

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VANTAGE SPECIALTY CHEMICALS, INC.,

Petitioner

v.

CARGILL, INC.,

Patent Owner

Case No. IPR2023-00589

Patent No. 11,248,245

Petition for *Inter Partes* Review

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Exhibit No.	Description
1001	U.S. Patent No. 11,248,245
1002	File History of U.S. Patent No. 11,248,245
1003	Declaration of Dr. David A. Rockstraw, Ph.D., P.E.
1004	Melanie Cummings et al., <i>A natural alternative</i> , SOAP, PERFUMERY, AND COSMETICS (SPC) ASIA (May 1, 1999) available at https://www.floratech.com/PDFs/Articles_MKT/ART15.pdf (“Cummings”)
1005	James Brown & Robert Kleinman, <i>Trans Isomers in Cosmetics</i> , SOAP & COSMETICS at 33 (May 2001) (“ <i>Trans Isomers 1</i> ”)
1006	James Brown & Robert Kleinman, <i>Trans Isomers in Cosmetics Part 2</i> , SOAP & COSMETICS at 44 (June 2001) (“ <i>Trans Isomers 2</i> ”)
1007	U.S. Patent No. RE38,141E1 to Brown et al. (“Brown”)
1008	Xuebing Xu, <i>Engineering of enzymatic reactions and reactors for lipid modification and synthesis</i> , 105 EUR. J. LIPID SCI TECH. 289 (2003) (“Xu”)
1009	David J. Sessa, <i>Derivation of a Cocoa Butter Equivalent from Jojoba Transesterified Ester via a Differential Scanning Calorimetry Index</i> , 72 J. SCI. FOOD AGRI. 295 (1996) (“Sessa”)
1010	U.S. Patent No. 5,968,530 to Arquette et al. (“Arquette”)
1011	U.S. Patent No. 6,280,746 to Arquette et al. (“the ’746 patent”)
1012	Barbara Fitch Haumann, <i>Tools: hydrogenation, interesterification</i> , 5 INFORM 668 (June 1994)
1013	Otero et al., <i>Continuous Enzymatic Transesterification of Sesame Oil and a Fully Hydrogenated Fat: Effects of Reaction Conditions on Product Characteristics</i> , 94 BIOTECH. & BIOENG’G 877 (2006)
1014	James Brown & Robert Kleinman, <i>Trans Isomers in Cosmetics Parts 1 and 2</i> , Reprinted from SOAP & COSMETICS (May & June 2001) available at https://www.floratech.com/PDFs/Articles_MKT/ART17.pdf
1015	U.S. Patent App. Pub. No. 2005/0176597 to Kodali & Nivens
1016	U.S. Patent App. Pub. No. 2004/0208904 to Touitou & Bergelson

Exhibit No.	Description
1017	X. Xu et al., <i>Chemical and enzymatic interesterification of lipids for use in food</i> , in <i>Modifying lipids for use in food</i> 234 (Frank D. Gunstone, ed., 2006)
1018	Arnaldo Lopez-Hernandez et al., <i>Lipase-catalyzed Transesterification of Medium-chain Triacylglycerols and a Fully Hydrogenated Soybean Oil</i> , 70 J. FOOD SCI. C365 (Jul. 13, 2005)
1019	Declaration of Nancy Adams, MLIS, EdD
1020	Complaint (Dkt No. 1) filed in <i>Cargill, Inc. v. Vantage Specialty Chemicals, Inc.</i> , No. 1:22-cv-00979-RGA-SRF (D. Del. July 26, 2022)
1021	Scheduling Order (Dkt No. 15) filed in <i>Cargill, Inc. v. Vantage Specialty Chemicals, Inc.</i> , No. 1:22-cv-00979-RGA-SRF (D. Del. Oct. 3, 2022)
1022	Excerpt of United States District Courts, Federal Court Management Statistics Report for the 12-month period ending June 30, 2022, available at https://www.uscourts.gov/sites/default/files/fcms_na_distprofile0630.2022_0.pdf
1023	T. Haryati et al., <i>Determination of Iodine Value of Palm Oil Based on Triglyceride Composition</i> , 75 J. AM. OIL CHEMISTS' SOC. 789 (1998)
1024	ASTM Int'l, ASTM D5554-95 Standard Test Method for Determination of the Iodine Value of Fats and Oils (Reapproved 2006)
1025	Am. Oil Chemists' Soc., <i>AOCS Recommended Practice Cd 1c-85</i> (Reapproved 2009), in Am. Oil Chemists' Soc., <i>Official Methods and Recommended Practices of the AOCS</i> (David Firestone, ed., 2013)
1026	Excerpt of Richard O'Brien, <i>Fats and Oils: Formulating and Processing for Applications</i> (CRC Press 3rd ed. 2009)
1027	Excerpt of <i>Physical and Chemical Characteristics of Oils, Fats, and Waxes</i> (AOCS Press, David Firestone, ed., 3rd ed. 2013).

Exhibit No.	Description
1028	Cosmetic Ingredient Review, <i>Final Report of the Cosmetic Ingredient Review Panel: Safety Assessment of Simmondsia Chinensis (Jojoba) Seed Oil, Simmondsia Chinensis (Jojoba) Seed Wax, Hydrogenated Jojoba Oil, Hydrolyzed Jojoba Esters, Isomerized Jojoba Oil, Jojoba Esters, Simmondsia Chinensis(Jojoba) Butter, Jojoba Alcohol, and Synthetic Jojoba Oil</i> (Sept. 23, 2008) available at https://www.cir-safety.org/ingredient/simmondsia-chinensis-jojoba-seed-oil
1029	Junzo Otera, <i>Transesterification</i> , 93 CHEM. REV. 1449 (1993)
1030	Ramesh Chandra Gupta & Gulab Kanwar, <i>Determination of Iodine Numbers of Edible Oils</i> , 22 Biomedical Education 47 (1994)

LIST OF CHALLENGED CLAIMS

Claim	U.S. Patent No. 11,248,245
1[preamble]	A process for transesterifying wax esters, the process comprising:
1[a]	providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters, wherein the amount of hydrogenated jojoba wax esters is 20% to 50% by weight of the feedstock;
1[b]	contacting the feedstock with a lipase; and transesterifying the jojoba wax esters and the hydrogenated jojoba wax esters in the feedstock with the lipase to form a transesterified product;
1[c]	wherein an oxidative stability index (OSI) of the transesterified product is greater than an OSI of the feedstock.
2	The process of claim 1, wherein the feedstock consists essentially of the jojoba wax esters and the hydrogenated jojoba wax esters.
3	The process of claim 1, wherein the feedstock does not comprise any free fatty alcohols.
5	The process of claim 1, wherein the feedstock does not comprise any methyl ester.

Vantage Specialty Chemicals, Inc. (“Petitioner”) respectfully requests *Inter Partes* Review (“IPR”) of claims 1-3 and 5 (the “Challenged Claims”) of U.S. Patent No. 11,248,245 (EX-1001, “the ’245 patent”), currently assigned—according to Patent Office records—to Cargill, Inc. (“Patent Owner”). There is a reasonable likelihood Petitioner will prevail on at least one Challenged Claim.

I. Introduction

The Challenged Claims of the ’245 patent claim a process for transesterifying wax esters, the process comprising: providing a feedstock comprising (or consisting essentially of) jojoba wax esters and 20% to 50% by weight of hydrogenated jojoba wax esters, contacting the feedstock with a lipase, and transesterifying the jojoba wax esters and hydrogenated jojoba wax esters in the feedstock with the lipase to form a transesterified product, wherein the transesterified product’s oxidative stability index (“OSI”) is greater than the feedstock’s OSI. *See* EX-1001, claims 1-3, 5.

As explained below and in the accompanying declaration of Dr. David Rockstraw (EX-1003), there is nothing novel or non-obvious about the Challenged Claims. As demonstrated by the exemplary prior art in the grounds of unpatentability below, it was well-known prior to the ’245 patent that: (i) processes for transesterifying a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters result in a transesterified product which has a greater OSI than the OSI

of the feedstock, (ii) such a feedstock was known to and can be manipulated to comprise 20% to 50% by weight of hydrogenated jojoba wax esters to obtain desired physical properties in the transesterified product, and (iii) such processes may be catalyzed using a lipase, as recited in the Challenged Claims.

II. Mandatory Notices (37 C.F.R. §42.8)

A. Real Parties in Interest (37 C.F.R. §42.8(b)(1))

The real party in interest is Vantage Specialty Chemicals, Inc.

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

Patent Owner has asserted the '245 patent against Petitioner in *Cargill, Inc., et al. v. Vantage Specialty Chemicals, Inc.*, No. 1:22-cv-00979-RGA-SRF, pending in the U.S. District Court for the District of Delaware (“the Delaware Matter”).

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

Petitioner designates the following lead and back-up counsel:

Lead Counsel

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Petitioner consents to e-mail service at the above e-mail addresses and also at vantage-cargill@shearman.com.

III. Payment of Fees (37 C.F.R. §42.103)

The Director is authorized to charge the filing fee for this Petition, as well as any other fees that may be required in these proceedings, to Deposit Account 500324.

IV. Requirements for *Inter Partes* Review (37 C.F.R. §42.104)

A. Grounds for Standing (37 C.F.R. §42.104(a))

Petitioner certifies the '245 patent is available for IPR, and that Petitioner is not barred or estopped from requesting an IPR challenging the claims on the identified grounds.

B. Identification of Challenge (37 C.F.R. §42.104(b)(1)-(2)) and Relief Requested (37 C.F.R. §42.22(a)(1))

Petitioner requests the Board institute IPR on the Challenged Claims because they are obvious under AIA 35 U.S.C. §103 on the following grounds:

Ground	Prior Art	Claims Challenged
1	Cummings (EX-1004) in view of Xu (EX-1008) and/or in further view of Sessa (EX-1009)	1-3, 5
2	<i>Trans</i> Isomers 2 (EX-1006) in view of Xu (EX-1008) and/or in further view of Sessa (EX-1009)	1-3, 5
3	<i>Trans</i> Isomers 2 (EX-1006) in view of <i>Trans</i> Isomers 1 (EX-1005) and/or in further view of Sessa (EX-1009)	1-3, 5
4	Brown (EX-1007) in view of Xu (EX-1008) and Cummings (EX-1004) and/or in further view of Sessa (EX-1009)	1-3, 5

V. Relevant Information Concerning the Contested Patent

A. Overview of the '245 Patent

The '245 patent, titled “Processes and Systems for Catalytic Manufacture of Wax Ester Derivatives,” issued from U.S. Patent Application No. 14/578,075 (“the Application”), filed December 19, 2014. EX-1001. AIA 35 U.S.C. §§102 and 103 apply to the '245 Patent. *See* M.P.E.P. §2159.02.

The '245 patent is directed to processes for transesterifying wax esters including providing a feedstock comprising wax esters (specifically, jojoba wax esters and hydrogenated jojoba wax esters), contacting the feedstock with a lipase, and transesterifying the wax esters in the feedstock with the lipase to form a

transesterified product, wherein the transesterified product's OSI is greater than the feedstock's OSI. EX-1001, Abstract, 1:22-28; EX-1003 ¶34.¹

The '245 patent recites, “[t]ransesterification for naturally occurring or structured or synthetic esters permits altering of various physical properties of the transesterified product when compared to the original feedstock[,]” including “oil (oxidative) stability index (OSI).” EX-1001, 3:38-46. “These changes take place at least in part because the chain lengths of the resulting ester products are randomized compared to the distribution in the original wax ester feedstock, which may alter the functionality of the transesterified material in a mixture and/or the thermal properties of the material.” EX-1001, 3:46-51.

The '245 patent admits conventional processes for transesterifying wax esters (including jojoba oil), using chemical catalysts, were well-known in the art, but they were also known to generate undesirable results. EX-1003 ¶36. “Methods and systems for transesterifying jojoba oil that include the use of acidic bentonite-type clay at temperatures between 150C-350C” were disclosed in U.S. Patent Nos. 4,329,298 (issued May 11, 1982) and 4,360,387 (issued November 3, 1982). EX-

¹ Declaration of Dr. David Rockstraw, a chemicals expert, including in the field of specialty chemicals. EX-1003 ¶¶7-19 (background); *see also* Appendix A to same (CV).

1001, 3:52-63. “Other conventional transesterification reactions use a chemical catalyst, such as sodium methylate (methoxide) or sodium hydroxide.” EX-1001, 3:66-4:1.

The '245 patent admits these conventional methods were known to result in a “5%-10% loss of the original jojoba oil” and “side reactions... that reduce the yield of the process and alter the properties of the transesterified product.” EX-1001, 4:4-6; EX-1003 ¶37. “Some of the property changes occur because of the damage/changes to the feedstock esters caused by the high temperatures... and low pressures... required to carry out” these reactions. EX-1001, 4:6-10. Other property changes occurred “because these conditions and/or the chemical catalysts themselves degrade, destroy, or reduce the effectiveness of other subcomponents of the wax ester feedstock” or “the transesterified product may include artifacts of these components which are undesirable or have undesirable effects in the product or subsequent mixtures that include the product.” EX-1001, 4:11-25. “Chemically catalyzed transesterification of wax esters is carried out in a batch reactor, and the catalyst cannot, accordingly, be recovered for reuse from the transesterification product.” EX-1001, 4:26-29.

The '245 patent admits these conventional methods were known to result in “side reactions [that] form various fatty acid methyl esters and leave various free fatty alcohols when sodium methoxide is used,” which may result in the

“transesterified product stream... includ[ing] 5% or less by weight of these fatty acid methyl esters, which may function as an emollient, and the free fatty alcohols, which may function as an emollient and viscosity controller.” EX-1001, 7:24-33; EX-1003 ¶38. “[T]he reaction of the chemical catalyst removes or degrades the... tocopherols... in the jojoba oil,” which “changes the functionality and physical properties of the transesterified product stream.” EX-1001, 7:33-38. “In particular, the degradation and/or removal of the tocopherols and other naturally occurring antioxidants reduces the OSI of the transesterified product to below the OSI of the original jojoba oil.” EX-1001, 7:38-42.

In contrast, the ’245 patent asserts that enzymatically transesterified processes do not generate these undesirable results. In Table 1, the ’245 patent compares “process parameters and some characteristics of the transesterified product stream” for processes using chemical and enzymatic catalysts. EX-1001, 7:49-63.

TABLE 1

Process Parameter	Chemical Catalyst	Enzymatic Catalyst
Reaction Temperature	100 C.-230 C.	10 C.-70 C.
Reaction Pressure	<7 mm Hg	760 mm Hg (ambient)
Product Color	Increased (changes color)	No changes
Soap Formation	Yes	No change
Transesterification Yield	85%-95%	>98%

In Table 2, the ’245 patent “shows [the] observed effect of the chemically catalyzed process and various enzymatically catalyzed processes on the various

naturally present components in jojoba oil as well as side reaction byproducts.” EX-1001, 7:64-8:19.

TABLE 2

Transesterified Product Component	Skin Care Formula Function	Chemical Catalyst	Enzyme Catalyst
Steryl Esters	Skin Conditioning Agent	Removed/Degraded	Functionally Unaffected
Sterols	Skin Conditioning Agent	Removed/Degraded	Functionally Unaffected
Tocopherols	Antioxidant	Removed/Degraded	Functionally Unaffected
Hydrocarbons	Skin Conditioning Agent	Removed/Degraded	Unchanged
Fatty Acid Methyl Esters	Emollient	Formed, <5%	Not formed
Free Fatty Alcohols	Emollient, Viscosity Controller	Formed, <5%	Not formed
Volatile Ingredients	Sensory Attributes	Removed/Degraded	Functionally Unaffected

Referencing these tables, the '245 patent recites that enzymatically catalyzed processes “proceed[] without removing/degrading the tocopherols or volatiles naturally contained in the jojoba oil.” EX-1001, 8:23-8:25.

B. Overview of the '245 Patent Prosecution History

The Application was filed December 19, 2014. EX-1002, 1-50. It contained 20 claims containing multiple species. EX-1002, 28-32, 168-175. The Applicant elected claims 1-7, directed to “a method of trans-esterifying wax esters to obtain higher oxidative stability index (OSI) in the transesterified feedstock[,]” and cancelled claims 8-20. EX-1002, 170, 177-181. The Applicant added claims 21-29; and, after additional rejections/amendments, examined claims 24, 25, and 27-29 issued February 15, 2022, as claims 1-5. *See* EX-1001; EX-1002, 1175-1179.

C. Person of Ordinary Skill in the Art

Several factors may be considered in determining the proper skill level, including “(A) ‘type of problems encountered in the art;’ (B) ‘prior art solutions to those problems;’ (C) ‘rapidity with which innovations are made;’ (D) ‘sophistication of the technology; and’ (E) ‘educational level of active workers in the field.’” M.P.E.P. §2141.03.

The level of skill is apparent from the cited art. *See In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). A person of ordinary skill in the art (“POSA”) would have had at least a B.S. in Chemical Engineering, Chemistry, or a related field, and three years of work experience working in the specialty chemicals industry, EX-1003 ¶¶30-32, although more education or skill might make up for less experience, and vice-versa. *GPAC*, 57 F.3d at 1579.

D. Claim Construction (37 C.F.R. §42.104(b)(3))

This Petition construes terms consistent with a POSA’s understanding at the time of invention, in view of intrinsic evidence and, where appropriate, extrinsic evidence. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314-15 (Fed. Cir. 2005); *see also* EX-1003 ¶48. Implicit constructions derived from Petitioner’s analysis of the prior art are for purposes of this IPR only, and may be based in part on Patent Owner’s infringement allegations. Regardless of whether such constructions are

ultimately adopted, the prior art renders obvious the Challenged Claims as explained herein.

VI. The Specific Grounds of Unpatentability

As evidenced by the prior art herein, the prior art of record, and Declaration of Dr. Rockstraw (EX-1003), there is nothing novel or non-obvious the Challenged Claims—they claim concepts well-known in the prior art, as set forth in the Grounds. As Dr. Rockstraw explains and the prior art shows, it was well-known prior to the '245 patent that: (i) processes for transesterifying a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters results in a transesterified product with an OSI greater than the OSI of the feedstock, (ii) such feedstock was known to and can be manipulated to comprise 20% to 50% by weight of hydrogenated jojoba wax esters to obtain desired physical properties in the transesterified product, and (iii) such processes may be catalyzed using a lipase. EX-1003 ¶¶49-51. The prior art teaches the claimed method, and a POSA would have found obvious the Challenged Claims. Authentication and public availability evidence for selected prior art references is included in the Declaration of Nancy E. Adams, Ed.D. *See* EX-1019.

A. Prior Art

1. Cummings

Cummings, entitled “*A natural alternative*,” published in SOAP, PERFUMERY AND COSMETICS (SPC) ASIA in May 1999. EX-1004; EX-1019 ¶¶11-17. It is prior

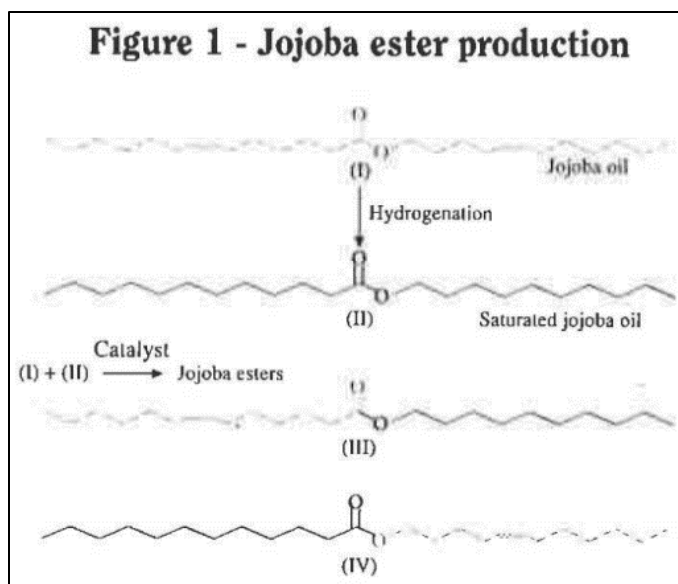
art under AIA 35 U.S.C. §102(a)(1).² It was not disclosed during prosecution.

Cummings describes “jojoba esters[...] oxidatively stable, plant-derived, oil-free emollients shown to be non-toxic, non-comedogenic, hypoallergenic, and biodegradeable.” EX-1004, 1.

“[T]he jojoba plant bears a... seed containing a unique oil that is chemically a liquid wax ester.... Jojoba oil is oxidatively stable and a popular cosmetic ingredient known for its non-greasy skin feel.” EX-1004, 1. “While jojoba oil has unique and beneficial cosmetic properties its utility has been broadened significantly by using it as the base material of a new family of jojoba esters.” EX-1004, 1.

“Jojoba oil is converted to jojoba esters through a process known as interesterification. In this process, different ratios of unsaturated jojoba oil are combined with fully saturated jojoba oil and then interesterified. The process results in jojoba esters engineered to deliver specific physical, functional and chemical characteristics.” EX-1004, 2. Cummings illustrates the interesterification reaction:

² AIA §102(b)(1) exceptions do not apply because the '245 patent is entitled to a priority date no earlier than December 19, 2014.



EX-1004, 2, Fig. 1; EX-1003 ¶56.

“Interesterification produces jojoba esters engineered to contain different ratios of molecules with either no double bonds (fully saturated), one double bond (monounsaturated) or two double bonds (fully unsaturated)... It is these compositional differences... that create their expanded utility in cosmetic preparations.” EX-1004, 2.

“[J]ojoba esters... improve cosmetic, functional and structural properties of a broad array of personal care products. They have shown distinctive utility in highly pigmented systems where emolliency and oxidative stability is sometimes lacking....” EX-1004, 1. “Jojoba esters demonstrate remarkable stability with OSI values of all jojoba esters greater than 100 hours and as high as 675 hours. [By contrast, t]he OSI of refined jojoba oil is around 35 hours.” EX-1004, 2.

Cummings identifies various physical properties of jojoba esters:

Figure 3 - Jojoba ester differences				
Product	Melting point °C AOCS Cc 18-80	Iodine value g/100g AOCS Cd 1-25	Visual appearance	Colour AOCS Cc 13c-92
Jojoba esters (15)	10 - 15	78 - 85	Clear, colourless liquid	< 1.5 Red
Jojoba esters (20)	42 - 48	64 - 70	White, creamy paste	< 1.0 Red
Jojoba Esters (30)	47 - 51	57 - 61	White, soft paste	< 1.0 Red
Jojoba Esters (60)	56 - 61	40 - 44	White, firm paste	< 1.0 Red
Jojoba esters (70)	66 - 70	< 2	White crystalline powder	< 1.0 Red

EX-1004, 1.

2. *Trans* Isomers 1

Trans Isomers 1, entitled “*Trans Isomers in Cosmetics*,” published in SOAP & COSMETICS in May 2001. EX-1005; EX-1014; EX-1019 ¶¶18-25. It forms a two-part series with *Trans* Isomers 2. See EX-1006, 1, 6; EX-1014, 3, 5. Petitioner’s citations include an electronic version of *Trans* Isomers 1 (EX-1005) which contains the same content as the print version published in 2001 and reprinted in 2004 (EX-1014). EX-1019 ¶¶18-25.

It is prior art under AIA 35 U.S.C. §102(a)(1).³ It is applicant-admitted prior art, EX-1001, 12:34-39, but was never cited by the Examiner or applied to the Challenged Claims.

Trans Isomers 1 states:

³ See *supra*, 11 n.2.

Cosmetic chemists may soon be called upon to identify the *trans* isomer content of their brand's formulations and to certify that their products are "*Trans* Free." The impetus behind the movement is in part due to consumer concerns that *trans* fatty acids are not healthful in their diets and will be undesirable to use on their body as well.

EX-1014, 2; EX-1005, 1.

Trans Isomers 1 discloses:

The challenge of cosmetic ingredient suppliers is therefore to provide manufacturers with oxidatively stable and affordable lipid based emollients that exhibit a broad range of melting points yet which contain no *trans* fatty isomers. Oil phase emollients with these desirable characteristics can be obtained without the formation of *trans* isomers through a process known as 'interesterification.' Rozenaal [] discussed use of this interesterification process to modify the melting characteristics of triglycerides using various catalysts including enzymes. Another paper by Haumann [] points out that the interesterification process may be a means of addressing the growing consumer concern for *trans* fatty acids.

EX-1014, 3; EX-1005, 3.

"Fully hydrogenated lipid materials contain neither *cis* nor *trans* fatty acid isomers.... Fully hydrogenated forms are... the most oxidatively stable of all possible chemical structures of lipids. Fully hydrogenated jojoba oil (melting point 68-70°C) contains neither *cis* nor *trans* isomers (there are no remaining double bonds in the molecule)...." EX-1014, 2; EX-1005, 2.

Trans Isomers 1 defines interesterification as “[t]he catalyzed chemical reaction between two or more esters in which the acids and alcohols present are recombined in a random manner, also known as transesterification. This reaction does not alter the double bond geometry of unsaturated compounds, i.e., no *trans* isomers are formed as a result of interesterification reactions.” EX-1014, 4; EX-1005, 4.

3. *Trans Isomers 2*

Trans Isomers 2, entitled “*Trans Isomers in Cosmetics, Part 2*,” published in SOAP & COSMETICS in June 2001. EX-1006; EX-1014; EX-1019 ¶¶18-25. It forms a two-part series with *Trans Isomers 1*. See EX-1006, 1, 6; EX-1014, 3, 5. Petitioner’s citations include an electronic version of *Trans Isomers 2* (EX-1006) which contains the same content as the print version published in 2001 and reprinted in 2004 (EX-1014). EX-1019 ¶¶18-25.

It is prior art under AIA 35 U.S.C. §102(a)(1).⁴ It is applicant-admitted prior art, EX-1001, 12:34-39, but was never cited by the Examiner or applied to the Challenged Claims.

Trans Isomers 2 continues the *Trans Isomers 1* discussion regarding using interesterification to prepare *trans*-isomer-free products: “[t]he interesterification reaction used to produce *trans* free emollients is one in which a fully hydrogenated

⁴ See *supra*, 11 n.2.

lipid material (no *trans* isomers) is reacted with neat oil containing only *cis* isomers. The resulting product is an isomorphous mixture of partially saturated, saturated and unsaturated esters that contain no *trans* isomers.” EX-1014, 5; EX-1006, 1. “Jojoba esters are an ideal model to use to demonstrate the *trans* free interesterification reaction and the properties of the resulting components.” EX-1014, 5; EX-1006, 1. “The CTFA Ingredient Dictionary defines Jojoba Esters as: A complex mixture of esters produced by the transesterification/interesterification of Simmondsia Chinensis (Jojoba) Oil, Hydrogenated Jojoba Oil, or a transesterified mixture of the two. Figure 4 represents the interesterification reaction between (I) jojoba oil (only *cis* isomers) and (II) fully hydrogenated jojoba oil (no *cis* or *trans* isomers).” EX-1014, 5; EX-1006, 1-2.

Figure 4

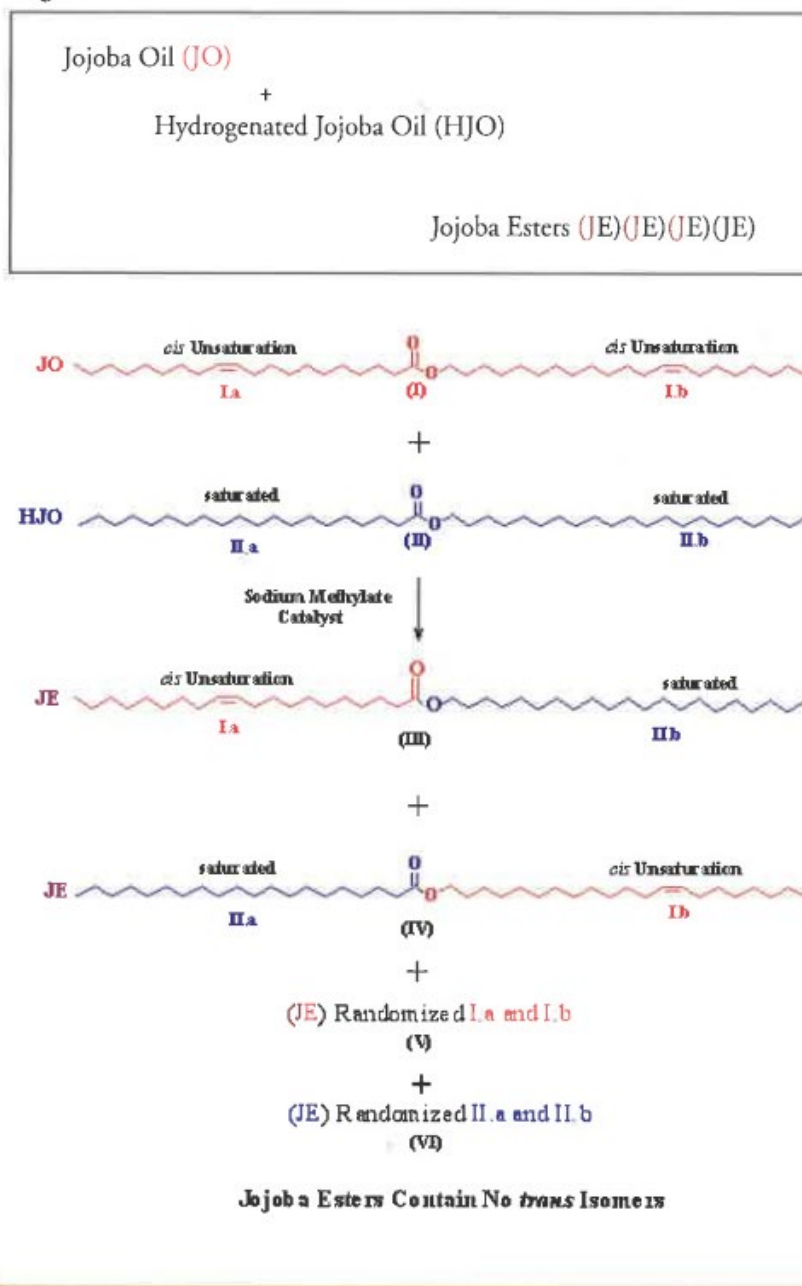


Table 2 “illustrates the range of properties achievable through this transesterification process that is used to produce ‘*Trans* Free’ Jojoba Esters.” EX-1014, 5-7; EX-1006, 2-3.

TABLE 2. CHEMICAL AND PHYSICAL PROPERTIES OF JOJOBA ESTERS						
Jojoba Ester	Melting Point °C	Iodine Value g I./100g	Oxidative Stability Value, Hours	Lubricity Degrees	Penetration, Mm	Monoene, Content, 0%
15	10-15	78-85	70	19.0	—	0
20	42-48	64-70	130	20.4	—	25-35
30	47-51	57-61	165	18.9	26.4	36-46
60	56-61	40-44	225	17.9	9.3	42-52
70	66-70	0-2	680	15.9	0.3	0

Table 4 compares chemical and physical properties of interesterified jojoba esters to partially hydrogenated jojoba derivatives exhibiting identical melting points. EX-1006, 4; EX-1014, 7-8.

TABLE 4. PHYSICAL PROPERTIES OF INTERESTERIFIED JOJOBA ESTERS IN COMPARISON WITH LIKE MELTING PARTIAL HYDROGENATES								
Sample	Melting Point °C	Iodine Value g I./100g of Sample	% Trans	Oxidative Stability Index, Hours	Index of Refraction $\mu_{\text{D}}@80^{\circ}\text{C}$	Penetrometer, Mm	Slip, Cadcamo, Degress (1%)	Slip, IFT, Degress (100%)
Jojoba Esters 30	49	58	0	165	1.4418	26.4	18.9	23
Jojoba oil Partial Hydrogenate	49	69	11	27	1.4435	—	19.3	>25
Jojoba Esters 60	59	42	0	225	1.4403	9.3	17.9	14.1
Jojoba Oil Partial Hydrogenate	59	49	37	108	1.4408	5.2	18.1	15.4

Trans Isomers 2 discloses that “Iodine Value (IV)... [is] commonly used to follow the progress of commercial hydrogenation reactions. Fully Hydrogenated Jojoba Oil exhibits an IV of less than 2.... Iodine Values for Hydrogenated Jojoba Oil in this range indicate that the double bond positions of the molecule comprising jojoba oil have been completely filled or ‘saturated’ with hydrogen.” EX-1006, 4; EX-1014, 8.

4. Brown

U.S. Patent No. RE38,141 to Brown, entitled “Dry Emollient Compositions,” was filed October 12, 2001, and issued June 10, 2003. EX-1007. It is prior art under AIA 35 U.S.C. §102(a)(1).⁵ It was not disclosed during prosecution.⁶

Brown relates to “emollient compositions for use in cosmetic, personal care, and pharmaceutical preparations... and processes for their preparation.” EX-1007, 1:10-13, 3:21-5:38. Brown discloses “a very effective dry-feel emollient composition additive for use in personal care, cosmetic and pharmaceutical products and a novel method of producing that composition [that] can be produced from combinations of fatty alcohols, isopropyl esters and wax esters obtained from the oil contained in the seed of the jojoba plant (*Simmondsia chinensis*), jojoba oil.” EX-1007, 3:37-45.

⁵ *See supra*, 11 n.2.

⁶ Brown is a reissue of the '746 patent, which is a continuation-in-part of Arquette, which was applied to the Challenged Claims during prosecution of the '245 patent. *See* EX-1002, 1176-1177. However, the '746 patent (and Brown) adds important new matter to Arquette not considered by the Examiner. *Compare* EX-1010 with EX-1007, Abstract, 7:7-19, 8:24-26, 8:45-54, EX-1011, Abstract, 7:1-13, 8:13-15, 8:30-42; EX-1003 ¶69, n.2; *see infra* §VIII.

Brown discloses:

Jojoba esters are prepared by processes described herein, which processes result in a randomized molecular combination of saturated with unsaturated jojoba fatty acids and fatty alcohols. These esters are a complex mixture of different jojoba fatty acids and fatty alcohols combined randomly and composed of differing chain lengths. The fatty acids and fatty alcohols may be either fully saturated, monounsaturated or with both the fatty alcohol and the fatty acid containing one point of unsaturation, as described above. The melting point, consistency, and physical appearance of these jojoba esters can be manipulated to produce a family of wax esters ranging from pourable liquids to hard, crystalline waxes.

EX-1007, 7:7-19. “Jojoba esters in the present invention are utilized as oxidatively stable carriers....” EX-1007, 8:24-25.

“The compositions comprising fatty alcohols, isopropyl esters and jojoba wax esters (jojoba oil) may be obtained by the base catalyzed alcoholysis reaction between jojoba oil and an alkyl alcohol.” EX-1007, 3:59-62. “A process for producing an emollient may comprise the steps of:

- a) providing a composition comprising jojoba oil,
- b) adding an alcohol... to said composition,
- c) effecting alcoholysis on said jojoba oil mixed with said alcohol to produce an emollient, and
- d) effecting interesterification of remaining wax esters.”

EX-1007, 4:60-67.

“Starting materials [for the reaction] could include:

I. The alcohol,

$R^4\text{—OH}$ (with isopropyl alcohol (IPA, $\text{HO—CH—(CH}_3)_2$) being primarily emphasized),

II. Jojoba Wax Esters

$R^1\text{—COO—CH}_2\text{—R}^1$, and

III. Fully hydrogenated Jojoba Wax Esters

$R^2\text{—COO—CH}_2\text{—R}^2$ ”

EX-1007, 4:4-13.

“The basic reactions which may be used in the preparation of the emollient compositions of the invention derived from jojoba oil may include at least... Reaction C I, and IIn and IIIn (catalyst)→IV, V, VI, VII, VIII, IX, IIr, IIIr. This product is referred to herein as ‘the broad melting range emollient’ and the properties of the emollient depend upon the relative amounts of IIn and IIIn[sic].” EX-1007, 4:39-51. “The subscripts n and r respectively represent n=the naturally occurring distribution of wax esters and r=the randomized distribution of wax esters resulting from rearrangements which occur during the reactions.” EX-1007, 4:52-55. Species IV, V, VI, VII, VIII, and IX are partially saturated wax esters, which are the “typical product components from the preferred synthetic reactions used in the practice of the present invention with jojoba oil.” EX-1007, 4:25-38. “As used in [Brown],

Floraesters 70 is III, Floraesters 15 is IIr, Floraesters 20, 30 and 60 are combinations of IIr, IV, V, and IIIr, Floraesters IPJ is a mixture of Ir, VI, and VIII, and Floraesters HIPJ is a combination of IIIr, VII and IX.” EX-1007, 5:39-43.

Brown discloses an exemplary process:

In preparing the emollient composition, refined jojoba oil (or hydrogenated jojoba oil or a mixture of the oil and hydrogenated oil) is introduced into an appropriate vessel.... The jojoba oil is first dried under vacuum at a temperature of 90 C to remove most or all moisture. The anhydrous isopropyl alcohol (or other alcohol) is then added with the amount of isopropyl used being from about 20% to about 50% by weight of jojoba oil. The reactor is sealed and heat is applied to bring the temperature of the reaction mixture to about 70-75° C. It is important that air be excluded and that the reactor be vented through a condenser to recover any unreacted alcohol. When the temperature has reached 70-75° C., a first addition of catalyst (e.g., a catalyst for alcoholysis and interesterification such as sodium methoxide) is made.

EX-1007, 5:1-20.

Brown discloses typical jojoba esters properties. EX-1007, 8:45-54:

<u>TYPICAL PROPERTIES OF JOJOBA ESTERS:</u>		
	Melting Point	Iodine Value
Floraesters - 70	66–70° C.	<2
Floraesters - 60	56–60° C.	40–44
Floraesters - 30	47–51° C.	57–61
Floraesters - 20	42–48° C.	64–70
Floraesters - 15	10–15° C.	78–85
Floraesters IPJ	6–12° C.	75–85
Floraesters HIPJ	55–65° C.	<2

5. Xu

Xu, entitled “*Engineering of enzymatic reactions and reactors for lipid modification and synthesis*,” published in the EUROPEAN JOURNAL OF LIPID SCIENCE AND TECHNOLOGY in 2003. EX-1008; EX-1019 ¶¶26-32. It is prior art under 35 U.S.C. AIA §102(a)(1).⁷ It was not disclosed during prosecution.

Xu relates to process design for enzymatic lipid modification and synthesis. EX-1008, 289.

Xu discloses, “[i]n 1984, *Zaks* and *Klibanov* published a paper in *Science*, indicating that enzymes could work in a solvent microaqueous medium at 100°C.... It means that enzymes can also be used for the catalysis of... esterification. This opens up a variety of potential applications. In the lipid area, a reaction such as interesterification (acidolysis, alcoholysis, and ester-ester exchange) is also possible with the catalysis of lipases in a probable hydrolysis-esterification two-step mechanism. Thus chemical interesterification, which has been implemented in the current industry can be fully replaced.” EX-1008, 289; *see* EX-1008, 301 (“In principle, many chemical methods can be replaced by enzymatic ones....”).

“The driving forces for the involvement of industrial sectors can be also listed as follows:

⁷ *See supra*, 11 n.2.

- very interesting products and potential market demands,
- improvement of product quality refereeing to mild conditions,
- reduction of enzyme price and balanced economy in general,
- simple processes and low investment,
- environmental considerations,
- customer perception and marketing strategy,
- know-how preparation and technology takeover/control.”

EX-1008, 289. “This list can be prolonged: ‘image’ strategy by using enzyme technology is important for many industrial companies; energy-efficiency of the technology is also often mentioned.” EX-1008, 289.

Xu discloses:

The major enzymatic reactions for the modification of lipids are often referring to hydrolysis, esterification, acidolysis, alcoholysis, and ester-ester exchange from the reaction mechanisms. Interesterification or transesterification is also commonly used in literature to describe some of the above reactions. A detail description is given below for the following two terms:

- **Interesterification:** a general term for the reactions between an ester and a fatty acid, an alcohol, or another ester, which includes acidolysis, alcoholysis, and ester-ester exchange. In literature, it sometimes describes only ester-ester exchange or alkaline-catalyzed randomization of oils and fats.

- **Transesterification:** a term often used for ester-ester exchange. It is also used in literature for the acidolysis reaction or as a general term for all the three reactions including alcoholysis.”

EX-1008, 290.

“Alcoholysis is the reaction between an ester and an alcohol.”

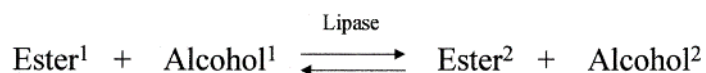
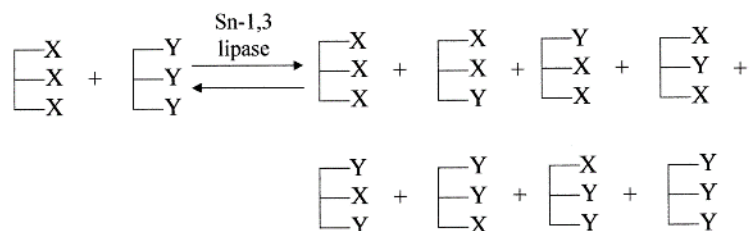


Fig. 15. An illustration enzymatic alcoholysis.

EX-1008, 296. “Chemical alcoholysis has been widely used in industry for the production of partial acylglycerols, such as MAGs and DAGs, and biodiesels such as fatty acid methyl esters or ethyl esters.... Enzymatic alcoholysis has been widely studied for the production of similar products.” EX-1008, 296.

“Ester-ester exchange is a reaction between two esters. Acids will be exchanged between the hydroxyl moieties. Chemical ester-ester exchange, often referring to as chemical interesterification, is dominantly used for the randomization of oils and fats, which has been widely applied in industry for oil and fat modification. Enzymatic ester-ester exchange is an alternative to the chemical method for the modification of fats and oils.” EX-1008, 298-99.



X and Y are two types of fatty acids.

Fig. 18. Reaction scheme of enzymatic ester-ester exchange between two triacylglycerols (XXX and YYY) with *sn*-1,3 specific lipases.

EX-1008, 299.

6. Sessa

Sessa, entitled “*Derivation of a Cocoa Butter Equivalent from Jojoba Transesterified Ester via a Differential Scanning Calorimetry Index*,” published in the JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE in 1996. EX-1009; EX-1019 ¶¶44-51. It is prior art under 35 U.S.C. AIA §102(a)(1).⁸ It is applicant-admitted prior art, EX-1001, 12:40-46, but was never cited by the Examiner or applied to the Challenged Claims.

Sessa relates to a study investigating the preparation of cocoa butter equivalents made from “[a] series of wax ester blends [] constructed by transesterifying native jojoba oil with 50-500 g/kg⁻¹ completely hydrogenated jojoba wax esters.” EX-1009, Abstract, 295. Sessa discloses “calibration sets consisting of

⁸ See *supra*, 11 n.2.

native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated [jojoba] wax esters to give a series of 50, 100, 150, 200, 300, 400 and 500 g kg⁻¹ saturated ester were provided by International Flora Technologies Ltd (Gilbert, AZ, USA).” EX-1009, 295-96.

Using the disclosed calibration sets, the authors “could optimise the level of saturation [(i.e., the content of completely hydrogenated jojoba wax esters)] needed to best mimic the melt and crystallization properties of cocoa butter. The wax ester blend with 400 g kg⁻¹ saturation most closely resembled the thermal properties of cocoa butter where the monounsaturated species of the jojoba blend gave identical thermograms to tempered cocoa butter.” EX-1009, Abstract, 295.

B. Ground 1: Cummings in view of Xu and/or in further view of Sessa

The combination of Cummings and Xu alone and/or in further view of Sessa discloses the steps of, and renders obvious, the Challenged Claims. It would have been obvious to (i) modify the process of transesterifying a feedstock comprising jojoba wax esters and fully hydrogenated jojoba wax esters taught in Cummings, which generates a transesterified product (jojoba esters) having an OSI greater than the OSI of the feedstock, with (ii) the lipase catalyst expressly taught in Xu and, (iii) to the extent it is found not to be disclosed by Cummings itself, the feedstock containing 20% to 50% by weight of hydrogenated jojoba wax esters expressly taught in Sessa. EX-1003 ¶¶89-130; *see* claims 1-3, 5, directly below.

In addition to the reasons below, a POSA would have combined these references because they (i) pertain to the same fields (lipid chemistry, food and cosmetic ingredients); (ii) discuss the same class of chemical reactions (transesterification/interesterification); (iii) seek to achieve the same results (improved physical properties); and, (iv) in Cummings and Sessa, identify the same contributors (FloraTech and Robert Kleiman). *See* EX-1003 ¶¶50-51, 92, 111-114, 118-124.

1. Claim 1

1[preamble] “A process for transesterifying wax esters, the process comprising:”

Whether the preamble is limiting, it is disclosed by Cummings alone and/or in view of Xu. EX-1003 ¶¶93-96; *see also* limitations 1[a]-1[c], directly below. Cummings discloses a process for transesterifying wax esters. EX-1004, 2, Fig. 1 (“Jojoba oil is converted to jojoba esters through a process known as interesterification. In this process, different ratios of unsaturated jojoba oil are combined with fully saturated jojoba oil and then interesterified.”); EX-1003 ¶¶94-95.⁹ Further, as Xu explains, “[i]nteresterification or transesterification is also

⁹ To the extent Patent Owner argues that Cummings does not disclose “transesterifying,” Cummings as a whole is consistent with Patent Owner’s use in

commonly used in literature to describe” the same major enzymatic reactions for the modification of lipids.” EX-1004, 2, Fig. 1; EX-1008, 290; EX-1003 ¶95.

1[a] “providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters, wherein the amount of hydrogenated jojoba wax esters is 20% to 50% by weight of the feedstock”

Cummings alone and/or in view of Sessa discloses limitation 1[a]. EX-1003 ¶¶97-114.

Cummings discloses providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters, wherein their respective amounts by weight in the overall feedstock may be varied. EX-1004, 1-2, Fig. 1 (“Jojoba oil is converted to jojoba esters through a process known as interesterification. In this process, different ratios of unsaturated jojoba oil are combined with fully saturated jojoba oil and then interesterified.”); EX-1003 ¶98.

While Cummings does not expressly disclose “20% to 50%” in specific words, a POSA would have understood that Cummings actually does through its teachings. Cummings shows various physical properties of Jojoba esters (15), (20), (30), (60), and (70), including iodine value (“IV”):

the Delaware Matter. Patent Owner accuses “an enzymatic process,” specifically “Inter-esterification between jojoba oil and jojoba wax,” of infringing the ’245 patent. EX-1020 ¶¶4, 31, 39; EX-1003 ¶95, n.3.

Figure 3 - Jojoba ester differences				
Product	Melting point °C AOCS Cc 18-80	Iodine value g/100g AOCS Cd 1-25	Visual appearance	Colour AOCS Cc 13e-92
Jojoba esters (15)	10 - 15	78 - 85	Clear, colourless liquid	< 1.5 Red
Jojoba esters (20)	42 - 48	64 - 70	White, creamy paste	< 1.0 Red
Jojoba Esters (30)	47 - 51	57 - 61	White, soft paste	< 1.0 Red
Jojoba Esters (60)	56 - 61	40 - 44	White, firm paste	< 1.0 Red
Jojoba esters (70)	66 - 70	< 2	White crystalline powder	< 1.0 Red

See EX-1004, 1, Fig. 3 (annotated); EX-1003 ¶¶98-99.

A POSA would have known how to calculate—using Figure 3’s IVs—the approximate weight percentage of hydrogenated jojoba esters in the feedstocks used to prepare each product. EX-1003 ¶¶99-107. A POSA would have known that IV is used to determine the degree of unsaturation—or the number of double bonds (which does not change due to transesterification)—in fats, oils and waxes. EX-1003 ¶¶100-101; EX-1023, 789, 792; EX-1024, 1-2; EX-1030, 47; EX-1006, 4; EX-1014, 8. A POSA further would have known how to estimate the IV based on the relative amounts of jojoba wax esters and hydrogenated wax esters, as well as the reverse. EX-1003 ¶¶100-104; EX-1025, 3; EX-1026, 214-15.15. A POSA would also have known that the IV of jojoba oil ranges from 81 to 89. EX-1003 ¶105; EX-1027, 3; EX-1028, 3.

Cummings discloses that fully hydrogenated jojoba wax esters are fully saturated (meaning there are no double bonds that are capable of absorbing iodine), EX-1004, 2, Fig. 1, which a POSA would have understood to mean that the IV of

fully hydrogenated jojoba wax esters is 0. *See* EX-1023, 789, 792; EX-1024, 1-2; EX-1030, 47; EX-1003 ¶¶100-106.

Using this information, as shown below in Table A, a POSA would have understood from Cummings' Figure 3 that the amount of fully hydrogenated jojoba wax esters is between 3.7% and 100% by weight of the feedstock, which includes the claimed range of 20% to 50%; also, individual products are inside the claimed range (Jojoba esters (20) and (30)). EX-1003 ¶107; *see Almirall, LLC v. Amneal Pharms. LLC*, 28 F.4th 265, 273-74 (Fed. Cir. 2022) ("A *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlaps the ranges disclosed in the prior art.") (internal quotations, citations omitted).

Table A		
Product	Jojoba esters IVs From Cummings, Figure 3	Estimated Hydrogenated Jojoba Wax Ester Content Of Feedstock (Wt %)
Jojoba esters (15)	78-85	3.7-4.5
Jojoba esters (20)	64-70	21-21.3
Jojoba esters (30)	57-61	29.6-31.5
Jojoba esters (60)	40-44	50.6-50.6
Jojoba esters (70)	0-2	97.8-100

Regardless, a POSA would have found it obvious to modify the process disclosed in Cummings to include 20% to 50% by weight of hydrogenated jojoba

wax esters in the feedstock, as disclosed in Sessa. EX-1009, 296; EX-1003 ¶¶108-113.

Specifically, Sessa discloses “[a] series of wax ester blends [] constructed by transesterifying native jojoba oil with 50-500 g kg⁻¹ completely hydrogenated jojoba wax esters,” and more specifically “calibration sets of consisting of native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated wax esters to give a series of 50, 100, 150, 200, 300, 400 and 500 g kg⁻¹ saturated ester.” EX-1009, Abstract, 295-96; EX-1003 ¶109.

Table B, below, shows the completely hydrogenated jojoba wax ester content of Sessa’s calibration sets expressed in grams of hydrogenated jojoba wax ester per kilogram of blend (*i.e.*, native jojoba wax esters and completely hydrogenated jojoba wax esters) converted into a weight percent. EX-1003 ¶110. A POSA would therefrom have understood that Sessa’s calibration sets disclose feedstocks comprising jojoba wax esters and hydrogenated jojoba esters, wherein the amount of fully hydrogenated jojoba wax esters is 5%, 10%, 15%, 20%, 30%, 40%, and 50% by weight of the feedstock, which encompasses the claimed range of 20% to 50% by weight of the feedstock (N.B. individual products are inside the claimed range). EX-1003 ¶110; *see Almirall*, 28 F.4th at 273-74.

Table B		
Hydrogenated Jojoba Wax Ester Content of Blend (g kg ⁻¹)		Wt% Hydrogenated Jojoba Wax Ester
50	$\times \frac{1 \text{ kg of Blend}}{1000 \text{ g of Blend}} \times 100 \text{ wt \%}$	5
100		10
150		15
200		20
300		30
400		40
500		50

A POSA would have been motivated—and found it routine optimization—to vary the amount of hydrogenated jojoba wax esters in the feedstock disclosed in Cummings to an amount that is 20% to 50% by weight of the feedstock, as disclosed in Sessa, to obtain desirable and/or improved physical properties, such as oxidative stability and thermal properties in the transesterified product, and would have had a reasonable expectation of success in so doing. *See Genentech, Inc. v. Hospira, Inc.*, 946 F.3d 1333, 1341-42 (Fed. Cir. 2020); EX-1004, 1 (explaining that jojoba esters “have shown distinctive utility in highly pigmented systems where... oxidative stability is sometimes lacking”); *id.*, 1-2 (disclosing that jojoba esters demonstrate oxidative stabilities and melting points desirable for “cosmetic systems,” and that interesterifying “different ratios of unsaturated jojoba oil... with fully saturated

jojoba oil... results in jojoba esters engineered to deliver specific physical, functional and chemical characteristics”); *id.* (stating that “interesterification produces jojoba esters engineered to contain different ratios of molecules with either no double bonds (fully saturated), one double bond (monounsaturated) or two double bonds (fully unsaturated).... It is these compositional differences within the family of jojoba esters that create their expanded utility in cosmetic preparations,” in particular with respect to oxidative stability); EX-1009, 298 (“We devised mathematical indices... to define the level of saturation in transesterified wax ester blends and used them to select the optimum level of saturation needed for obtaining a cocoa butter equivalent.”); EX-1009, Abstract (“The wax ester blend with 400 g kg⁻¹ saturation [*i.e.*, 40% by weight of hydrogenated jojoba wax ester] most closely resembled the thermal properties of cocoa butter....”); EX-1003 ¶¶111-112, 50-51.

The ability to engineer specific physical properties in a transesterified product by manipulating the ratio of the reacting fats and oils in a feedstock would have been within a POSA’s background knowledge. *See* EX-1004, 1-2; EX-1009, 298, Abstract; EX-1012, 675 (“The effect [of the interesterification¹⁰ processes] on melting and solidification properties ultimately depends on the type and mixture of the starting materials[.]”); EX-1013, 878 (“Transesterification between a fat and oil

¹⁰ *See supra* 28-29 n.9.

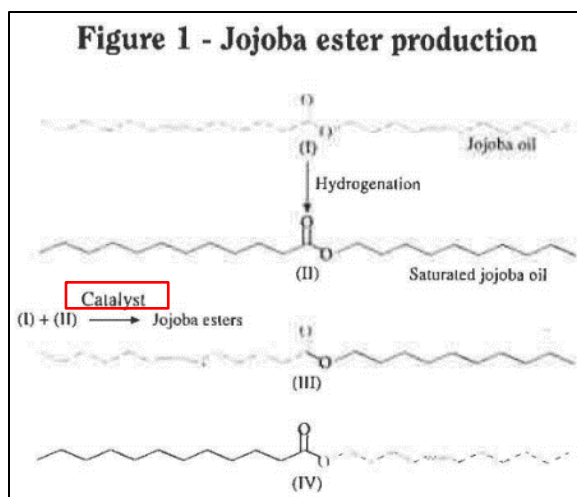
typically involves exchange of fatty acid residues between the precursor acylglycerols and is accompanied by a concomitant change in the properties of the original material. The properties of the product are in large measure governed by a convenient choice of the precursor reagents [and] their respective proportions in the starting mixture[.]”); EX-1003 ¶¶112-113, 50-51; *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1003 (Fed. Cir. 2016).

It is significant, with respect to obviousness, that the ’245 patent does not teach that the 20-50% range is critical. EX-1003 ¶¶42-44.

1[b] “contacting the feedstock with a lipase; and transesterifying the jojoba wax esters and the hydrogenated jojoba wax esters in the feedstock with the lipase to form a transesterified product”

The combination of Cummings and Xu discloses limitation 1[b]. EX-1003 ¶¶115-121; *see also* discussion of limitation 1[preamble], above.

Cummings discloses providing a feedstock including jojoba oil and hydrogenated jojoba oil and contacting the feedstock with a catalyst for the purpose of transesterification:



EX-1004, Fig. 1 (annotated); EX-1003 ¶116.

Cummings does not expressly disclose “contacting the feedstock with a lipase.” However, a POSA would have found it obvious to modify the catalyzed process of Cummings to use the lipase disclosed in Xu as the catalyst. EX-1003 ¶¶117-120; EX-1008, 289, 296-99, 301, Figs. 15, 18; EX-1012, 676; EX-1013, 877. The use of lipases as a catalyst in interesterification/transesterification reactions is explicitly disclosed in Xu. EX-1008, 296-99, Figs. 15, 18. Xu discloses that interesterification and transesterification both refer to the same class of reactions, including alcoholysis and/or ester-ester exchange reactions, and that lipases can be used to catalyze such class of reactions. EX-1008, 296-99, Figs. 15, 18; EX-1003 ¶117.

A POSA would have been motivated to use, and had a reasonable expectation of success in using, a lipase as the catalyst (including in the reaction of Cummings) for the several reasons stated in Xu, including (i) “very interesting products and

potential market demands,” (ii) “improvement of product quality refereeing to mild conditions,” (iii) “reduction of enzyme price and balanced economy in general,” (iv) “simple processes and low investment,” (v) “customer perception and marketing strategy,” (vi) “know-how preparation and technology takeover/control,” and (vii) “energy-efficiency.” Ex 1008, 289, 301; EX-1003 ¶118.

Further, replacing chemical catalysts in interesterification/transesterification processes with lipases would have been within a POSA’s background knowledge. EX-1003 ¶119; EX-1012, 676 (“Chemical interesterification, however, is not the only route for this process. Also gaining scrutiny is enzymatic interesterification, now used commercially to produce high value-added products such as structured triglycerides for confectionery use.”) (“Intesterification using random lipases produces fat compositions similar to those obtainable from standard chemical methods. An advantage is that these lipases generally are perceived as ‘natural’ alternatives to chemical techniques. Current applications of lipases... allow[] the manufacture of specific triglycerides in high yield.... [L]ow levels can improve the processing or storage properties of products....”); EX-1013, 877 (“[E]nzymatic transesterification reactions between a solid fat and a liquid oil can be employed for production of semi-solid fats that contain no *trans* fatty acid residues.... Enzymatic processes... are advantageous because of their selectivity (generation of fewer undesired byproducts), mild reaction conditions, and ease of product recovery. They

also facilitate process control and minimize problems of waste disposal.”) (internal citations omitted); *Unwired Planet*, 841 F.3d at 1003.

1[c] “wherein an oxidative stability index (OSI) of the transesterified product is greater than an OSI of the feedstock.”

Cummings discloses limitation 1[c]. EX-1003 ¶¶122-124.

Cummings discloses that the transesterified product, “[j]ojoba esters[,] demonstrate remarkable stability with OSI values of all jojoba esters greater than 100 hours and as high as 675 hours”; this is significantly greater than the OSI of the refined jojoba oil that forms part of the feedstock (“around 35 hours”). EX-1004, 2; *see* EX-1004, 2 (“The structure of all jojoba esters is different from its starting material—jojoba oil. It is these compositional differences within the family of jojoba esters that create their expanded utility in cosmetic preparations[,]” including oxidative stability); EX-1003 ¶122. Thus, a POSA would have understood he could achieve—and had a reasonable expectation of success of achieving—an OSI of the transesterified product (jojoba esters) that is greater than the OSI of a feedstock containing jojoba wax esters and hydrogenated jojoba wax esters. EX-1003 ¶122.

Further, it was well-known that the transesterification of fats, oils and wax esters—including in lipase-catalyzed processes and processes involving jojoba wax esters and hydrogenated jojoba wax esters—can produce a product having improved, and thus greater, oxidative stability. EX-1003 ¶¶123, 24-26; EX-1015, [0005] (“Transesterifying various short saturated fatty acid esters with a vegetable oil

improves oxidative stability and low temperature properties due to the increased saturation and the heterogeneity of the fatty acids esterified to the polyols.”); EX-1016, [0031] (“‘Jojoba Esters’ is a complex mixture of esters produced by the transesterification of jojoba oil, hydrogenated jojoba oil, or a mixture of the tw[o] with organic alcohols. Jojoba esters are produced in a broad range of melting points and are colorless, odorless and extremely resistant to oxidative degradation. Jojoba esters are useful as components of highly pigmented cosmetic systems.”); EX-1017, 245 (“The margarines produced from enzymatically interesterified fats generally had much lower peroxide values compared to the margarine produced from chemically randomized fats stored at 25 °C.... A similar observation was also apparent in a pure oil system.... This confirms that enzymatic interesterification has advantages for the oxidative stability of the products.”); EX-1018, C371 (“Structured lipids [(SL)] containing different levels of MCT [(medium-chain TAG (triacylglycerides))] were produced by lipase-catalyzed interesterification reactions.... The SL generated in these experiments contain only saturated fatty acid residues.... The absence of unsaturated fatty acids residues implies that the products of the synthesis reaction have enhanced stability with regard to oxidation processes.”).

This evidence shows the obviousness of the claimed invention, not only because it shows the generally understood interchangeability of lipase- and chemically catalyzed esterification (*see* limitation 1[b]), but also because it rebuts

any assertion by Patent Owner that increased OSI is an unexpected result of transesterifying jojoba esters and hydrogenated jojoba esters, using a lipase. EX-1003 ¶¶24-26, 50-51, 122-124. *See In re Merck & Co., Inc.*, 800 F.2d 1091, 1098-1100 (Fed. Cir. 1986) (claims directed to a method of treating depression with amitriptyline (or nontoxic salts thereof) were rejected as obvious over prior art disclosures that amitriptyline is a compound known to possess psychotropic properties and that imipramine is a structurally similar psychotropic compound known to possess antidepressive properties, in view of prior art suggesting the aforementioned compounds would be expected to have similar activity); *In re Wiseman*, 596 F.2d 1019, 1022-23 (CCPA 1979) (holding that mere recognition of latent properties in the prior art does not render nonobvious an otherwise known invention); *Ex parte Obiaya*, 227 U.S.P.Q. 58, 60 (Bd. Pat. App. & Inter. 1985) (“The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.”). In *Ex parte Blanc*, 13 U.S.P.Q.2d 1383 (Bd. Pat. App. & Inter. 1989), for example, the claims were directed to a process of sterilizing a polyolefinic composition with high-energy radiation in the presence of a phenolic polyester antioxidant to inhibit discoloration or degradation of the polyolefin. *Id.* at 1384-85. Appellant argued that it is unpredictable whether a particular antioxidant will solve the problem of

discoloration or degradation. However, the Board found that—because the prior art taught that appellant’s preferred antioxidant is very efficient and provides better results compared with other prior art antioxidants—there would have been a reasonable expectation of success. *Id.* at 1386.

2. Claim 2

“....wherein the feedstock consists essentially of the jojoba wax esters and the hydrogenated jojoba wax esters.”

Claim 2—by use of “consists essentially of”—limits claim 1 by restricting the feedstock to the jojoba wax esters, the hydrogenated jojoba wax esters and only those additional materials that do not materially affect the basic and novel properties of the invention (such as indicated in the claim itself, improved OSI). *HZNP Meds. LLC v. Actavis Labs. UT, Inc.*, 940 F.3d 680, 692-93 (Fed. Cir. 2019). The combination that renders claim 1 unpatentable teaches such a feedstock—*e.g.*, no additional OSI-affecting materials. *See* EX-1004, 1-2, Fig. 1; EX-1008, 289-90, 296-99, 301, Figs. 15, 18; EX-1009, 295-96; EX-1003 ¶¶125-126.

3. Claim 3

“....wherein the feedstock does not comprise any free fatty alcohols.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any free fatty alcohols.” EX-1003 ¶¶127-128. A POSA would have understood that the feedstock of Cummings alone and/or as modified by the teachings of Sessa, *see* §VI.B.1 (limitation 1[a]), which discloses calibration sets

“consisting of native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated wax esters,” does not comprise any free fatty alcohols. EX-1009, Abstract, 295-96; EX-1003 ¶¶127-128.

4. Claim 5

“....wherein the feedstock does not comprise any methyl esters.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any methyl esters.” EX-1003 ¶¶129-130. A POSA would have understood that the feedstock of Cummings alone and/or as modified by the teachings of Sessa, *see* §VI.B.1 (limitation 1[a]), which discloses transesterified blends “consisting of native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated wax esters,” does not comprise any methyl esters. EX-1009, Abstract, 295-96; EX-1003 ¶¶129-130.

C. Ground 2: *Trans* Isomers 2 in view of Xu and/or in further view of Sessa

The combination of *Trans* Isomers 2 and Xu alone and/or in further view of Sessa discloses the steps of, and renders obvious, the Challenged Claims. It would have been obvious to (i) modify the process of transesterifying a feedstock comprising jojoba wax esters and fully hydrogenated jojoba wax esters taught in *Trans* Isomers 2, which generates a transesterified product (jojoba esters) having an OSI greater than the OSI of the feedstock, with (ii) the lipase catalyst expressly taught in Xu and, (iii) to the extent it is found not to be disclosed by *Trans* Isomers

2 itself, the feedstock containing 20% to 50% by weight of hydrogenated jojoba wax esters expressly taught in Sessa. EX-1003 ¶¶131-167; *see* claims 1-3, 5 directly below.

In addition to the reasons below, a POSA would have combined these references because they (i) pertain to the same fields (lipid chemistry, food and cosmetic ingredients); (ii) discuss the same class of chemical reactions (transesterification/interesterification); (iii) seek to achieve the same results (improved physical properties); and (iv) in *Trans* Isomers 2 and Sessa, identify the same contributors (FloraTech and Kleiman). EX-1003 ¶¶50-51, 134, 144-148, 153-157.

1. Claim 1

1[preamble] “A process for transesterifying wax esters, the process comprising:”

Whether the preamble is limiting, it is disclosed by *Trans* Isomers 2. EX-1003 ¶¶135-136; *see* elements 1[a]-1[c], directly below. *Trans* Isomers 2 discloses a process for transesterifying wax esters. EX-1006, 1-2, Fig. 4; EX-1014, 5-6, Fig. 4 (explaining that jojoba esters are “[a] complex mixture of esters produced by the transesterification/interesterification of Simmondsia Chinensis (Jojoba) Oil, Hydrogenated Jojoba Oil, or a transesterified mixture of the two. Figure 4 represents

the interesterification reaction between (I) jojoba oil (only *cis* isomers) and (II) fully hydrogenated jojoba oil (no *cis* or *trans* isomers).”); EX-1003 ¶136.¹¹

1[a] “providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters, wherein the amount of hydrogenated jojoba wax esters is 20% to 50% by weight of the feedstock”

Trans Isomers 2 alone and/or in view of *Sessa* discloses limitation 1[a]. EX-1003 ¶¶137-150.

Trans Isomers 2 discloses providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters. EX-1006, 1-2, Fig. 4; EX-1014, 5-6, Fig. 4 (explaining that jojoba esters are “[a] complex mixture of esters produced by the transesterification/interesterification of *Simmondsia Chinensis* (Jojoba) Oil, Hydrogenated Jojoba Oil, or a transesterified mixture of the two. Figure 4 represents the interesterification reaction between (I) jojoba oil (only *cis* isomers) and (II) fully hydrogenated jojoba oil (no *cis* or *trans* isomers).”); EX-1003 ¶138.

Trans Isomers 2 does not expressly disclose “20% to 50%.” However, a POSA would have understood that *Trans Isomers 2* does. Specifically, *Trans Isomers 2*, at

¹¹ To the extent Patent Owner argues *Trans Isomers 2* does not disclose “transesterifying,” *Trans Isomers 2* as a whole is consistent with Patent Owner’s use of such term in the Delaware Matter. *See supra*, 28 n. 9.

Table 2 (annotated), shows various physical properties of Jojoba Esters 15, 20, 30, 60, and 70, including IV:

TABLE 2. CHEMICAL AND PHYSICAL PROPERTIES OF JOJOBA ESTERS						
Jojoba Ester	Melting Point °C	Iodine Value g I ₂ /100g	Oxidative Stability Value, Hours	Lubricity Degrees	Penetration, Mm	Monoene, Content, 0%
15	10-15	78-85	70	19.0	—	0
20	42-48	64-70	130	20.4	—	25-35
30	47-51	57-61	165	18.9	26.4	36-46
60	56-61	40-44	225	17.9	9.3	42-52
70	66-70	0-2	680	15.9	0.3	0

See EX-1014, 6-8, Table 2 (annotated); EX-1006, 3, Table 2; EX-1003 ¶139.

A POSA would have known how to calculate the approximate weight percentage of hydrogenated jojoba esters in the feedstock used to prepare each of Jojoba Esters 15, 20, 30, 60 and 70, using the IVs listed in Table 2. See § VI.B.1 (limitation 1[a]); EX-1003 ¶¶139-141. *Trans Isomers 2* discloses that “Fully Hydrogenated Jojoba Oil exhibits an IV of less than 2.” EX-1006, 4; EX-1014, 8; EX-1003 ¶142. Thus, a POSA would have understood that the IV of hydrogenated jojoba wax esters may range from 0 to 2. See EX-1006, 4; EX-1014, 8; EX-1003 ¶142.

Using this known information, and as shown below in Table C, a POSA would have understood from Table 2 of *Trans Isomers 2* that the amount of fully hydrogenated jojoba wax esters is between 3.7% and 100% by weight of the feedstock, which includes the claimed range of 20% to 50% by weight of the feedstock (N.B. individual products are inside the claimed range). EX-1003 ¶143; see *Almirall*, 28 F.4th at 273-74.

Table C		
Jojoba Ester	Jojoba Esters IVs From <i>Trans</i> Isomers 2, Table 2	Estimated Hydrogenated Jojoba Wax Ester Content Of Feedstock (Wt %)
15	78-85	3.7-4.6
20	64-70	21-21.8
30	57-61	29.6-32.2
60	40-44	50.6-51.7
70	0-2	100

Regardless, a POSA would have found it obvious to modify the process disclosed in *Trans* Isomers 2 to include 20% to 50% by weight of hydrogenated jojoba wax esters in the feedstock, as disclosed in Sessa. *See* EX-1003 ¶144; EX-1009, 296. Specifically, as discussed in §VI.B.1 (limitation 1[a]), Sessa discloses the limitation, “wherein the amount of hydrogenated jojoba wax esters is 20% to 50% by weight of the feedstock.” EX-1003 ¶145.

A POSA would have been motivated—and found it routine optimization—to vary the amount of hydrogenated jojoba wax esters in the feedstock disclosed in *Trans* Isomers 2 to an amount that is 20% to 50% by weight of the feedstock as disclosed in Sessa to obtain desirable and/or improved physical properties such as oxidative stability and melting characteristics in the transesterified product, and would have had a reasonable expectation of success in so doing. EX-1003 ¶¶146-147; *see Genentech*, 946 F.3d at 1341-42.

In this vein, *Trans* Isomers 2 discloses:

The interesterification reaction used to produce *trans* free emollients is one in which a fully hydrogenated lipid material (no *trans* isomers) is reacted with neat oil containing only *cis* isomers. The resulting product is an isomorphous mixture of partially saturated, saturated and unsaturated esters that contain no *trans* isomers. This...produce[s] “*Trans* Free” oxidatively stable emollients with a broad range of melting characteristics....

Jojoba Esters are an ideal model to use to demonstrate the *trans* free interesterification reaction and the properties of the resulting components. The CTFA Ingredient Dictionary defines Jojoba Esters as: A complex mixture of esters produced by the transesterification/interesterification of *Simmondsia Chinensis* (Jojoba) Oil, Hydrogenated Jojoba Oil, or a transesterified mixture of the two.

EX-1014, 5; EX-1006 at 1; EX-1003 ¶146.

Similarly, as discussed in Ground 1 above, Sessa discloses that the thermal properties of a transesterified product can be optimized by varying the amount of hydrogenated jojoba wax esters in a feedstock. *See* EX-1009, 298 (“We devised mathematical indices... to define the level of saturation in transesterified wax ester blends and used them to select the optimum level of saturation....”); EX-1009, Abstract (“The wax ester blend with 400 g kg-1 saturation most closely resembled the thermal properties of cocoa butter[.]”); EX-1003 ¶147.

Further, the ability to engineer specific physical properties in a transesterified product by manipulating the ratio of jojoba wax esters to hydrogenated jojoba wax esters in a feedstock would have been within a POSA's background knowledge. *See* §VI.B.1 (limitation 1[a]); EX-1004, 1-2; EX-1009, 298, Abstract; EX-1012, 675; EX-1013, 878; EX-1003 ¶148.

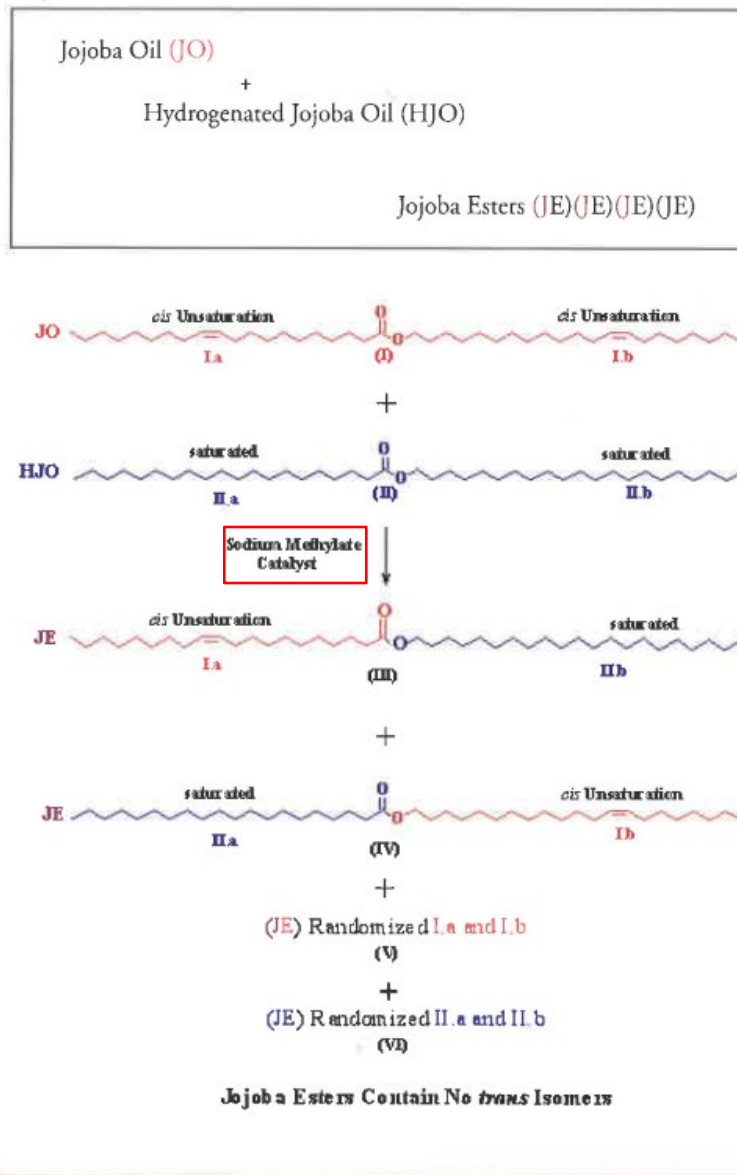
It is significant, with respect to obviousness, that the '245 patent does not teach that the 20-50% range is critical. EX-1003 ¶¶42-44.

1[b] “contacting the feedstock with a lipase; and transesterifying the jojoba wax esters and the hydrogenated jojoba wax esters in the feedstock with the lipase to form a transesterified product”

The combination of *Trans* Isomers 2 and Xu discloses limitation 1[b]. EX-1003 ¶¶151-157; *see also* discussion of limitation 1[preamble], above.

Trans Isomers 2 discloses providing a feedstock including jojoba oil and hydrogenated jojoba oil and contacting the feedstock with a sodium methylate catalyst (*i.e.*, a chemical catalyst) for the purpose of transesterification:

Figure 4



EX-1014, 6, Fig. 4 (annotated); EX-1006, 2, Fig. 4; EX-1003 ¶152.

Trans Isomers 2 does not expressly disclose “contacting the feedstock with a lipase.” However, a POSA would have found it obvious to modify the chemically catalyzed process of *Trans* Isomers 2 to use the lipase disclosed in Xu as the catalyst. EX-1003 ¶¶153-154. EX-1008, 296-99, Figs. 15, 18. The use of lipases as a catalyst

in interesterification/transesterification reactions is explicitly disclosed in Xu. Xu discloses that interesterification and transesterification both refer to the same class of reactions, including alcoholysis and/or ester-ester exchange reactions, and that lipases can be used to catalyze such class of reactions. EX-1008, 296-99, Figs. 15, 18; EX-1003 ¶153.

A POSA would have been motivated to replace, and had a reasonable expectation of success in replacing, the chemical catalyst of *Trans* Isomers 2 with a lipase as disclosed in Xu as the catalyst in the reaction of *Trans* Isomers 2, for the reasons stated in Xu. EX-1003 ¶154; EX-1008, 289, 301. In particular, as discussed in Ground 1 above, Xu discloses that the use of chemical catalysts in industry can be “fully replaced” with the use of lipases, and that the industry has several reasons to do so, including: “interesting products...market demands..., improvement of product quality...[,] mild conditions, reduction of enzyme price and balanced economy..., simple processes and low investment..., environmental considerations..., customer perception and marketing strategy....” EX-1008, 289; *see id.* (additionally, “‘image’ strategy by using enzyme technology is important for many industrial companies; energy-efficiency of the technology is also often mentioned.”); EX-1003 ¶154.

Further, replacing chemical catalysts in interesterification/transesterification processes with lipases would have been within a POSA's background knowledge. See §VI.B.1 (limitation 1[b]); EX-1012, 676; EX-1013, 877; EX-1003 ¶155.

1[c] “wherein an oxidative stability index (OSI) of the transesterified product is greater than an OSI of the feedstock.”

Trans Isomers 2 discloses limitation 1[c]. EX-1003 ¶¶158-161.

Trans Isomers 2 discloses in Table 4 that the OSI of jojoba esters is greater than the OSI of partially hydrogenated jojoba oils exhibiting identical melting points. EX-1006, 3-4, Table 4; EX-1014, 7-8, Table 4; EX-1003 ¶158.

Sample	Melting Point °C	Iodine Value g I/100g of Sample	% Trans	Oxidative Stability Index, Hours	Index of Refraction μ_m @80°C	Penetrometer, Mm	Slip, Cadcamo, Degress (1%)	Slip, IFT, Degress (100%)
Jojoba Esters 30	49	58	0	165	1.4418	26.4	18.9	23
Jojoba oil Partial Hydrogenate	49	69	11	27	1.4435	—	19.3	>25
Jojoba Esters 60	59	42	0	225	1.4403	9.3	17.9	14.1
Jojoba Oil Partial Hydrogenate	59	49	37	108	1.4408	5.2	18.1	15.4

Specifically, the “Jojoba Esters 30” and “Jojoba Esters 60” had OSIs of 165 and 225, respectively—significantly greater than the OSIs of the partially hydrogenated jojoba oils exhibiting identical melting points, which were 27 and 108 hours. EX-1006, 3-4, Table 4; EX-1014, 7-8, Table 4; EX-1003 ¶159. Thus, a POSA would have understood that he could achieve—and had a reasonable expectation of success of achieving—an OSI of the transesterified product (jojoba esters) that is greater than the OSI of a feedstock containing jojoba wax esters and hydrogenated jojoba wax esters. EX-1003 ¶159.

Further, it was well-known that the transesterification of fats, oils and wax esters—including in lipase-catalyzed processes and processes involving jojoba wax esters and hydrogenated jojoba wax esters—can produce a product having improved, and thus greater, oxidative stability. *See* §VI.B.1 (limitation 1[c]); EX-1015, [0005]; EX-1016, [0031]; EX-1017, 245; EX-1018, C371; EX-1003 ¶160.

This evidence shows the obviousness of the claimed invention, not only because it shows the generally understood interchangeability of lipase- and chemically catalyzed esterification (*see* §VI.B.1 (limitation 1[b])), but also because it rebuts any assertion by Patent Owner that increased OSI is an unexpected result of transesterifying jojoba esters and hydrogenated jojoba esters, using a lipase. EX-1003 ¶¶24-26, 160-161. *See Merck*, 800 F.2d at 1098-100; *Wiseman*, 596 F.2d 1022-23; *Obiaya*, 227 U.S.P.Q. at 60; *Ex parte Blanc*, 13 U.S.P.Q.2d 1384-86.

2. Claim 2

“....wherein the feedstock consists essentially of the jojoba wax esters and the hydrogenated jojoba wax esters.”

Claim 2 limits claim 1 by restricting the feedstock to only the jojoba wax esters, the hydrogenated jojoba wax esters and only those additional materials that do not materially affect the basic and novel properties of the invention (such as indicated in the claim itself, improved OSI). *HZNP Meds.*, 940 F.3d at 692-93. The combination that renders claim 1 unpatentable teaches such a feedstock—*e.g.*, no

additional OSI-affecting materials. *See* EX-1006, 1-2; EX-1014, 5-7, Fig. 4; EX-1008, 289-90, 296-99, 301, Figs. 15, 18; EX-1009, 295-96; EX-1003 ¶¶162-163.

3. Claim 3

“....wherein the feedstock does not comprise any free fatty alcohols.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any free fatty alcohols.” EX-1003 ¶¶164-165. A POSA would have understood that the feedstock of *Trans* Isomers 2 alone and/or as modified by the teachings of Sessa, *see* limitation 1[a] directly above, which discloses calibration sets “consisting of native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated wax esters,” does not comprise any free fatty alcohols. EX-1009, Abstract, 295-96; EX-1003 ¶¶164-165.

4. Claim 5

“....wherein the feedstock does not comprise any methyl esters.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any methyl esters.” EX-1003 ¶¶166-167. A POSA would have understood that the feedstock of *Trans* Isomers 2 alone and/or as modified by the teachings of Sessa, *see* limitation 1[a] directly above, which discloses calibration sets “consisting of native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated wax esters,” does not comprise any methyl esters. EX-1009, Abstract, 295-96; EX-1003 ¶¶166-167.

D. Ground 3: *Trans* Isomers 2 in view of *Trans* Isomers 1 and/or in further view of Sessa

The combination of *Trans* Isomers 2 and *Trans* Isomers 1 alone and/or in further view of Sessa discloses the steps of, and renders obvious, the Challenged Claims. It would have been obvious to (i) modify the process for transesterifying jojoba oil and fully hydrogenated jojoba wax esters taught in *Trans* Isomers 2, which generates a transesterified product (jojoba esters), wherein the jojoba esters have an OSI greater than the feedstock, with (ii) the enzyme catalyst expressly taught in *Trans* Isomers 1 and, (iii) to the extent it is found not to be disclosed by *Trans* Isomers 2 itself, the feedstock containing 20% to 50% by weight of hydrogenated jojoba wax esters expressly taught in Sessa. EX-1003 ¶¶168-199; *see* claims 1-3, 5, directly below.

In addition to the reasons below, a POSA would have combined these references because they (i) pertain to the same fields (lipid chemistry, food and cosmetic ingredients); (ii) discuss the same class of chemical reactions (transesterification/interesterification); (iii) seek to achieve the same results (improved physical properties and lack of *trans* isomers); and, (iv) with respect to *Trans* Isomers 1 and 2, being published as a series in two consecutive issues of the same publication and sharing the same authors, Brown and Kleiman). EX-1003, ¶¶50-51, 171, 178-182, 185-189.

1. Claim 1

1[preamble] “A process for transesterifying wax esters, the process comprising:”

Whether the preamble is limiting, it is disclosed by *Trans Isomers 2*. EX-1003 ¶¶172-173; *see* elements 1[a]-1[c], directly below. *Trans Isomers 2* discloses a process for transesterifying wax esters. EX-1006, 1-2, Fig. 4; EX-1014, 5-7, Fig. 4 (explaining that jojoba esters are “[a] complex mixture of esters produced by the transesterification/interesterification of *Simmondsia Chinensis* (Jojoba) Oil, Hydrogenated Jojoba Oil, or a transesterified mixture of the two. Figure 4 represents the interesterification reaction between (I) jojoba oil (only *cis* isomers) and (II) fully hydrogenated jojoba oil (no *cis* or *trans* isomers).”).¹²

1[a] “providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters, wherein the amount of hydrogenated jojoba wax esters is 20% to 50% by weight of the feedstock”

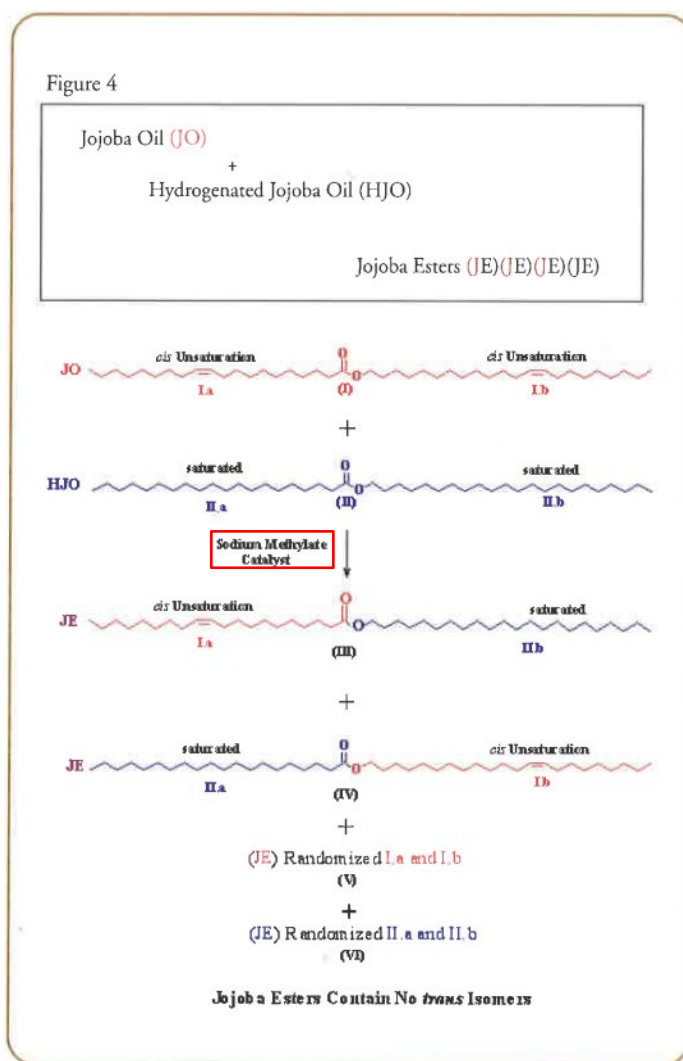
Trans Isomers 2 alone and/or in view of *Sessa* discloses limitation 1[a], and renders obvious the claimed invention, for the reasons described in §VI.C.1 (limitation 1[a]). *See also* EX-1006, 1-2, Fig. 4; EX-1014, 5-7, Fig. 4; EX-1009, 296; EX-1003 ¶¶174-182.

¹² *See supra* 44 n.11.

1[b] “contacting the feedstock with a lipase; and transesterifying the jojoba wax esters and the hydrogenated jojoba wax esters in the feedstock with the lipase to form a transesterified product”

The combination of *Trans* Isomers 2 and *Trans* Isomers 1 discloses limitation 1[b]. EX-1003 ¶¶183-189; *see also* discussion of limitation 1[preamble], above.

Trans Isomers 2 discloses providing a feedstock including jojoba oil and hydrogenated jojoba oil and contacting the feedstock with a sodium methylate catalyst (*i.e.*, a chemical catalyst) for the purpose of transesterification:



EX-1014, 5-6, Fig. 4 (annotated); EX-1006, 1-2, Fig. 4; EX-1003 ¶184.

Trans Isomers 2 does not expressly disclose “contacting the feedstock with a lipase.” However, a POSA would have found it obvious to modify the catalyzed process of *Trans* Isomers 2 to use the enzyme¹³ disclosed in *Trans* Isomers 1 as the catalyst. EX-1005, 3-4; EX-1014, 3; EX-1003 ¶185. The use of enzymes as a catalyst in interesterification/transesterification reactions is explicitly disclosed in *Trans* Isomers 1. *Trans* Isomers 1 discloses that interesterification and transesterification refer to “[t]he catalyzed chemical reaction between two or more esters in which the acids and alcohols present are recombined in a random manner” and that enzymes can be used to catalyze such reactions. EX-1005, 3-4 (“Rozenaal discussed use of th[e] interesterification process...using various catalysts including enzymes.”); EX-1014, 3; EX-1003 ¶185.

A POSA would have been motivated to use, and had a reasonable expectation of success in using, an enzyme as the catalyst in the reaction of *Trans* Isomers 2 to, as disclosed in *Trans* Isomers 1, “provide manufacturers with oxidatively stable and affordable lipid based emollients that exhibit a broad range of melting points yet which contain no *trans* fatty isomers.” EX-1003 ¶186; Ex 1014, 3; Ex 1005, 3. A

¹³ The '245 patent provides a broad definition: “[a]s used herein, ‘lipase’ means any enzyme or protein capable of being used in a transesterification reaction of a wax ester.” EX-1001, 4:63-65; EX-1003, ¶168 n.6.

POSA would further have been motivated to combine the teachings of *Trans* Isomers 2 with the teachings of *Trans* Isomers 1 because *Trans* Isomers 2 specifically refers and cites to *Trans* Isomers 1, calling it “Part 1 of this series.” See EX-1006, 1, 4; EX-1014, 5, 8; EX-1003 ¶186.

Further, replacing chemical catalysts in interesterification/transesterification processes with lipases would have been within a POSA’s background knowledge. See §VI.B.1 (limitation 1[b]); EX-1012, 676; EX-1013, 877; EX-1003 ¶187.

1[c] “wherein an oxidative stability index (OSI) of the transesterified product is greater than an OSI of the feedstock.”

Trans Isomers 2 discloses limitation 1[c], and renders obvious the claimed invention, for the reasons described in §VI.C.1 (limitation 1[c]). See also EX-1006, 3-4, Table 4; EX-1014, 6-7, Table 4; EX-1003 ¶¶190-193.

2. Claim 2

“....wherein the feedstock consists essentially of the jojoba wax esters and the hydrogenated jojoba wax esters.”

Claim 2 limits claim 1 by restricting the feedstock to only the jojoba wax esters, the hydrogenated jojoba wax esters and only those additional materials that do not materially affect the basic and novel properties of the invention (such as indicated in the claim itself, improved OSI). *HZNP Meds.*, 940 F.3d at 692-93. The combination that renders claim 1 unpatentable teaches such a feedstock—e.g., no additional OSI-affecting materials. See EX-1006, 1-2, Fig. 4; EX-1005, 2-3; EX-1014, 6-7, Fig. 4; EX-1009, 295-96; EX-1003 ¶¶194-195.

3. Claim 3

“....wherein the feedstock does not comprise any free fatty alcohols.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any free fatty alcohols.” EX-1003 ¶¶196-197. A POSA would have understood that the feedstock of *Trans* Isomers 2 alone and/or as modified by the teachings of Sessa, *see* limitation 1[a] directly above, which discloses calibration sets “consisting of native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated wax esters,” does not comprise any free fatty alcohols. EX-1009, Abstract, 295-96; EX-1003 ¶¶196-197.

4. Claim 5

“....wherein the feedstock does not comprise any methyl esters.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any methyl esters.” EX-1003 ¶¶198-199. A POSA would have understood that the feedstock of *Trans* Isomers 2 and/or as modified by the teachings of Sessa, *see* limitation 1[a] directly above, which discloses calibration sets “consisting of native jojoba wax esters that were transesterified with proportionate blends of completely hydrogenated wax esters,” does not comprise any methyl esters. EX-1009, Abstract, 295-96; EX-1003 ¶¶198-199.

E. Ground 4: Brown in view of Xu and Cummings and/or in further view of Sessa

The combination of Brown, Xu, and Cummings alone, and/or in further view of Sessa discloses the steps of, and renders obvious, the Challenged Claims. It would have been obvious to (i) modify the process for transesterifying jojoba oil and fully hydrogenated jojoba wax esters taught in Brown with (ii) the lipase catalyst expressly taught in Xu and, (iii) to the extent it is found not to be disclosed by Brown itself, with the feedstock containing 20% to 50% by weight of hydrogenated jojoba wax esters expressly taught in Sessa. Further, (iv) based on Cummings, a POSA would have had a reasonable expectation of success in generating a transesterified product (jojoba esters), wherein the jojoba esters have an OSI greater than the feedstock. EX-1003 ¶¶200-244; *see* claims 1-3, 5, directly below.

In addition to the reasons below, a POSA would have combined these references because they (i) pertain to the same fields (lipid chemistry, food and cosmetic ingredients); (ii) discuss the same class of chemical reactions (transesterification/interesterification); (iii) seek to achieve the same results (improved physical properties); and (iv) in Brown, Sessa, and Cummings, identify overlapping contributors (FloraTech, Brown, and Kleiman). EX-1003 ¶¶50-51, 203, 218-225, 228-232.

1. Claim 1

1[preamble] “A process for transesterifying wax esters, the process comprising:”

Whether the preamble is limiting, it is disclosed by Brown alone and/or in view of Xu. EX-1003 ¶¶204-210; *see* elements 1[a]-1[c], directly below. Brown discloses a process for transesterifying wax esters. EX-1007, 3:59-62; 4:4-5:31.¹⁴ Further, Xu explains, “[i]nteresterification or transesterification is also commonly used in literature to describe” the same major enzymatic reactions for the modification of lipids, including alcoholysis, which is “the reaction between an ester and an alcohol.” EX-1008, 290, 296.

1[a] “providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters, wherein the amount of hydrogenated jojoba wax esters is 20% to 50% by weight of the feedstock”

The combination of Brown alone and/or in view of Sessa discloses limitation 1[a]. EX-1003 ¶¶211-225.

Brown discloses providing a feedstock comprising jojoba wax esters and hydrogenated jojoba wax esters. EX-1007, 4:4-24, 4:39-55; *see* EX-1007, 5:1-31

¹⁴ To the extent Patent Owner argues Brown does not disclose “transesterifying,” Brown as a whole is consistent with the ’245 Patent’s description of “[t]ransesterification.” *See* EX-1001, 3:28-37.

(“[R]efined jojoba oil (or hydrogenated jojoba oil or a mixture of the oil and hydrogenated oil) is introduced into an appropriate vessel[.]”); EX-1003 ¶212.

Brown does not expressly disclose “20% to 50%.” However, a POSA would have understood that Brown does. Specifically, Brown shows various physical properties of transesterified jojoba ester product (including Floraesters 60, 30, 20, 15, IPJ, HIPJ), including iodine value (“IV”), as shown below:

<u>TYPICAL PROPERTIES OF JOJOBA ESTERS:</u>		
	Melting Point	Iodine Value
Floraesters - 70	66–70° C.	<2
Floraesters - 60	56–60° C.	40–44
Floraesters - 30	47–51° C.	57–61
Floraesters - 20	42–48° C.	64–70
Floraesters - 15	10–15° C.	78–85
Floraesters IPJ	6–12° C.	75–85
Floraesters HIPJ	55–65° C.	<2

See EX-1007, 8:45-54 (annotated); EX-1003 ¶213.

A POSA would have known how to calculate the approximate weight percentage of hydrogenated jojoba esters in the feedstock used to prepare each of Floraesters 60, 30, 20, 15, IPJ, and HIPJ, using the IVs listed in Brown at 8:45-54. See § VI.B.1 (limitation 1[a)); EX-1003 ¶¶214-215. Brown discloses that “Floraesters 70 is III,” which species is “[f]ully hydrogenated Jojoba wax esters.” See EX-1007, 4:4-24, 5:39-40; EX-1003 ¶216. Thus, a POSA would have

understood that the IV of hydrogenated jojoba wax esters may range from 0 to 2. *See* EX-1007, 5:39-40, 8:45-54; EX-1003 ¶216.

Using this information, and as shown below in Table D, a POSA would have understood from Brown, at 8:45-54, that the amount of fully hydrogenated jojoba wax esters is between 3.7% and 100% by weight of the feedstock, which includes the range of 20% to 50% by weight of the feedstock claimed in claim 1 (also, individual products are inside the claimed range). EX-1003 ¶217; *see Almirall*, 28 F.4th at 273-74.

Table D		
	Jojoba Esters IVs From Brown at 8:45-54	Estimated Hydrogenated Jojoba Wax Ester Content Of Feedstock (Wt %)
Floraesters – 60	40-44	50.6-51.7
Floraesters – 30	57-61	29.6-32.2
Floraesters – 20	64-70	21-21.8
Floraesters – 15	78-85	3.7-4.6
Floraesters IPJ	75-85	4.6-7.4
Floraesters HIPJ	<2 (<i>i.e.</i> , 0-2)	100

Regardless, a POSA would have found it obvious to modify the process disclosed in Brown to include 20% to 50% by weight of hydrogenated jojoba wax esters in the feedstock, as disclosed in Sessa. *See* EX-1003 ¶¶218-225; EX-1009, 296.

Specifically, Sessa discloses the claimed “20% to 50%.” *See* §VI.B.1 (limitation 1[a]); EX-1003 ¶¶218-225. A POSA would have been motivated—and found it routine optimization—to vary the amount of hydrogenated jojoba wax esters in the feedstock disclosed in Brown to an amount that is 20% to 50% by weight of the feedstock, as disclosed in Sessa, to obtain desirable and/or improved physical properties, such as oxidative stability and thermal properties in the transesterified product, and would have had a reasonable expectation of success in so doing. *See Genentech*, 946 F.3d at 1341-42; EX-1003 ¶220.

In this vein, Brown discloses:

Jojoba esters are prepared by processes described herein, which processes result in a randomized molecular combination of saturated with unsaturated jojoba fatty acids and fatty alcohols. These esters are a complex mixture of different jojoba fatty acids and fatty alcohols combined randomly and composed of differing chain lengths.... The melting point, consistency, and physical appearance of these jojoba esters can be manipulated to produce a family of wax esters ranging from pourable liquids to hard, crystalline waxes.... Jojoba esters in the present invention are utilized as oxidatively stable carriers of fragrance oils[.]

EX-1007 at 7:7-19, 8:24-26; EX-1003 ¶220. Brown further discloses that the transesterification of a mixture of jojoba wax esters and hydrogenated jojoba wax esters results in a “broad melting range” product which properties are not obtainable

by the mixture of the products of the transesterification of jojoba wax esters alone and the transesterification of hydrogenated jojoba wax esters alone, thus teaching that the relative amounts of jojoba wax esters and hydrogenated jojoba wax esters may be used to manipulate the physical properties of the resulting jojoba ester product. *See* EX-1007 4:4-68; EX-1003 ¶221.

Similarly, as discussed in Ground 1 above, Sessa discloses that the thermal properties of a transesterified product can be optimized by varying the amount of hydrogenated jojoba wax esters in a feedstock. *See* §VI.B.1 (limitation 1[a]); EX-1009, 298 (“We devised mathematical indices... to define the level of saturation in transesterified wax ester blends and used them to select the optimum level of saturation....”); EX-1009, Abstract (“The wax ester blend with 400 g kg⁻¹ saturation most closely resembled the [desired] thermal properties....”); EX-1003 ¶222.

Further, the ability to engineer specific physical properties in a transesterified product by manipulating the ratio of jojoba wax esters to hydrogenated jojoba wax esters in a feedstock would have been within a POSA’s background knowledge. *See* §VI.B.1 (limitation 1[a]); Ex. 1004, 1-2; Ex. 1009, 298, Abstract; EX-1012, 675; EX-1013, 878; EX-1003 ¶223.

It is significant, regarding obviousness, that the ’245 patent does not teach that the 20-50% range is critical. EX-1003 ¶42-44.

1[b] “contacting the feedstock with a lipase; and transesterifying the jojoba wax esters and the hydrogenated jojoba wax esters in the feedstock with the lipase to form a transesterified product”

The combination of Brown and Xu discloses limitation 1[b]. EX-1003 ¶¶226-232.

Brown discloses providing a feedstock including jojoba oil and hydrogenated jojoba oil and contacting the feedstock with “a catalyst for alcoholysis and interesterification such as sodium methoxide” (*i.e.*, a chemical catalyst) for the purpose of transesterification. EX-1007, 5:13-16; *see* EX-1007, 3:59-4:3 (“The compositions comprising fatty alcohols, isopropyl esters and jojoba wax esters (jojoba oil) may be obtained by the base catalyzed alcoholysis reaction between jojoba oil and an alkyl alcohol.”); EX-1003 ¶227.

Brown does not expressly disclose “contacting the feedstock with a lipase.” However, a POSA would have found it obvious to modify the chemically catalyzed process of Brown to use the lipase disclosed in Xu as the catalyst. EX-1003 ¶228; EX-1008, 296-99, Figs. 15, 18. The use of lipases as a catalyst in interesterification/transesterification reactions is explicitly disclosed in Xu. Xu discloses that interesterification and transesterification both refer to the same class of reactions, including alcoholysis and/or ester-ester exchange reactions, and that lipases can be used to catalyze such class of reactions. EX-1008, 296-99, Figs. 15, 18; EX-1003 ¶228.

A POSA would have been motivated to replace, and had a reasonable expectation of success in replacing, the chemical catalyst of *Trans* Isomers 2 with a lipase as the catalyst in the reaction of Brown for the reasons stated in Xu. EX-1003 ¶229; Ex 1008, 289, 301. In particular, as discussed in Ground 1 above, Xu discloses that the use of chemical catalysts in industry can be “fully replaced” with the use of lipases, and that the industry has several reasons to do so, including: “interesting products... market demands..., improvement of product quality..., reduction of enzyme price and balanced economy..., simple processes and low investment..., environmental considerations..., customer perception and marketing strategy....” See §VI.B.1 (limitation 1[b]); EX-1008, 289; *see id.* (additionally, “‘image’ strategy by using enzyme technology is important for many industrial companies; energy-efficiency of the technology is also often mentioned.”); EX-1003 ¶229.

Further, replacing chemical catalysts in interesterification/transesterification processes with lipases would have been within a POSA’s background knowledge. See §VI.B.1 (limitation 1[b]); EX-1012, 676; EX-1013, 877; EX-1003 ¶230.

1[c] “wherein an oxidative stability index (OSI) of the transesterified product is greater than an OSI of the feedstock.”

The combination of Brown and Cummings discloses limitation 1[c]. EX-1003 ¶¶233-238.

Brown discloses the transesterification of a feedstock of jojoba wax esters and hydrogenated jojoba esters to prepare jojoba esters. EX-1007, 4:4-24, 4:39-55, 5:1-

31; EX-1007, Abstract (“The compositions of the present invention may be obtained by a novel process of a base catalyzed alcoholysis reaction between jojoba oil and an alcohol, such as isopropyl alcohol. These components, whether exclusively jojoba esters or when combined with other carrier and vehicle components... can form excellent carrier composition for use in the cosmetic, personal care and/or pharmaceutical field.”); EX-1003 ¶234.

Cummings explicitly discloses that the transesterified product, “[j]ojoba esters[,] demonstrate remarkable stability with OSI values of all jojoba esters greater than 100 hours and as high as 675 hours”; this is significantly greater than the OSI of the refined jojoba oil that forms part of the feedstock, which “is around 35 hours.” EX-1004, 2. EX-1004, 1-2 (“The structure of all jojoba esters is different from its starting material—jojoba oil. It is these compositional differences within the family of jojoba esters that create their expanded utility in cosmetic preparations[,]” including regarding oxidative stability); EX-1003 ¶235.

Like Cummings, Brown discloses the transesterification¹⁵ of a feedstock of jojoba wax esters and hydrogenated jojoba esters to prepare jojoba esters. EX-1004,

¹⁵ As Xu explains, “[i]nteresterification or transesterification is also commonly used in literature to describe” the same major enzymatic reactions for the modification of lipids, including alcoholysis. EX-1008, 290; EX-1003 ¶236, n.10.

2; EX-1007, 4:4-24, 4:39-55, 5:1-31. Thus, a POSA would have understood it was reasonable to expect that the Brown process would also result in a transesterified jojoba ester product with the same properties as those in Cummings. EX-1003 ¶236.

Further, it was well-known that the transesterification of fats, oils and wax esters—including in lipase-catalyzed processes and processes involving jojoba wax esters and hydrogenated jojoba wax esters—can produce a product having improved, and thus greater, oxidative stability. *See* §VI.B.1 (limitation 1[c]); EX-1015, [0005]; EX-1016, [0031]; EX-1017, 245; EX-1018, C371; EX-1003 ¶237.

This evidence shows the obviousness of the claimed invention, not only because it shows the generally understood interchangeability of lipase- and chemically catalyzed esterification (*see* §VI.B.1 (limitation 1[b])), but also because it rebuts any assertion by Patent Owner that increased OSI is an unexpected result of transesterifying jojoba esters and hydrogenated jojoba esters, using a lipase. EX-1003 ¶¶24-26, 237-238. *See Merck*, 800 F.2d at 1098-100; *Wiseman*, 596 F.2d 1022-23; *Obiaya*, 227 U.S.P.Q. at 60; *Ex parte Blanc*, 13 U.S.P.Q.2d 1384-86.

2. Claim 2

“....wherein the feedstock consists essentially of the jojoba wax esters and the hydrogenated jojoba wax esters.”

Claim 2 limits claim 1 by restricting the feedstock to only the jojoba wax esters, the hydrogenated jojoba wax esters and only those additional materials that do not materially affect the basic and novel properties of the invention (such as

indicated in the claim itself, improved OSI). *HZNP Meds.*, 940 F.3d at 692-93. The combination that renders claim 1 unpatentable teaches such a feedstock—*e.g.*, no additional OSI-affecting materials. *See* EX-1004, 1-2, Fig. 1; EX-1007, 4:4-5:31; EX-1008, 289-90, 296-99, 301, Figs. 15, 18; EX-1009, 295-96 ; EX-1003 ¶¶239-240.

3. Claim 3

“....wherein the feedstock does not comprise any free fatty alcohols.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any free fatty alcohols.” EX-1003 ¶¶241-242. A POSA would have understood that the feedstock of Brown alone and/or as modified by the teachings of Sessa, *see* limitation 1[a] directly above, which consists of an anhydrous isopropyl alcohol and refined jojoba oil, hydrogenated jojoba oil, or a mixture of the two, does not comprise any free fatty alcohols. EX-1007, 4:4-5:20; EX-1003 ¶241.

4. Claim 5

“....wherein the feedstock does not comprise any methyl esters.”

The combination that renders claim 1 unpatentable teaches a feedstock that “does not comprise any methyl esters.” EX-1003 ¶¶243-244. A POSA would have understood that the feedstock of Brown alone and/or as modified by the teachings of Sessa, *see* limitation 1[a] directly above, which consists of an anhydrous isopropyl alcohol and refined jojoba oil, hydrogenated jojoba oil, or two, does not comprise any methyl esters. EX-1007, 4:4-5:20; EX-1003 ¶243.

VII. Section 314 Denial is Unwarranted

If instituted, Petitioner will stipulate to not pursue prior art invalidity in court *on any grounds based entirely on prior art patents or publications, including the grounds in this Petition.* This alone demonstrates that denial is unwarranted. See Director’s Memorandum on the Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation, 3 (June 21, 2022) (“Director’s Interim Procedure Memo”).

Regardless, consideration of *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential), and the Director’s Interim Procedure Memo, favors institution.

A. Factor 1: Potential Stay is Neutral

If instituted, Petitioner will seek a Delaware Matter stay. This factor is neutral, as the court’s decision will come after institution, and is “based on a variety of circumstances and facts beyond [the Board’s] control and to which the Board is not privy.” *Sand Revolution II, LLC v. Continental Intermodal Grp. – Trucking, LLC*, IPR2019-01393, Paper 24, 7 (PTAB June 16, 2020) (informative); see *Western Digital Corp. v. Kuster*, IPR2020-01410, Paper 13, 9-10 (PTAB Feb. 17, 2021).

B. Factor 2: Trial Date and Median Time-to-Trial Favor Institution

The Delaware Matter court set a June 24, 2024, trial date. EX-1021. However, the trial may not occur until sometime later, and after a final written decision, because the average time-to-trial in Delaware is 36.0 months. EX-1022, 3; *Micron*

Tech., Inc. v. Godo Kaisha IP Bridge 1, IPR2020-01008, Paper 10, 13-14 (PTAB Dec. 7, 2020); *Sand Revolution*, IPR2019-01393, Paper 24, 9; Director’s Interim Procedure Memo, 8-9 and n.12 (“A court’s scheduled trial date...is not by itself a good indicator....”).

In contrast, the Board must follow the one-year 35 U.S.C. §316(a)(11) deadline. *See Sand Revolution*, IPR2019-01393, Paper 24, 9.

Therefore, post-trial motions—if not the actual trial date—will likely occur months after the final written decision.

Factor 2 favors institution.

C. Factor 3: Early Stage and District Court’s Minimal Investment Favor Institution

The Delaware Matter is in its infancy: preliminary contentions and associated documents have been served; discovery requests were served, but not responded to; and the court has invested no time on the merits. Petitioner has been diligent, filing this petition less than 7 months after the court complaint. *See generally* EX-1020.

Factor 3 favors institution. *See Apple Inc. v. Seven Networks, LLC*, IPR2020-00156, Paper 10, 11 (PTAB June 15, 2020) (finding diligence where petition was filed four months before statutory bar date).

D. Factor 4: Minimal Overlap Between Issues Favors Institution

If instituted, Petitioner will stipulate not to pursue invalidity in court on any grounds based entirely on prior art patents or publications, including these. *See*

Sotera Wireless, Inc. v. Masimo Corp., IPR2020-01019, Paper 12, 19 (PTAB Dec. 1, 2020) (precedential as to § II.A); Director's Interim Procedure Memo, 3.

Factor 4 favors institution.

E. Factor 5: Parties are Involved in the District Court Case

Only Petitioner, Patent Owner, and the prior patent owner (FloraTech) are involved in the Delaware Matter. Factor 5 is neutral.

F. Factor 6: Merits Favor Institution

Petitioner's Grounds are strong, favoring institution and overriding other factors. *See* Director's Interim Procedure Memo, 3-5; *Fintiv*, IPR2020-00019, Paper 11, 14-15.

VIII. Section 325 Denial is Unwarranted

The Board should not exercise its discretion under 35 U.S.C. §325(d) to deny institution because no reference used as the basis for a Ground herein was cited by the Examiner or applied to the Challenged Claims. *See Apple Inc. v. Omni MedSci, Inc.*, IPR2020-00175, Paper 11, 11 (PTAB June 17, 2020); *Zip Top, LLC v. Stasher, Inc.*, IPR2018-01216, Paper 14, 35 (PTAB Jan. 17, 2019); *Amazon.com, Inc. v. M2M Sols. LLC*, IPR2019-01205, Paper 14, 16 (PTAB Jan. 27, 2020). Further, denial is unwarranted because: (i) Grounds 1, 2 and 4 rely upon references not disclosed during prosecution (and, thus, in combinations not available then); (ii) no rejection based on any combination used herein was raised during prosecution; (iii) if the references in any ground had been actually considered, the claims would have been

found obvious; and (iv) all grounds rely upon the new testimony of Dr. Rockstraw which explains how a POSA would have understood the prior art's teachings and state of the art, and why a POSA would have found the combinations obvious (including Dr. Rockstraw's explanation about the relationship between IV values and percent of hydrogenated esters). *See Caterpillar Inc. v. Wirtgen Am., Inc.*, IPR2022-01278, Paper 12, 43 (PTAB Feb. 7, 2023); *Tesla, Inc. v. Arsus, LLC*, IPR2022-01216, Paper 9, 7-8 (PTAB Dec. 23, 2022); *Amcol Int'l Corp. v. Oil-Dri Corp. of Am.*, IPR2022-01107, Paper 10, 12-14 (PTAB Dec. 5, 2022).

Petitioner acknowledges that Brown is a reissue of the '746 patent, which is in turn a continuation-in-part of Arquette, which was cited and applied during prosecution. *See* EX-1001. However, the '746 patent (and thus Brown) includes new matter not disclosed in Arquette, and therefore not before the Examiner during prosecution. Specifically, Brown adds (1) that the disclosed processes prepare “[j]ojoba esters [having] a randomized molecular combination of saturated with unsaturated jojoba fatty acids and fatty alcohols”; (2) that “[t]he melting point, consistency, and physical appearance of these jojoba esters can be manipulated to produce a family of wax esters ranging from pourable liquids to hard, crystalline waxes”; (3) that the disclosed jojoba esters “are utilized as oxidatively stable carriers of fragrance oils” compared with jojoba oils that would have reacted with the fragrance oil; and (4) the properties of various jojoba esters products, including their

IV. *Compare* EX-1010 with EX-1007, Abstract, 7:7-19, 8:24-26, 8:45-54; EX-1003 ¶69, n.2.

Combined with the disclosure carried over from Arquette that “the properties of the emollient depend upon the relative amounts of IIn [naturally occurring jojoba wax esters] and IIN [*sic*] [naturally occurring hydrogenated jojoba wax esters]” and the disclosed reactions result in “the randomized distribution of wax esters”—*compare* EX-1010, 7:67-8:7, 8:37-44 with EX-1007, 4:6-14, 4:48-55—the new matter in Brown supplies the “connection between the ratio of hydrogenated jojoba wax esters and jojoba wax esters and the OSI of an enzymatically transesterified product” that applicant argued (during prosecution) was missing from Arquette (in support of applicant’s argument that Arquette fails to disclose that the amount of hydrogenated jojoba wax esters is a result-effective variable). EX-1002, 1092-1093; EX-1003 ¶69, n.2.

Additionally, the new disclosure that the disclosed jojoba esters “are utilized as oxidatively stable carriers of fragrance oils” (compared with jojoba oils that would have reacted with the fragrance oil) would have been relevant during prosecution—because it would have taught a POSA that jojoba esters may have improved physical properties (including oxidative stability) compared to jojoba oil, which is part of the disclosed feedstock. EX-1007, 8:17-26; EX-1003 ¶69, n.2. As the October 28, 2021, Notice of Allowance, noted: Arquette does not teach “the oxidative stability index

(OSI) of the transesterified product is greater than an OSI of the feedstock.” EX-1002, 1176-1177.

IX. Conclusion

Claims 1-3 and 5 are unpatentable. Petitioner requests cancellation.

Respectfully submitted,

SHEARMAN & STERLING LLP

Dated: February 24, 2023

/Patrick Colsher/

Patrick Colsher (Reg. No. 74,955)

Lead Counsel for Petitioner

CERTIFICATE OF COMPLIANCE

I hereby certify that this paper complies with the type-volume limitation of 37 C.F.R. §42.24 (as determined by the Microsoft Word word-processing system used to prepare this paper) because it contains 13,906 words, excluding the parts of the paper exempted by 37 C.F.R. §42.24(a).

Dated: February 24, 2023

/Patrick Colsher/

Patrick Colsher (Reg. No. 74,955)

Lead Counsel for Petitioner

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Petition for *Inter Partes* Review and the Exhibits listed on the List of Exhibits were served on February 24, 2023, by Priority Mail Express, upon the following:

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