

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTIF FOODWORKS, INC.,
Petitioner,

v.

IMPOSSIBLE FOODS, INC.,
Patent Owner.

Case No. IPR2023-00206
Patent No. 9,943,096

PATENT OWNER'S RESPONSE

TABLE OF CONTENTS

I.	Introduction.....	1
II.	Person of Ordinary Skill in the Art.....	5
III.	Claim Construction.....	6
	A. “a compound”.....	7
	B. “food flavor additive composition”.....	11
IV.	Ground 1: Claims 1-5, 7-9, 23, 24 Are Not Anticipated by Brown	12
	A. Petitioner Fails to Establish Independent Claim 1 Is Anticipated by Brown	12
	1. Petitioner fails to establish Brown discloses the claimed sulfur-containing compound (element 1[c]).....	12
	2. Petitioner fails to establish Brown discloses “a food flavor additive composition” as claimed	13
	B. Petitioner Fails to Establish Dependent Claims 2-5, 7-9 and 23-24 Are Anticipated by Brown	18
	1. Claims 4 and 24.....	18
	2. Claim 7.....	21
	3. Claim 23	21
V.	Ground 2A: Claims 1-12, 14-17, and 20-24 Are Not Obvious over Giacino and Brown.....	23
	A. Petitioner Fails to Establish Independent Claim 1 Is Obvious over Giacino and Brown.....	25
	1. Petitioner’s Ground 2A lacks the requisite degree of particularity to establish obviousness	25
	2. Petitioner fails to establish that the combination of Giacino and	

	Brown “results in the production of at least two volatile compounds which have a meat-associated aroma”	28
3.	Petitioner fails to establish that a POSA would have had a reason to combine Giacino with Brown	30
B.	Petitioner Fails to Establish Independent Claim 10 Is Obvious over Giacino and Brown.....	35
C.	Petitioner Fails to Establish Dependent Claims 2-9, 11-12, 14-17, and 20-24 Are Obvious over Giacino and Brown	35
VI.	Ground 2B: Claims 18-19 Are Not Obvious over Giacino, Brown, and MacLeod	35
VII.	Ground 3A: Claims 1-2, 4-7, 9-12, 14-15, and 20-24 Are Not Obvious over Giacino, Conrad, and Crane	36
A.	Petitioner Fails to Establish Independent Claim 1 Is Obvious over Giacino, Conrad, and Crane	36
1.	Petitioner fails to establish Crane is analogous art	36
2.	Petitioner fails to establish a POSA would have been motivated to combine Giacino, Conrad, and Crane.....	41
B.	Petitioner Fails to Establish Independent Claim 10 Is Obvious over Giacino, Conrad, and Crane	48
C.	Petitioner Fails to Establish Dependent Claims 2, 4-7, 9, 11-12, 14-15, and 20-24 Are Obvious over Giacino, Conrad, and Crane	49
VIII.	Ground 3B: Claims 3 and 16 Are Not Obvious over Giacino, Conrad, Crane, and Proulx	49
IX.	Ground 3C: Claims 8 and 17 Are Not Obvious over Giacino, Conrad, Crane, and Perret	49
X.	Ground 3D: Claims 18-19 Are Not Obvious over Giacino, Conrad, Crane, and MacLeod	50
XI.	Ground 4A: Claims 1-7, 9-12, 14-16, and 20-24 Are Not Obvious over Giacino, Proulx, and Conrad	50

A.	Petitioner Fails to Establish Independent Claim 1 Is Obvious over Giacino, Proulx, and Conrad	50
B.	Petitioner Fails to Establish Independent Claim 10 Is Obvious over Giacino, Proulx, and Conrad	52
C.	Petitioner Fails to Establish Dependent Claims 2-7, 9, 11-12, 14-16, and 20-24 Are Obvious over Giacino, Proulx, and Conrad	52
XII.	Ground 4B: Claims 8 and 17 Are Not Obvious over Giacino, Proulx, Conrad, and Perret	52
XIII.	Ground 4C: Claims 18-19 Are Not Obvious over Giacino, Proulx, Crane, and MacLeod	53
XIV.	Conclusion	53
XV.	Appendix.....	55

I. INTRODUCTION

Motif FoodWorks, Inc. (“Motif” or “Petitioner”) challenges claims 1-12 and 14-24 of U.S. Patent No. 9,943,096 (“the ’096 patent,” EX1001) based on ten grounds. Impossible Foods Inc. (“Impossible Foods” or “Patent Owner”) respectfully requests that the Board issue a final written decision rejecting Petitioner’s grounds of challenge and affirming the patentability of the challenged claims.

The petition’s ten grounds are based on four sets of grounds asserting that the challenged claims are anticipated or obvious over the prior art. However, for each set of grounds, Petitioner’s evidence and reasoning fail to support Petitioner’s burden in establishing the unpatentability of the challenged claims.

First, Petitioner’s Ground 1 asserts that certain claims of the ’096 patent are anticipated by Brown. However, by Petitioner’s own admission, Ground 1 is based on a claim interpretation of the term “compound” that both Petitioner and its experts contend does not represent the plain and ordinary meaning of the term. That is, Petitioner’s Ground 1 is based on the premise that the “compound” limitations of the challenged claims are met by “pea flour, which contains proteins having the claimed sugar and sulfur compounds.” Pet., 12. However, before the district court, Petitioner, supported by its IPR expert, Dr. Robert McGorin, contended the opposite: that the term “compound” *did not* encompass proteins

having the claimed sulfur-containing compounds incorporated into its structure. The district court adopted Petitioner's rationale, finding that "the 'sulfur-containing compound' limitation must be satisfied by a compound that is present separately from a protein." EX2016, 9. Given that Ground 1 is premised on a reading of the challenged claims that Petitioner successfully urged before the district court does not represent the plain and ordinary meaning of the term "compound," Ground 1 necessarily fails.

Further, in addition to Petitioner's concession that Ground 1 rests on a diametrically opposed claim construction from its district court position, Petitioner also relies on a particular embodiment of a composition disclosed in Brown that Petitioner mischaracterizes as a "muscle replica" that is "added" to a meat replica, thus rendering that composition a food flavor additive composition as claimed. However, contrary to Petitioner's assertions, Brown makes a clear distinction between the "muscle replica" of that embodiment and the leghemoglobin that is added to the final composition. In this regard, to the extent Brown discloses a "muscle replica" that is "added" to a meat replica, it is one that does not contain each of the claimed ingredients. Moreover, it is only the final end product that contains each of the claimed ingredients. As the district court found (based on Petitioner's arguments), such a composition cannot satisfy the limitations of the claims.

For Grounds 2A-2B, Petitioner advances an obviousness case based on the combination of Giacino and Brown that is unsupported and contradicted by Petitioner's own experts and evidence. For instance, notwithstanding that Petitioner fails to identify a specific composition from Giacino, Petitioner's case rests primarily on the notion that because Giacino suggests the use of cysteine and ribose as optional ingredients, the presence of those ingredients in a composition will necessarily result in a Maillard reaction that will produce volatile compounds having a meaty aroma. However, what specific compositions those ingredients are added to are never identified by Petitioner. This creates a significant flaw in Petitioner's case because, as Dr. McGorin testifies, the presence of other ingredients, such as water, lipids, and even heme-containing proteins, will impact whether a Maillard reaction will occur and, if it does, whether volatile compounds having a meaty aroma will be produced. By failing to identify such a composition, Petitioner's case lacks the requisite degree of particularity necessary to meet its burden in establishing obviousness and it fails to establish that the claimed volatile compounds would be present.

Moreover, Petitioner goes on to contend that this result would not change even if leghemoglobin is added. According to Petitioner, the addition of leghemoglobin "would only further contribute" to the meaty aroma of Giacino's composition (whatever that composition may be). Yet Petitioner makes such

claims based on the testimony of its expert, Dr. Rodrigo Tarté, who himself admitted to lacking the requisite knowledge to opine on the matter. Dr. Tarté instead deferred to Dr. McGorin, but Dr. McGorin does not address the combination of Giacino and Brown. Rather, Dr. McGorin's testimony, both in this IPR and before the district court, along with other evidence of record contradict the assertions of Dr. Tarté, showing instead that the effects of adding leghemoglobin is dependent on the particular composition and can lead to off-flavors and other undesirable aromas. As a result, Petitioner's stated motivation that leghemoglobin "would only further contribute" to Giacino's composition is conclusory and lacks support.

Lastly, for Grounds 3A-3D and 4A-4C, the institution decision confirmed that the petition fails to make out a *prima facie* case of obviousness. For Grounds 3A-3D, the petition fails to establish that Crane constitutes analogous art to the claimed invention. Further, even taking Crane into account, the petition's purported combination—one that relies on the incorporation of animal blood from Conrad's meat extender to Giacino's flavoring compositions, only to be replaced by Crane's recombinant, animal-free heme-proteins—is illogical and finds no basis in the references' teachings. Similarly, for Grounds 4A-4C, the petition makes an even bigger leap to replace the animal blood of Conrad with the plant

leghemoglobin of Proulx for alleged flavor and nutritional purposes, none of which is actually supported by the references themselves.

For these reasons, and as further detailed below, each of Petitioner's grounds of challenge should be rejected.

II. PERSON OF ORDINARY SKILL IN THE ART

Petitioner contends that a person of ordinary skill in the art ("POSA") would have at least "a Master of Science degree or Ph.D. in food science or at least three years of experience working as a food scientist." Pet., 5. The POSA "could also be part of a team of food scientists, including flavor chemists." *Id.* For the purposes of this proceeding, Patent Owner applies the level of ordinary skill in the art as proposed by Petitioner. Submitted with this response is the declaration of Dr. Michael C. Qian, Ph.D., who is qualified to opine on the POSA as of the relevant timeframe of January 11, 2013.¹ EX2030, ¶¶2-6, 16-17; EX2031.

¹ While Petitioner challenges the priority date of the '096 patent, the Board need not decide the patent's priority date because Petitioner's reliance on Brown, which Petitioner bases its priority challenge on (Pet., 5-6), fails for other reasons detailed below. *See* EX2030, ¶23 n.1.

III. CLAIM CONSTRUCTION

A claim subject to *inter partes* review receives its plain and ordinary meaning, interpreted in light of the specification of the patent in which it appears. *See* 37 C.F.R. § 42.100(b). “This is the same claim construction standard used by Article III federal courts and the ITC, which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) and its progeny.” Consolidated Trial Practice Guide, 46 (Nov. 2019).

On August 15, 2023, the district court in the co-pending litigation issued its claim construction order construing terms that are recited in the challenged claims of the '096 patent. *See generally* EX2016; Consolidated Trial Practice Guide, 47 (“[T]he Board will consider any prior claim construction determination in a civil action if that court has previously construed a term in the involved claim using the same standard and the claim construction determination has been timely made of record in the IPR...proceeding.”). For some of those terms, Petitioner advanced arguments before the district court that are inconsistent with the positions that it takes in this IPR when applying the prior art, particularly Brown, to the challenged claims.

In particular, before the district court, Petitioner advanced a construction for the term “a compound” that is at odds with its theory in this IPR that Brown anticipates the challenged claims because it discloses the use of pea flour, which

contains proteins having the recited compounds. In contrast to its anticipation ground here, Petitioner contended before the district court that the plain and ordinary meaning of the term did not encompass such proteins, and the district court agreed. Because Petitioner's anticipation theory is based on an interpretation that Petitioner urged was erroneous, and won on that issue, Petitioner's theory underlying Ground 1 necessarily fails.

Further, also affecting Petitioner's Ground 1 is the district court's findings with regard to the term "food flavor additive composition," which the district court agreed with Petitioner did not encompass end food products. Because Petitioner relies on an embodiment of Brown that is itself a "meat replica" (*i.e.*, end food product), Petitioner's Ground 1 fails for this additional reason.

A. "a compound"

The challenged claims are directed to a food flavor additive composition that includes "a compound" selected from certain sugar compounds and "a compound" selected from certain sulfur-containing compounds. With regard to these terms, the petition asserts that Impossible Foods "has implicitly taken the position in the Litigation that this term is not limited to *free* compounds of the claimed sugars and sulfur compounds (*i.e.*, compounds not chemically bound to the structure of another compound)." Pet., 12. Based on this interpretation, the petition's "Ground 1 maps '*a compound* selected from cysteine ...' and '*a compound* selected from

alanine ...’ to pea flour, which contains proteins having the claimed sulfur compounds.” *Id.*; *see also id.*, 12 (contrasting Ground 1 from Grounds 2-4 which “are unaffected because they map these terms to free sugar and sulfur compounds”), 20 (Brown anticipates “[i]f the Board adopts PO’s interpretation of ‘a compound’ to not be limited to free compounds”), 22 n.7; EX1003, ¶¶105, 120 n.7; EX2032, 116:6-119:18 (confirming Ground 1 applies interpretation where “proteins satisf[y] the sulfur compound limitation”). Thus, Petitioner’s Ground 1 relies on the theory that “pea flour, which contains proteins having the claimed sulfur compounds,” satisfies the sulfur-containing compound limitations.

However, as detailed below, the premise that “proteins having the claimed sulfur compounds” can satisfy the claimed compound limitations has now been rejected by the district court at Motif’s urging. As a result, because the theory on which Petitioner bases its Ground 1 has been found to not to satisfy the limitations of the claims, Ground 1 must fail.

First, it should be noted that Petitioner’s interpretation of the claims for Ground 1 is not a bona fide claim construction. The sole basis underlying Petitioner’s interpretation is an alleged “implicit” admission from Patent Owner’s complaint. *See* Pet., 12 (citing EX1116, ¶¶36, 51). Conspicuously absent from its analysis are any citations to the specification or prosecution history of the ’096 patent. *See id.*; EX1003, ¶105. Indeed, Petitioner’s expert, Dr. Tarté, stated that

he applied different claim interpretations of the “compound” term between Ground 1 and Grounds 2-4, with the former being based solely on representations made by Petitioner’s counsel. EX2032, 88:10-91:8, 116:6-119:18 (asserting Ground 1 does not apply the plain and ordinary meaning of the term). Thus, as an initial matter, Petitioner’s interpretation that the term “compound” includes plant proteins is not based on a proper claim construction analysis under the *Philips* standard.

Furthermore, the premise that proteins can satisfy the claimed compound limitations has been rejected by the district court. *See* EX2016, 7-11. Based on the claims and the specification of the patents asserted in the co-pending litigation, the district court found that “a protein, which is itself a complex organic compound, is not a ‘sulfur compound’ as that term is used in the asserted claims.” *Id.*, 8-9. Thus, the court concluded that “the ‘sulfur compound’ limitation must be satisfied by a compound that is present separately from a protein.” *Id.*, 9.

The district court made such findings based on Motif’s urging that the plain and ordinary meaning of the terms did not encompass proteins having the claimed compounds. *See* EX2019, 17-20. As support for its position, Motif relied on the same expert appearing in this IPR, Dr. Robert McGorin, who opined before the district court that a POSA “would understand that the terms refer to th[e] free, stand-alone molecules, rather than their inclusion as part of a larger and more

complex structure such as a protein.” EX2020, ¶21; *see also id.*, ¶¶22, 77-79. Dr. McGorin further opined that a POSA would understand the terms to “refer to different ingredients of a replica foodstuff than proteins such as plant proteins” because “plant proteins in particular contribute to flavor in undesirable ways.” *Id.*, ¶21; *see also id.*, ¶¶69, 82. Given Motif’s contrary representations, Motif should be estopped from arguing that the Board should construe the compound limitations to map to “to pea flour, which contains proteins having the claimed sulfur compounds” (Pet., 12), under the same claim construction standard applied by the district court. *Egenera, Inc. v. Cisco Sys., Inc.*, 972 F.3d 1367, 1378 (Fed. Cir. 2020) (explaining “[j]udicial estoppel is an equitable doctrine that prevents a litigant from taking a litigation position inconsistent with one successfully asserted in an earlier court proceeding”) (citing *New Hampshire v. Maine*, 532 U.S. 742, 749 (2001) (identifying relevant factors)). This is especially true given that Motif itself argued that the patent’s specification does not support such a reading.

Because Ground 1 is premised on a theory that Motif itself has argued is contrary to the plain and ordinary meaning of the claims and, because that theory was adopted by the district court, Motif’s application of Brown to the challenged claims fails.

B. “food flavor additive composition”

Petitioner also argues that, based on Patent Owner’s second amended complaint, Patent Owner’s alleged interpretation of the term “food flavor additive composition” “covers meat substitutes that are end products *directly* consumed by the consumer (not just additives to meat substitutes).” Pet., 11-12.

Before the district court, Motif argued that the term “food flavor additive composition” means “a composition that modulates a food product’s flavor and/or aroma when added to the food product.” EX2016, 17 (citing EX2019, 16). Motif distinguished this construction from “Impossible’s infringement contentions” that, according to Motif, “make clear in Impossible’s view there are ‘multiple, unrelated ingredients in Motif’s end food products’ that together constitute a food flavor additive composition ‘simply by virtue of being present in the patty.’” *Id.* (citing EX2019, 17 & n.6). The district court agreed with Motif’s proposed construction, finding that, “in order to be a ‘food flavor additive composition,’ the composition must be one that can be added to a food product to modulate the product’s flavor and/or aroma.” *Id.*, 18. “It is not sufficient that the three recited compounds are present in the end food product.” *Id.*

The district court’s findings are relevant to Petitioner’s Ground 1 because Petitioner relies on an embodiment of Brown where “the three recited compounds are present in the end food product” (*i.e.*, a “meat replica”), *not* a composition that

is added to a food product. As explained below, for this additional reason, Petitioner’s reliance on Brown in Ground 1 also fails.

IV. GROUND 1: CLAIMS 1-5, 7-9, 23, 24 ARE NOT ANTICIPATED BY BROWN

In view of Petitioner’s positions regarding claim construction advanced before (and adopted by) the district court, Petitioner’s Ground 1 fails to establish that Brown anticipates the challenged claims. *See* EX2030, ¶¶18, 42-64.

A. Petitioner Fails to Establish Independent Claim 1 Is Anticipated by Brown

1. Petitioner fails to establish Brown discloses the claimed sulfur-containing compound (element 1[c])

Claim 1 recites a food flavor additive composition having “a compound selected from cysteine, cystine, thiamine, methionine, and mixtures of two or more thereof.” As explained above, Petitioner argued—and the district court agreed—that this claimed compound limitation does not encompass compounds contained within “a protein, which is itself a complex organic compound.” EX2016, 9; *supra*, section III.A. As Petitioner admits, Ground 1 is premised on Brown’s disclosure of the use of “pea flour, which contains proteins having the claimed sugar and sulfur compounds.” Pet., 12; *see also* EX1003, ¶105. During cross-examination, Petitioner’s expert, Dr. Tarté, confirmed that Ground 1 relies on proteins contained in Brown’s pea flour for disclosure of the sulfur-containing compound limitations, and that the ground does not apply the plain and ordinary

meaning of the term as he understands it. *See* EX2032, 33:19-34:12, 92:14-93:8, 98:11-99:9 (“[I]n as much as...Patent Owner considers proteins to satisfy the sulfur compound claim, then...the pea protein flour of Brown also satisfies the [sulfur] compound claim.”), 116:6-119:18 (confirming Ground 1 applies interpretation where “proteins satisf[y] the sulfur compound limitation”).

Petitioner’s proffered claim construction that the claimed compound limitations do not extend to proteins, which the district court adopted as the plain and ordinary meaning of the “compound” term, is dispositive to Ground 1. That is, because Petitioner’s Ground 1 maps Brown’s “pea flour, which contains proteins having the claimed sugar and sulfur compounds,” to the claimed sulfur-containing compound limitation, Ground 1 must fail. *See* EX2030, ¶¶32, 52.

2. Petitioner fails to establish Brown discloses “a food flavor additive composition” as claimed

Claim 1 is generally directed to a “food flavor additive composition” that contains specific ingredients, namely, “an isolated heme-containing protein,” a sugar compound, and a sulfur-containing compound. Petitioner asserts that Brown anticipates claim 1 via the alleged disclosure of a particular composition described in paragraph [00364] of Brown. *See* Pet., 20. Petitioner alleges that the paragraph

“teaches a muscle replica that contains pea flour (which includes cysteine^[2], methionine, and thiamine), glucose, sunflower oil, and isolated soy leghemoglobin (‘heme-containing protein’), and does not contain any animal products.” *Id.* (further alleging the paragraph in Brown discloses that heating the composition releases volatile compounds having a meaty aroma) (citing EX1012, [00364]). According to Petitioner, because Brown allegedly discloses that the composition is a “muscle replica,” it is a food flavor additive composition “because it is added to a meat substitute that contains other tissue replicas to impart a cooked meat aroma.” *Id.*

Petitioner’s reading of the composition disclosed in paragraph [00364] is unsupported by Brown. EX2030, ¶¶48-51. Rather than disclosing a “muscle replica” having each of the ingredients recited in claim 1, Brown instead discloses a *meat replica* that comprises those ingredients. *Id.* And, because a meat replica in Brown represents an end product intended to be directly consumed, it is not a “food flavor additive composition” as Petitioner has asserted that term to mean. *Id.*; *see also id.*, ¶¶30-31, 43.

² The petition is inconsistent if pea flour contains cysteine, as alleged here, or cystine, as alleged elsewhere (*see* Pet., 29 n.9), or both.

First, paragraph [00364] of Brown makes clear that the composition relied upon by Petitioner is a “meat replica” that comprises a muscle replica that is heated in the presence of leghemoglobin to form the meat replica composition. EX2030, ¶48. In particular, Brown states that the composition provides “[e]vidence that the presence of leghemoglobin contributes favorably to aroma of *meat replicas*.” EX1012, [00364] (emphasis added); EX2030, ¶49. The composition, according to Brown, is formed by “[a] muscle replica comprising pea flour, sunflower oil, and glucose” that “was heated for 10 minutes at 140C in the presence of...reduced leghemoglobin (LHb).” EX1012, [00364]. In other words, the “muscle replica” relied upon by Petitioner includes pea flour, sunflower oil, and glucose, and leghemoglobin is added as a separate ingredient to form the final meat replica composition. EX2030, ¶49. This distinction is reinforced later in the same paragraph, in which Brown details “a comparison of aligned GCMS profiles...of other identical muscle-replica samples *cooked in the presence of leghemoglobin*.” EX1012, [00364] (emphasis added); EX2030, ¶49. Thus, a POSA would have understood from Brown’s paragraph [00364] that, contrary to Petitioner’s assertions, the “muscle replica” described in the paragraph does not include leghemoglobin; instead, the “muscle replica,” together with leghemoglobin, represents the final meat replica product. EX2030, ¶50. Nothing in paragraph

[00364] in Brown suggests that the product is added to another product to make an end product. *Id.*, ¶51.

That the composition described in paragraph [00364] of Brown represents a meat replica composition is also illustrated by the testimony of Petitioner’s expert, Dr. Tarté. For example, in numerous instances, Dr. Tarté references Brown, including at paragraph [00364], as disclosing a “meat replica” or “meat substitute.” *See* EX1003, ¶¶80 (“Brown discloses that the ***meat substitute*** includes a heme-containing protein, *e.g.*, soy leghemoglobin, that ‘contributes favorably to aroma of meat replicas’” (emphasis added)) (citing EX1012, [00364]), 109. When asked to identify the “meat replica” composition that he was referring to in those paragraphs, Dr. Tarté identified the ***same*** composition as the “muscle replica” he relies on for Ground 1. EX2032, 30:22-31:3. In other words, according to Dr. Tarté, the “muscle replica” he relies on for Ground 1 and the “meat replica” to which it is added are one and the same. This further evidences that the composition Petitioner relies on for anticipatory purposes is not ***added*** to anything—it ***is*** the end product.

As noted above, according to Petitioner and the district court, “[i]t is not sufficient that the three recited compounds are present in the end food product” for a composition to qualify as the claimed “food flavor additive composition.” EX2016, 18; *supra*, section III.B. In the case of the composition of paragraph

[00364], Brown, at best, discloses the presence of the relied-upon ingredients in the end product—a “meat replica.” *See* EX2030, ¶¶30-31, 43.

Further, as Dr. Qian explains, consistent with the district court’s claim construction, it was understood that a “food flavor additive composition” is a composition that is added to a food product for the purpose of imparting flavor and such compositions were generally understood to be concentrated products so as to minimize dilution of the food product to which the additive is added. *Id.*, ¶¶44-46 (explaining a food flavor additive composition could be a seasoning package that is added in minimum quantities to a food product, without substantial change to the matrix of the food product itself) (citing EX1038, 139-140; EX1020, 1:20-34; EX1015, 7:15-28). In contrast, Brown explains that a muscle replica is a composition that “replicates or approximates key features of animal skeletal muscle” (*e.g.*, the “physical organization of skeletal muscle”) and is combined into a meat substitute product at 40-90% of the product by weight. EX1012, [00191], [00244], [00305]; EX2030, ¶47. In view of this, Petitioner’s reliance on the muscle replica of Brown is also insufficient to establish that Brown discloses a “food flavor additive composition” because a muscle replica is physically organized as a food product that replicates key features of muscle and is present as a significant component of a meat substitute, rather than as a concentrated flavor additive. EX2030, ¶47.

Accordingly, for these reasons, Petitioner fails to establish that the composition of Brown's paragraph [00364] is a "food flavor additive composition" as claimed.

B. Petitioner Fails to Establish Dependent Claims 2-5, 7-9 and 23-24 Are Anticipated by Brown

Petitioner's Ground 1 also challenges dependent claims 2-5, 7-9, and 23-24 as allegedly anticipated by Brown. Pet., 13. Claims 2-5, 7-9, and 23-24 depend from independent claim 1. Thus, these claims are not anticipated by Brown for the same reasons identified above with respect to claim 1. EX2030, ¶53. Furthermore, additional discussion below for certain dependent claims provides additional reasons why Petitioner fails to meet its burden in showing the unpatentability of the challenged claims. *Id.*, ¶¶54-64.

1. Claims 4 and 24

Claim 4 depends from claim 1 and further recites "the food flavor additive composition is a powder or a liquid composition." Claim 24 depends from claim 1 and further recites that the food flavor additive composition is "in the form of a soup, stew base, a bouillon powder, bouillon cube, flavor packets or seasoning packet." EX2030, ¶54.

Petitioner argues Brown anticipates claims 4 and 24 because Brown discloses that "[t]he muscle replica 'can be optionally dried at room temperature overnight, then ground to a **fine powder** (<60 mesh) using a Braun food grinder,'"

which a POSA allegedly would understand is “a ‘bouillon powder’.” Pet., 24 (citing EX1012, [00311]). Petitioner’s assertions that paragraph [00311] of Brown discloses a muscle replica (which Petitioner maps to the claimed food flavor additive composition) that is a “powder” or a “bouillon powder” is unsupported and mischaracterizes the reference. EX2030, ¶55.

Brown describes that, in certain embodiments, “the invention provides methods for making a muscle replica.” EX1012, [00310]; EX2030, ¶56. Brown states that the “muscle replica” can be formed “into asymmetric fibers prior to incorporation into the consumable,” which can “replicate muscle fibers.” EX1012, [00310] (stating further that the fibers may also be “spun fibers” or “extruded fibers”). Brown goes on to detail a particular method of extrusion to form “the final product.” *Id.*, [00311]; EX2030, ¶57. After the final product is extruded, Brown explains that samples may be “collected” so that “[o]bservations can be made on color opacity, structure, and texture.” EX1012, [00311]; EX2030, ¶58. In addition, the “[c]ollected samples can be optionally dried at room temperature overnight, then ground to a fine powder,” after which “[t]he pH of samples can be measured in duplicate using 10% (w/v) slurries of powdered sample in distilled water.” *Id.*

As Dr. Qian explains, the “powder” described in paragraph [00311] of Brown would not have been understood to represent the “final product” of muscle

replica intended for “incorporation into the consumable.” EX2030, ¶59 (citing EX1012, [00310]-[00311]). Instead, a POSA would have understood the powder to merely represent a *testing* sample for measuring characteristics of the extruded material for, *e.g.*, quality assurance purposes. *Id.* In this regard, a POSA therefore would not have understood the powder to be a “muscle replica” (which Petitioner maps to the claimed food flavor additive composition). *Id.*, ¶¶57-59. Indeed, this is evident from Brown’s description of a “muscle replica,” which may be formed as a fibrous structure meant to replicate muscle fibers, which a powder does not do. EX1012, [00310]; *see also id.*, [00305]-[00306], [00396]-[00403] (“Constructing a Muscle Tissue Analog”); EX2030, ¶56.

Furthermore, even if Brown may be said to describe a powder in connection with a method of making a muscle replica, a POSA would not have understood that powder to represent the muscle replica itself. EX2030, ¶60. Instead, the POSA would have, at best, viewed the powder as an intermediary product in the process of making a muscle replica. *Id.* This is illustrated by Brown’s description of methods of producing muscle replicas, *e.g.*, by forming “asymmetric fibers” that can “replicate muscle fibers,” and reference to methods of extrusions for producing such fibers, where a powder can be formed as an intermediate during extrusion to form muscle replica fibers, but the muscle replica is not itself a powder. *Id.* (citing EX2012, [00310]; EX2010, [0007]).

Thus, given the above, a POSA would not have understood the “powder” described in paragraph [00311] of Brown to be a “muscle replica,” and therefore, a food flavor additive composition as advanced by Petitioner. EX2030, ¶¶54-61.

2. Claim 7

Claim 7 depends from claim 1 and recites the food flavor additive composition further comprises “one or more of a compound selected from alanine, arginine, asparagine, aspartate, glutamic acid, glutamine, glycine, histidine, isoleucine, leucine, lysine, phenylalanine, proline, threonine, tryptophan, tyrosine, valine, maltodextrin, thiamine, IMP, GMP, lactic acid, and creatine.”

Petitioner contends Brown discloses the limitations of claim 7 because the pea flour of Brown’s composition contains certain compounds recited in the claim. Pet., 25. As with claim 1, Petitioner relies on the proteins contained in Brown’s pea flour as having the compounds the recited in the claim. *See id.*, 12 (noting Ground 1 reliance on pea proteins applies to dependent claim 7). Accordingly, for the same reasons discussed above with respect to claim 1, Petitioner fails to establish that Brown anticipates claim 7. *Supra*, sections III.A, IV.A.1.

3. Claim 23

Claim 23 depends from claim 1 and recites “[a] process for imparting a meaty flavor and/or meaty aroma to a consumable food product.” The process comprises “adding to the consumable food product a food flavor additive

composition of claim 1” and “heating the consumable food product after the adding step.” EX2030, ¶62.

Petitioner contends that Brown anticipates claim 23 because “[t]he composition is added to a meat substitute (‘consumable food product’) comprising other tissue replicas (fat, connective tissue)” and “[t]he meat substitute is then cooked.” Pet., 26. Petitioner, however, does not establish that Brown discloses that the composition of *paragraph [00364]* is added to a meat substitute that is then cooked. EX2030, ¶63. Instead, Petitioner merely points to other, unrelated disclosure in Brown, including disclosure that discusses cooking meat replicas containing *different* compositions. *See, e.g.*, EX1012, [0035]-[0042] (discussing indicators that indicates cooking progression), [00189], [00191] (general discussion of “some embodiments” of a meat substitute product as containing muscle, fat tissue, and connective tissue replicas), [00272] (discussion of general appearance of consumable products), [00270], [00412] (discussing ground beef patty of Figure 17 having muscle tissue analog compositions of paragraphs [00396]-[00403]); EX2030, ¶63. This is significant because, as discussed above, the composition of Brown’s paragraph [00364] is already cooked (and generated compounds having a meaty aroma) to form a meat replica. *See supra*, section IV.A.2; EX2030, ¶64. Petitioner provides no evidence or explanation as to why a POSA would understand from different disclosures of Brown that the cooked

product of paragraph [00364] would be subsequently added to another product and cooked again. EX2030, ¶64. Petitioner’s reliance on selective mixing-and-matching fails to establish that claim 23 is anticipated by Brown.

V. GROUND 2A: CLAIMS 1-12, 14-17, AND 20-24 ARE NOT OBVIOUS OVER GIACINO AND BROWN

For Ground 2A, Petitioner asserts that “Giacino discloses every limitation of the independent claims except ‘an isolated heme-containing protein’ (which is taught by Brown).” Pet., 26. Petitioner contends that the compositions of Giacino “include well-known meat flavor precursors,” including cysteine, thiamine, and ribose, which, when heated, produce “meaty flavor.” *Id.*, 26-27. Petitioner further contends that a POSA would have sought to also include leghemoglobin, as taught by Brown, to Giacino’s compositions because it “would further Giacino’s goal of providing a ‘truer flavor’ of meat” and “would only further contribute to the meaty aroma volatiles.” *Id.*, 30, 34.

Petitioner’s Ground 2A fails for several reasons. EX2030, ¶¶19, 65-80. First, Petitioner argues that Giacino discloses each of the limitations of claim 1 based on alleged compositions that include certain ingredients, specifically, Maillard reaction precursors, cysteine, ribose, and thiamine. However, nowhere does Giacino exemplify a composition that actually contains those ingredients. EX2030, ¶65. Instead, Petitioner must pull from distinct disclosures in Giacino to stitch together certain ingredients to include in the composition, but what that final

composition includes is never identified by Petitioner. Such an omission is significant. According to Petitioner's expert and its own evidence, knowledge of each of the ingredients contained in a given composition is necessary to determine whether a given composition will result in the production of volatile compounds associated with a meaty aroma. *Infra*, section V.A.1. Merely because Maillard reaction precursors may be present in a composition does not necessarily dictate whether the Maillard reaction will occur and whether that reaction will produce volatile compounds associated with a meaty aroma. By failing to address this necessary component of its obviousness case, Petitioner's Ground 2A fails.

Furthermore, Petitioner must rely on the addition of Brown's leghemoglobin to Giacino's (unidentified) composition for its obviousness position. Yet the basis that Petitioner identifies as motivating the POSA to do so—an aspirational expectation that it “would only further contribute” to Giacino's composition—comes from the testimony of its expert, Dr. Tarté, who lacks the knowledge to make that conclusion. And the only expert who Petitioner relies on as having that knowledge, Dr. McGorin, fails to address the particular combination of Giacino and Brown applied in this ground. The only evidence of record instead indicates that the effects of leghemoglobin were equivocal at best and that it was certainly not a given that leghemoglobin “would only further contribute” to the compositions described in Giacino. EX2030, ¶66. Thus,

Petitioner's rationale for motivating the combination of Giacino and Brown is unsubstantiated and not supported by the record, including testimony from its own experts, and thus Ground 2A fails for this additional reason.

A. Petitioner Fails to Establish Independent Claim 1 Is Obvious over Giacino and Brown

1. Petitioner's Ground 2A lacks the requisite degree of particularity to establish obviousness

As a threshold matter, Petitioner fails to meet its burden with respect to Ground 2A because the petition lacks the requisite degree of particularity to establish obviousness. Petitioner's ground essentially rests on an inherent obviousness theory—that is, by including cysteine, thiamine, and ribose in a composition, it would necessarily result in the production of at least two volatile compounds associated with a meaty aroma upon heating. *See* Pet., 33-34. Petitioner further asserts that this result will not change even if leghemoglobin, a plant protein, is also included in the composition. *Id.*

Petitioner's evidence, however, contradicts its own assertions to support obviousness. Petitioner's entire case rests on the theory that cysteine, thiamine, and ribose will “induce[] a Maillard reaction that produces a myriad of volatiles (at least two) known to have a meat-associated aroma.” *Id.*, 34. However, as Petitioner's evidence supports, the specific ingredients contained in a composition and other factors will dictate whether a Maillard reaction will even occur and, even

if such a reaction occurs, whether volatiles having a meat-associated aroma will be produced. EX2030, ¶¶35-40, 65, 67-68. For example, Dr. McGorin's IPR testimony opines that "[t]he reaction rate of the Maillard reaction is influenced by factors such as the amount(s) and identity of the precursor compounds, cooking temperature, pH, cooking time, and water activity (amount of available moisture)." EX1005, ¶56; *see also id.*, ¶¶98-99, 103-104. Even if precursor compounds, such as cysteine and ribose, are present, a given volatile may or may not be produced, and is dependent on other ingredients in the composition. *See* EX1129, 986 (Table 1) (showing varying concentrations, from not detected to very large, of volatile compounds depending on the relative presence of cysteine, ribose, phospholipid, and water); EX2030, ¶¶37, 68. And, as Dr. Qian notes, even the Maillard reaction itself is not unique to producing meat-associated aromas and can result in other aromas (*e.g.*, chocolate, coffee, toasted cereal grains, wheat bread crust, popcorn, roasted nut). EX2030, ¶¶35, 68.

In addition, Dr. McGorin further opines in his IPR declaration that knowledge of the particular composition and sensory testing is necessary to determine whether volatile compounds associated with a meaty aroma will be produced. For instance, Dr. McGorin testifies that a POSA "would understand that the milieu of the foodstuff could affect the Maillard reaction chemistry and resulting aroma of the product," for example, "depending on the foodstuff's pH

and moisture content” and “[d]epending on the presence of other components.”

EX1005, ¶106; *see also id.*, ¶¶150-151 (“Even differences in the particle size and structure of foodstuffs can affect aroma production.”), 162, 164 (“In fact, the combination of Maillard reactants and heme-containing protein with plant proteins and other components of a meat replica (e.g., lipids) could potentially lead to a non-‘beef-like’ volatile profile.”). Moreover, according to Dr. McGorin, “sensory panels are necessary to determine whether a product’s profile of volatiles achieves a particular aroma.” *Id.*, ¶¶158-159. Thus, according to Petitioner’s own evidence, certain Maillard-related precursors that are present in a composition (whatever that composition may be) may not be enough to establish that meat-aroma volatile compounds will be produced—instead, the particular composition matters.

Yet despite this acknowledged need for particularity, Petitioner’s case rests on an indeterminate obviousness case. When asked to identify the composition he envisioned in the proposed Giacino-Brown composition, Dr. Tarté could not answer. *See* EX2032, 43:13-46:23 (acknowledging only thiamine and taurine are required in Giacino), 48:14-49:14 (“I hadn’t really thought of what I envisioned.”), 55:16-58:24 (acknowledging different possible ingredients discussed in Giacino, but “defer[ring] to Dr. McGorin” as to whether other ingredients matter to achieving meaty flavor). However, given Petitioner’s theory of its case—that including cysteine and ribose in Giacino’s composition and further adding

leghemoglobin from Brown *will* result in a meaty aroma—and given that Petitioner is the moving party, it was incumbent on Petitioner to propose a composition in its petition, given its own expert’s IPR testimony that such knowledge is necessary. Petitioner’s indecisiveness and refusal to identify any specific composition makes the petition’s conclusions speculative at best and prevents any meaningful opportunity of response to test those conclusions. As such, the petition’s lack of particularity is insufficient to meet Petitioner’s burden in establishing the obviousness of the claimed invention.

2. Petitioner fails to establish that the combination of Giacino and Brown “results in the production of at least two volatile compounds which have a meat-associated aroma”

Petitioner’s lack of particularity further highlights its failure in showing that the proposed combination of Giacino and Brown would result in a food flavor additive composition that, when cooked, “results in the production of at least two volatile compounds which have a meat-associated aroma.” Yet, Petitioner’s evidence on this aspect is tenuous, at best, because it rests on the testimony of an expert witness who admittedly lacks the knowledge necessary to testify on the issue and the expert who has such knowledge does not opine on the proposed combination.

Specifically, in asserting that a POSA “would understand that heating Giacino’s composition, which includes cysteine, thiamine, and ribose, induces a

Maillard reaction that produces a myriad of volatiles (at least two) known to have a meat-associated aroma,” Petitioner relies on the testimony of Dr. Tarté. Pet., 34 (citing EX1003, ¶¶210-211). However, when pressed on the basis for that opinion and whether that would be the case irrespective of other ingredients present in the composition, Dr. Tarté could not answer. Instead, Dr. Tarté admitted that the question was “outside of [his] basic knowledge of...meat flavor” and “defer[red] to Dr. McGorin” as the basis for Petitioner’s position. EX2032, 57:7-58:24. Yet, Dr. McGorin, particularly the portions of his testimony that Petitioner and Dr. Tarté rely upon as evidence, does not address the combination of Giacino at issue in the ground, which leaves the basis for Petitioner’s conclusion that the claimed volatile compounds would necessarily be produced unsupported. See Pet., 34 (citing EX1005, Sections V.B, V.D); EX1003, ¶210 (citing same); EX1005, Sections V.B (discussing Maillard chemistry generally), V.D (discussing general history of simulated meat flavoring compositions).

Indeed, as explained above, the art and Dr. McGorin’s own IPR testimony demonstrate that it is not a simple matter of whether cysteine, thiamine, and ribose are present in a composition for a Maillard reaction producing a meaty aroma to occur; instead, the complex “matrix” of the composition must be accounted for to make any such conclusions. *Supra*, section V.A.1; see also EX2030, ¶¶68-71. For example, as Dr. Qian notes, Giacino explains that its meaty flavor is the result of

heating thiamine and *taurine* as the reactive components, yet Petitioner wholly fails to address this necessary reactive component of Giacino and its impact on the Maillard reaction (and resulting volatiles) that Petitioner alleges will occur from cysteine, thiamine, and ribose. EX2030, ¶¶69 (citing EX1015, 1:12-15, 1:60-65, 2:8-13); *see also id.*, ¶¶35-40, 70-71 (further noting that Petitioner references numerous other potential ingredients, including saccharide materials, thiamine, cysteine, cystine, vegetable protein hydrolysate, albumin or a globulin, and gum arabic, which, according to Petitioner’s evidence, can impact the resulting reactions and alter the flavor and identity of the aroma compounds).

Because Petitioner’s case lacks any such analysis, particularly from an expert qualified to opine on such a matter, Petitioner’s assertions that the combination of Giacino and Brown would result in the production of volatile compounds as claimed is unsupported.

3. Petitioner fails to establish that a POSA would have had a reason to combine Giacino with Brown

For similar reasons, Petitioner’s purported reasons why a POSA would have been motivated to modify Giacino to include leghemoglobin in view of Brown are also unsubstantiated. EX2030, ¶¶72-80. In this regard, Petitioner asserts that a POSA “would have been motivated to add leghemoglobin to a flavoring composition, such as Giacino’s, that already includes flavor precursors (*e.g.*, sulfur compounds and reducing sugars) to provide a cooked meat aroma and flavor.”

Pet., 30. According to Petitioner, “[t]his modification would further Giacino’s goal of providing a ‘truer flavor’ of meat” and “would only further contribute to the meaty aroma volatiles because Brown’s process reacts leghemoglobin with amino acids and sugars to achieve a ‘cooked meat’ aroma.” *Id.*, 30, 34. Petitioner relies on the testimony of Dr. Tarté to support these assertions. *See id.* (citing EX1003, ¶¶175, 195, 212).

First, the notion that a POSA would have understood that leghemoglobin “would only further contribute to the meaty aroma” in Giacino is not supported by Petitioner’s own record. While Dr. Tarté makes this conclusion, Dr. Tarté admitted that it was a conclusion that he himself could not make, and again deferred to Dr. McGorin for such knowledge:

Q. Right. And in Paragraph 212, you state that adding leghemoglobin would only further the flavor, correct?

A. Yes.

Q. And is that the only possible outcome of positive contribution to the meaty aroma?

A. I don’t know. I would defer to Dr. McGorin on that. I would not have a good answer to that.

Q. Okay. So you would defer to Dr. McGorin as to whether it’s possible that adding leghemoglobin would negatively impact the meaty aroma?

[A]. Either negatively or in any other way. It's outside my area of expertise.

EX2032, 78:10-25.

Thus, despite testifying that adding leghemoglobin “would *only further contribute* to the meaty aroma” in Giacino (EX1003, ¶212 (emphasis added)), Dr. Tarté revealed that he lacked the requisite knowledge to draw such a conclusion, and instead, only Dr. McGorin could opine on the accuracy of that statement.

Yet, Dr. McGorin did not address the combination of Giacino and Brown, nor did he opine on a POSA's expectations regarding whether Brown's leghemoglobin “would only further contribute” to the meaty aroma of Giacino's compositions. *See* EX1003, ¶¶175, 195, 212 (Dr. Tarté addressing motivation); Pet., 30, 34 (citing to EX1003, ¶¶175, 195, 212). Given this, Petitioner's motivation to combine Giacino and Brown rests on conclusory statements made by an expert who lacks such knowledge.

Moreover, Petitioner's evidence undermines its asserted motivation. In particular, Dr. McGorin's IPR testimony explains that “the combination of Maillard reactants and heme-containing protein with plant proteins and other components” can lead to non-meat-like volatile profiles. EX1005, ¶164. Further, in district court, Dr. McGorin opined that plant proteins generally were known to contribute to undesirable flavors and aromas, and Dr. Tarté explained that

leghemoglobin is a protein produced by plants. EX2020, ¶69; EX2032, 24:20-25:4. Additional evidence confirms that it was known that leghemoglobin could contribute to off-flavors. EX2030, ¶¶38-40, 75-80 (particularly noting the effects of lipid oxidation and autooxidation and their potential impact on flavor additives such as Giacino) (citing EX1148, 2715-2716; EX2003; EX1028, 70, EX1048, Abstract, 287; EX1015, 1:60-72, 6:15-31). This evidence directly contradicts Petitioner’s conclusory motivation that the addition of leghemoglobin to Giacino would “only further contribute” to the meaty aroma.

Petitioner’s citation to Brown’s use of leghemoglobin in its composition does not undermine the lack of support underlying Petitioner’s rationale. As Dr. Qian observes, neither Giacino nor Brown discuss that a Maillard reaction is the reaction underlying the production of meaty flavor or aroma in its compositions, with each identifying different underlying reactive components. EX2030, ¶73 (noting Giacino identifies taurine and thiamine as the basis for its meaty flavor, while Brown attributes leghemoglobin to its meaty aroma). Furthermore, Brown discloses a different composition that a POSA would have understood results in different reactions for producing its meaty aroma, which Dr. McGorin agrees is an important consideration in determining whether a meaty aroma will result from a particular matrix. EX2030, ¶¶74-75 (contrasting Giacino’s concentrated taurine-thiamine-based additives with the replica composition of Brown); *supra*, section

V.A.1. Further, while Petitioner attempts to bridge the gap between Giacino’s compositions and Brown’s compositions by claiming “[p]ea flour contains well-known flavor precursors including thiamine, cystine, and methionine” (Pet., 29 n.9³), Petitioner’s assertions are undermined by Dr. McGorin’s district court testimony, where he opined that such compounds, present as part of large protein structures, would not have been understood to contribute to flavor (and thus, would not be “flavor precursors”).⁴ EX2020, ¶¶21, 49-51, 68-69.

In view of the above, Petitioner’s stated motivation that Brown’s leghemoglobin “would only further contribute” to Giacino’s flavoring compositions lacks any factual basis in the evidence. In addition to being made by an expert with no knowledge to make such a conclusion, it is directly undermined by the testimony of Petitioner’s expert with such knowledge and other evidence of

³ As noted above, while cystine is referenced here, the petition alleges that cysteine is present in pea flour elsewhere (Pet., 12).

⁴ Petitioner’s assertions are also undermined by its own IPR positions, where Petitioner expressly distinguishes between Brown’s pea flour, and any sulfur-containing compounds contained within it, in Ground 1 and the sulfur-containing compounds it relies on for Grounds 2-4 (*i.e.*, Giacino). *See* Pet., 12.

record. For these reasons, Petitioner fails to establish that a POSA would have been motivated to combine Giacino and Brown as proposed.

B. Petitioner Fails to Establish Independent Claim 10 Is Obvious over Giacino and Brown

For independent claim 10, Petitioner relies on the same reasoning for combining Giacino and Brown it advances for claim 1. *See* Pet., 38-39 (incorporating claim 1 analysis). Thus, Petitioner fails to establish the obviousness of claim 10 for the same reasons discussed above with respect to claim 1. EX2030, ¶81.

C. Petitioner Fails to Establish Dependent Claims 2-9, 11-12, 14-17, and 20-24 Are Obvious over Giacino and Brown

Petitioner's Ground 2A also challenges dependent claims 2-9, 11-12, 14-17, and 20-24 as allegedly obvious over Giacino and Brown. Pet., 14. Claims 2-9 and 23-24 depend from independent claim 1. Claims 11-12, 14-17, and 20-22 depend from independent claim 10. Thus, these claims are not rendered obvious over Giacino and Brown for the same reasons identified above with respect to claims 1 and 10. EX2030, ¶82.

VI. GROUND 2B: CLAIMS 18-19 ARE NOT OBVIOUS OVER GIACINO, BROWN, AND MACLEOD

Petitioner's Ground 2B challenges dependent claims 18-19 as allegedly obvious over Giacino, Brown, and MacLeod. Pet., 14. Claims 18-19 depend from independent claim 10. Thus, these claims are not obvious over Giacino, Brown,

and MacLeod for the same reasons identified above with respect to claims 1 and 10. EX2030, ¶83.

VII. GROUND 3A: CLAIMS 1-2, 4-7, 9-12, 14-15, AND 20-24 ARE NOT OBVIOUS OVER GIACINO, CONRAD, AND CRANE

For the same reasons identified in Patent Owner’s preliminary response (POPR, 23-40), and recognized in the Institution Decision (Paper 23 (“ID”), 33-38), the petition fails to establish the obviousness of the challenged claims based on the combination of Giacino, Conrad, and Crane.

A. Petitioner Fails to Establish Independent Claim 1 Is Obvious over Giacino, Conrad, and Crane

As noted in Patent Owner’s preliminary response, the petition fails to establish that Crane qualifies as analogous art to the claimed invention. POPR, 24-27. Further, the petition fails to show that a POSA would have been motivated to combine Giacino, Conrad, and Crane with a reasonable expectation of success. POPR, 27-35; EX2030, ¶¶84-94.

1. Petitioner fails to establish Crane is analogous art

Petitioner’s Ground 3A relies on replacing Conrad’s animal blood having hemoglobin with Crane’s recombinant heme proteins in order to arrive at a food flavor additive composition recited in the claims. *See* Pet., 48-59. As a threshold matter, however, Petitioner’s ground fails because the petition fails to establish

(indeed, does not even attempt to establish) that Crane is analogous art under the proper legal framework. EX2030, ¶¶85-87.

“A reference qualifies as prior art for an obviousness determination only when it is analogous to the claimed invention.” *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1379 (Fed. Cir. 2019). A reference is analogous art when the reference is either (1) “from the same field of endeavor, regardless of the problem addressed” by the reference, or (2) “if the reference is not within the field of the inventor’s endeavor,” the reference “still is reasonably pertinent to the particular problem with which the inventor is involved.” *Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359 (Fed. Cir. 2020). The petition makes no attempt to establish Crane as analogous art under this legal framework.

First, Petitioner fails to establish that Crane is “from the same field of endeavor” as the ’096 patent. EX2030, ¶86. As Petitioner acknowledges, “[t]he ’096 patent claims are directed to food-flavor additive compositions that ‘modulate the flavor and/or aroma of consumable food products.’” Pet., 3 (alterations and emphases omitted); *see also* EX1001, 1:22-25 (stating the field of invention “relates to food products”). Yet, nowhere does Crane even mention flavor additives, or even food products generally, much less how to prepare such additives and food products. Instead, in contrast to the ’096 patent’s field, Crane is expressly directed to “methods of producing recombinant functional heme-binding

proteins...and methods of identifying agents that modulate the activity of heme-binding proteins.” EX1014, Abstract; *see Airbus*, 941 F.3d at 1381 (affirming non-analogous art finding when a reasonable factfinder could not conclude that “a reference that is expressly directed to exercise equipment and fails to mention the word ‘fire’ even a single time” would “fall[] within the field of fire prevention and suppression”). Thus, Crane is not from the same field of endeavor as the ’096 patent because, as the Institution Decision found, “the ’096 patent is directed to food products while Crane, on the other hand, relates to ‘methods for producing recombinant functional heme-binding proteins.’” ID, 35; *see also* EX2030, ¶86.

Second, Petitioner fails to show Crane is “reasonably pertinent to the particular problem with which the inventor is involved.” EX2030, ¶87. As noted by the Federal Circuit, this test “ultimately rests on the extent to which the reference of interest and the claimed invention relate to a similar problem or purpose.” *Donner Tech.*, 979 F.3d at 1359. As described in the ’096 patent, the problem solved by the inventors was to provide meat-like-food products that overcome the limitations of prior-art meat substitutes, “which largely fail to replicate the experience of cooking and eating meat,” “fail[] to cause a shift to a vegetarian diet,” and lack “appeal to the larger consumer segment accustomed to eating meat.” EX1001, 1:46-62; EX2030, ¶87. The ’096 patent explains that “[i]t would be useful to have improved plant-based meat substitutes which better

replicate the aromas and flavors of meat, particularly during and/or after cooking.” EX1001, 1:59-62; *see also id.*, 1:66-2:3 (“Provided herein are methods and compositions for modulating the flavor and/or aroma profile of consumable food products....”).

In contrast, Crane is directed to the problem of producing recombinant heme-binding proteins with complete heme incorporation. *See* EX1014, [0003]-[0005]; EX2030, ¶87. Entirely absent from Crane is any mention that the recombinant heme-binding proteins with complete heme incorporation produced by its methods are relevant to improving meat-associated flavors or aromas in food flavor additives, or even food products in general. Indeed, the uses that Crane does identify for the recombinant heme-binding proteins produced by its methods stand in stark contrast to the production of food products. *See, e.g., id.*, [0062] (“Recombinant hemoglobin preparations are used as effective and safe oxygen carriers as an alternative to blood transfusion”), [0063] (“preclinical screening assays that are designed to predict drug metabolism and toxicity”), [0066] (production of “bio-ethanol and chemical feedstocks for commercial use”); EX2030, ¶87. As the Institution Decision observed, Crane is aimed at producing recombinant heme-binding proteins with complete heme incorporation for functional purposes such as improved “electron transfer, transport and storage of oxygen species, catalytic oxidation of substrates, signal transduction and control of

gene expression.” ID, 36 (citing EX1014, ¶¶4, 7). This fails to support that a POSA interested in replicating the experience of cooking meat would have found Crane to be reasonably pertinent to improving the flavor of food products, much less food products that replicate meat. EX2030, ¶87.

The petition thus fails to demonstrate Crane’s facially distinct problem would have been viewed by a POSA as “reasonably pertinent” to the problem faced by the inventors of the ’096 patent, which was not directed to how to generate recombinant proteins, but instead how to generate meat substitutes that accurately replicate meat. Accordingly, for the reasons above, Petitioner fails to show that Crane is analogous art to the ’096 patent. Because Petitioner’s Ground 3A relies on Crane to replace the animal-sourced blood of Giacino and Conrad in its combination, the ground necessarily fails because Crane is not within the scope and content of prior art in an obviousness determination. At a minimum, Crane’s status as non-analogous art undermines Petitioner’s rationale for obviousness because the petition fails to establish why a POSA would be motivated to look to Crane—a reference entirely unrelated to food products—for guidance on how to supplement a food flavor additive composition. *See In re Klein*, 647 F.3d 1343, 1350-1351 (Fed. Cir. 2011) (“If [a reference] is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it.”) (citing *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992)).

2. Petitioner fails to establish a POSA would have been motivated to combine Giacino, Conrad, and Crane

Notwithstanding the petition's failure to establish Crane as analogous art, the petition's purported reasons as to why a POSA would have been motivated to combine Giacino, Conrad, and Crane to arrive at the claimed invention are premised on an illogical and unsubstantiated rationale. EX2030, ¶¶88-94. Petitioner's analysis starts with a flavor composition of Giacino that, by Petitioner's own assertions, already achieves the flavor of meat. *See* Pet., 47 (Giacino's compositions "better replicate the 'true flavor' of meat"). Petitioner then turns to Conrad's "wheat meat," a product designed to add bulk to actual meat, and its incorporation of blood to the wheat-based extender. *Id.*, 47-48. Petitioner proposes incorporating that same blood into Giacino's flavor compositions for the same purported reason mentioned in Conrad, but Petitioner provides no explanation as to why a POSA would have sought to use blood meant for a wheat-filler in mixed meat products like Conrad's in a flavor composition like Giacino's. A further confounding feature underlying its combination is Petitioner's subsequent abandonment of Conrad's blood in favor of an entirely different substitute—the recombinant heme proteins disclosed in Crane, a molecular biology reference that says nothing about food products. *See id.*, 48-49.

The only basis that Petitioner advances for supporting its rationale to combine the three references is reasoning that can be found nowhere in the

reference. That is, Petitioner’s alleged reasoning as to why a POSA, starting with Giacino’s flavor composition, would look to Conrad’s wheat-based filler for meat and then to Crane’s recombinant heme proteins, is based on the alleged motivation “to create a meat-flavored composition that closely mimics the attributes of conventionally sourced meat...to encourage consumption by consumers who ordinarily enjoy consuming conventionally sourced meat.” Pet., 46. However, none of the references relied upon by Petitioner cite any such desire.

Rather than being based on an articulated rationale rooted logically in the prior art’s teachings, Petitioner’s combination of Giacino, Conrad, and Crane is a litigation-driven claim mapping exercise that merely reconstructs the claimed invention through hindsight. Such a rationale is insufficient to establish obviousness and thus Petitioner’s grounds fail for this additional reason.

a) The petition fails to establish motivation to combine Giacino with Conrad

Petitioner’s combination first relies on the modification of Giacino in view of Conrad. *See* Pet., 47. While Petitioner contends that Giacino discloses meaty flavoring compositions (Pet., 46), Petitioner nevertheless asserts that a POSA would have turned to Conrad and sought to add “hemoglobin”—*i.e.*, blood—to “improve the meat flavour of the final product.” Pet., 47. Petitioner’s reasoning, however, is unavailing because it fails to address and account for the distinct products and purposes of Giacino and Conrad—a flavor composition on the one

hand, and a wheat-based extender for mixed meat products on the other—and fails to explain why a POSA would have sought a solution disclosed by one (the addition of blood) and applied it to the other. EX2030, ¶89.

First, Petitioner ignores the differences between the compositions disclosed in Giacino and the products disclosed in Conrad. For instance, Conrad is directed to a mixed meat product where, due to the general expense of meat itself, “some” of it is replaced with a meat replacement product made from wheat (*i.e.*, “wheat meat”). EX1013, 1:25-40; EX2030, ¶89. Because the wheat meat “has a brown-yellow color deriving partly from the brown bran and partly from the yellow gluten,” Conrad discloses that its “colour can advantageously be transferred into meat colour by adding thereto up to 15% by weight of blood, preferably the hemoglobin part separated off from blood....” EX1013, 4:3-8. Conrad also states that “[t]he addition of blood/hemoglobin further gives a desired taste improvement as it improves the meat flavour of the final product.” *Id.*, 4:13-16.

Thus, Conrad is directed to the production of a wheat-based product designed to replace some portion of meat itself, thereby extending the meat and making the meat product cheaper. EX2030, ¶89. However, because Conrad is effectively diluting actual meat with a product that is decidedly not meat in terms of both color and taste, Conrad discloses adding in animal blood to recover color and taste lost by the addition of the wheat to mixed meat. *Id.*

Giacino is not directed to any wheat-based product, but “artificial meaty flavoring compositions,” which can be used to flavor food products. EX1015, 1:19-20; EX2030, ¶89. Petitioner fails to explain why a POSA would have been motivated to modify Giacino to “improve” its meat flavor, when the reference itself already achieves a “perfectly well suited” meat flavor (EX1015, 3:58-63), in view of a reference that seeks to add blood to a meat-based product to recoup flavor lost by its extension with wheat. EX2030, ¶89. In other words, the references concern two different products directed to two different problems. *Personal Web Tech., LLC v. Apple, Inc.*, 848 F.3d 987 (Fed. Cir. 2017) (Board reversed where no adequate explanation of “*how* the combination of the [obviousness] references was supposed to work”).

Petitioner’s purported reasons for combining the two references fail to account for these differences and Petitioner fails to explain how a POSA would have understood Giacino’s artificial meaty flavoring composition as having the same problems in relation to flavor as Conrad’s meat product that Conrad seeks to solve with animal blood. Moreover, Petitioner ignores the component differences in the products themselves—one is a flavor additive, the other is a wheat-based filler for minced meat—and fails to explain how a POSA would have understood that any improvement to flavor caused by the addition of animal blood to one type of product would necessarily occur in the other wholly different product type.

EX2030, ¶89; *see also supra*, section V.A.1 (noting Petitioner’s evidence that compositional matrix of a product matters in achieving flavor and aroma).

Accordingly, for this reason, Petitioner’s rationale for combining Giacino and Conrad fails to satisfy its burden in establishing the obviousness of the challenged claims.

b) The petition fails to establish motivation to further combine Giacino and Conrad with Crane

Petitioner’s tortured analysis of the prior art to reach the claimed invention is further highlighted by its reliance on Crane. In particular, Petitioner’s grounds rely on an additional step—not only would a POSA seek to add animal blood to purportedly add additional flavor to Giacino’s flavor compositions, the POSA would further be motivated to substitute that animal blood with an entirely different composition, namely, heme-containing proteins produced recombinantly using the methods disclosed in Crane. *See* Pet., 48-49. In addition to failing to establish Crane as analogous art (*see supra*, section VII.A.1), Petitioner’s alleged reasons for supporting the combination are premised on mischaracterizations and strained readings of the applied references that fail to provide an objective-based rationale supporting a finding of obviousness. EX2030, ¶¶90-94.

For instance, Petitioner generally points to Crane’s disclosure that its recombinant heme proteins are suitable for “commercial applications.” Pet., 48 (citing EX1014, Abstract, [0021], [0024]). However, nothing in Crane’s general

reference to “commercial applications” suggests using its recombinant heme proteins in flavoring compositions for use in food products. EX1014, [0024] (stating generally that “these proteins are completely functional and are more suitable for research, clinical, and commercial applications”); *see also id.*, [0062]-[0063], [0066]; *supra*, section VII.A.1 (noting applications discussed in Crane). Petitioner’s attempt to rely on a general, nondescript reference to “commercial applications” as an untaught reason to use Crane’s recombinant heme proteins in flavor compositions is unsound and unsubstantiated. EX2030, ¶¶85-87, 91.

In addition, Petitioner argues that using Crane’s recombinant heme proteins “would have also been a cost-effective option and would have produced the proteins with a high degree of purity.” Pet., 48. But Crane does not characterize its recombinant heme proteins as “a cost-effective option” in terms of its option as an ingredient in a food flavor additive, especially relative to any cost-effectiveness of Conrad’s animal blood. EX2030, ¶92. Moreover, simply because Crane’s heme-proteins can be purified (*e.g.*, for blood transfusions) provides no rationale for combining Crane with Giacino and Conrad. *See Belden*, 805 F.3d at 1073 (Fed. Cir. 2015) (standard is “would have” made the proposed combination, not “could have”).

Petitioner also invokes its conclusory assertion that a POSA “would have also been motivated to use recombinantly sourced heme-containing protein to appeal to individuals who have concerns about environmental, health, and animal welfare impacts of consuming previously live animal products or who otherwise abstain from consuming such animal products.” Pet., 48. Aside from citations to its expert (who does not even provide this reasoning, *see* EX1003, ¶¶310-11), Petitioner’s assertions are unsupported by the references, as none of the references express a motivation to appeal to consumers “who have concerns about environmental, health, and animal welfare impacts of consuming previously live animal products or who otherwise abstain from consuming such animal products.” Instead, Giacino expressly contemplates the use of animal products in its flavor compositions (*see* EX1015, 3:10-12, 3:21-23), Conrad’s express purpose is to use actual meat (EX1013, 1:15-18), and Crane is wholly unrelated to food in general (EX1014, Abstract).

Finally, Petitioner argues that a POSA would have been motivated to replace Conrad’s animal blood with Crane’s recombinant heme proteins and add it to Giacino’s flavor compositions because it would allegedly improve the compositions’ nutrition. Pet., 48-49. Petitioner’s argument again rest on hindsight and are unsupported and unsubstantiated by the references. Neither Conrad nor Crane discuss any nutritional benefit incurred from the consumption of animal

blood or recombinant heme proteins. EX2030, ¶¶93. And more importantly, Giacino expresses no desire that its compositions, which are *flavor additives*, are intended to impart any nutritional benefit in the first place. *Id.*, ¶¶44-47, 93 (“The definition of a flavor captures the notion that it is a powerful material whose significant function is flavor and not nutrition or functionality”) (quoting EX1038, 139-140). Further, as discussed above with respect to Ground 2A, heme-containing proteins were known to have detrimental effects to flavor, thus further undermining Petitioner’s assertions that a POSA would have been motivated to combine Giacino, Conrad, and Crane as proposed. *Id.*, ¶¶38-40, 75-80, 94; *supra*, section V.A.3.

Accordingly, for these reasons, Petitioner fails to meet its burden in establishing that a POSA would have been motivated to further combine Crane with Giacino and Conrad.

B. Petitioner Fails to Establish Independent Claim 10 Is Obvious over Giacino, Conrad, and Crane

Petitioner relies on the same reasoning for combining Giacino, Conrad, and Crane as it advances for claim 1. *See* Pet., 53-54 (incorporating claim 1 analysis). Thus, Petitioner fails to establish the obviousness of claim 10 for the same reasons discussed above with respect to claim 1. EX2030, ¶95.

C. Petitioner Fails to Establish Dependent Claims 2, 4-7, 9, 11-12, 14-15, and 20-24 Are Obvious over Giacino, Conrad, and Crane

Petitioner's Ground 3A also challenges dependent claims 2, 4-7, 9, 11-12, 14-15, and 20-24 as allegedly being obvious over Giacino, Conrad, and Crane. Pet., 14. Claims 2, 4-7, 9, and 23-24 depend from independent claim 1. Claims 11-12, 14-15, and 20-22 depend from independent claim 10. Thus, these claims are not rendered obvious over Giacino, Conrad, and Crane for the same reasons identified above with respect to claims 1 and 10. EX2030, ¶96.

VIII. GROUND 3B: CLAIMS 3 AND 16 ARE NOT OBVIOUS OVER GIACINO, CONRAD, CRANE, AND PROULX

Petitioner's Ground 3B challenges dependent claims 3 and 16 as allegedly obvious over Giacino, Conrad, Crane, and Proulx. Pet., 14. Claims 3 and 16 depend from independent claims 1 and 10, respectively. Thus, these claims are not obvious over Giacino, Conrad, Crane, and Proulx for the same reasons identified above with respect to claims 1 and 10. EX2030, ¶97.

IX. GROUND 3C: CLAIMS 8 AND 17 ARE NOT OBVIOUS OVER GIACINO, CONRAD, CRANE, AND PERRET

Petitioner's Ground 3C challenges dependent claims 8 and 17 as allegedly obvious over Giacino, Conrad, Crane, and Perret. Pet., 14. Claims 8 and 17 depend from independent claims 1 and 10, respectively. Thus, these claims are not obvious over Giacino, Conrad, Crane, and Perret for the same reasons identified above with respect to claims 1 and 10. EX2030, ¶98.

X. GROUND 3D: CLAIMS 18-19 ARE NOT OBVIOUS OVER GIACINO, CONRAD, CRANE, AND MACLEOD

Petitioner's Ground 3D challenges dependent claims 18-19 as allegedly obvious over Giacino, Conrad, Crane, and MacLeod. Pet., 14. Claims 18-19 depend from independent claim 10. Thus, these claims are not obvious over Giacino, Conrad, Crane, and MacLeod for the same reasons identified above with respect to claim 10. EX2030, ¶¶99.

XI. GROUND 4A: CLAIMS 1-7, 9-12, 14-16, AND 20-24 ARE NOT OBVIOUS OVER GIACINO, PROULX, AND CONRAD

For the same reasons identified in Patent Owner's preliminary response, and recognized in the Institution Decision, the petition fails to establish the obviousness of the challenged claims based on the combination of Giacino, Proulx, and Conrad. See POPR, 39-40; ID, 37-38; EX2030, ¶¶100-104.

A. Petitioner Fails to Establish Independent Claim 1 Is Obvious over Giacino, Proulx, and Conrad

Petitioner's Ground 4A swaps out Crane for Proulx and largely advances the same combination based on Giacino, Conrad, and Crane in Ground 3A. EX2030, ¶100. However, for this ground, Petitioner leads with the benefits to "nutritional content" that would allegedly be conferred by the addition of Proulx's soy leghemoglobin. Pet., 58-59. As discussed above for Ground 3A, Giacino is directed to the production of *flavor additives* for food products. Nothing in Giacino suggests that the purpose of its flavor additives is to also provide

nutritional content to a food product, and Petitioner’s basis for improving the alleged “nutritional content” of an additive that is not designed for that purpose is unsupported and baseless. EX2030, ¶¶44-47, 93, 101 (noting flavor additives are meant to impart flavor, rather than nutrition or functionality) (citing EX1038, 139-140). Moreover, Petitioner’s reliance to Proulx’s alleged teaching regarding the improved bioavailability of heme iron compared to nonheme iron is also inapt as Conrad already includes hemoglobin and Petitioner does not explain why a POSA, already seeking to add Conrad’s blood to improve upon the meat flavor of Giacino’s compositions, would seek to further replace that blood for “improved bioavailability of heme iron.”

Further, with regard to flavor, Petitioner’s motivation to combine Giacino, Conrad, and Proulx fails for the same reasons discussed above. *See supra*, section VII.A.2. Indeed, Petitioner’s attempt to equate the “meat flavour” of Conrad’s “red blood cells” to Proulx’s “soy leghemoglobin” is even further afield (*see* Pet., 60-61). EX2030, ¶¶88-94, 102. Further, Petitioner points to no basis in the references that a POSA would have reasonably expected Proulx’s “soy leghemoglobin” would result in a flavor composition having acceptable organoleptic properties. *See supra*, section V.A.3; EX2030, ¶¶38-40, 75-80.

B. Petitioner Fails to Establish Independent Claim 10 Is Obvious over Giacino, Proulx, and Conrad

Petitioner relies on the same reasoning for combining Giacino, Proulx, and Conrad as it advances for claim 1. *See* Pet., 63-64 (incorporating claim 1 analysis). Thus, Petitioner fails to establish the obviousness of claim 10 for the same reasons discussed above with respect to claim 1. EX2030, ¶103.

C. Petitioner Fails to Establish Dependent Claims 2-7, 9, 11-12, 14-16, and 20-24 Are Obvious over Giacino, Proulx, and Conrad

Petitioner's Ground 3A also challenges dependent claims 2-7, 9, 11-12, 14-16, and 20-24 as allegedly being obvious over Giacino, Proulx, and Conrad. Pet., 14. Claims 2-7, 9, and 23-24 depend from independent claim 1. Claims 11-12, 14-16, and 20-22 depend from independent claim 10. Thus, these claims are not rendered obvious over Giacino, Proulx, and Conrad for the same reasons identified above with respect to claims 1 and 10. EX2030, ¶104.

XII. GROUND 4B: CLAIMS 8 AND 17 ARE NOT OBVIOUS OVER GIACINO, PROULX, CONRAD, AND PERRET

Petitioner's Ground 4B challenges dependent claims 8 and 17 as allegedly obvious over Giacino, Proulx, Conrad, and Perret. Pet., 14. Claims 8 and 17 depend from independent claims 1 and 10, respectively. Thus, these claims are not obvious over Giacino, Proulx, Conrad, and Perret for the same reasons identified above with respect to claims 1 and 10. EX2030, ¶105.

XIII. GROUND 4C: CLAIMS 18-19 ARE NOT OBVIOUS OVER GIACINO, PROULX, CRANE, AND MACLEOD

Petitioner's Ground 4C challenges dependent claims 18-19 as allegedly obvious over Giacino, Proulx, Crane, and MacLeod. Pet., 14. Claims 18-19 depend from independent claim 10. Thus, these claims are not obvious over Giacino, Proulx, Crane, and MacLeod for the same reasons identified above with respect to claim 10. EX2030, ¶106.

XIV. CONCLUSION

Accordingly, for at least the reasons set forth above, the petition fails to meet its burden of establishing the unpatentability of claims 1-12 and 14-24 of the '096 patent. Patent Owner respectfully submits that the challenged claims should be found to be not unpatentable over the grounds raised in the petition.

Respectfully submitted,

Date: September 29, 2023

/Michael T. Rosato/
Michael T. Rosato, Lead Counsel
Reg. No. 52,182

CERTIFICATE OF COMPLIANCE

Pursuant to §42.24(d), the undersigned certifies that this paper contains no more than 14,000 words, not including the portions of the paper exempted by §42.24(b). According to the word-processing system used to prepare this paper, the paper contains 11,591 words.

Respectfully submitted,

Date: September 29, 2023

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XV. APPENDIX

EXHIBIT NO.	DESCRIPTION
2001	Request for Certificate of Correction, Certificate of Correction and Petition to Accept Unintentionally Delayed Benefit Claims Under 37 C.F.R. §§ 1.78(c) and 1.78(e) for US Patent No. 9,700,067 and US Patent No. 10,172,381
2002	Goldfine, “A brief history of Impossible Foods: how ‘bleeding’ plant-based burgers started a food industry trend,” The Business of Business, https://www.businessofbusiness.com/articles/impossible-foods-plant-based-burgers-milk-food-industry-trend-data/ , Last Accessed July 27, 2022
2003	Proulx, “Diversified strategies for improving iron bioavailability of maize” Ph.D. Thesis, Iowa State University, 2007
2004	Declaration of Dr. Keith Cadwallader, excerpt from ’306 patent prosecution file history, submitted October 17, 2017
2005	Declaration of Dr. Celeste Holz-Schietinger (dated December 2, 2016), excerpt from ’306 patent prosecution file history, submitted October 17, 2017
2006	Declaration of Dr. Celeste Holz-Schietinger (dated August 17, 2017), excerpt from ’306 patent prosecution file history, submitted October 17, 2017
2007	Declaration of Dr. Devin Grant Peterson, excerpt from ’306 patent prosecution file history, submitted October 17, 2017
2008	Declaration of Dr. S. Christopher Davis, excerpt from ’306 patent prosecution file history, submitted October 17, 2017
2009	Declaration of Dr. David Lipman, excerpt from ’306 patent prosecution file history, submitted October 17, 2017

2010	U.S. Patent Publication No. 2012/0093994 to Hseih et al.
2011	Cerny, “Formation of aroma compounds from ribose and cysteine during the Maillard Reaction” <i>J. Agric. Food Chem.</i> 51:2714-2721 (2003)
2012	File History of U.S. Provisional Application 61/671,069 filed on July 12, 2012.
2013	G. Reineccius, Flavor Chemistry and Technology 2 nd Ed., 2006, Chap. 7, “ <i>Off-Flavors and Taints in Foods</i> ”, p.161-199
2014	Email from the Patent Trial and Appeal Board dated April 3, 2023
2015	Petition to Accept Unintentionally Delayed Benefit Claims Under 37 C.F.R. §§ 1.78(C) and 1.78(E); Petition for Expedited Review under 37 C.F.R. §1.182; Supplemental Application Data Sheet, and Request for Certificate of Correction in U.S. Patent No. 9,943,096 filed on May 30, 2023; including copy of Petitioner’s Opposition to Patent Owner’s Motion Pursuant to 37 C.F.R. §1.323 [Paper 11]; copy of Order Granting Patent Owner’s Motion for Leave to Seek Certificate of Correction [Paper 15] issued May 22, 2023
2016	Claim Construction Order, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. Aug. 15, 2023)
2017	Plaintiff Impossible Foods Inc.’s Opening Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. June 21, 2023)
2018	Declaration of Hal Alper, Ph.D., In Support of Plaintiff Impossible Foods Inc.’s Opening Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. June 14, 2023)
2019	Defendant Motif Foodworks, Inc.’s Answering Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 7, 2023)

2020	Declaration of Dr. Robert McGorin In Support of Motif's Answering Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. June 28, 2023)
2021	Declaration of Dr. Jerrad Legako In Support of Motif's Answering Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. June 28, 2023)
2022	Declaration of Dr. Carl Batt In Support of Motif's Answering Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. June 28, 2023)
2023	Plaintiff Impossible Foods Inc.'s Claim Construction Reply Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 14, 2023)
2024	Reply Declaration of Hal Alper, Ph.D., In Support of Plaintiff Impossible Foods Inc.'s Claim Construction Reply Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 7, 2023)
2025	Declaration of Paul Sarnoski, Ph.D., In Support of Plaintiff Impossible Foods Inc.'s Claim Construction Reply Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 14, 2023)
2026	Defendant Motif Foodworks, Inc.'s Sur-reply Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 19, 2023)
2027	Supplemental Declaration of Dr. Robert McGorin In Support of Motif's Sur-reply Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 14, 2023)
2028	Declaration of Dr. Jerrad Legako In Support of Motif's Sur-reply Claim Constructoin Brief, <i>Impossible Foods Inc. v. Motif</i>

	<i>Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 14, 2023)
2029	Supplemental Declaration of Dr. Carl Batt In Support of Motif's Sur-reply Claim Construction Brief, <i>Impossible Foods Inc. v. Motif Foodworks, Inc.</i> , Case No. 1:22-cv-00311-WCB (D. Del. July 14, 2023)
2030	Declaration of Michael C. Qian, Ph.D.
2031	<i>Curriculum Vitae</i> of Michael C. Qian, Ph.D.
2032	Transcript of September 7, 2023, Deposition of Rodrigo Tarté, Ph.D.

CERTIFICATE OF SERVICE

I certify that the foregoing Patent Owner's Response Pursuant to 37 C.F.R. § 42.107 and accompanying Exhibits 2016-2032 were served on this 29th day of September 2023, on the Petitioner at the following electronic service addresses:

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