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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CARGILL INCORPORATED,
Petitioner,

v.

BUNGE LODERS CROKLAAN USA, LLC,
Patent Owner.

Case IPR2024-01360
Patent 7,645,473

PATENT OWNER'S PRELIMINARY RESPONSE
37 C.F.R. § 42.107

TABLE OF CONTENTS

TABLE OF AUTHORITIES	III
LIST OF PATENT OWNER’S EXHIBITS	VI
CHALLENGED CLAIM LISTING FOR U.S. PATENT NO. 7,645,473	VII
I. INTRODUCTION	1
II. SUMMARY OF ARGUMENT.....	1
III. SUMMARY OF ’473 PATENT.....	5
A. The ’473 Patent	5
B. Claim 1 of the ’473 Patent.....	7
C. Prosecution History	8
IV. TECHNOLOGY OVERVIEW	9
A. Fatty Acids and Triglycerides	9
B. Interesterification.....	10
V. SCOPE AND CONTENT OF THE PRIOR ART FOR GROUND I.....	12
VI. INSTITUTION SHOULD BE DENIED FOR FAILING TO SHOW A REASONABLE LIKELIHOOD THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE	13
A. Petitioner’s Ground 1 Relies on a Covert and Flawed Inherency Argument.....	14
1. Differing Interesterification Processes Refute Inherency	19

TABLE OF CONTENTS
(continued)

	Page
2. Variability of Fatty Acid Values Further Refutes Inherency	21
3. Petitioner’s Calculations, Even Under Its Own Assumptions, Refute Inherency	31
B. The Petition’s Reliance on “General Knowledge” is Improper	32
1. The Evidence that Defeats Inherency Also Undermines Petitioner’s Obviousness Argument	32
2. The Petition’s “General Knowledge” Arguments Fail to Meet Legal and Evidentiary Standards	33
3. Petitioner’s Reliance on Specific Disclosures from Neff and Deffense Table IV Is Not “General Knowledge”	36
4. Petitioner’s Reliance on Cited Case Law is Misplaced	38
C. Petitioner Improperly Relies on Non-Ground References	39
D. Petitioner’s Analysis of Interesterification Is Erroneous and Contradictory	43
E. Petitioner’s Ground 2 Also Fails Due to Deficiencies in Ground 1	48
F. Petitioner’s POSITA Definition Further Undermines the Petition	48
VII. CONCLUSION	50

SCHEDULE A

SCHEDULE B

TABLE OF AUTHORITIES

	Page
CASES	
<i>Alcon Research, Ltd. v. Apotex Inc.</i> , No. 2011-1455, 2012 WL 3224040 (Fed. Cir. Aug. 8, 2012).....	17
<i>Apple Inc. v. MPH Techs. Oy</i> , Nos. 2021-1355, 2021-1356, 2022 WL 4103286 (Fed. Cir. Sept. 8, 2022)	41
<i>Arendi S.A.R.L. v. Apple Inc.</i> , 832 F.3d 1355 (Fed. Cir. 2016)	34
<i>Atlas Powder Co. v. Ireco, Inc.</i> , 190 F.3d 1342 (Fed. Cir. 1999)	17
<i>Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.</i> , 809 Fed. App’x 984 (Fed. Cir. 2020)	41
<i>Bright Data LTD v. Oxylabs, UAB</i> , IPR2023-01442, Paper 7 (PTAB Apr. 3, 2024)	8, 48
<i>Cont’l Can Co. USA, Inc. v. Monsanto Co.</i> , 948 F.2d 1264 (Fed. Cir. 1991)	14, 17, 21, 27, 31
<i>EmeraChem Holdings, LLC v. Volkswagen Grp. of Am., Inc.</i> , 859 F.3d 1341 (Fed. Cir. 2017)	41
<i>Ferno-Washington, Inc. v. Stryker Corp.</i> , IPR2024-00042, Paper 9 (PTAB Mar. 19, 2024).....	8, 48
<i>In re Stepan Co.</i> , 868 F.3d 1342 (Fed. Cir. 2017)	42
<i>In re Van Os</i> , 844 F.3d 1359 (Fed. Cir. 2017)	35

TABLE OF AUTHORITIES

(continued)

Page

<i>In re Zurko</i> , 258 F.3d 1379 (Fed. Cir. 2001)	34, 35
<i>Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016)	38
<i>Koninklijke Philips N.V. v. Google LLC</i> , 948 F.3d 1330 (Fed. Cir. 2020)	38, 39, 40
<i>K/S Himpp v. Hear-Wear Techs., LLC</i> , 751 F.3d 1362 (Fed. Cir. 2014)	35
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007), <i>aff’d</i> <i>Teleflex Inc. v. KSR Int’l Co.</i> , 228 Fed. App’x 988 (Fed. Cir. 2007).....	34, 38
<i>M&K Holdings, Inc. v. Samsung Elecs.</i> , 985 F.3d 1376 (Fed. Cir. 2021)	40
<i>Reactive Surfaces LTD., LLP v. Toyota Motor Corp.</i> , IPR2019-00867, Paper 6 (PTAB Sept. 18, 2019)	42-43
<i>Regents of Univ. of California v. Broad Inst., Inc.</i> , 903 F.3d 1286 (Fed. Cir. 2018)	47
<i>Schering Corp. v. Geneva Pharms., Inc.</i> , 339 F.3d 1373 (Fed. Cir. 2003)	17
<i>Takeda Chem. Indus., Ltd. v. Alphapharm Pty, Ltd.</i> , 492 F.3d 1350 (Fed. Cir. 2007)	34

TABLE OF AUTHORITIES
(continued)

Page

STATUTES AND OTHER AUTHORITIES

35 U.S.C. § 102	17
35 U.S.C. § 103	13, 17
35 U.S.C. § 103(a) (2012)	34
35 U.S.C. 103(a) (pre-AIA)	49
35 U.S.C. § 314	1
37 C.F.R. § 42.107(a)	1
37 C.F.R. § 42.108(c)	1
MPEP § 2144.03 (9 th ed., Rev. 01.2024, Nov. 2024)	34

LIST OF PATENT OWNER'S EXHIBITS

PO Exhibit Number	Description
2001	Declaration of Eric A. Decker, Ph.D. ("Decker Decl.")
2002	<i>Curriculum vitae</i> of Eric A. Decker, Ph.D.
2003	Gurr <i>et al.</i> , "Lipids in Foods," <i>Lipid Biochemistry</i> , 5 th ed., Osney Med, Oxford: Blackwell Science, pp. 131-132 (2002) ("Gurr")
2004	Wang, "Soybean Oil," in Gunstone, ed., <i>Vegetable Oils in Food Technology: Composition Properties and Uses</i> , Boca Raton, Florida: CRC Press, pp. 18-58 (2002) ("Wang")
2005	Lin, "Palm Oil," in Gunstone, ed., <i>Vegetable Oils in Food Technology: Composition Properties and Uses</i> , Boca Raton, Florida: CRC Press, pp. 59-97 (2002) ("Lin")
2006	Rossell <i>et al.</i> , "Composition of Oil," <i>Journal of the American Oil Chemists' Society</i> , 62(2):221-230 (1985) ("Rossell")
2007	FAO and WHO. 1999. Standard for Named Vegetable Oils. Codex Alimentarius Standard, No. CSX 210-1999. Codex Alimentarius Commission. Rome. ("Codex Stan")
2008	Defendant's Answer to Amended Complaint for Patent Infringement, Defenses, and Counterclaims filed on December 4, 2024 in <i>Bunge Loders Crokiaan USA, LLC v. Cargill, Inc.</i> , Civil Action No. 1:24-cv-00884-RGA (D. Del.)

CHALLENGED CLAIM LISTING FOR U.S. PATENT NO. 7,645,473

1. [1Preamble] A vegetable fat composition comprising glycerides, wherein the triglyceride content of the composition is:

[1a] 6 to 20% SSS,

[1b] 5 to less than 20% SUS

[1c] 5 to less than 25% SSU

[1d] 10 to 39 [%] SU₂ and

[1e] at least 20% U₃,

[1f] wherein S is a saturated fatty acid residue having 16 to 24 carbon atoms and U is an unsaturated fatty acid residue having at least 18 carbon atoms and all percentages are by weight based on the total triglycerides present in the composition,

[1g] the weight ratio SUS/SSU is between 0.5 and 2.0,

[1h] the weight ratio of (saturated fatty acid residues having 18 to 24 carbon atoms)/(saturated fatty acid residues having 16 carbon atoms) in the total S content of the triglycerides is less than 0.2,

[1i] and the triglycerides contain less than 3% of arachidic and behenic acid residues based on the total fatty acid residue content of the triglycerides.

6. Composition as claimed in claim 1, wherein the S₂U content is less than 35%.

7. Composition as claimed in claim 1, wherein the S₃ content is greater than 8%.

8. Composition as claimed in claim 1, wherein the weight ratio of (saturated fatty acid residues having 18 to 24 carbon atoms)/(saturated fatty acid residues having 16 carbon atoms) in the total S content of the triglycerides is less than 0.15.
9. Composition as claimed in claim 1, wherein the saturated fatty acid residue content of the triglycerides is less than 40% by weight of the total fatty acid residues in the triglycerides.
11. Composition as claimed in claim 1 having an N_{10} of 20 to 50.
12. Composition as claimed in claim 1 having an N_{10} of 30 to 40.
13. Composition as claimed in claim 1 having an N_{20} of 10 to 35.
14. Composition as claimed in claim 1 having an N_{20} of 15 to 30.
15. Composition as claimed in claim 1 having an N_{30} of less than 18.
16. Composition as claimed in claim 1 having an N_{30} of 3 to 15.
17. Composition as claimed in claim 1 which is essentially free of trans fatty acid residues.
18. A method of producing a baked product which comprises preparing a mixture and baking the mixture, and which comprises the step of incorporating the composition of claim 1 in the mixture.

19. A method of produced an iced confectionery product which comprises applying to a baked product an icing comprising the composition of claim 1.
20. The use of the composition of claim 1 as an ingredient in baking.
21. Bakery composition comprising the composition of claim 1 and one or more other baking ingredients.
22. Icing composition comprising the composition of claim 1, sugar and water.
23. Baked product comprising the composition of claim 1.
24. Iced confectionery product comprising the composition of claim 1.

'473 Patent (EX1001), 7:20-41, 7:56-8:10, 8:18-47.

I. INTRODUCTION

Pursuant to 37 C.F.R. § 42.107(a), Bunge Loders Croklaan USA, LLC (“Patent Owner” or “PO”), submits this Preliminary Response to the Petition for *Inter Partes* Review (“Petition”) filed by Cargill, Incorporated (“Petitioner”) on August 28, 2024, challenging claims 1, 6-9, and 11-24 (“Challenged Claims”) of U.S. Patent No. 7,645,473 (“the ’473 Patent”). The Patent Trial and Appeal Board (“PTAB”) mailed a Notice on September 30, 2024, according the Petition a filing date of August 28, 2024 (Paper 3). This Preliminary Response is timely filed.¹

II. SUMMARY OF ARGUMENT

Petitioner has the burden to show a reasonable likelihood that at least one of the Challenged Claim is unpatentable. *See* 37 C.F.R. § 42.108(c); *see also* 35 U.S.C. § 314. Petitioner fails to meet its burden because its invalidity theories are disguised and, even when considered on their merits, fail.

¹ The Declaration of Eric A. Decker, Ph.D. (EX2001), filed herewith, supports this Preliminary Response. *See* EX2001, ¶2.

First, Petitioner's Ground 1 argument, while presented as an obviousness combination based on Petrauskaite² and "knowledge generally available in the art," *functionally relies* on an inherency position. Petitioner attempts to show that Petrauskaite's disclosed composition, once converted from mole percentages to weight percentages using alleged general knowledge, meets all limitations of claim 1. Petitioner's own expert, Dr. Marangoni, confirms this reliance on inherency (EX1003, ¶177):

While Petrauskaite discloses the claimed interesterified fat blends, knowledge generally available in the art provides specific (i) molecular weights and weight ratios for the various fatty acids that make up palm stearin and soybean oil and (ii) a method for determining the SUS and SSU triglyceride content of interesterified fat blends.

However, the Petition fails to address, let alone meet, the required standards for demonstrating inherency. This omission is likely because, as demonstrated below, Petrauskaite's own disclosures, when applied to Petitioner's calculations, result in a composition **outside** the ranges of claim 1. This contradiction fatally

² Petrauskaite, V., W. De Greyt, M. Kellens, and A. Huyghebaert. "Physical and Chemical Properties of Trans-Free Fats Produced by Chemical Interesterification of Vegetable Oil Blends." *Journal of the American Oil Chemists' Society*, vol. 75, no. 4 (April 1998): 489-493 ("Petrauskaite") (EX1007).

undermines any argument that Petrauskaite *necessarily* discloses a composition meeting the limitations of claim 1. Thus, it is impossible to argue that Petrauskaite's composition inherently discloses any of the Challenged Claims.

Second, Petitioner further obfuscates its argument by improperly relying on the Neff and Deffense references (defined below, non-ground references) under the guise of "general knowledge." These references are used to supply specific values for fatty acid weight ratios that are *not* in Petrauskaite. The Petition and Petitioner's expert label these references as "**Applied Prior Art**" (Pet., 6-9; EX1003, ¶¶33-38), which confirms that Petitioner is using specific teachings from these references as prior art. This is not a proper common knowledge analysis; it is an attempt to combine references with Petrauskaite without demonstrating a motivation to do so. Indeed, the Petition does not even cite Neff or Deffense in its Ground 1 or Ground 2 motivation to combine analysis.

Third, in a further layer of misdirection, Petitioner attempts to use Neff and Deffense to establish "general knowledge" of specific fatty acid ratios for palm stearin and soybean oil. These are specific values that Petitioner needs for its calculations, and which it admits are not disclosed in Petrauskaite. Petitioner asserts these values are "general knowledge" simply because they were known, *i.e.* disclosed in these references. However, this ignores the critical fact, disclosed in Deffense itself (EX1014, Tables I-IV) that these fatty acid ratios *vary*.

Petitioner's analysis is not a proper assessment of common or general knowledge; instead Petitioner is relying on specific teachings from non-ground references (Neff and Deffense, Table IV) to supplement a deficient primary reference. It is a selective, hindsight-driven exercise of cherry-picking values from specific non-ground references to perform calculations to arrive at the ranges recited in claim 1. Since alternative values for these fatty acid ratios were known in the art, Petitioner cannot simply declare its chosen values as "general knowledge." The Petition offers no explanation for why a person of ordinary skill in the art ("POSITA"), at the time of the invention, would have been motivated to select those *particular* values over others, especially given the known variability. This selective use of data, combined with the reliance on non-ground references, points to an improper hindsight exercise to reconstruct the claimed invention. Therefore, Petitioner's common or general knowledge analysis is improper.

Fourth, Dr. Marangoni's analysis rests on the incorrect assumption of fully random interesterification. Petrauskaite's own data refutes this, fundamentally undermining his analysis. Moreover, Dr. Marangoni's calculations use values from Petrauskaite that *contradict* his randomization assumption. If Dr. Marangoni had used Petrauskaite's *calculated* values (which are based on a Random Distribution Hypothesis, and thus consistent with his assumption), his calculations would have yielded values outside claim 1.

Fifth, Dr. Marangoni defines a POSITA *without* reference to the priority date of the '473 Patent (June 13, 2006), or any other time period at all, further suggesting a hindsight-driven analysis.

For at least these reasons, Petitioner fails to meet its burden of establishing a reasonable likelihood that at least one of the Challenged Claims is unpatentable. Therefore, institution should be denied.

III. SUMMARY OF '473 PATENT

A. The '473 Patent

The '473 Patent (EX1001), entitled "Fat Composition," relates to "a vegetable fat composition comprising glycerides and to its applications in baked products and iced confectionary products." EX1001, 1:6-8; EX2001, ¶¶46-48. The '473 Patent explains the need for such a composition: consumers desire food products low in both *trans* and saturated fatty acids. EX1001, 1:9-12; EX2001, ¶48. Modifying triglyceride compositions to achieve this is complex because the component fatty acids, particularly saturated fatty acids, affect the functional and organoleptic properties. EX1001, 1:13-17; EX2001, ¶48.

The '473 Patent discloses an improved vegetable fat composition with specific amounts of SSS, SUS, SSU, SU₂, and U₃ triglycerides ("S" representing a saturated fatty acid residue with 16 to 24 carbon atoms, and "U" representing an unsaturated fatty acid residue with at least 18 carbons). EX1001, 2:10-20; EX2001,

¶49. The composition achieves a low saturated and *trans* fatty acid content, while maintaining desirable functional and organoleptic properties (structure, appearance, and mouthfeel), suitable for baking and confectionery icing. EX1001, 2:65-67, 3:1-5; EX2001, ¶49.

The composition can be a blend of commercially available fats, including an interesterified palm olein (iodine value (IV) of 45 to 70) and a palm oil fraction (SUS-content of less than 50 wt%, SSS-content of at least 20 wt%). EX2001, ¶49. The blend can also include other liquid oils like canola oil. EX1001, 3:6-15; EX2001, ¶49. The component amounts are selected to achieve the claimed triglyceride composition. EX1001, 4:53-55, 4:62-64; EX2001, ¶49.

Example 1 of the '473 Patent describes blending refined, bleached, deodorized canola oil; refined, bleached palm stearin (IV 35); and refined, bleached, deodorized fully interesterified palm olein (IV 55) to produce a low saturate fat blend. EX1001, 5:39-59 (Example 1); EX2001, ¶50. This blend, when used in cookies and cake icing, demonstrated comparable or superior texture, mouthfeel, and aeration compared to higher-saturated fat formulations. EX1001, 6:54-62 (Examples 2), 7:5-18 (Example 3); EX2001, ¶¶51, 52.

B. Claim 1 of the '473 Patent

Independent claim 1, which is the sole independent claim, recites:

1. A vegetable fat composition comprising glycerides, wherein the triglyceride content of the composition is:

6 to 20% SSS,
5 to less than 20% SUS
5 to less than 25% SSU
10 to 39 SU₂ and
at least 20% U₃,

wherein S is a saturated fatty acid residue having 16 to 24 carbon atoms and U is an unsaturated fatty acid residue having at least 18 carbon atoms and all percentages are by weight based on the total triglycerides present in the composition,
the weight ratio SUS/SSU is between 0.5 and 2.0,
the weight ratio of (saturated fatty acid residues having 18 to 24 carbon atoms)/(saturated fatty acid residues having 16 carbon atoms) in the total S content of the triglycerides is less than 0.2,
and the triglycerides contain less than 3% of arachidic and behenic acid residues based on the total fatty acid residue content of the triglycerides,
and wherein the saturated fatty acid residue content of the triglycerides is less than 45% by weight of the total fatty acid residues in the triglycerides.

EX1001, 7:20-41; EX2001, ¶¶54, 55.

This Preliminary Response focuses on the deficiencies in Petitioner's argument regarding independent claim 1, which are sufficient to warrant denial of institution. Since challenged dependent claims 6-9 and 11-24 incorporate the limitations of claim 1, and Petitioner has not shown a reasonable likelihood of success in challenging claim 1, the Petition necessarily fails as to these dependent claims as well, since they incorporate all limitations of claim 1. *See Bright Data LTD v. Oxylabs, UAB*, IPR2023-01442, Paper 7, at 32 (PTAB Apr. 3, 2024) ("Petitioner's anticipation challenges to [the] dependent claims . . . are insufficient for the reasons explained above for [the] independent claims."); *Ferno-Washington, Inc. v. Stryker Corp.*, IPR2024-00042, Paper 9, at 24, 31 (PTAB Mar. 19, 2024) (same); *see also* EX1001, 7:56-8:10, 8:18-47; EX2001, ¶56.³

C. Prosecution History

The U.S. Patent and Trademark Office ("PTO") made no substantive rejection of the claims during prosecution. EX1002, 128-130; EX2001, ¶53. It issued a Notice of Allowance on August 28, 2009, noting that the prior art failed to show all features of claim 1. EX1002, 23-24; EX2001, ¶53.

³ For purposes of this Preliminary Response only and in relation to the invalidity arguments raised by Petitioner, Patent Owner is not addressing Petitioner's claim construction positions. EX2001, ¶¶58, 59.

IV. TECHNOLOGY OVERVIEW

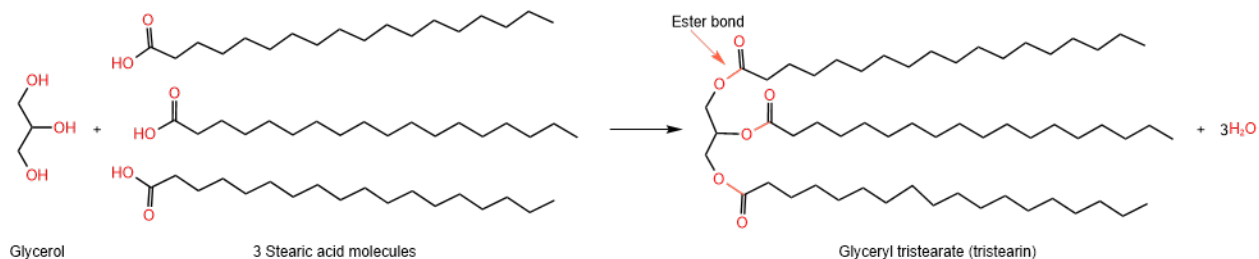
A. Fatty Acids and Triglycerides

Lipids, such as fats and oils, are organic compounds composed of repeating units called fatty acids. Fatty acids are organic compounds with a carboxylic acid group and a long hydrocarbon chain. EX2001, ¶60. Fatty acids are categorized as either saturated or unsaturated. EX2001, ¶61.

- **Saturated fatty acids** have only single bonds between carbon atoms in their hydrocarbon chains. Each carbon atom is bonded to the maximum possible number of hydrogen atoms (*i.e.*, it is “saturated” with hydrogen). EX2001, ¶61.
- **Unsaturated fatty acids** have one or more double bonds between carbon atoms in their hydrocarbon chains, reducing the number of bonded hydrogen atoms. An unsaturated fatty acid with one double bond is called monounsaturated, while one with multiple double bonds is called polyunsaturated. EX2001, ¶¶61-62.

A **triglyceride** is a type of lipid molecule formed by the condensation of glycerol with three fatty acids. EX2001, ¶¶63, 64. These three fatty acids, called fatty acid residues, can be identical, two can be the same, or all three can be different. *Id.*, ¶64. As an example, the condensation of three stearic acid molecules (fatty

acids) with glycerol form a triglyceride, shown below:



A triglyceride composed of three unsaturated fatty acids (“U”) is a UUU or U₃ triglyceride. *Id.* A triglyceride composed of three saturated fatty acids (“S”) is an SSS or S₃ triglyceride. *Id.* Triglycerides can also consist of combinations of saturated and unsaturated fatty acids, such as S₂U (SUS, SSU) and SU₂ (UUS, USU). *Id.* This S/U nomenclature is used throughout claim 1 of the ’473 Patent. *Id.*

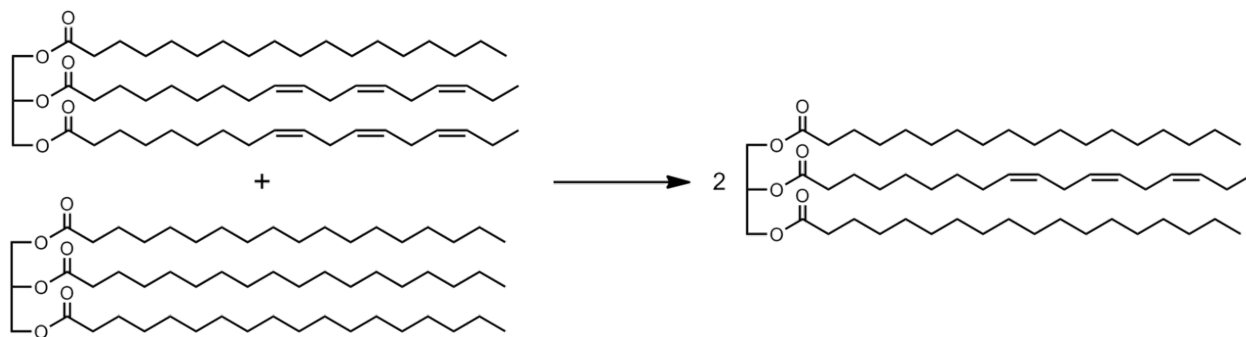
The relative amounts of different triglycerides in a fat composition are expressed as weight percentages (wt%). EX2001, ¶65. Thus, fat composition containing 6% to 20% SSS triglycerides means that 6% to 20% of all the triglycerides in the composition are in the SSS form. *Id.*

B. Interesterification

Interesterification of triglycerides rearranges the fatty acid residues within two or more triglyceride molecules, effectively “swapping” their positions on the glycerol backbone to produce a mixture of different triglycerides. EX2001, ¶80. This alters the chemical and physical properties of the fat, like its molecular weight, melting point, and consistency. *See, e.g.,* Gurr et al., “Lipids in Foods,” in *Lipid*

Biochemistry, 5th ed, Osney Mead, Oxford: Blackwell Science, pp. 131-132 (2002) (“Gurr”, EX2003); EX2001, ¶80.

An illustrative example of interesterification between a SSS triglyceride and a SUU triglyceride, resulting in the production of a SUS triglyceride, is shown schematically below:



Interesterification of the two triglycerides on the left (*i.e.*, SUU and SSS) results is the creation of a SUS triglyceride, although other triglycerides could also be generated, depending on how the interesterification process is carried out. EX2001, ¶81.

Chemical interesterification is generally known among food and lipid chemists as involving treatment of a fat or fat blend with a catalyst (*e.g.*, sodium methoxide) at an elevated temperature to randomize the fatty acids among the triacylglycerol molecules, as distinct from their natural stereo-specific distribution. *See, e.g.*, EX2003, 131-132 (Gurr); EX2001, ¶82. Differences in how fat compositions are made and when the individual components or blends are

interesterified are important, because the interesterification process changes the content of the triglycerides in the composition. EX2001, ¶85.

V. SCOPE AND CONTENT OF THE PRIOR ART FOR GROUND I

Petitioner purportedly relies solely on Petrauskaite (EX1007), for its Ground 1 invalidity argument. EX2001, ¶¶57, 66, 70. Petrauskaite relates to the “physical and chemical properties of *trans*-free fats produced by chemical interesterification of vegetable oil blends.” EX1007, Title; EX2001, ¶66. This publication focuses on fat blends created by mixing a highly saturated fat (palm stearin or fully hydrogenated soybean oil) with a native vegetable oil (soybean oil) in various ratios, then subjecting the blend to chemical interesterification. EX1007, Abstract; EX2001, ¶66. The reference analyzes the resulting triglyceride composition, solid fat content, free fatty acid content, and *trans* fatty acid levels. EX1007, Abstract; EX2001, ¶66.

Petrauskaite states that interesterified blends with 30% to 50% hardstock exhibited properties suitable for commercial shortenings and margarines, while 20% hardstock blends were suited for soft tub margarines. EX1007, Abstract; EX2001, ¶67. The authors also suggest that confectionery fat bases could be prepared from blends with 40% palm stearin or 25% fully hydrogenated soybean oil. EX1007, Abstract; EX2001, ¶67.

**VI. INSTITUTION SHOULD BE DENIED FOR FAILING TO SHOW A REASONABLE
LIKELIHOOD THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE**

Petitioner proffers two Grounds for invalidity of independent claim 1 and dependent claims 6-9 and 11-24:

Ground	Claims	Basis for Rejection
1	1, 6-9, 11-17, and 20	§103: Petrauskaite (EX1007) in view of knowledge generally available in the art
2	18, 19, 21-24	§103: Petrauskaite (EX1007) in view of Idris (EX1009)

See Pet., 3; EX2001, ¶57.

As discussed below, Petitioner fails to show a reasonable likelihood of success on either Ground. The Petition, as well as Dr. Marangoni's Declaration, do not demonstrate that Petrauskaite, even when combined with purported "knowledge generally available in the art," teaches or suggests the weight percent (wt%) values of the triglycerides recited in claim 1 (*i.e.*, 6-20% SSS, 5 to less than 20% SUS, 5 to less than 25% SSU, 10 to 39[%]⁴ SU₂, and at least 20% U₃). EX2001, ¶71. Since

⁴ Claim 1 of the '473 Patent appears to possess a typographical error, which has no impact on the meaning of the claim. Specifically, there is no "%" symbol following the "10 to 39 SU₂" value recited in the claim. Patent Owner reads the "10 to 39 SU₂" value as being a weight % value like the other triglyceride values recited in the claim. EX2001, ¶71

all Challenged Claims ultimately depend from claim 1, this deficiency is fatal to the Petition.

Instead, the Petition and Dr. Marangoni's Declaration present a deeply flawed obviousness analysis. Institution should be denied because: (i) the Petition disguises an inherency argument as obviousness, without meeting the required legal standards; (ii) the Petition improperly uses purported common or general knowledge to assert obviousness based on selected compositions, when it was known that those compositions varied; (iii) the Petition improperly relies on non-ground references (Neff and Deffense, Table IV) without explicitly including them in Ground 1 or demonstrating motivation to combine; (iv) Petitioner's calculations contradict its own assumptions on interesterification; and (v) Petitioner's expert conducts an improper hindsight-based analysis. *See* EX2001, ¶¶71-77.

A. Petitioner's Ground 1 Relies on a Covert and Flawed Inherency Argument

While Petitioner frames Ground 1 as an obviousness combination based on Petrauskaite and "knowledge generally available in the art," the argument is, in fact, a flawed inherency position, disguised to avoid the applicable legal standards. *See Cont'l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991) (holding that inherency "may not be established by probabilities or possibilities.").

Petitioner asserts that Petruskaite discloses “[f]at blends, formulated by mixing a highly saturated fat (palm stearin or fully hydrogenated soybean oil) with a native vegetable oil (soybean oil).” *See* Pet., 14. It then highlights Petruskaite’s disclosure of two blends of palm stearin and soybean oil (after interesterification) that have a SSS triglyceride mol% of 6.3% and 10.4%. *Id.*, 14. However, Petitioner acknowledges that Petruskaite does *not* disclose triglyceride *weight* percentages (wt%), which are the values recited in claim 1. *Id.* (“Petruskaite is silent with respect to the wt% of the listed triglycerides.”); EX2001, ¶72. Petitioner then argues that these wt% values can “easily be calculated” based on general knowledge of fatty acid compositions. Pet., 14-15; EX2001, ¶73. This reveals the core of its flawed logic: Petitioner is implicitly arguing that the claimed wt% values are *inherent* to the composition formed in Petruskaite, even if not expressly disclosed. EX 2001, ¶73.

This reliance on inherency is further confirmed by several statements:

- **Petitioner’s statement:** “...the wt% of Petruskaite’s fat blends can easily be calculated based on the generally available prior art knowledge of fatty acid compositions of palm stearin and soybean oil.” Pet., 14-15. This indicates that the claimed wt% values are inherent features of Petruskaite’s blends.
- **Petitioner’s statement:** “One of skill in the art would naturally have turned to these references to understand Petruskaite’s components

better.” Pet., 37. This confirms that Petitioner’s position is that a POSITA utilizing purported general knowledge would understand that Petrauskaite discloses claim 1—a hallmark of inherency.

- **Dr. Marangoni’s statement:** “While Petrauskaite discloses the claimed interesterified fat blends, knowledge generally available in the art provides specific (i) molecular weights and weight ratios for the various fatty acids that make up palm stearin and soybean oil and (ii) a method for determining the SUS and SSU triglyceride content of interesterified fat blends.” EX1003, ¶177. This confirms Dr. Marangoni’s view that all one needs to do is use general knowledge to convert Petrauskaite’s composition to wt%, meaning Petrauskaite inherently discloses a composition that would meet the limitations of claim 1.
- **Petitioner’s Counterclaim in the pending District Court litigation:** Petitioner’s Answer to Amended Complaint for Patent Infringement, Defenses, and Counterclaims filed on December 4, 2024 in *Bunge Lodders Croklaan USA, LLC v. Cargill, Inc.*, Civil Action No. 1:24-cv-00884-RGA (D. Del.) (EX2008), alleges that “[t]he fat blends of **Petrauskaite satisfy all elements of and therefore anticipate at least claims 1, 6-9, and 11-24** of the ’473 patent or render them

obvious” EX2008, 27 at ¶26 (emphasis added). In view of Petitioner's acknowledgement that Petrauskaite does not expressly disclose the wt% values recited in claim 1, Petitioner's reference to “anticipate” confirms that Petitioner is relying on inherency.

Despite these clear indicators, Petitioner strategically avoids relying *expressly* on inherency. EX2001, ¶73. This is likely because Petitioner cannot meet the high legal standards for inherency: including that any missing disclosure must be *necessarily* present in the prior art. “‘To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently.’” *Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999) (citation omitted). Inherency arguments are most often encountered in rejections under 35 U.S.C. § 102; however, the inherent disclosure of references can also be used as a basis for a rejection under 35 U.S.C. § 103. *See Alcon Research, Ltd. v. Apotex Inc.*, No. 2011-1455, 2012 WL 3224040, at *7 (Fed. Cir. Aug. 8, 2012). While an inherent feature need not be recognized by one of ordinary skill in the art at the time of the invention (*see, e.g., Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003)), to establish inherency, the missing descriptive matter must *necessarily be present* in the thing described in the reference. *See Cont'l Can Co. USA, Inc.*, 948 F.2d at 1268-69 (emphasis added). That is, inherency “may not be established by probabilities or possibilities.” *Id.* at 1269. Moreover, “[t]he mere

fact that a certain thing *may* result from *a given set of circumstances* is not sufficient.” *Id.* (emphasis added).

Petitioner avoids this standard by framing Ground 1 as an obviousness argument, combining Petruskaite with purported general knowledge, because Petitioner cannot present the evidence necessary to meet the inherency standard.

The Petition fails to demonstrate that the claimed triglyceride wt% values are *necessarily* present in Petruskaite, as required for inherency. Three key factors undermine any inherency theory: (i) differing interesterification processes between Petruskaite and the '473 Patent; (ii) known variations in fatty acid values, acknowledged in Deffense itself; and (iii) if calculations were done consistent with Petitioner's *own* assumptions about random interesterification, it would yield results **outside** the '473 Patent's claimed ranges. Since these factors preclude inherency, Petitioner attempts to disguise its argument as one of obviousness.

Petitioner provides no basis to conclude that Petruskaite inherently discloses a composition having the claimed triglyceride wt% ranges. Its argument relies entirely on assumptions and calculations presented in the Marangoni Declaration. EX2001, ¶74. These calculations, however, are based on data and assumptions that contradict inherency. Specifically, Dr. Marangoni uses specific disclosures from Neff and Deffense (Table IV) to supplement Petruskaite, despite the known variability in the relevant values, as acknowledged in Deffense Tables I-III and other

references. EX2001, ¶¶ 74, 92-107. Furthermore, Dr. Marangoni's analysis relies on flawed assumptions, including (i) random interesterification, when Petrauskaite itself confirms that interesterification is not completely random; and (ii) incorrect assumptions regarding the chemical composition of lipids. EX2001, ¶74. As a result, Petrauskaite's fat compositions do *not* inherently disclose the wt% ranges recited in claim 1.

In fact, as detailed below, performing Dr. Marangoni's calculations using values expressly disclosed in Petrauskaite that are consistent with his own assumption of random interesterification, results in values **outside** the scope of claim 1 of the '473 Patent. EX2001, ¶76. This fatal flaw fundamentally undermines Petitioner's implicit inherency argument. EX 2001, ¶¶75-77.

1. Differing Interesterification Processes Refute Inherency

A critical distinction between Petrauskaite and the '473 Patent lies in *when* interesterification is performed. While Dr. Marangoni's calculations are based on the compositions disclosed in Petrauskaite, he fails to account for this key difference, which significantly impacts the triglyceride content and thus whether the fat blends of Petrauskaite would necessarily meet the claimed limitations. EX2001, ¶78.

Petrauskaite describes a process of first blending neutralized bleached soybean oil, fully hydrogenated soybean oil, and palm stearin, and *then* interesterifying the resulting blend. EX1007, 489-490, EX2001, ¶¶79-83. In

contrast, the '473 Patent claims a composition formed by blending: (i) an *already-interesterified* palm olein; and (ii) a palm oil fraction with a SUS-content of less than 50 wt% and an SSS-content of at least 20%. EX1001, 2:60-64, 3:6-15, 4:43-49, 5:41-49; EX2001, ¶84. This is not a simple distinction; it has significant implications for the final triglyceride profile. EX2001, ¶85.

Since the palm oil fraction in the '473 Patent is *not* subject to the same random interesterification process as the blend in Petrauskaite, its fatty acid distribution, and therefore its triglyceride profile, will necessarily differ from the pre-interesterified palm olein. *Id.* Simply blending these two components *cannot* replicate the same distribution of triglycerides generated by the assumed random interesterification process of Petrauskaite. *Id.* Consequently, Dr. Marangoni's calculations, which rely on the assumption of random interesterification applied to a pre-blended mixture, are problematic and inconsistent with the triglyceride composition achieved by the '473 Patent's process of blending *pre-interesterified* components. EX2001, ¶¶78-85.

The Petition and the Marangoni Declaration entirely fail to address this key difference. EX2001, ¶86. Dr. Marangoni's failure to acknowledge this distinction undermines his entire analysis. *Id.*

Given this crucial difference, Petitioner cannot argue that Petrauskaite *necessarily* discloses the claimed wt% values, because when different parts (either

part of a fat blend or full fat blend) are interesterified, different types of triglycerides in different proportions are generated, which results in different triglyceride compositions in the fat blend. A composition made according to Petrauskaite's process will have a different triglyceride profile than one made according to the '473 Patent. EX2001, ¶¶78-85. This precludes a finding of inherency. *See Cont'l Can Co. USA, Inc.*, 948 F.2d at 1269. Moreover, as discussed in Section D below, the data reported in Petrauskaite demonstrates that even its *intended* random interesterification does not result in a fully randomized distribution, further highlighting the flawed nature of Dr. Marangoni's analysis.

2. Variability of Fatty Acid Values Further Refutes Inherency

Petitioner next asserts that palm stearin and soybean oil have specific and known wt% values for their constituent fatty acids. Pet., 16. However, these purportedly known values are absent from Petrauskaite. To address this deficiency, Petitioner selectively pulls wt% values from Neff and Deffense (Table IV), two non-ground references.⁵ *See* Pet., 15-31; EX 2001, ¶¶89, 90. These values form the basis

⁵ The Petition also relies on a third non-ground reference (Bailey, EX1018), but solely for purposes of this preliminary response, Patent Owner focuses on the improper use of Neff (EX1011) and Deffense (EX1014).

of Dr. Marangoni's calculations. EX 2001, ¶¶88, 110-119.⁶ However, the selected values are merely *exemplary*, not standards. EX 2001, ¶¶95, 103.

Indeed, Deffense itself discloses *variations* in fatty acid content for palm stearin, directly contradicting Petitioner's assertion of specific, "known" values. EX1014, Tables I-IV; EX 2001, ¶96. In fact, Tables I-IV each include different values for the fatty acid content of palm stearin (EX1014, 377-380, highlighting added):

⁶ The specifics on how these values are used in the first step of Dr. Marangoni's calculations are set forth in Schedule A to this Preliminary Response.

TABLE I

C.M.B. Oleins and Stearins from Single Stage Fractionation

Palm oil	RBD					
Origin	Indonesia		Malaysia			
Process			Continuous		Batch	
Fraction	Stearin	Olein	Stearin	Olein	Stearin	Olein
Code	239		231-2		231-3	
Iodine Value (GLC)	44.3	57.1	46.7	58.0	47.8	58.6
Yield (%) (calc.)	37	63	40	60	40	60
Slip melting point (C)	48.6	24.5	48.2	24	47.7	23
SFC (%) by pulsed NMR						
5 C	75.9	52.8	75.3	54.7	74.2	48.3
10 C	68.6	36.9	66.7	37.0	65.8	36.4
15 C	59.2	19.9	55.5	17.4	53.9	18.6
20 C	47.6	3.0	44.0	3.0	42.2	2.2
25 C	36.0		32.4		30.0	
30 C	26.1		23.4		21.4	
35 C	18.5		16.2		14.3	
40 C	13.1		9.5		8.3	
45 C	8.0		5.7		4.3	
50 C	2.1		.8		—	
55 C	—		—		—	
Fatty acids (% wt as Me)						
C 16:0	51.4	40.4	49.3	39.5	48.4	39.0
C 18:0	4.7	4.3	4.9	4.3	4.9	4.4
C 18:1	32.8	41.1	33.8	41.5	34.5	41.7
C 18:2	8.7	11.9	9.6	12.2	9.9	12.4
Diglyceride (% wt)	5.1	6.2	5.2	6.9	5.5	6.8
Triglyceride (% wt)	94.9	93.8	94.8	93.1	94.5	93.2
Triglyceride composition (area %) by HPLC						
S ₃	19.5	.4	17.3	.5	16.0	.4
S ₂ U	46.4	50.0	45.9	48.2	45.8	48.0
SU ₂	30.0	42.8	31.6	44.3	33.0	44.5
U ₃	4.1	6.8	5.2	7.0	5.2	7.1
Cloud point (C) ^a	—	10	—	10.1	—	9.6
Cold test at 22 C ^b (days)	—	1	—	1	—	2

^aCloud point (AOCS Cc-6-25).

^bCold test (AOCS Cc-11-53).

TABLE II

De Smet Oleins and Stearins from Single Stage Fractionation

Palm oil Origin Fraction Code	RBD Malaysia			
	Stearins		Oleins	
	237-B	236-1	237-B	236-1
Iodine value (GLC)	44.9	48.7	57.6	58.4
Yield (%) (calc.)	37	40	63	60
Slip melting point (C)	48.8	45.9	24.2	23.3
SFC (%) by pulsed NMR				
5 C	77.2	72.4	55.7	54.1
10 C	69.6	61.9	39.0	36.8
15 C	58.9	50.7	20.0	17.2
20 C	47.5	38.6	2.5	.9
25 C	36.2	27.0		
30 C	26.4	18.1		
35 C	18.9	12.4		
40 C	12.9	6.2		
45 C	8.5	2.0		
50 C	2.2	—		
55 C	—	—		
Fatty acids (% wt as Me)				
C 16:0	50.6	47.4	39.8	39.2
C 18:0	5.2	5.0	4.4	4.5
C 18:1	32.9	35.3	41.4	41.7
C 18:2	9.0	10.0	12.1	12.4
Diglyceride (% wt)	5.3	5.7	6.8	7.0
Triglyceride (% wt)	94.7	94.3	93.2	93.0
Triglyceride composition (area %) by HPLC				
S ₃	19.3	13.8	.6	.7
S ₂	46.0	46.2	48.1	47.9
SU ₂	30.0	34.6	44.6	44.1
U ₃	4.7	5.4	6.7	7.3
Cloud point (C)	—	—	10.2	10.3
Cold test at 22 C (days)	—	—	1.5	1.2

TABLE III

Tirtiaux Oleins and Stearins for Single Stage Fractionation

Origin Fraction Code	RBD				Neutralized			
	Indonesia		Malaysia					
	Stearins 229-B	Oleins 229-A	Stearin 244-B	Olein 243-A	Stearin 244-B	Olein 243-A	Stearin 244-B	Olein 243-A
Iodine value (GLC)	39.4	40.4	57.6	58.2	28.6	57.2	40.1	57.2
Yield (%) (calc.)	30	33	70	67	32	68	28	72
Slip melting point (C)	51.4	50.7	23.0	19.9	50.7	22.2	49.7	21.5
SFC (%) by pulsed NMR								
5 C	83.0	82.1	56.0	55.9	80.3	55.7	76.9	58.4
10 C	78.8	77.2	38.9	35.2	76.0	40.0	70.1	39.2
15 C	70.5	68.7	19.8	15.7	6.3	19.3	61.2	19.7
20 C	59.9	58.0	1.8	—	54.7	.2	48.7	.5
25 C	48.9	46.1	—	—	43.1	—	38.0	—
30 C	38.1	35.0	—	—	31.9	—	28.0	—
35 C	28.4	24.2	—	—	23.2	—	19.7	—
40 C	21.1	18.3	—	—	16.9	—	14.3	—
45 C	15.4	12.3	—	—	11.0	—	9.3	—
50 C	7.9	5.9	—	—	4.8	—	3.2	—
55 C	—	—	—	—	—	—	—	—
Fatty acids (% wt as Me)								
C 16:0	55.5	54.6	40.2	39.4	55.5	39.5	55.2	39
C 18:0	4.9	4.9	3.8	4.0	4.9	4.6	4.9	4.4
C 18:1	29.9	30.7	41.7	42.3	29.1	41.3	29.9	41.7
C 18:2	7.5	7.6	11.8	11.9	7.2	11.7	7.8	11.6
Diglyceride (% wt)	4.3	4.5	6.5	6.7	4.7	6.6	4.6	5.8
Triglyceride (% wt)	95.7	95.5	93.5	93.3	95.3	93.4	95.4	94.2
Triglyceride composition (area %) by HPLC								
S ₃	26.5	23.3	.6	—	21.9	.4	20.2	.2
S ₂ U	44.5	48.1	48.8	47.8	47.0	48.1	45.6	48.7
SU ₂	25.4	25.3	44.1	45.4	27.1	44.7	29.7	44.3
U ₃	3.6	3.3	6.5	6.8	4.0	6.8	4.5	6.8
Cloud point (C)	—	—	9.5	6.8	—	8.7	—	8.5
Cold test at 22 C (days)	—	—	2.5	7 ^a	—	5	—	2

^aMinimum.

TABLE IV

Alfa Laval Oleins and Stearins from Single Stage Fractionation

Palm oil	Crude					
Origin	Indonesia		Malaysia			
Fraction	Stearin	Olein	Stearins		Oleins	
Code	230		223-2	234-1	223-2	234-1
Iodine value (GLC)	24.9	58.0	28.0	34.6	57.8	57.8
Yield (%) (calc.)	20	80	17	23	83	77
Slip melting point (C)	55.9	19.0	55.3	53.8	21.7	19.9
SFC (%) by pulsed NMR						
5 C	92.0	49.2	91.4	86.9	54.4	53.2
10 C	92.1	32.7	90.0	81.9	34.4	34.9
15 C	90.8	9.2	84.9	76.2	14.6	13.4
20 C	86.6	—	79.8	68.6	.6	—
25 C	78.0		71.5	57.3		
30 C	68.2		61.6	46.6		
35 C	57.0		51.8	37.8		
40 C	46.0		41.9	29.9		
45 C	35.8		32.2	23.0		
50 C	25.0		22.5	13.0		
55 C	9.3		7.9	.4		
Fatty acids (% wt as Me)						
C 16:0	68.8	40.0	66.2	60.1	39.4	39.6
C 18:0	5.1	4.3	4.8	5.1	4.3	4.4
C 18:1	19.1	40.8	21.6	26.0	42.3	41.7
C 18:2	4.5	12.3	5.0	6.6	11.3	11.8
FFA (mol wt 256) (%)	2.2	3.9	2.2	2.3	4.3	3.5
Diglyceride (% wt)	3.6	6.5	2.8	3.9	6.0	5.2
Triglyceride (% wt)	96.4	93.4	97.2	96.1	94.0	94.8
Triglyceride composition (area %) by HPLC						
S ₃	46.1	.2	42.0	32.9	.3	.1
S ₂ U	43.9	50.9	41.4	45.5	50.2	50.1
SU ₂	9.2	43.2	14.2	19.0	43.2	43.7
U ₃	.8	5.7	2.4	2.6	6.3	6.1
Cloud point (C)	—	9.8	—	—	10.9	8.7
Cold test at 22 C (days)	—	4	—	—	3	7

Despite these disclosed variations in fatty acid content of palm stearin described by Deffense, Petitioner offers no explanation for choosing certain values

(*i.e.*, those from Table IV) while ignoring others (*i.e.*, those from Tables I-III). Pet., 16; EX1003, ¶38; EX 2001, ¶108. This selective use of data undermines the Petition's covert inherency theory. The variability of fatty acid content prevents Petitioner from meeting the "necessarily present" standard for inherency. *See Cont'l Can Co.*, 948 F.2d at 1268. This likely explains Petitioner's avoidance of explicitly arguing inherency.

Dr. Marangoni's calculations begin by determining the average molecular weight of saturated (S) and unsaturated (U) fatty acids in 100% palm stearin ("Pst") and 100% soybean oil ("SBO"), relying on the values he selected from Neff and Defense (Table IV) for Petrauskaite's 40:60 and 50:50 Pst/SBO fat blends. EX1003, ¶62; EX2001, ¶87. However, as noted, Petrauskaite *does not* describe those values, forcing Dr. Marangoni to seek external sources. He claims these selected values represent "knowledge generally available in the art." EX1003, ¶59; EX2001, ¶88. However, this assertion is refuted by the demonstrated variability in the art. *See e.g.*, EX 2001, ¶¶96, 104-106.

For palm stearin, Dr. Marangoni relies on Table IV in Deffense, "Fractionation of Palm Oil," *Journal of the American Oil Chemists' Society* 62(2):376-385 (1985) ("Deffense", EX1014); EX 2001, ¶89.

Deffense Table IV states that palm stearin comprises four fatty acids (68.8% palmitic acid, 5.1% stearic acid, 19.1% oleic acid, and 4.5% linoleic acid). EX1003,

¶63 at Table 1; EX1014, Table IV; EX 2001, ¶¶89, 92. However, it was well-known that the relative amounts of fatty acids in a given palm stearin can vary. EX2001, ¶¶95-99. The values Dr. Marangoni selects from Deffense Table IV are just *one example* of a palm stearin, not a standard. *Id.*, ¶95. As of the Critical Date, it was well-established that the composition of palm stearin exists as a *range* of values, as shown in Deffense itself. For example, Lin (“Palm Oil,” in Gunstone, ed., *Vegetable Oils in Food Technology: Composition Properties and Uses*, Boca Raton, Florida: CRC Press LLC, pp. 59-97 (2002) (“Lin”, EX2005) at pg. 67 (Table 3.6)), reports palm stearin comprising 47.2-73.8% palmitic acid, 4.4-5.6% stearin acid, 15.6-37.0% oleic acid, and 3.2-9.8% linoleic acid. As another example, Rossell et al., (“Composition of Oil,” *Journal of the American Oil Chemists’ Society*, 62(2):221-230 (1985) (“Rossell”, EX2006)), reports palm stearin comprising 46.5-68.9% palmitic acid, 4.4-5.5% stearic acid, 19.9-38.4% oleic acid, and 4.1-9.3% linoleic acid. EX2005, 67 (Table 3.6); EX2006, 224 (Table III); EX2001, ¶¶96-99. These variations are summarized as follows (EX2001, ¶98):

Table 2. Fatty Acid Composition Values for Palm Stearin

Reference	Palmitic Acid (16:0)	Stearic acid (18:0)	Oleic acid (18:1)	Linoleic acid (18:2)
Deffense Table IV	68.8%	5.1%	19.1%	4.5%
Lin	47.2-73.8%	4.4-5.6%	15.6- 37.0%	3.2-9.8%
Rossell	46.5-68.9%	4.4-5.5%	19.9- 38.4%	4.1-9.3%

The same variability exists for soybean oil. EX2001, ¶¶100-107. Dr. Marangoni relies on Neff et al., “Oxidative Stability of Blends and Interesterified Blends of Soybean Oil and Palm Olein,” *Journal of the American Oil Chemists’ Society*, 71(10):1111-1116 (1994) (“Neff”, EX1011), which discloses a soybean oil composition that contains five fatty acids (10% palmitic acid, 4.2% stearic acid, 25.4% oleic acid, 53.4% linoleic acid, and 7% linolenic acid). EX1003, ¶65 (Table 2), EX2001, ¶90. The precise amounts of each fatty acid can vary significantly. EX2001, ¶¶103-104. Dr. Marangoni uses the values from Neff, but these are just one example among a range of possibilities. EX2001, ¶103. Alternative values are available in the art, such as those presented in Wang (“Soybean Oil,” in Gunstone, ed., *Vegetable Oils in Food Technology: Composition Properties and Uses*, Boca Raton, Florida: CRC Press LLC, pp. 18-58 (2002) (“Wang”, EX2004) at 21 (Table 2.3)), which describes the fatty acid composition of soybean oil as 11.0% palmitic acid, 4.0% stearic acid, 23.4% oleic acid, 53.2% linoleic acid, and 7.8% linolenic

acid, and FAO and WHO. 1999. Standard for Named Vegetable Oils. Codex Alimentarius Standard, No. CXS 210-1999. Codex Alimentarius Commission. Rome. (“Codex Stan”, EX2007), at 6 (Table 1), which describes the composition of the major fatty acids of soybean oil as 8.0-13.5% palmitic acid, 2.0-5.4% stearic acid, 17-30% oleic acid, 48.0-59.0% linoleic acid, and 4.5-11.0% linolenic acid. EX2001, ¶¶104-107. These variations are summarized as follows (EX2001, ¶106):

Table 4. Fatty Acid Composition Values for Soybean Oil

Reference	Linoleic acid (18:2)	Linolenic acid (18:3)	Oleic acid (18:1)	Palmitic Acid (16:0)	Stearic acid (18:0)
Neff	53.4%	7%	25.4%	10%	4.2%
Wang	53.2%	7.8%	23.4%	11.0%	4.0%
Codex Stan	48.0-59.0%	4.5-11.0%	17-30%	8.0-13.5%	2.0-5.4%

Dr. Marangoni’s failure to acknowledge this widely understood variability in fatty acid compositions is a critical flaw. EX 2001, ¶¶108, 109. He selectively uses data from Neff and Deffense Table IV while ignoring other known values. *Id.* This cherry-picking of data renders his “general knowledge” position misleading and ultimately undermines his entire analysis. The known variability in palm stearin and soybean oil composition renders it *impossible* for Petitioner to show that

Petrauskaite *necessarily* discloses a composition having the claimed wt% values. *See Cont'l Can Co. USA, Inc.*, 948 F.2d at 1268-69.

3. Petitioner's Calculations, Even Under Its Own Assumptions, Refute Inherency

As detailed below, Dr. Marangoni's calculations, when performed using values consistent with his own assumption of random interesterification, yield triglyceride values outside the ranges claimed in the '473 Patent. *See infra*, 39-44; EX2001, ¶¶122-137. Petrauskaite's calculated values are based on a Random Distribution Hypothesis, so those are the values consistent with Dr. Marangoni's assumption (nevertheless Dr. Marangoni does not use them). EX1007, 490 (Table 2, Column C). Using those values results in an SU₂ content of 43.2 wt% for the 40:60 blend and a U₃ content of 14.8 wt% for the 50:50 blend. EX 2001, ¶¶129-133. These values fall outside the claimed ranges of 10-39 wt% for SU₂ and at least 20 wt% for U₃, respectively. *See* EX1001, 7:22-26; EX 2001, ¶135.

This internal inconsistency in Petitioner's analysis is fatal to its argument. If, as Petitioner suggests, Petrauskaite discloses the claimed limitations, then calculations based on Petrauskaite *should necessarily* yield results within the claimed ranges. The fact that they do *not* demonstrates that the claimed triglyceride values are *not* necessarily present in Petrauskaite. Therefore, the Petition fails to meet the fundamental requirements for inherency. Since an inherency position could

not succeed, Petitioner improperly attempts to reframe it as an obviousness argument using purported “general knowledge.” This tactic, however, is equally flawed.

B. The Petition's Reliance on “General Knowledge” is Improper

To circumvent the fatal flaw of its covert inherency theory, the Petition attempts to establish obviousness based on Petruskaite in view of “knowledge generally available in the art.” *See* Pet., 13-49. However, the Petition fails to clearly articulate if this “general knowledge” is being used: (i) to understand Petruskaite; (ii) to modify Petruskaite; or (iii) to supply a missing limitation. The closest the Petition comes is the statement: “[o]ne of skill in the art would naturally have turned to these references to *understand Petruskaite's components better.*” Pet., 37 (emphasis added). As discussed above, this language shows reliance on inherency.

However, even if viewed as an obviousness argument, the Petition's reliance on purported “general knowledge” is fundamentally flawed.

1. The Evidence that Defeats Inherency Also Undermines Petitioner's Obviousness Argument

Even accepting Petitioner's argument as one of obviousness, the Petition still fails. The deficiencies that defeat Petitioner's covert inherency position, as discussed in Section A above, also undermine its obviousness theory. For example, the above-noted differences in the processes of the '473 Patent and Petruskaite would have discouraged a POSITA from considering Petruskaite as a starting point

for the claimed invention. EX2001, ¶¶78-86. Similarly, the known variability in fatty acid compositions of palm stearin and soybean oil undermines the argument that Petrauskaite combined with general knowledge would have rendered claim 1 obvious. EX2001, ¶¶95-99, 103-107. Moreover, the specific values for the fatty acid compositions of palm stearin and soybean oil relied on in the Petition do not constitute general knowledge sufficient to establish obviousness. Instead, as explained below, they represent a selective and hindsight-driven use of specific disclosures from Neff and Deffense Table IV, both of which are non-ground references. EX 2001, ¶¶108, 109.

2. The Petition's "General Knowledge" Arguments Fail to Meet Legal and Evidentiary Standards

The Petition's attempt to establish obviousness based on "general knowledge" falls short of the required legal and evidentiary standards. Despite the known variability of fatty acid compositions in palm stearin and soybean oil, Petitioner nevertheless cherry-picks specific values from Neff and Deffense Table IV to support its calculations. This selective approach contradicts its "general knowledge" assertion. EX2001, ¶¶108, 109.

A patent is obvious "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in

the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2012). A proper obviousness analysis requires more than simply stating that certain information is “known.” It requires evidence demonstrating that the specific combination of elements would have been made by a POSITA *at the time of the invention*, without the benefit of hindsight, and would render the claimed invention obvious. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007), *aff’d Teleflex Inc. v. KSR Int’l Co.*, 228 Fed. App’x 998 (Fed. Cir. 2007). In certain circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention. *See, e.g., Takeda Chem. Indus., Ltd. v. Alphapharm Pty, Ltd.*, 492 F.3d 1350, 1357 (Fed. Cir. 2007). Importantly, conclusory statements and unspecific expert testimony are insufficient to justify the use of general knowledge to modify a reference or provide a missing limitation. *See, e.g., Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1362 (Fed. Cir. 2016) (“[R]eferences to ‘common sense’—whether to supply a motivation to combine or a missing limitation—cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified.”).

The MPEP reinforces this requirement, stating that reliance solely on “common knowledge” without evidentiary support is improper. MPEP § 2144.03 (9th ed., Rev. 01.2024, Nov. 2024) (*citing In re Zurko*, 258 F.3d 1379, 1386 (Fed.

Cir. 2001) (“[T]he Board cannot simply reach conclusions based on its own understanding or experience—or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings.”).

As the Federal Circuit held in *Zurko*, an assessment of basic knowledge and common sense that is not based on any evidence in the record lacks substantial evidentiary support. *Id.* at 1386. *See also Arendi*, 832 F.3d at 1362 (finding that the PTAB had not provided a reasoned analysis, supported by the evidence of record, for why “common sense” taught the missing process step); *see also In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017) (“Absent some articulated rationale, a finding that a combination of prior art would have been ‘common sense’ or ‘intuitive’ is no different than merely stating the combination ‘would have been obvious.’” (citation omitted)).

Further, general conclusions about “basic knowledge” or “common sense” cannot replace record evidence supporting core factual findings in a patentability determination. As the Federal Circuit explained in *K/S Himpp*, accepting unsupported conclusions “would be to embark down a slippery slope which would permit the examining process to deviate from the well-establish and time-honored requirement that rejections be supported by evidence.” *K/S Himpp v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1366 (Fed. Cir. 2014).

Here, Petitioner provides no such evidentiary support. It offers no test data, technical publications, or other evidence demonstrating that the specific values it selects from Neff and Deffense Table IV represent an established and accepted standard for the compositions of palm stearin and soybean oil. *See* EX2001, ¶108. Instead, Petitioner simply asserts that these values were “known,” ignoring that other values were also known (*e.g.*, those disclosed in Deffense (Tables 1-3), Wang, Rossell, Lin, and Codex Stan). EX2001, ¶¶95-99, 103-07. This directly contradicts the claim of “general knowledge” and exposes Petitioner’s hindsight-driven selection of specific values that happen to support its invalidity position.

3. Petitioner’s Reliance on Specific Disclosures from Neff and Deffense Table IV Is Not “General Knowledge”

As demonstrated above, the Petition’s core argument relies on Dr. Marangoni’s calculations, which convert Petrauskaite’s mol% values to wt% values in an attempt to match the limitations of claim 1 of the ’473 Patent. These calculations depend entirely on the *specific* wt% values for fatty acids he derives from Deffense Table IV and Neff. EX2001, ¶¶89-90. However, because general knowledge in the art encompassed a *range* of values for these fatty acid compositions, Dr. Marangoni’s reliance on these specific disclosures demonstrates that he is not relying on “general knowledge” in the art, but rather on the *specific teachings* of Neff and Deffense Table IV. EX2001, ¶¶91-108.

Dr. Marangoni supports his use of those values based solely on the fact that they were “known,” offering no explanation for why these *particular* values were selected over other known alternatives. EX2001, ¶91. As detailed in the previous section, the wt% values for palm stearin and soybean oil were known at the time of the invention to vary. EX2001, ¶¶95-99, 103-107. Dr. Marangoni does not address this variability or explain how these variations might impact his calculations. EX2001, ¶108. He also fails to explain why a POSITA, without the benefit of hindsight, would have chosen *these particular values* from Neff and Deffense Table IV, when other values were known in the art. EX2001, ¶¶108, 109.

The Petition attempts to characterize these specific disclosures as “known fatty acid compositions of palm stearin and soybean oil” (Pet., 38), but this is misleading. As discussed above, the relevant compositions vary. The Petition offers no technical basis or reasoned justification for selecting these precise values over others within the known variations. Instead, it simply declares the chosen values to be “readily available and well-known in the art.” Pet., 38. However, mere availability of information does not equate to general knowledge sufficient to support an obviousness argument. The Petition must establish why a POSITA would have selected these specific values. At a minimum, to claim these values represent general knowledge, Petitioner needed to provide a reasoned, evidence-backed justification for selecting them over other known possibilities.

Furthermore, Dr. Marangoni fails to explain why a POSITA would have consulted Deffense Table IV and Neff *specifically* in conjunction with Petrauskaite. EX2001, ¶¶91, 108; EX1003, ¶¶63, 65.

Petitioner's approach here is fatally infected with hindsight bias. *See KSR Int'l Co.*, 550 U.S. at 421. Absent a reasoned explanation, Petitioner's attempt to modify Petrauskaite using cherry-picked values from Neff and Deffense Table IV is fundamentally flawed and fails to meet the basic requirements of an obviousness analysis.

Therefore, because Petitioner improperly relies on specific disclosures from Neff and Deffense Table IV that do not represent general or common knowledge, institution should be denied. *KSR Int'l Co.*, 550 U.S. at 421; *see also Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367-68 (Fed. Cir. 2016) (holding it is "[petitioner]'s burden to demonstrate both 'that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.'" (citations omitted)).

4. Petitioner's Reliance on Cited Case Law is Misplaced

The Petition cites *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330 (Fed. Cir. 2020), in an attempt to justify its reliance on "general knowledge." Pet.,

15. However, the facts of that case are readily distinguishable from those here, rendering the precedent inapplicable.

In *Koninklijke Philips*, the Federal Circuit permitted the use of the skilled artisan's knowledge to supplement a primary reference where the missing element involved a known technique. *Id.* at 1337. Critically, Petitioner's argument here does not involve a known technique or a known accepted value. Instead, Petitioner seeks to modify Petrauskaite's disclosure with calculations using specific values for fatty acid compositions taken from Neff and Deffense Table IV (when other values were known). These values are not universally accepted techniques or standards in the field. As demonstrated above, the variability of fatty acid compositions in palm stearin and soybean oil, including as disclosed in Deffense itself (Tables I-III), undermines Petitioner's assertion that its selected values represent common knowledge.

Therefore, Petitioner's reliance on *Koninklijke Philips* is misplaced. Petitioner's argument involves selective use of data from non-ground references, not the application of a known technique. This crucial distinction negates the applicability of *Koninklijke Philips* and further weakens Petitioner's already flawed obviousness argument.

C. Petitioner Improperly Relies on Non-Ground References

The Petition's reliance on specific disclosures from Deffense Table IV and

Neff is not only a misuse of “general knowledge,” but also substantively improper.

While purporting to rely on general knowledge, Petitioner actually uses Neff and Deffense Table IV to supply specific wt% values for fatty acids in palm stearin and soybean oil—values necessary for its attempt to show that Petrauskaite discloses the claimed limitations. EX2001, ¶¶90, 110-119. The Petition and Dr. Marangoni's declaration confirm this reliance. Despite listing Neff and Deffense in a section titled “**Summary of the Applied Prior Art**,” these references are *not* included as part of Ground 1 or Ground 2. Pet., 6; EX1003, ¶¶33-38. Indeed, in its Answer to Amended Complaint for Patent Infringement, Defenses, and Counterclaims. (EX2008), Petitioner alleges that “Petrauskaite in light of Idris, Hustedt, Neff, and/or Deffense render all the claims obvious” confirming that Petitioner is relying on a multiple reference obviousness argument. EX2008, 27 at ¶26. However, the Petition presents no Ground including Deffense or Neff.

Petitioner's reliance on the specific teachings of Deffense Table IV and Neff improperly deviates from the asserted ground, *i.e.*, Petrauskaite in view of common knowledge in the art. *See Koninklijke Philips*, 948 F.3d at 1335 (holding the PTAB erred when it instituted *inter partes* review based on a combination of prior art references not advanced in the petition); *see also M&K Holdings, Inc. v. Samsung Elecs.*, 985 F.3d 1376, 1385 (Fed. Cir. 2021) (finding the PTAB had violated the APA because a patent owner was not put on notice that a reference

would be used to anticipate a claim when the petition challenged the claim only for obviousness); *EmeraChem Holdings, LLC v. Volkswagen Grp. of Am., Inc.*, 859 F.3d 1341, 1352 (Fed. Cir. 2017) (finding an APA violation when a reference relied upon in the final written decision was not a part of the grounds for rejection of those claims in the petition or the institution decision); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 Fed. App'x 984, 989 (Fed. Cir. 2020) (“[w]e see no error in the Board’s decision not to decide grounds of unpatentability not raised in the petition[s].” (quotation marks and citation omitted)); *Apple Inc. v. MPH Techs. Oy*, Nos. 2021-1355, 2021-1356, 2022 WL 4103286, at *7 (Fed. Cir. Sept. 8, 2022) (holding that the PTAB properly declined to consider arguments not made in Petition).

Moreover, Petitioner offers *no* motivation to combine Petruskaite with Neff or Deffense. It provides only a conclusory and unsupported assertion that a POSITA would have consulted unnamed and uncited references to “understand Petruskaite’s components better.” Pet., 37. This vague statement fails to explain why a POSITA, *without knowledge of the ’473 Patent’s claims*, would have specifically chosen Neff and Deffense Table IV, among the varying information available to determine the wt% values of fatty acids in palm stearin and soybean oil. Pet., 38; EX 2001, ¶¶140-142.

Specifically, the flaws in the Petition's motivation to combine showing are:

- **Omission from Motivation to Combine Analysis:** The Petition's motivation to combine analysis for Ground 1 (and Ground 2 for the matter), does *not* mention or cite to Neff or Deffense.
- **Dr. Marangoni's Vague Mention of "References":** Similarly, Dr. Marangoni's discussion of motivation to combine (EX1003, ¶¶178-193) only vaguely refers to unspecified "references." He fails to identify Neff and Deffense as the source of the specific values used in his calculations.

These omissions are not accidental. Dr. Marangoni clearly understood how to frame a motivation to combine when relying on multiple references, as demonstrated by his analysis of Ground 2, where he explicitly names, cites, and analyzes the teachings of two specific references in the combination (Petrauskaite and Idris - defined below). See EX1003, ¶¶217-231.

The Petition's strategic omission of Neff and Deffense from the grounds, while relying on their specific teachings, constitutes a fatal defect in Petitioner's obviousness argument. See *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017); see also *Reactive Surfaces LTD., LLP v. Toyota Motor Corp.*, IPR2019-

00867, Paper 6 at 8 (PTAB Sept. 18, 2019). For this additional reason, institution should be denied.

D. Petitioner's Analysis of Interesterification Is Erroneous and Contradictory

Even if the above fatal deficiencies in the Petition's covert inherency, general knowledge, and obviousness arguments were disregarded, institution should still be denied because Dr. Marangoni's analysis of interesterification is fundamentally flawed. *See generally*, EX2001, ¶¶122-139. His calculations are based on contradictory assumptions and incorrect data, undermining their reliability. When calculations are done that follow Petitioner's assumption and utilize express disclosures in Petrauskaite, they yield values **outside** the ranges of claim 1.

First, Dr. Marangoni's analysis assumes that interesterification occurs with randomization, when Petrauskaite contradicts that assumption. EX2001, ¶¶74, 124, 125 (*citing* EX1003, ¶82). This is a critical error. Interesterification is not completely random, as demonstrated in Petrauskaite itself (*see below*). *Id.*, ¶125. This lack of full randomization could be for a number of reasons, including differences in hydrolysis conditions, interesterification rates of different fatty acids, and fatty acid positioning on the glycerol backbone. EX2001, ¶124. Loss of components, including free fatty acids and monoglycerides, may also affect the interesterification so that complete randomization is not achieved. *Id.* Indeed, as

detailed below, Petrauskaite itself confirms that interesterification is not completely random. *Id.*

Petrauskaite's Table 2 presents experimentally measured triglyceride values (after interesterification) alongside values calculated based on a Random Distribution Hypothesis. The significant discrepancies between these values demonstrate that interesterification is *not* fully random. EX2001, ¶125, 127, 129. If it were, the experimental and calculated values would be substantially the same. *Id.* However, as shown in Table 2, below, the experimental values (I) and calculated values (C) are different.

TABLE 2
Triacylglycerol Class^a of Fat Blends of Palm Stearin and Soybean Oil
Before (B) and After (I) Interesterification and Calculated (C)
According to Random Distribution Hypothesis

Fat blend (Pst/SBO) ^c wt(%)	Triacylglycerol ^b (mol %)								
	U ₃			U ₂ S			S ₃		
	B	I	C	B	I	C	B	I	C
10:90	51.9	51.1	49.5	27.1	30.9	39.2	8.2	0.9	0.9
20:80	49.8	39.4	37.0	25.8	33.3	43.6	21.9	3.7	2.3
30:70	45.5	33.1	28.3	24.0	34.2	44.4	30.7	4.3	4.1
40:60	37.2	23.0	21.0	19.3	33.6	43.0	38.5	6.3	6.7
50:50	35.0	21.0	14.3	18.4	29.3	39.2	47.7	10.4	10.9

^aDetermined by reversed-phase high-performance liquid chromatography with refractive index detector.
^bFatty acids in triacylglycerol: U, unsaturated; S, saturated.
^cPst/SBO, blend of palm stearin and soybean oil.

Despite this clear evidence from Petrauskaite, in his calculations Dr. Marangoni uses the experimentally derived values, which *contradict* his

randomization assumption. EX2001, ¶125 (*citing* EX1003, ¶82). Had he used the *calculated* values from Petrauskaite (Table 2, Column C) -- which are *consistent* with random interesterification because they are based on a Random Distribution Hypothesis -- his results would have fallen **outside** the ranges claimed in claim 1 of the '473 Patent. EX2001, ¶¶129-134.⁷

When using the calculated values disclosed in Petrauskaite, the content of SU₂ triglyceride in the 40:60 interesterified blend of Petrauskaite's Pst/SBO fat composition is 43.2 wt.%, which is **outside** the claimed range of 10 to 39% recited in claim 1 of the '473 Patent. EX2001, ¶130, 131.

Similarly, repeating the calculations using the calculated mole% for the 50:50 interesterified blend of Petrauskaite's Pst/SBO fat composition in Dr. Marangoni's calculations also yields triglyceride values **outside** the scope of claim 1 of the '473 Patent. EX2001, ¶132. Specifically, the content of triglycerides UUU and SU₂ are 14.8% and 39.6%, respectively, each of which is **outside** the claimed ranges of at least 20% and 10 to 39%, respectively. *Id.*, ¶133.

⁷ The specifics of this calculation are set forth in Schedule B to this Preliminary Response.

Dr. Marangoni's reliance on data that contradicts his own assumption, while avoiding data that would disprove his conclusion, reveals a flawed and results-oriented analysis.

A POSITA would not have expected a calculation based on Petrauskaite to accurately yield the wt% of the SSS, UUU, SU₂, or S₂U triglyceride species recited in claim 1 of the '473 Patent. EX2001, ¶135. This is because if a POSITA were assuming random interesterification (as does Dr. Marangoni), that POSITA would have used the calculated values, and those values yield ranges outside claim 1 of the '473 Patent. *Id.*

Second, compounding his flawed assumptions, Dr. Marangoni's calculation of SUS and SSU triglyceride content is also based on the erroneous assumption of random interesterification. He calculates the mol% of SUS and SSU triglycerides from the mol% of S₂U triglycerides, assuming a random distribution where 2/3 of the unsaturated fatty acid appears in position 1 and 1/3 appears in position 2. EX2001, ¶136 (*citing* EX1003, ¶¶82, 90). Based on this flawed assumption, he calculates the mol% of SUS as 1/3 of the S₂U mol% and the mol% of SSU is 2/3 of the S₂U mol%. *Id.* (*citing* EX1003, ¶¶82, 90). He then uses these inaccurate mol% values to calculate the wt% of SUS and SSU. EX2001, ¶137.

However, as previously demonstrated, Petrauskaite's data shows that interesterification does *not* occur with complete randomization. Therefore, Dr.

Marangoni's foundational assumption is incorrect, rendering his subsequent calculations of the SUS and SSU content invalid. *Id.*, ¶138. His reliance on experimental values (rather than Petrauskaite's calculated values based on a Random Distribution Hypothesis), further weakens his analysis. Thus, a POSITA would not have arrived at the claimed invention by relying on the teachings of Petrauskaite based on these discrepancies of Petrauskaite's teachings. *Id.*, ¶139.

In summary, Dr. Marangoni's flawed assumptions about random interesterification, coupled with his incorrect calculations of SUS and SSU triglyceride content, render his analysis inaccurate and unreliable. This flawed technical analysis cannot support a reasonable likelihood of success under Petitioner's purported obviousness theory, and therefore, institution should be denied. *See, e.g., Regents of Univ. of California v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018) ("[a]n obviousness determination requires finding that a person of ordinary skill in the art would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of success in doing so.").

* * *

Given that Petitioner's arguments as to claim 1 fail for the multiple reasons discussed above, the Petition likewise fails as to the other claims challenged in Ground 1, namely claims 6-9, 11-17, and 20, which depend from claim 1. As the

PTAB has held, dependent claims cannot be found unpatentable if the independent claim from which they depend is patentable. *See Bright Data Ltd.*, IPR2023-01442, Paper 7 at 32; *Ferno-Washington*, IPR2024-00042, Paper 9 at 24, 31 (same); EX2001, ¶56.

E. Petitioner's Ground 2 Also Fails Due to Deficiencies in Ground 1

Petitioner's Ground 2, challenging claims 18, 19, and 21-24, relies on a combination of Petrauskaite and Idris et al., "Evaluation of Shortenings Based on Various Palm Oil Products," *Journal of the Science of Food and Agriculture* 46(4):481-493 (1989) ("Idris", EX1009). Idris relates generally to an "evaluation of shortenings based on various palm oil products." EX1009, Title.

Petitioner and Dr. Marangoni have failed to show a reasonable likelihood of success in challenging claim 1. Idris is only relied on for additional limitations set forth in dependent claims 18, 19, and 21-24. EX2001, ¶¶68, 69. As a result, and because claims 18, 19, and 21-24 ultimately depend from and incorporate the limitations of claim 1, Ground 2 fails for the same reasons discussed above for claim 1. *See* case law cited *supra* at 8, 46-47.

F. Petitioner's POSITA Definition Further Undermines the Petition

Dr. Marangoni acknowledges that an obviousness analysis must be based on the knowledge of a POSITA *at the time of the invention*, or in other words, as of the priority date of the patent. EX1003, ¶19. However, he then defines a POSITA

without any reference to a specific time period, let alone the '473 Patent's priority date of June 13, 2006. EX1003, ¶¶26-27. This contradicts his own statement and raises serious concerns about the validity of his analysis.

A proper obviousness analysis requires determining whether the claimed invention would have been obvious to a POSITA *at the time of the invention*, based on the knowledge and resources available *at that time*. See pre-AIA 35 U.S.C. 103(a). By defining a POSITA without regard to a relevant time period, Dr. Marangoni opens the door to hindsight bias, potentially relying on knowledge or techniques not available at the time of the invention. EX2001, ¶45. Dr. Marangoni's failure to tie his POSITA definition to the relevant time period calls into question his entire analysis. This omission is particularly concerning given the Petition's repeated reliance on hindsight reasoning, as discussed above.

The Petition itself is similarly silent regarding the relevant time period for the POSITA definition. See Pet., 9-10. This further reinforces that Petitioner's entire obviousness analysis is infected by hindsight bias.

For all the reasons discussed above, Petitioner fails to meet its burden of showing a reasonable likelihood of success on either ground. The Petition's covert reliance on inherency, its misuse of "general knowledge," its improper reliance on non-ground references, its flawed analysis of interesterification, and its incorrect POSITA definition all demonstrate that Petitioner has not met its burden to show a

reasonable likelihood that the Challenged Claims are unpatentable. EX 2001, ¶143.
Therefore, institution should be denied.

VII. CONCLUSION

For the reasons set forth above, Petitioner has failed to demonstrate a reasonable likelihood that it would prevail with respect to any of the Challenged Claims. Thus, *Inter Partes* Review of the '473 Patent should be denied.

Respectfully submitted,

Date: December 27, 2024

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SCHEDULE A

Dr. Marangoni calculates the average molecular weight of saturated and unsaturated fatty acids in both 100% palm stearin and 100% soybean oil using the molecular weights of the individual fatty acids and the wt% values derived from Deffense Table IV and Neff, respectively. EX1003, paras [64] and [66]. This is done by multiplying the relative proportions of each fatty acid by their respective molecular weight and adding these values together to get an average molecular weight. The relative proportion of each saturated fatty acid is calculated by dividing its wt% by the combined wt% of all the saturated fatty acids in that particular fat (*i.e.*, palm stearin or soybean oil). EX2001, ¶111

The relative proportion of each unsaturated fatty acid is calculated by dividing its wt% by the combined wt% of all the unsaturated fatty acids in that particular fat (*i.e.*, palm stearin or soybean oil). For example, palm stearin contains two saturated fatty acids, palmitic acid and stearic acid. The proportion of palmitic acid in palm stearin would be calculated by dividing its wt% by the combined wt% of palmitic acid and stearic acid, and the proportion of stearic acid in palm stearin is calculated by dividing its wt% by the combined wt% of palmitic acid and stearic acid. Palm stearin contains two unsaturated fatty acids, oleic acid and linoleic acid, so the proportion of oleic acid in palm stearin is calculated by dividing its wt% by the

combined wt% of oleic acid and linoleic acid, and the proportion of linoleic acid is calculated by dividing its wt% by the combined wt% of oleic acid and linoleic acid.

Id., ¶112

The equations used by Dr. Marangoni for calculating the average molecular weight for both saturated and unsaturated fatty acids in 100% palm stearin, are as follows (see EX1003, para [62]):

Avg. Mol. Wt. for Saturated fatty acids

$$= (\text{Mol. Wt. Palmitic Acid}) * \text{wt\% Palmitic acid} / (\text{total wt\% of Saturated fatty acids}) + (\text{Mol. Wt. Stearic Acid}) * \text{wt\% Stearic acid} / (\text{total wt\% of Saturated fatty acids})$$

Avg. Mol. Wt. for Unsaturated fatty acids

$$= (\text{Mol. Wt. Oleic Acid}) * \text{wt\% Oleic Acid} / (\text{total wt\% of Unsaturated fatty acids}) + (\text{Mol. Wt. Linoleic Acid}) * \text{wt\% Linoleic acid} / (\text{total wt\% of Unsaturated fatty acids})$$

EX2001, ¶113.

Using these equations and the wt% values from Deffense, the average molecular weight for *saturated* fatty acids in 100% palm stearin was calculated by Dr. Marangoni to be 258.4 g/mol and the average molecular weight for *unsaturated* fatty acids in 100% palm stearin was calculated to be 282.1 g/mol. EX1003, para [64], reproduced below:

Avg. Mol. Wt for Saturated Fatty Acids =

$$\left(256.42 \frac{\text{g}}{\text{mol}}\right) * \frac{68.8}{(68.8 + 5.1)} + \left(284.47 \frac{\text{g}}{\text{mol}}\right) * \frac{5.1}{(68.8 + 5.1)} = 258.4 \frac{\text{g}}{\text{mol}} \text{ saturated fatty acid}$$

Avg. Mol. Wt for Unsaturated Fatty Acids

$$\begin{aligned} &= \left(282.44 \frac{\text{g}}{\text{mol}}\right) * \frac{19.1}{(19.1 + 4.5)} + \left(280.43 \frac{\text{g}}{\text{mol}}\right) * \frac{4.5}{(19.1 + 4.5)} \\ &= 282.1 \frac{\text{g}}{\text{mol}} \text{ unsaturated fatty acid} \end{aligned}$$

EX2001, ¶114.

The average molecular weight of saturated and unsaturated fatty acids in soybean oil is calculated using the same approach described above. Soybean oil contains two *saturated* fatty acids, palmitic acid and stearic acid, and three *unsaturated* fatty acids, oleic acid, linoleic acid, and linolenic acid. The equations

used for calculating the average molecular weight for both saturated and unsaturated fatty acids in 100% soybean oil are as follows (see EX1003, para [66]):

Avg. Mol. Wt. for Saturated Fatty Acids

= (Mol. Wt. of Palmitic Acid) wt% of Palmitic acid/(total wt% of Saturated fatty acids) + (Mol. Wt. of Stearic Acid)* wt% of Stearic acid/(total wt% of Saturated fatty acids)*

Avg. Mol. Wt. for Unsaturated Fatty Acids

= (Mol. Wt. of Oleic Acid) wt% of Oleic Acid/(total wt% of Unsaturated fatty acids) + (Mol. Wt. of Linoleic Acid)* wt% Linoleic acid/(total wt% of Unsaturated fatty acids) + (Mol. Wt. of Linolenic Acid)* wt% of Linolenic acid/(total wt% of Unsaturated fatty acids)*

EX2001, ¶115.

Using these equations and the wt% from Neff, Dr. Marangoni calculated the average molecular weight for *saturated* fatty acids to be 264.7 g/mol and the average molecular weight for *unsaturated* fatty acids to be 280.8 g/mol. EX1003, para [66], reproduced below:

Avg. Mol. Wt for Saturated Fatty Acids

$$\begin{aligned} & \left(256.42 \frac{\text{g}}{\text{mol}}\right) * \frac{10.0}{(10.0 + 4.2)} + \left(284.47 \frac{\text{g}}{\text{mol}}\right) * \frac{4.2}{(10.0 + 4.2)} \\ & = 264.7 \frac{\text{g}}{\text{mol}} \text{ saturated fatty acid} \end{aligned}$$

Avg. Mol. Wt for Unsaturated Fatty Acids

$$\begin{aligned} & \left(282.44 \frac{\text{g}}{\text{mol}}\right) * \frac{25.4}{(25.4 + 53.4 + 7.0)} + \left(280.43 \frac{\text{g}}{\text{mol}}\right) * \frac{53.4}{(25.4 + 53.4 + 7.0)} + (278.41) \\ & * \frac{7.0}{(25.4 + 53.4 + 7.0)} = 280.8 \frac{\text{g}}{\text{mol}} \end{aligned}$$

EX2001, ¶116.

This first step in Dr. Marangoni's calculation is the above determination of the average molecular weights of saturated and unsaturated fatty acids in both 100% palm stearin and 100% soybean oil, based on the wt% values derived from Deffense Table IV and Neff, respectively. EX2001, ¶117.

SCHEDULE B

Calculation of wt% values for the 40:60 Pst/SBO blend disclosed in Petruskaite using Dr. Marangoni's formulas and the calculated mole% values disclosed in Petruskaite (EX1007, 490 (Table 2, Col. C) (substituted values highlighted and in bold font). EX 2001, ¶¶129-130.

Average Total Weight for UUU Triglyceride

$$\begin{aligned} &= (\text{Avg. mol. wt. of UUU triglyceride of 40:60 Pst/SBO blend}) * (\text{Mol \% of} \\ &\text{UUU triglyceride of 40:60 Pst/SBO blend}) = 882.1 \text{ g/mol} * \mathbf{21.0} = 18,524.1 \\ &\text{g/mol} \end{aligned}$$

Average Total Weight for SU₂ Triglyceride

$$\begin{aligned} &= (\text{Avg. mol. wt. of SU}_2 \text{ triglyceride of 40:60 Pst/SBO blend}) * (\text{Mol \% of} \\ &\text{SU}_2 \text{ triglyceride of 40:60 Pst/SBO blend}) = 862.9 \text{ g/mol} * \mathbf{43.0} = 37,104.7 \\ &\text{g/mol} \end{aligned}$$

Average Total Weight for SSS Triglyceride

$$= (\text{Avg. mol. wt. of SSS triglyceride of 40:60 Pst/SBO blend}) * (\text{Mol \% of SSS triglyceride of 40:60 Pst/SBO blend}) = 824.7 \text{ g/mol} * \mathbf{6.7} = 5,525.5 \text{ g/mol}$$

Average Total Weight for S₂U Triglyceride

$$= (\text{Avg. mol. wt. of S}_2\text{U triglyceride of 40:60 Pst/SBO blend}) * (\text{Mol \% of S}_2\text{U triglyceride of 40:60 Pst/SBO blend}) = 843.8 \text{ g/mol} * \mathbf{29.3} = 24,723.3 \text{ g/mol}$$

Total Weight of Triglyceride Species

$$= 18,524.1 + 37,104.7 + 5,525.5 + 24,723.3 = 85,877.6 \text{ g/mol}$$

Weight % for UUU Triglyceride

$$= (18,524.1 / 85,877.6) * 100 = 21.6 \text{ wt\%}$$

Weight % for SU₂ Triglyceride

$$= (37,104.7 / 85,877.6) * 100 = \mathbf{43.2 \text{ wt\%}}$$

Weight % for SSS Triglyceride

$$= (5,525.5/85,877.6)*100 = 6.4 \text{ wt\%}$$

Weight % for S₂U Triglyceride

$$= (24,723.3/85,877.6)*100 = 28.8 \text{ wt\%}$$

Id., ¶130.

As shown above, the content of SU₂ triglyceride in the 40:60 interesterified blend of Petrauskaite's Pst/SBO fat composition is 43.2 wt.%, which is outside the claimed range of 10 to 39% recited in claim 1 of the '473 Patent. *Id.*, ¶131.

The above calculation was also repeated using the calculated mole% for the 50:50 interesterified blend of Petrauskaite's Pst/SBO fat composition, and the results from that calculation also yielded triglyceride values outside the scope of claim 1 of the '473 Patent. *Id.*, ¶132.

Specifically, the contents of triglycerides UUU and SU₂ are 14.8% and 39.6%, respectively, each of which is outside the claimed ranges of at least 20% and 10 to 39%, respectively. *Id.*, ¶133.

CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this preliminary response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 10,260 words (including Schedules A and B hereto), according to the word-processing system used to prepare this preliminary response, excluding the parts of this preliminary response that are exempted by 37 C.F.R. § 42.24(c) (table of contents, table of authorities, exhibits list, listing of facts, certificate of service, this certificate of word count, appendix of exhibits).

Date: December 27, 2024

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), this is to certify that on this 27th day of December, 2024, I caused to be served a true and correct copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE (with EX2001-2008)** by e-mail (as agreed in the Service Information section of the Petition):

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