used in the '647 Patent, and thus its so-called same or similar hardness ranges reflect that the Bianchi compositions are actually *significantly harder* than those claimed in the '647 Patent (*i.e.*, it requires twice the weight of the penetration needle assembly to yield similar penetration depths). (*Id.*) Petitioner's failure to understand this difference in testing methodology is fatal to its case on the hardness claims.

Bianchi-518 teaches a hardness range of "7.0 to about 14.0 mm" based on penetration results using the ASTM D-1321 testing method, which utilizes 100 grams of weight. (Ex. 1006 at 2:58, 6:25-28; Ex. 2011 at ¶¶ 79-81; Ex. 2018 at 5-6 ("Place a 50-g weight above the penetrometer needle, making a *total load of 100 ± 0.015 g* for the needle and all attachments.")) This ASTM D-1321 hardness

penetration method using 100 grams of total load was readily known to a POSA. (Ex. 2011 at ¶ 81.)

The '647 Patent uses a different hardness testing method. The '647 Patent explains that its invention exhibits a hardness in the range of “70 mm*10 to about 140 mm*10” (independent claims 1, 18) or “90 mm*10 to about 110 mm*10” (dependent claim 7) as measured using an ASTM D-1321 penetration needle in a test similar to ASTM D-1321, but with a significant difference: “the total weight of the shaft and needle is 50±0.2 grams when the shaft is in free fall.” ('647 at 23:25-26.) The '647 Patent's method does not include the extra “50-g weight” added to the needle in the standard ASTM D-1321 test utilized by Bianchi-518 and therefore does not utilize a 100-gram load as required by the hardness test of Bianchi-518. (Ex. 2011 at ¶ 82.)

In other words, the hardness values in Bianchi-518 reflect its antiperspirant stick's response to 100 grams of shaft and needle weight, whereas the hardness values in the '647 Patent reflect the response of the claimed deodorant stick to 50 grams of shaft and needle weight. (Ex. 2011 at ¶ 83.) Thus, the hardness values disclosed in Bianchi-518 are based on the penetration depth of a needle assembly having *two times the weight* of the needle assembly utilized in the '647 Patent. (*Id.*) If the Bianchi compositions were tested using the method of the '647 Patent (*i.e.*, with a 50-g total needle assembly, as opposed to a 100-g one), the 50-g assembly

would have a much shorter penetration distance than an assembly twice its weight. (*Id.*)

Thus, while Petitioner attempts to paint the Bianchi-518 harness range as overlapping with the '647 Patent hardness range, the two ranges are not overlapping at all. They are significantly different—they reflect very similar penetration values for very different load weights. A POSA would have understood that Bianchi-518 required a 100-g weight needle assembly that would penetrate to a greater distance than a 50-g weight needle assembly would penetrate in the '647 claimed compositions. (Ex. 2011 at ¶ 84.) Dr. Lochhead explains that while there are no formulas to convert the results of one of these methods to the other, a POSA would have expected that the hardness range disclosed in Bianchi-518 actually indicates *significantly harder* sticks than that claimed in the '647 Patent. (*Id.*)

In short, Petitioner has not cited any reference disclosing the hardness range as measured by the test defined in the '647 Patent, and thus no reference with the hardness range specified in the claims of the '647 Patent. This failure alone is fatal to all of the Lesniak-based grounds for claims 1-13 and 18-19.

2. *Even If the Claimed Hardness Range Is Disclosed (It Is Not), Petitioner's Argument Still Fails.*

Moreover, even if Bianchi-518's hardness range was relevant to the hardness range of the '647 Patent claims—which it is not—Petitioner's argument still falls short for several additional reasons.

First, Bianchi-518 expressly ties its hardness disclosure to the specific inventive antiperspirant compositions described in the reference, which as Dr. Lochhead explains, are silicone-based, and which contain aluminum salts or aluminum complexes—ingredients the claims of the '647 Patent expressly exclude. (*Id.*; Ex. 2011 at ¶ 87.) Bianchi-518 discloses Compositions A–U, with their ingredients expressed in weight percentages in the tables below. As highlighted, each of Bianchi-518's compositions contain one or more aluminum salts or complexes:

Ingredient	A	B	C	D	E	F	G	H
Cyclomethicone DC245	40.3	38.0	37	41.32	41.57	36.49	39	36
Phenyl Trimethicone DC556			4			2.0		2
Paraffin wax SF1642	16.92	9.25	18	16.05	16.05	9.37	17	12.08
Silicone wax		7.75		1		3.22		
Castorwax	6.85	10.0	3	5.98	5.98	10.13	7	10.98
PEG-8	2.85			4.5	4.2	4.63		4.94
Distearate								
Hydrogenated Vegetable oil							1	
Finsolv TN	1.55				1		2	
PPG-14	10.03	12.5	12.5	10.4	10.4	12.66	10	12.5
Butyl ether								
AZG-370	20.00	22.0	22.0	20.0	20	20	22	20
Talc			1.5					
Fragrance	1.50	0.5	2.0	0.75	0.8	1.5	2	1.5

Ingredient	I	J	K	L	M	N
Cyclomethicone DC245	41.05	41.32	38.85	36.8	39.10	37.07
Paraffin wax	16.92	16.05	16.01	16.92	15.19	16.05
Castorwax	6.85	5.98	6.48	6.85	5.66	5.98
PPG-14 Butyl ether	10.03	10.40	9.49	10.03	9.84	10.40
Finsolv TN	1.55	—	1.47	1.55	—	—
PEG-8 Distearate	2.85	4.50	2.70	2.85	4.26	4.50
SF 1642	—	1.00	—	—	0.95	1.00
AZG-370	20.00	20.0	—	—	—	—
Q 5-7167	—	—	24.00	24.00	24.00	24.00
Fragrance	0.75	0.75	1.00	1.00	1.00	1.00

Ingredient	O	P	Q	R
DC 345	38.85	36.80	39.10	37.07
Paraffin wax	16.01	16.92	15.19	16.05
Castorwax	6.48	6.85	5.66	5.98
Fluid AP	9.49	10.03	9.84	10.40
Finsolv TN	1.47	1.55	—	—
Estol EO4DS3724	2.70	2.85	4.26	4.50
SF 1642	—	—	0.95	1.00
AZG-370	—	—	—	—
Q 5-7167	12.00	12.00	12.00	12.00
AZG 6313-15	12.00	12.00	12.00	12.00
Fragrance	1.00	1.00	1.00	1.00

Ingredient	S	T	U
CYCLOMETHICONE DC 245	34.8	37.8	36.7
PHENYL TRIMETHICONE DC556	—	—	—
Paraffin wax	8.5	9.25	9.05
SF 1642 Silicone Wax	1.5	1.5	1
Castor wax	10.5	6.85	8
PEG-8 Distearate	5.5	9.25	5
Hydrogenated Vegetable Oil	—	—	—
Finsolv TN	—	—	—
PPG-14 Butyl Ether	18.5	16	16.5
AZG-370	20	20	—
W ZR30B DM CP5**	—	—	23
Talc	—	—	—
Fragrance	0.7	0.7	0.75

**Aluminum Zirconium Trichlorohydrate-Gly

(Ex. 1006 at 3:45-67, 5:15-6:14; Ex. 2007 at 1:17-18, 7:15, 9:18-21.) Petitioner's expert agrees that all of these compositions contain aluminum. (Ex. 2012 at 99:6-

101:17.) The Petition is silent on Bianchi-518's use of aluminum, and neither Petitioner nor its expert explain how a POSA could have achieved the hardness range taught for Bianchi-518's aluminum-based compositions in an aluminum-free deodorant composition.

Second, Petitioner fails to explain why a POSA would have been motivated to modify the hardness of Lesniak in the first place, given Petitioner's assertion that it is allegedly a "complete deodorant stick[]" that did not require additional ingredients or modifications. (*See* Petition at 29). Petitioner's expert concedes Lesniak does not identify any deficiencies with the hardness of its compositions such that a POSA would have sought to modify it. (*See* Ex. 2012 at 76:2-7 (Q: "And Lesniak doesn't indicate anywhere that this hardness is insufficient, right?" A: "I believe he doesn't." Q: "He doesn't say that the sticks are too soft or too hard?" A: "I believe not...."); *see also* Ex. 1002 ¶ 76.) And Lesniak's known stability issues would have further dissuaded a POSA from modifying it. (Ex. 2011 at ¶ 88.) Beyond hindsight reconstruction, Petitioner provides no basis for its obviousness argument.

Third, given the POSA's understanding of the instability of Lesniak's compositions, a POSA would not have been able to arrive at the claimed hardness through routine optimization of Lesniak, nor would he or she had a reasonable expectation of success in modifying Lesniak to achieve the purported hardness of Bianchi-518 (which, again, does not overlap with the '647 Patent's claimed range in

the first place). (Ex. 2011 at ¶ 89.) “[K]nowledge of the goal does not render its achievement obvious.” *Abbott Laby’s. v. Sandoz, Inc.*, 544 F.3d 1341, 1352 (Fed. Cir. 2008); *see also Procter & Gamble Co. v. McNeil-PPC, Inc.*, 615 F. Supp. 2d 832, 849-50 (W.D. Wisc. 2009). And here, even if the Board were to ignore the falsity of Petitioner’s hardness range comparisons between Bianchi-518 and the ’647 claimed invention, achievement of the claimed hardness range would not have been obvious to a POSA. Neither Petitioner nor its expert tried to convert the hardness range disclosed in Lesniak to the claimed hardness metric, so neither Petitioner nor its expert can even provide a starting point for the POSA as to Lesniak’s hardness. (See Ex. 2011 at ¶ 90.)

Moreover, as discussed above, even the slightest change in Lesniak’s ingredients could yield unstable and unusable compositions. (*Id.* at ¶ 91.) And, in view of Lesniak’s Table 2, POSA would have understood that an increase in structurant content, for example, would not predictably provide physical stability to the formulation, and as such would not have affected Lesniak’s overall hardness in the easy and expected way Petitioner contends. (See Petition at 30-33; Ex. 2011 at ¶ 91; *see also* Ex. 1008 at Tables 1, 6 (showing even small changes in ingredients yield different hardnesses).) Instead, a POSA would not have had a reasonable expectation of success in modifying Lesniak to achieve the claimed hardness in a stable composition. (Ex. 2011 at ¶¶ 91-92.)

All of these additional failings further highlight Petitioner's deficient challenge to the hardness limitation, which already loses at the outset for failing to cite a single reference that teaches the hardness limitation of all claims. (Ex. 2011 at ¶¶ 86-92.)

E. A POSA Would Not Have Modified Lesniak with Phinney or Nabavi, or Have Had a Reasonable Expectation of Success in Doing So.
(Ground 3: Claim 2; Ground 4: Claims 3 and 13)

Petitioner's arguments as to the antimicrobial limitations of claims 2, 3 and 13 also lack merit. Claim 2 recites that "the primary antimicrobial is selected from the group consisting of ... magnesium hydroxide." Claim 3 requires a deodorant stick with an "additional antimicrobial different from the primary antimicrobial, selected from the group consisting of ... magnesium hydroxide, cinnamon essential oil, ... and combinations thereof," and claim 13 requires a specific water solubility of the antimicrobials. Petitioner presents several alternate theories for these claims, contending they are rendered obvious either by the combination of Lesniak and Phinney (purportedly either disclosing the use of zinc oxide as a primary antimicrobial and magnesium hydroxide as an additional antimicrobial, or the use of magnesium hydroxide as a primary antimicrobial over zinc oxide), or the combination of Lesniak with Phinney and with Nabavi (purportedly disclosing the use of magnesium hydroxide as a primary antimicrobial over zinc oxide, and also the addition of cinnamon essential oil as an additional antimicrobial). (Petition at

37-45.) Petitioner’s antimicrobial arguments fall short as to both Phinney and Nabavi. (Ex. 2011 at ¶ 94.)

1. *A POSA Would Not Have Looked to Phinney to Modify Lesniak With Petitioner’s Cherry Picking Method.*

First, Petitioner cannot show that a POSA would have been motivated to look to Phinney to completely reformulate Lesniak to include magnesium hydroxide. Petitioner contends “Lesniak teaches deodorant stick compositions that may contain zinc oxide (a known antimicrobial),” but “it does not expressly teach the use of magnesium hydroxide” and “does not expressly teach deodorant stick compositions containing at least one additional antimicrobial.” (Petition at 37, 41.) Petitioner argues a POSA would have found it obvious to add magnesium hydroxide to the composition of Lesniak, either as the primary antimicrobial required by claim 2 or the additional antimicrobial required by claim 3, “to provide ‘long lasting protection against odour’” and because of its alleged “enhanced effectiveness in preventing odor when used in combination with zinc oxide.” (*Id.* at 37-45.) Petitioner’s rationale is belied by Phinney itself.

First, Lesniak and Phinney describe entirely different uses for their metal oxides/hydroxides and a POSA would not have looked to combine their teachings on this topic. (Ex. 2011 at ¶ 96.) Lesniak includes zinc oxide in its sunscreen and diaper cream products as a protective barrier, *i.e.*, to protect the skin from sun and other irritants, and in the case of the diaper cream, to help prevent diaper rash. (*See*,

e.g., Ex. 1003 at cl. 13; *see also* Ex. 2003.) Lesniak does not use zinc oxide for odor control at all. As explained above, a POSA would have understood Lesniak's formulas with high concentrations of zinc oxide to be unsuitable for use as an underarm deodorant or antiperspirant. (Ex. 2011 at ¶ 26; *see also* Ex. 1004 at 2:33-36 (“[Z]inc oxide... [is] very unreactive against perspiration odour.”), 3:20-21.). Thus, a POSA would not have been motivated to look at Phinney to modify Lesniak or incorporate any additional antimicrobial into Lesniak “to improve odor protection,” as odor protection was not a goal of Lesniak's zinc oxide in the first place. (Ex. 2011 at ¶ 26.)

Second, Petitioner cherry picks the single ingredient magnesium hydroxide from Phinney's disclosure of a three- or four-ingredient combination to combat odor. Phinney explains that to combat odor, its compositions contain a combination of (1) magnesium hydroxide, *and* (2) zinc *hydroxide*, *and* (3) potassium chloride and/or potassium sulfate. (Ex. 1004 at 8:7-31, cl. 1.) There are two significant aspects to this multi-part odor fighting combination: the requirement of zinc hydroxide, not zinc oxide; and the requirement of potassium chloride/sulfate. (Ex. 2011 at ¶ 97.)

Phinney emphasizes the need for zinc *hydroxide*, not zinc *oxide*, stating that “[t]he zinc hydroxide typically lowers the pH of the magnesium hydroxide-perspiration odour-controlling formulation of the invention,” which “avoid[s] skin irritation.” (*Id.* at 5:31-33, 52-60.) Phinney further requires the “disinfection

capacity” of a potassium and/or sulfate potassium chloride, and makes clear at least one of these ingredients is responsible “for destroying microorganisms associated with odour.” (*Id.* at 3:66-4:4, 5:1-5, 5:64-67; Ex. 2011 at ¶ 97.)

Thus, Phinney does not teach, as Petitioner would have it, a combination of zinc oxide and magnesium hydroxide at all. Rather, Phinney utilizes an odor-fighting mixture of zinc *hydroxide*, magnesium hydroxide, *in combination with* potassium sulfate and/or chloride: “In respect of greater detail regarding the formulation, *magnesium oxide* and *zinc oxide* must have high reactivity and are *added to water along with potassium sulfate* and mixed until the magnesium oxide and zinc oxide are converted to their hydroxides.... .” (*Id.* at 8:22-41; Ex. 2011 at ¶ 97.)

Petitioner’s cherry picking of magnesium hydroxide alone is unsupported by Phinney’s disclosure and is further evidence of Petitioner’s hindsight bias. (Ex. 2011 at ¶ 97.) Petitioner’s expert acknowledges that the Phinney reference does not disclose any deodorant composition containing magnesium hydroxide without zinc hydroxide *and* the separate ingredient(s)—potassium sulfate and/or chloride—as the disinfecting agent. (Ex. 2012 at 89:4-10 (Q: “And so none of these compositions that are disclosed in Phinney contain magnesium hydroxide alone without the other two elements that we’ve discussed, right?” A: “No, because I guess his invention was the -- the actual combination that he was looking at.”))

Third, Petitioner glosses over the conversion of zinc oxide to zinc hydroxide required by Phinney. Phinney teaches its metal oxides must be converted to their hydroxides by mixing with water, lest “skin irritation will occur.” (Ex. 1004 at 4:48-51, 8:40-41.) Phinney’s compositions are, on average, 20% by weight water, whereas Lesniak’s zinc oxide compositions are anhydrous. Petitioner ignores this fundamental difference, and fails to address that a POSA would have needed to add a significant amount of water to the Lesniak compositions to convert Lesniak’s zinc oxide into zinc hydroxide, as required by Phinney’s teachings, which would have fundamentally altered the Lesniak-combination composition to the point that it might not even form a stick at all. (Ex. 2011 at ¶ 98.) Phinney suggests combining zinc oxide and magnesium oxide, which are then both hydrated in a slurry to form zinc hydroxide and magnesium hydroxide. (Ex. 1004 at 8:22-26.) Were a POSA to add Phinney’s magnesium oxide to the zinc oxide in Lesniak, neither would be converted to hydroxide in Lesniak’s anhydrous composition. (Ex. 2011 at ¶ 98.)

Fourth, Petitioner does not rectify the vast difference in the amounts of the metal oxides/hydroxides in Lesniak and Phinney. A POSA would have understood Lesniak’s upwards of 20% zinc oxide compositions to be far from the 0.5-1.5% of zinc hydroxide used in Phinney. (*Id.* at ¶ 99; *see also* Ex. 2012 at 84:14-16 (Petitioner’s expert testifying in agreement that Phinney’s zinc oxide is “much lower” than Lesniak’s).) Moreover, Phinney requires the magnesium hydroxide to

be substantially in excess of the zinc hydroxide to be effective in his deodorant compositions. (Ex. 1004 at 8:42-43.) As Petitioner's expert confirmed, "Phinney teaches [a POSA] that you should have *more* magnesium hydroxide than zinc hydroxide," and in fact, "it should be a ratio of 3 to 1." (Ex. 2012 at 83:20-84:8; Ex. 1004 at 8:42-43; Ex. 2011 at ¶ 99.) Petitioner's alleged motivations to combine do not consider the incompatibility of the disclosures in Lesniak and Phinney whatsoever.

Given the disparate teachings of the two references, which disclose two very different types of cosmetic systems (Lesniak anhydrous, triglyceride-based; Phinney water/polyol based), a POSA would not have looked to Phinney to modify Lesniak, and would not have been motivated to pluck magnesium hydroxide out of the Phinney multi-ingredient teachings to add it to the high zinc *oxide* concentration Lesniak compositions. (Ex. 2011 at ¶ 100.)

Nor would a POSA have had a reasonable expectation of success in any such modification. Indeed, as explained above, Lesniak teaches that its triglyceride-carried formulations are delicate, with even the slightest changes yielding unstable results. (Ex. 2011 at ¶ 101.) A POSA would have understood and appreciated the instability of the formulations disclosed in Lesniak, and thus would not have had a reasonable expectation of success in reformulating Lesniak to add magnesium hydroxide, at either the amount specified in Phinney or the scaled-up amount

required to maintain Phinney’s “effective” 3:1 ratio of magnesium hydroxide to zinc hydroxide. (*Id.*) And a POSA certainly would not have had a reasonable expectation of success in a reformulation comprising not just magnesium hydroxide, but also the requisite amount of water to turn Lesniak’s 20% zinc oxide into zinc hydroxide, as required by Phinney. (*Id.*)

Further, a POSA would have understood that the deodorant formulations disclosed in Phinney comprise water/propylene glycol carrier systems structured by sodium stearate, which a POSA would have appreciated is different than the anhydrous and triglyceride-based carrier systems relied on in Lesniak. (Ex. 2011 at ¶ 102.) A POSA would have known and appreciated the fundamental differences between Lesniak’s and Phinney’s technologies, in terms of their carriers, structurant(s), and crystal network, and as such, would not have had a reasonable expectation of success in combining the references’ teachings. (*Id.*)

For all of these reasons, Petitioner does not articulate a rational motivation to combine Lesniak and Phinney with any reasonable expectation of success. (Ex. 2011 at ¶¶ 93-103.

2. *A POSA Would Not Have Modified Lesniak with Nabavi Because Nabavi Does Not Teach Cinnamon in Underarm Deodorant*

Neither would a POSA have looked to Nabavi to modify Lesniak. According to Petitioner, the four-reference combination of Lesniak, Bianchi-518, Phinney, and

Nabavi discloses claim 3 because “if, as discussed above, a POSA used magnesium hydroxide as the primary antimicrobial in Lesniak’s deodorant stick, it 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.” (Petition at 44-45.)

Again, Petitioner’s proposed combination fails at the threshold. Petitioner contends a POSA would have been motivated to add two additional antimicrobials to Lesniak, yet maintains “a POSA would have understood Lesniak’s formulations to be complete deodorant sticks that did not require additional ingredients.” (Petition at 29, 35.) Both cannot be true, and Petitioner’s contradictions demonstrate its hindsight bias. (Ex. 2011 at ¶¶ 104-106.)

Moreover, Nabavi does not teach use of cinnamon essential oil as an antimicrobial in an underarm deodorant; instead, it discloses the use of cinnamon as a preservative to prevent food or product spoilage by bacteria. (Ex. 1067 at 7742; Ex. 2011 at ¶ 107.) Nabavi explains that “[c]innamon use in food products and cosmetics could be a good strategy to reduce or avoid bacterial degradation and *thus to reduce the incidence of infection caused by food and cosmetics.*” (Ex. 1067 at 7742.) Nabavi does not disclose cinnamon essential oil either as an antimicrobial to fight odor-causing bacteria, in a deodorant stick or antiperspirant stick, or as an additional antimicrobial paired with magnesium hydroxide and/or zinc oxide. (*See*

generally Ex. 1067.) In fact, Nabavi warns against the use of cinnamon essential oil in cosmetic topical formulations due to “contact dermatitis” and “inflammation and alteration of the surface epidermis” after use, and therefore states “long standing excessive use is not recommended.” (Ex. 1067 at 7742.) A POSA reading Nabavi thus would not have been motivated to include cinnamon essential oil in a deodorant underarm formulation. (Ex. 2011 at ¶ 107.)

All told, Nabavi does not describe cinnamon as an effective deodorizer for underarm applications, and instead identifies the prevention or retardation of microbially induced food and product breakdown and its potential antibacterial effect against certain infectious diseases as its key benefits. (Ex. 2011 at ¶ 108; Ex. 1067 at 7736, 7738-39.) A POSA would not have been motivated to take Nabavi’s teaching of cinnamon as a food or product preservative and add it to the ’647 Patent as a deodorant antimicrobial. Petitioner has not identified a prior art reference that recommends use of cinnamon in an underarm deodorant, and thus offers no more than hindsight based on the ’647 Patent’s teaching. *TQ Delta, LLC v. CISCO Systems, Inc.*, 942 F.3d 1352, 1361–62 (Fed. Cir. 2019).

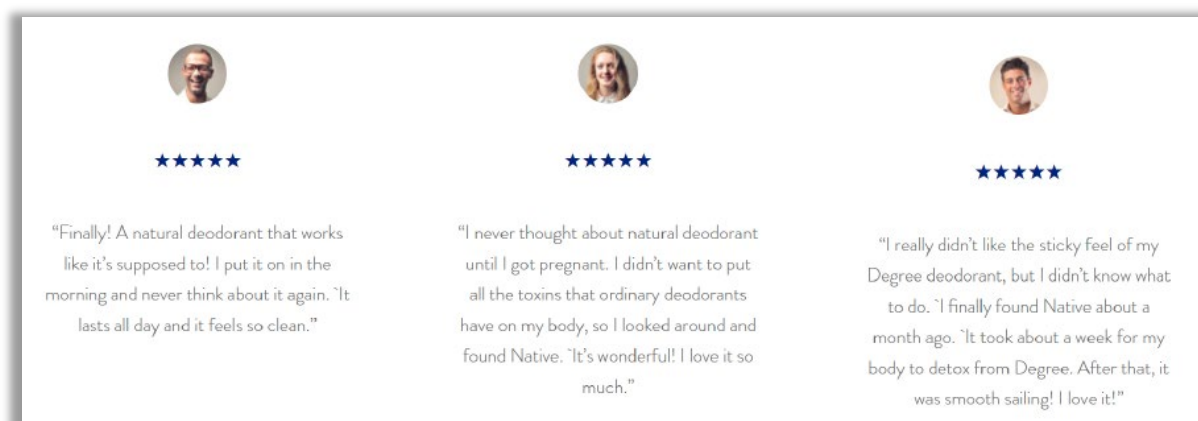
For all of these reasons, Petitioner’s Lesniak-based grounds do not render obvious claims 2, 3, and 13. (Ex. 2011 at ¶¶ 93-109.)

V. PETITIONER'S NATIVE-BASED GROUNDS ARE SIMILARLY UNCONVINCING

Petitioner's Native-based grounds fail to render obvious the challenged claims. In these grounds, Petitioner first combines Native with Bianchi-254 (Ground 5), and then adds Easy Homemade (Ground 6), and finally adds Nabavi (Ground 7) for a four-reference combination. These combinations are wholly unsupportable on both the facts and the law, for the independent reasons described below.

A. A POSA Would Have Had No Reason to Modify Native (*Grounds 5-7: All Claims 1-13, 16-19*)

As an initial matter, Petitioner provides no legitimate reason for the POSA to have modified Native at all. According to Petitioner, Native lists the ingredients of a commercially available deodorant stick that was “a known leader in the field” that had “reached internet fame” by 2017. (Petition at 46; Ex. 1010.) The Native exhibit contains uniformly positive reviews from customers:



(Ex. 1007 at 8.) Petitioner’s expert agrees there is nothing in the Native reference that indicates a problem with the Native stick. (Ex. 2012 at 117:15-118:14.). With this level of consumer acceptance and praise, and no identified issues or concerns, there was simply no reason for a POSA to have sought to modify Native. (Ex. 2011 at ¶¶ 110-112.) Petitioner’s attempts to manufacture so-called motivations are based on improper hindsight and must be rejected. *See TQ Delta*, 942 F.3d at 1361–62 (cautioning against “allowing the challenger to use the challenged patent as a roadmap to reconstruct the claimed invention using disparate elements from the prior art—i.e., the impermissible *ex post* reasoning and hindsight bias that *KSR* warned against.”). In addition to this foundational defect of all of Petitioner’s Native grounds, each combination has additional flaws, discussed in turn below.

B. The Combination of Native and Bianchi-254 Does Not Support a Case of *Prima Facie* Obviousness.
(Grounds 5-7: All Claims 1-13, 16-19)

As with Petitioner’s proposed combination of Lesniak and Bianchi-518, the proposed combination of Native and Bianchi-254 is also improper and does not support a *prima facie* case of obviousness for the same reasons. The Native reference advertises and markets to consumers an aluminum-free deodorant product containing natural ingredients. (Ex. 1007.) In contrast, Bianchi-254 discloses compositions comprising, together, up to 50% or more of a volatile silicone and aluminum-containing antiperspirant active. (*See* Ex. 1008 at [0042], Tables 1, 5; Ex.

2012 at 108:10-14.) The POSA would not have been motivated to consider the teachings of Bianchi-254 in combination with Native, as Bianchi-254's prominent use of non-natural ingredients and aluminum would defeat the core objective of Native to provide aluminum-free, natural deodorant products. *See In re Fritch*, 972 F.2d at 1265; *In re Gordon*, 733 F.2d at 902 (Fed. Cir. 1984). (Ex. 2011 at ¶ 113.)

C. A POSA Would Not Have Implemented Bianchi-254's Weight Percentages With Any Success
(Grounds 5-7: All Claims 1-13, 16-19)

An additional issue with the Native combination lies with implementing Bianchi-254's weight percentages. Specifically, Petitioner admits Native "identifies the specific ingredient to use, but lacks weight percents" as claimed in the '647 Patent, but contends Bianchi-254 "teaches the conventional weight percentages...." (Petition at 48.) This argument misses the mark.

A POSA seeking to develop a natural deodorant stick would not have been motivated to implement the weight percentages disclosed in Bianchi-254, which describes and claims antiperspirant formulations containing 50% or more by weight of aluminum and silicone. (Ex. 2011 at ¶¶ 114-15.) For example, the antiperspirant compositions disclosed in Bianchi-254 contain, *e.g.*, "from 20 to 40 wt. %" of a volatile silicone, and silicone is the ingredient often present in the greatest amount across Bianchi-254's compositions. (*See* Ex. 1008 at [0042], Tables 1, 5; Ex. 2012 at 108:10-14.) The Bianchi-254 compositions further include from 20 to 30 wt. %

of the aluminum-containing antiperspirant active. (Ex. 1008 at Tables 1, 5; Ex. 2012 at 108:10-14.)

Petitioner ignores Bianchi-254's inclusion of these ingredients, despite its sole reason for combining Native and Bianchi-254 hinging on it: "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 amount of ingredients" and "preferred hardness." (Petition at 47, 56.)

Yet Bianchi-254 does not disclose a "natural, aluminum-free deodorant stick." Petitioner does not reconcile this with its supposed motivation to combine. The Petition does not explain what would have motivated a POSA to have implemented the weight-percentages from a non-natural antiperspirant stick into the natural, aluminum-free stick of Native (if it is even possible), or what a POSA would have substituted for aluminum and volatile silicones in order to preserve the same weight percentages without the presence of the aluminum active and silicones. (Ex. 2011 at ¶¶ 115-17.) Nor does the Petition explain how a POSA would have had a reasonable expectation of success in implementing Bianchi-254's teachings while maintaining a stable composition. (Ex. 2011 at ¶¶ 117-18.)

Thus, Petitioner has not shown the Native-based grounds disclose or render obvious the limitations of any of the challenged claims.

**D. Petitioner’s Hardness Challenge Is Again Wholly Deficient.
(Grounds 6-7: Claims 1-13, 18-19)**

Just like the Lesniak-based grounds, Petitioner cannot show its Native combination discloses the hardness range required by claims 1-13 and 18-19 of the ’647 Patent.

1. No Reference Discloses a Stick of the Claimed Hardness.

None of the references cited in Petitioner’s Native-based grounds disclose a deodorant stick with the claimed hardness. Petitioner admits Native “does not disclose the hardness of the deodorant stick,” as required by most of the ’647 Patent’s claims. (Petition at 54.) Its expert agrees. (Ex. 2012 at 114:1-3.) Thus, Petitioner adds Bianchi-254, which allegedly “establish[es that] the claimed hardness range was standard.” (Petition at 54.)

Petitioner’s combination does not support a *prima facie* case of obviousness for the reasons provided above, but further, Petitioner relies on the same false equivalence of Bianchi-254’s hardness measurements to those of the ’647 Patent as it does with respect to Bianchi-518. (Ex. 2011 at ¶¶ 119-21.) Bianchi-254 discloses hardness values “from 5 to 15 mm, more particularly 5 to 10,” and “from 8 to 15 mm, preferably 8 to 10 mm,” measured pursuant to the standard DIN 51-579 hardness method. (Ex. 1008 at [0026], [0117]; Ex. 2011 at ¶¶ 120-21.) Like the ASTM D-1321 test, the DIN 51-579 method utilizes a 100-g total load for the needle assembly, whereas the ’647 Patent test requires a total needle assembly load of 50 g.

(Compare Ex. 2019 at 2 (“The weight of the test needle should be $2.5\text{ g} \pm 0.05\text{ g}$ and that of the guide rod $97.5\text{ g} \pm 0.1\text{ g}$.”), with ’647 Patent at 23:25-26.) For the same reasons explained above, if the Bianchi compositions were tested using the method of the ’647 Patent (*i.e.*, with a 50-g total needle assembly, as opposed to a 100-g one), the hardness values would be much lower. (Ex. 2011 at ¶ 121.) Thus, Bianchi-254’s desired range actually indicates *significantly harder* sticks than that claimed in the ’647 Patent. (*Id.*) Put another way, Petitioner has not cited *any reference* disclosing the hardness range as measured by the test defined in the ’647 Patent, and thus no reference with the hardness ranges specified in any of claims 1, 7, and 18. This issue alone is fatal to Petitioner’s argument on claims 1-13 and 18-19.

2. *Even if the Claimed Hardness Range Was Taught by Bianchi-254 (It Was Not), Petitioner’s Argument Still Fails.*

Even if the hardness ranges of Bianchi-254 and the ’647 Patent were overlapping (which Petitioner has not shown), Petitioner’s argument misses the mark for several additional reasons.

First, given Native’s silence as to hardness, Petitioner’s argument that a POSA would have modified Native—whether through so-called routine optimization or via Petitioner’s proposed combination with Bianchi-254—starts from a false premise. A POSA looking at the Native reference would have had no indication whether Native discloses a deodorant that is either too hard or too soft as

compared to the challenged claims. (Ex. 2011 at ¶¶ 123.) And as a result, a POSA would not have known which ingredients to alter or by how much. (*Id.*)

Second, Bianchi-254 expressly ties its hardness disclosure to the inventive formulations it discloses, stating that in “embodiment[s] of interest,” it is “desirable” that the antiperspirant stick compositions have that particular hardness. (Ex. 1008 at [0026].) As Bianchi-254 makes clear, all of its antiperspirant formulations contain aluminum—an ingredient independent claims 1, 16, and 18 expressly forbid:

COMPONENT (wt. %)	FORMULATION NO.										
	1	2	3	4	5	6	7	8	9	10	11
Castor Wax (mp 80° C.)	3.5	4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4
Stearyl Alcohol (mp 60°)	18	18	20	18	18	18	18	18	18	18	18
Polyethylene (400 mw; mp 82–84° C.)	0.3	0.5	0.5	0.5	0.5	1	1	1	1	1	1
Silica	0.3			0.3	0.3			0.5	0.5	0.75	1
PPG-14 Butyl Ether	20	5	5	20	20	9.5	15	15	25	31.25	8
C12–C15 Alkyl Benzoate (Finsolv TN)	5	20	18	5	5	15	23.5	23	13	8	31
Dimethicone, 50 cst; (Dow Corning 200)	1	1	1	1	1	1	1	1	1	1	1
Sunflower Oil	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Talc				3.5	2						2.5
AAZG (17.8%)	24	20	20	20	20	20	24	24	24	24	24
Fragrance	1	1	1	1	1	1	1	1	1	1	1
BHT (butylated hydroxytoluene)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Cyclomethicone; (Silicone 245; Dow Corning)	26.35	29.95	30.45	26.65	28.15	30.45	12.45	12.45	12.45	10.45	7.95

TABLE 5								
Antiperspirant Stick Formulations								
COMPONENT (wt. %)	FORMULATION NO.							
	12	13	14	15	16	17	18	19
Castor Wax (mp 80° C.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Stearyl Alcohol (mp 60°)	18	18	18	18	18	18	18	18
Polyethylene (400 mw; mp 82–84° C.)	1	1	1	1	1	1	1	1
Steareth 100	0.5	0.5	0.5	0.5	—	—	0.5	—
PPG-14 Butyl Ether	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
C12–C15 Alkyl Benzoate (Finsolv TN)	15	15	15	15	15	15	15	15
Dimethicone, 50 cst. (Dow Corning 200)	1	1	1	1	1	1	1	1
Sunflower Oil	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AAZG (17.8%)	20	20	20	20	30	24	20	24
Fragrance	1.25	1.25	1.25	1.25	1	1	1.25	1
Fragrance Encapsulate							1.5	1.5
BHT (butylated hydroxytoluene)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Cyclomethicone (Silicone 245; Dow Corning)	28.7	27.7	28.2	29.7	20.45	26.45	28.2	24.95
Cyclodextrin	1	2	1.5					

(Ex. 1008 at Tables 1, 5; *see also id.* at [0033] (defining AAZG as “an aluminum zirconium tetrachlorohydrate complex with glycine”).) Even Petitioner’s expert agrees that each of these formulations contain aluminum. (Ex. 2012 at 108:10-14.) The Petition is silent on Bianchi-254’s use of aluminum salts or complexes, and neither Petitioner nor its expert explain how, or whether, a POSA could have achieved the hardness of Bianchi-254’s aluminum-based compositions, let alone the hardness claims 1-13 and 18-19, in an aluminum-free deodorant composition. (Ex. 2011 at ¶ 124.

Third, a POSA would not have had a reasonable expectation of success in formulating Native to achieve the purported hardness of Bianchi-254 (which, again, is significantly harder than the claimed range). (Ex. 2011 at ¶ 125.) A POSA would have appreciated that Native’s ingredient list suggests it is an anhydrous, wax-

structured semisolid with a triglyceride-based carrier system, similar to Lesniak's examples, where even the slightest change in ingredients could yield unstable and unusable compositions. (*See id.*; *see also* Ex. 1003 at Table 2.)

For these additional reasons, compounded with Petitioner's threshold failure to cite a single reference that discloses the claimed range, Petitioner has not shown its Native-based grounds render obvious the hardness limitations of claims 1-13 and 18-19. (Ex. 2011 at ¶¶ 119-26.)

E. A POSA Would Not Have Added Easy Homemade's Magnesium Hydroxide to Native or Had a Reasonable Expectation of Success in Doing So.
(Ground 6: Claims 1-2, 4-7, 9-12, and 18-19)

Additionally, Petitioner cannot show that a POSA would have been motivated to reformulate the cited Native product to include magnesium hydroxide as an antimicrobial, or would have reasonably expected success in doing so. Petitioner argues that "[w]hile Native teaches a deodorant stick composition comprising an antimicrobial (baking soda)..., a POSA would have known that deodorants containing baking soda could cause skin irritation for some users...." (Petition at 55.) Accordingly, Petitioner claims "[a] POSA would have looked to publications in the field of deodorants describing known and preferably, natural antimicrobials that were not known to cause skin irritation," like the Easy Homemade hobbyist blog, which allegedly "confirms ... that magnesium hydroxide was a known substitute for baking soda that avoided skin irritation." (*Id.* at 55.)

As an initial matter, Petitioner has not sufficiently established that Easy Homemade is prior art that would have been publicly accessible to a POSA. Simply because a document is archived on the Internet Archive’s Wayback Machine®, does not qualify it as publicly accessible prior art for an IPR challenge, even when accompanied by a standard affidavit from the Internet Archive. *In First Solar Inc. v. Rovshan Sade*, IPR2023-00827, Paper 13 (Nov. 16, 2023). Like the Petitioner in *First Solar*, Petitioner here does not provide any evidence that interested persons exercising reasonable diligence would have been able to locate Easy Homemade at the time of the priority date of the challenged patent, such as “evidence, or even argument, that [the] webpage was ‘indexed... (through search engines or otherwise)’ and thus locatable by a search engine.” *See id.* at 18.

Petitioner’s only “evidence” of alleged public accessibility is a statement from its expert that Easy Homemade was a “part of a series of related ‘Soap Deli News’ articles... with significant engagement from individuals globally” (Ex. 1002 at ¶ 113), where she cites three different “Soap Deli News” posts in apparent support. These additional blogposts do nothing to show the public accessibility of the specific Easy Homemade blogpost on which Petitioner relies, at any time before the priority date of the challenged patent. Since Petitioner has failed to sufficiently establish Easy Homemade as a publicly accessible printed publication to the POSA as of the critical date, Petitioner’s grounds based on Easy Homemade should fail.

Further, Petitioner’s argument evinces a fundamental misunderstanding of Easy Homemade. Petitioner contends Easy Homemade teaches a POSA how to use magnesium hydroxide powder as “a known substitute for baking soda that avoided skin irritation,” but Easy Homemade does not actually teach the removal and substitution of baking soda. (Petition at 55.) Rather, the Easy Homemade hobbyist tells her followers to purchase a pre-made baking soda-free deodorant base—a base Petitioner’s expert could not identify the ingredients of—and add some magnesium hydroxide powder to it. (Ex. 1009 at 7; *see* Ex. 2012 at 120:6-8 (Q: “Do you know what natural deodorant base she’s starting with?” A: “At this stage I’m not sure.”; Ex. 2011 at ¶¶ 127-28.) As Petitioner’s expert confirms, Easy Homemade “doesn’t talk about removing any ingredients from these sticks; she’s talking about adding ingredients.” (Ex. 2012 at 121:1-9.)

Further, Petitioner cannot show why a POSA would have been motivated to look at the amateur Easy Homemade soap blog in the first place, or why a POSA would have found it necessary to modify the already-commercialized Native product. Petitioner claims baking soda can be a skin irritant, but the Native webpage also shows that its formulation includes shea butter and coconut oil, which a POSA would have understood to have anti-inflammatory and healing properties for skin. (Ex. 1007 at 15; Ex. 2011 at ¶ 129.) The Native reference also contains positive reviews

from its users, none of which discuss experiencing any skin irritation. (Ex. 1007 at 17.)

Petitioner does not show any issue with the Native formula that would have motivated a POSA to have modified it, and also does not provide any rationale behind a POSA's alleged selection of magnesium hydroxide to replace Native's baking soda, apart from hindsight. As Petitioner's expert confirms, there are many different antimicrobial options a POSA could have chosen if it wished to remove baking soda from Native, and Petitioner provides zero reasoning as to why a POSA would have selected magnesium hydroxide specifically. (*See* Ex. 2012 at 52:9-54:18; Ex. 2011 at ¶ 130.) Rather than a motivation to combine, Petitioner offers only hindsight based on a "roadmap" of the '647 Patent's successful formula. *See TQ Delta*, 942 F.3d at 1360–62.

Finally, even if a POSA would have been motivated to modify the cited Native product and replace baking soda with magnesium hydroxide, a POSA would not have had a reasonable expectation of success in any such modification. As explained above, a POSA would have understood and appreciated that compositions like Native are delicate. (Ex. 2011 at ¶ 131; *see also* Ex. 1003 at Table 2.) As Lesniak exemplifies, even the slightest changes in these types of formulas, to the degree of a single weight percent, may yield unstable results. (*Id.*) A POSA would have understood the instability that could result from a reformulation of Native, and thus

would not have had a reasonable expectation of success in modifying Native to incorporate the teachings of Easy Homemade on magnesium hydroxide. (Ex. 2011 at ¶ 131.)

Petitioner does not articulate a rational motivation to combine Native and Easy Homemade with any reasonable expectation of success. Petitioner's Native-based grounds do not render obvious claims 1-2, 4-7, 9-12, and 18-19 for this additional reason.

F. Petitioner's Arguments Regarding the Additional Antimicrobial And Nabavi are Erroneous And Contradictory.
(Ground 7: Claims 3 and 13)

Petitioner runs into more trouble with claims 3 and 13, which require the deodorant stick to have an additional antimicrobial selected from the group consisting of magnesium hydroxide and cinnamon essential oil. Petitioner contends these claims are disclosed by the four-reference combination of Native, Bianchi-254, Easy Homemade, and Nabavi. The POSA would not have been motivated to make such a combination.

First, for the reasons described above in reference to the Nabavi combination in the Lesniak-based grounds, Nabavi does not disclose cinnamon essential oil as an underarm deodorant antimicrobial, and a POSA would not have been motivated to use it as such, particularly given Nabavi's teachings of cinnamon as a skin irritant. (Ex. 1067 at 7742; Ex. 2011 at ¶¶ 133-34.)

Second, under Petitioner’s theory, the motivation for why a POSA would have looked to Nabavi to introduce cinnamon essential oil would not exist, as Native’s purported baking soda problem would have already been solved by the POSA’s implementation of Easy Homemade. To highlight, Petitioner argues that since “Native discloses a deodorant stick with an antimicrobial, baking soda, which had known skin irritation issues,” “[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.” (Petition at 64.) But Petitioner is also relying on the combination of Native and Easy Homemade here, as Petitioner argues its combination meets claim 3 because “it would have been obvious to *substitute magnesium hydroxide for baking soda* as Native’s primary antimicrobial[,] [and i]t also would have been obvious to *include an additional antimicrobial such as cinnamon essential oil* taught by Nabavi....” (Petition at 65.) If, according to Petitioner, the POSA would have replaced baking soda with magnesium hydroxide in the Native combination, then Petitioner’s motivations to further combine with Nabavi—that rest on the POSA being motivated to, again, replace baking soda in Native (*see* Petition at 65)—would not exist. (Ex. 2011 at ¶ 135.)

Petitioner’s argument is devoid of any other motivation to add Nabavi’s cinnamon essential oil as an additional antimicrobial to Native, including for the

reasons discussed above with respect to Nabavi's deficient disclosure. (*See* Section IV.D.) All that remains is improper hindsight reconstruction by cherry picking cinnamon essential oil from the prior art and adding it to an already-deficient combination of Native, Bianchi-254, and Easy Homemade, to achieve the '647 Patent's claims. *See TQ Delta*, 942 F.3d at 1360-62.

Petitioner's Native-based grounds do not render obvious dependent claims 3 and 13 for these additional reasons. (Ex. 2011 at ¶¶ 133-37.)

VI. CONCLUSION

For the reasons set forth above, the challenged claims of the '647 Patent are not unpatentable.

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CERTIFICATE OF WORD COUNT

Pursuant to Rule 37 C.F.R. 42.24(d), the undersigned hereby certifies that, based upon the word count of the word-processing system used to prepare this Response, the number of words in this Response is 12,840.

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §42.6(e), I certify that I caused to be served on the counsel for Petitioner a true and correct copy of the foregoing by email on May 2, 2025, at the following address:

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