

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTIF FOODWORKS, INC.,
Petitioner,

v.

IMPOSSIBLE FOODS, INC.,
Patent Owner.

IPR2023-00209
Patent 10,039,306 B2

Before DONNA M. PRAISS, CHRISTOPHER M. KAISER, and
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

ABRAHAM, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

A. *Background and Summary*

Motif FoodWorks, Inc. (“Petitioner”) filed a petition for an *inter partes* review (Paper 2 (“Pet.”)) challenging claims 1, 3–11, 13, 14, 16–24, 26, 27, and 29–33 of U.S. Patent No. 10,039,306 B2 (Ex. 1001 (“the ’309 patent”)). Impossible Foods, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). At the Board’s request, the parties also filed briefs regarding Patent Owner’s request to file a petition for a certificate of correction for the ’306 patent. Papers 9, 11.

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2022). The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless the Director determines . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

For the reasons set forth below, we determine the information presented in the Petition does not establish a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Accordingly, we do not institute an *inter partes* review.

B. *Real Parties-in-Interest*

Each party identifies itself as the real party-in-interest. Pet. 74; Paper 14, 1.

C. *Related Matters*

The parties identify *Impossible Foods, Inc. v. Motif Foodworks, Inc.*, Case Number: 22-cv-00311-WCB (D. Del), as well as IPR2023-00206, involving U.S. Patent No. 9,943,096 B2; IPR2023-00207, involving U.S.

Patent No. 11,224,241 B2; and IPR2023-00208, involving U.S. Patent No. 11,013,250, as related matters. Pet. 74; Paper 14, 1. Patent Owner also identifies IPR2022-00887, involving U.S. Patent No. 10,863,761 B2 and opposition proceedings in EP2943072 as related matters. Paper 14, 1.

D. The '306 Patent (Ex. 1001)

The '306 patent, titled “Methods and Compositions for Consumables,” issued on August 7, 2018. Ex. 1001, codes (45), (54). According to the '306 patent, existing meat substitute compositions extrude soy/grain mixtures “which largely fail to replicate the experience of cooking and eating meat.” Ex. 1001, 1:57–60. The '306 patent describes the common product limitations as “texture and mouthfeel that are more homogenous than that of equivalent meat products.” Ex. 1001, 1:60–63. Further, the '306 patent explains that because these products are largely sold pre-cooked with artificial flavors and aromas built in, they fail to replicate aromas, flavors, and other features associated with cooking meat. Ex. 1001, 1:63–66.

The '306 patent describes its invention as being “designed to replicate the experience of eating a food product, e.g., meat.” Ex. 1001, 12:31–33. In particular, the '306 patent is directed to a method for imparting a beef-like aroma to meat replicas. *See, e.g.*, Ex. 1001, 123:11–12 (claim 1). The '306 patent states that “[t]he release of odorants upon cooking is an important aspect of meat consumption. In some embodiments, the consumable is a meat replica entirely composed of non-animal products that when cooked generates an aroma recognizable by humans as typical of cooking beef.” Ex. 1001, 50:52–57. According to the '306 patent, “[c]haracteristic flavor and fragrance components in meat are mostly produced during the cooking process by chemical reactions molecules (precursors) including amino acids,

fats and sugars that are found in plants as well as meat,” and “[b]eef flavors and aromas can be created in non beef consumables by addition of heme proteins.” Ex. 1001, 73:62–63, 84:9–12.

In one example, the ’306 patent discloses adding flavor precursors and 1% Leghemoglobin to replica products and analyzing the resulting flavor attributes. Ex. 1001, 84:5–85:16 (Example 33). For this example, the ’306 patent reports that “[t]he addition of precursors increased the beefy flavor, the bloody notes, overall flavor quantity, and decreased the off notes in the replica.” Ex. 1001, 84:18–20.

E. Illustrative Claims

Of the challenged claims, claims 1, 14, and 27 are independent claims. Claim 1 is illustrative and reproduced below.

1. A method for imparting a beef-like aroma to a meat replica matrix, wherein the meat replica matrix comprises one or more plant proteins, a sugar selected from glucose, ribose, sucrose, fructose, xylose, maltodextrin, and combinations thereof, and at least one sulfur compound selected from methionine, cysteine and thiamine, the method comprising

adding 0.01%–5% (by weight of the meat replica matrix) of a non-animal heme-containing protein to the meat replica matrix,

wherein, upon cooking of the meat replica matrix, at least two volatile compounds are generated that are associated with a beef-like aroma, thereby imparting a beef-like aroma to the meat replica matrix.

Ex. 1001, 123:11–25.

F. Asserted Unpatentability Challenges

Petitioner asserts that claims 1, 3–11, 13, 14, 16–24, 26, 27, and 29–33 are unpatentable based on the following challenges:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, 29–33	103	Conrad, ¹ Mottram, ² Crane ³
1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, 29–33	103	Conrad, Mottram, Proulx ⁴
1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, 29–33	103	Rovaart, ⁵ Conrad, Crane
1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, 29–33	103	Rovaart, Conrad, Proulx
7, 8, 19, 20	103	Rovaart, Conrad, Crane/Proulx, Cho ⁶
7, 8, 19, 20	103	Conrad, Mottram, Crane/Proulx, Cho
9, 10, 21, 22, 32	103	Conrad, Mottram, Crane/Proulx, Boye ⁷
9, 10, 21, 22, 32	103	Rovaart, Conrad, Crane/Proulx, Boye

¹ US 4,818,557, issued Apr. 4, 1989 (Ex. 1013).

² Donald S. Mottram, *Flavour formation in meat and meat products: a review*, FOOD CHEMISTRY, Vol. 62, No. 4, pp. 415–424, 1998 (Ex. 1017).

³ US 2011/0287467 A1, published Nov. 24, 2011 (Ex. 1014).

⁴ Amy K. Proulx and Manju B. Reddy, *Iron Bioavailability of Hemoglobin from Soy Root Nodules Using a Caco-2 Cell Culture Model*, J. AGRIC. FOOD CHEM., 2006, 54, 1518–1522, 2006 (Ex. 1019).

⁵ US 3,930,044, issued Dec. 30, 1975 (Ex. 1125).

Petitioner relies on the declaration of Rodrigo Tarté, Ph.D. (Ex. 1003), the declaration of Robert McGorin, Ph.D. (Ex. 1005), and the declaration of Carl Batt, Ph.D. (Ex. 1007).

II. ANALYSIS

A. *Legal Standards*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). The burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

A claim is unpatentable under 35 U.S.C. § 103 if “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103. The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when present, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

To show obviousness, it is not enough to merely show that the prior art includes separate references covering each separate limitation in a

⁶ US 2008/0008815 A1, published Jan. 10, 2008 (Ex. 1140).

⁷ Boye et. al, *Pulse proteins: Processing, characterization, functional properties and applications in food and feed*, FOOD RESEARCH INTERNATIONAL, 43, 414–413, 2010 (Ex. 1016).

challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). “Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Id.* (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007)). “This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.” *KSR*, 550 U.S. at 418–19. On the other hand, an obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 418; *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Nevertheless, “[a] factfinder should be aware . . . of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR*, 550 U.S. at 421.

B. Level of Ordinary Skill in the Art

According to Petitioner, a person of ordinary skill in the art would have had “(i) a Bachelor of Science degree in food sciences, biology, chemistry, microbiology, or a related discipline, and (ii) a Master’s degree or Ph.D. in food science or at least three years of experience working as a food scientist.” Pet. 5. Petitioner also asserts that a person of ordinary skill in the art could be “part of a team of food scientists, including flavor chemists.” Pet. 5 (citing Ex. 1003 ¶¶ 34–36; Ex. 1005 ¶¶ 82–83; Ex. 1007 ¶ 39). Patent Owner does not challenge Petitioner’s definition or offer its own.

In light of the record before us, and for purposes of this Decision, we adopt Petitioner’s proposal regarding the level of ordinary skill in the art.

Based on our review of the '306 patent and the prior art of record, we determine that the definition offered by Petitioner comports with the qualifications a person would have needed to understand and implement the teachings of the '306 patent and the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required “where the prior art itself reflects an appropriate level and a need for testimony is not shown”) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

C. Claim Construction

In an *inter partes* review, we construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2022). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Petitioner argues that the preamble of the challenged claims should not be found limiting, that the term “thereby imparting a beef-like aroma to the meat replica matrix” should not be limiting, and that the term “matrix” should be given its plain and ordinary meaning. Pet. 9–11. Petitioner also states that “[i]n parallel litigation, [Patent Owner] asserts that ‘no animal products’ covers bovine myoglobin, which is native to an animal (*Bos taurus* (cow)), even when produced in engineered yeast.” Pet. 11 (citing Ex. 1116

¶¶ 32–36). Petitioner explains that the outcome here would not be affected if the Board adopts Patent Owner’s infringement interpretation advanced in the parallel litigation. Pet. 11.

Patent Owner disagrees that the preamble of the challenged claims and the term “thereby imparting a beef-like aroma to the meat replica matrix” are not limiting. PO Resp. 5–7.

After considering the arguments and information presented in the Petition and Preliminary Response, we determine that we do not need to expressly construe any terms for purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

D. Challenges Based on the Combined Teachings of Conrad and Mottram

Petitioner contends claims 1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, and 29–33 are unpatentable as obvious in view of Conrad, Mottram, and Crane, claims 1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, and 29–33 are unpatentable as obvious in view of Conrad, Mottram, and Proulx, claims 7, 8, 19, and 20 are unpatentable as obvious in view of Conrad, Mottram, Crane/Proulx, and Cho, and claims 9, 10, 21, 22, and 32 are unpatentable as obvious in view of Conrad, Mottram, Crane/Proulx, and Boye. *See* Pet. 12.

1. Conrad (Ex. 1013)

Conrad is directed to a “meat replacement product to be used in mixed minced meat products, . . . whereby the meat replacement product comprises the gluten protein and the bran fractions of whole cereal grain, preferably wheat.” Ex. 1013, code (57). Conrad explains that animal meat can be

“somewhat expensive,” and that “[p]eople of today have too little fibre in their food.” Ex. 1013, 1:25–28. Therefore, according to Conrad, “

It would be desirable from a nutritional point of view and from a cost benefit point of view to be able to replace some of the meat in minced meat products . . . with a vegetable preferably cereal product, whereby the amino acid composition of the final product can be varied and whereby the costs can be lowered compared with a pure meat product.

Ex. 1013, 1:32–40.

Conrad states that its “grain meat” is preferably “wheat meat,” and is formed by crushing the wheat grain to a suitable size and separating the grain meat from a suspended aqueous phase comprising “starch granules containing most of the water-soluble components of the grain such as soluble proteins, salts, and sugars.” Ex. 1013, 2:1–8. In one example, Conrad states that the wheat meat had a brown-yellow color, and that “[t]he colour can advantageously be transferred into meat colour by adding . . . blood, preferably the hemoglobin part separated off from blood.” Ex. 1013, 4:5–10. According to Conrad, “[t]he addition of blood/hemoglobin further gives a desired taste improvement as it improves the meat flavor of the final product,” which, in Conrad, includes a mixed minced meat product wherein up to 50% of the “meat part” is replaced by the wheat meat. Ex. 1013, 4:14–16, 4:45–49.

2. Mottram (Ex. 1017)

Mottram presents a review of flavor formation in meat and meat products, stating that “there has been much research aimed at understanding the chemistry of meat flavour,” and that “[t]he desirable characteristics of meat flavour have . . . been sought in the production of simulated meat flavourings which are of considerable importance in convenience and

processed savoury foods.” Ex. 1017, 415. Mottram teaches that meat flavor is thermally derived, and that “[t]he main reactions during cooking, which result in aroma volatiles, are the Maillard reaction between amino acids and reducing sugars, and the thermal degradation of lipid.” Ex. 1017, 415. Mottram specifically identifies cysteine and ribose as playing an important role in meat flavor formation. Ex. 1017, 416.

3. *Analysis*

a) *Independent Claims 1, 14, and 27*

Each of the independent claims in the ’306 patent recites a meat replica matrix that comprises “a sugar selected from glucose, ribose, sucrose, fructose, xylose, maltodextrin, and combinations thereof, and at least one sulfur compound selected from methionine, cysteine and thiamine,” Ex. 1001, 123:13–17 (claim 1), 124:14–18 (claim 14), 125:6–9 (claim 27). Petitioner does not contend that Conrad’s wheat meat product contains the required sugar and sulfur components. Pet. 20–23. Rather, Petitioner explains that Conrad’s matrix is “depleted of sugars and other components during its manufacture, such that Conrad’s replica might undesirably lack meaty, beef-like aroma.” Pet. 22 (citing Ex. 1013, 2:1–46; Ex. 1003 ¶ 196).

Petitioner contends that a person of ordinary skill in the art would recognize that “the claimed sugars and sulfur compounds are ‘Maillard reaction’ precursors, which have long been known to produce volatile compounds associated with meaty aromas when heated.” Pet. 20 (citing Ex. 1003 ¶¶ 189–190). Petitioner further contends that Mottram “teaches that Maillard reactions between amino compounds and reducing sugars are ‘one of the most important routes to flavour compounds in cooked foods, including meat.’” Pet. 20 (quoting Ex. 1017, 417; citing Ex. 1017, 416, 422; Ex. 1003 ¶¶ 190–191).

According to Petitioner, the Maillard reaction precursors “have long been used in the art for the purpose of providing meaty flavor.” Pet. 21 (citing Ex. 1005 ¶¶ 54–55). Petitioner thus argues that “[b]ecause a [person of ordinary skill in the art] would recognize that Maillard precursors (e.g., sugars) are depleted from Conrad’s products during preparation of the ‘grain meat’ fraction, a [person of ordinary skill in the art] would be motivated to add **Mottram**’s precursors (e.g., cysteine/ribose) to Conrad’s meat replicas in order to increase generation of volatile compounds associated with ‘beef-like’ aroma.” Pet. 23 (citing Ex. 1003 ¶ 198); *see also* Pet. 21 (arguing that a person of ordinary skill in the art would be motivated to improve the “meaty flavor” of Conrad’s grain/wheat meat “in order to enhance its ‘meat like’ qualities and thereby appeal to consumers by better creating the sensory experience of consuming real meat”), 42 (referring to the Petition’s prior analysis regarding Conrad and Mottram for Petitioner’s challenges that rely on Proulx instead of Crane).

Patent Owner argues that Petitioner’s motivation to combine Conrad and Mottram is “driven by hindsight.” Prelim. Resp. 12. In particular, Patent Owner argues that Petitioner “recogni[zes] that the claimed compounds ‘are naturally present in meat’,” which makes the combination of Mottram with Conrad “illogical” because meat and animal products are already present in Conrad. Prelim. Resp. 14. Patent Owner explains that

Not only does Conrad include real meat in its product, it doubles-down on animal products by adding *animal blood/hemoglobin* to its wheat-meat mixture in order to improve the color of the “brown-yellow” wheat meat product and “further give[] a desired taste improvement as it improves the meat flavour of the final product,” as well as cheese fines and animal fat.

Prelim Resp. 13 (quoting Ex. 1013, 4:14–16).

After considering the parties' argument and information in the present record, we are not persuaded by Petitioner's arguments that a person of ordinary skill in the art would have added Mottram's precursors (e.g., cysteine/ribose) to Conrad's grain/wheat meat in order to improve the "meaty flavor" and enhance the "meat-like" qualities of Conrad's products. Conrad already addresses concerns regarding taste improvement of its grain/wheat meat by adding animal blood/hemoglobin to its product. Ex. 1013, 4:14–16. In addition, Conrad's grain/wheat meat is intended to be mixed with actual meat, which, as Petitioner acknowledges, already contains cysteine and ribose. Ex. 1013, code (57), 1:32–40, 4:45–49, 5:23–41; Pet. 21. It is undisputed that these components present in actual meat enhance the meat-like aroma of products. Pet. 21; Prelim. Resp. 14. These facts undermine Petitioner's assertion that a person of ordinary skill in the art would have looked to a different reference (i.e., Mottram) to add these same precursors to Conrad's products.

Furthermore, we agree with Patent Owner that Petitioner's motivation to combine Mottram and Conrad is driven by hindsight. As Petitioner acknowledges, Conrad teaches that a suspended aqueous phase containing soluble proteins, salts, and sugars, is separated from its grain/wheat meat during manufacturing. Pet. 22–23; Ex. 1013, 2:1–46. Conrad explains that "[t]he suspended aqueous phase of starch granules can be used directly in the production of glue or in the production of sugars by hydrolysis in a way known per se." Ex. 1013, 2:21–24. Conrad does not disclose adding the suspended aqueous phase, or any of its components, back into the grain/wheat meat. Nevertheless, Petitioner argues that a person of ordinary skill in the art would have added materials similar to those that were just removed from Conrad's product back into it. This approach is

counterintuitive and indicative of reasoning based on hindsight. Moreover, the fact that the materials Petitioner suggests adding back into Conrad's products correspond to the specific compounds recited in the claim further demonstrates that hindsight is driving Petitioner's arguments.

For all of these reasons, we are not persuaded by Petitioner's argument that a person of ordinary skill in the art would have had reason to combine the teachings of Conrad and Mottram to arrive at the invention recited in independent claims 1, 14, and 27. Accordingly, we determine Petitioner has failed to establish a reasonable likelihood of prevailing on its challenge that claims 1, 14, and 27 are unpatentable as obvious in view of Conrad and Mottram, further in view of Crane or Proulx.

b) Dependent Claims 3–11, 13, 16–24, 26, and 29–33

Claims 3–11 and 13 depend from independent claim 1, claims 16–24 and 26 depend, directly or indirectly, from independent claim 14, and claims 29–33 depend from independent claim 27. For its challenges of these claims, Petitioner relies on the arguments presented for independent claims 1, 14, and 27. *See, e.g.*, Pet. 33 (reciting “As explained above (claims 1, 4, 27)” in its analysis of claims 3, 16, and 29), 46. Nothing in Petitioner's analysis of the additional references relied upon for its challenges of the dependent claims cures the deficiencies discussed above regarding the proposed combination of Conrad and Mottram. Therefore, for the same reasons discussed above for independent claims 1, 14, and 27, we determine Petitioner has failed to establish a reasonable likelihood of prevailing on its challenges that claims 3–11, 13, 16–24, and 29–33 are unpatentable as obvious in view of Conrad and Mottram, further in view of Crane, Proulx, Cho, and Boye.

E. Challenges Based on the Combined Teachings of Rovaart and Conrad

Petitioner contends claims 1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, and 29–33 are unpatentable as obvious in view of Rovaart, Conrad, and Crane, claims 1, 3–9, 11, 13, 14, 16–21, 23, 24, 26, 27, and 29–33 are unpatentable as obvious in view of Rovaart, Conrad, and Proulx, claims 7, 8, 19, and 20 are unpatentable in view of Rovaart, Conrad, Crane/Proulx, and Cho, and claims 9, 10, 21, 22, and 32 are unpatentable as obvious in view of Rovaart, Conrad, Crane/Proulx, and Boye. Pet. 12,

1. Rovaart (Ex. 1125)

Rovaart discloses a “process for preparing an expanded porous food product having a meat-like flavour” that comprises “heating under pressure a mixture comprising (a) a finely divided food material, (b) a sulphur compound such as a sulphur-containing amino-acid, (c) a pentose or hexose, and (d) water, and rapidly releasing the pressure.” Ex. 1125, code (57). Rovaart explains that prior art processes for forming products with a porous expanded structure and meat-like taste involved first forcing a moistened raw material through an extrusion die to form the desired expanded porous structure, followed by a subsequent “flavouring treatment” involving “incorporating into the expanded porous products suitable flavouring agents, which may be natural or synthetic.” Ex. 1125, 1:8–29. In contrast to prior art processes, Rovaart explains that in its process, which it characterizes as being “particularly simple,” the desired texture and taste are obtained in a single operation. Ex. 1125, 1:38–42.

2. *Analysis*

a) *Independent Claims 1, 14, and 27*

Each of the independent claims of the '306 patent recites a method for imparting a beef-like aroma to a meat replica matrix, comprising adding or incorporating 0.01%–5% (by weight of the meat replica matrix) of a non-animal heme-containing protein to or into the meat replica matrix. Ex. 1001, 123:11–20 (claim 1), 124:12–22 (claim 14); 125:4–12 (claim 27). For its challenges based on Rovaart and Conrad, Petitioner contends Rovaart “discloses a meat replica matrix and methods of imparting beef-like aroma thereto.” Pet. 47. Petitioner asserts that Rovaart teaches including “*suitable flavouring agents*” in its products, “which may be natural,” and teaches adding sugars/sulfur compounds for this purpose. Pet. 47, 50 (quoting Ex. 1125, 1:24–29; Ex. 1003 ¶ 334). Based on these disclosures, Petitioner argues that Rovaart “generally motivates a [person of ordinary skill in the art] to provide meaty flavor in its products.” Pet. 50. Petitioner also argues that a person of ordinary skill in the art would have been “generally motivated by Rovaart itself to use techniques and ingredients that *enhance* the meaty flavor of Rovaart’s food products,” and would have “recognize[d] that one way to do so would be to include other ‘natural’ ‘suitable flavouring agents’ in the products.” Pet. 50–51 (citing Ex. 1003 ¶¶ 336–337).

Petitioner then argues that Conrad would have motivated a person of ordinary skill in the art to add 0.01%–5% of heme-containing protein to a meat replica. Pet. 50. Specifically, Petitioner contends that a person of ordinary skill in the art “would be motivated to further enhance the meaty flavors and other meat-like properties of Rovaart’s product using 0.01%–5% leghemoglobin taught in Conrad and Crane.” Pet. 48; *see also* Pet. 51 (“To further enhance **Rovaart**’s products’ meaty flavor, **Conrad** teaches a

[person of ordinary skill in the art] that adding ‘up to’ about 5% heme-protein by weight would contribute meaty flavor in addition to other benefits.”). Petitioner relies on Conrad’s teaching that adding the hemoglobin part of animal blood to its grain/wheat meat confers color and taste characteristics of real meat. Pet. 51 (citing Ex. 1013, 4:3–17; Ex. 1003 ¶ 339).

Patent Owner asserts that Petitioner’s proposed combination is illogical and based on hindsight. Prelim. Resp. 33. Specifically, Patent Owner argues Petitioner fails to account for the differences between Conrad’s “wheat-based product designed to replace some portion of meat itself,” and Rovaart’s soybean flour products that “already have a meat-like flavor.” Prelim. Resp. 35. According to Patent Owner,

Petitioner fails to explain why a [person of ordinary skill in the art] would have been motivated to modify Rovaart to “enhance” its meat flavor or color, when the reference itself already achieves a “more pronounced and fuller” meat flavor . . . and is unconcerned with color, in view of a reference that seeks to add blood to a meat-based product to recoup flavor and color lost by its extension with a non-meat-based product.

Prelim. Resp. 36 (citing Ex. 1125, 2:58–61).

After considering the parties’ arguments and information in the present record, we are not persuaded by Petitioner’s contention that a person of ordinary skill in the art would have had reason to combine the teachings of Conrad and Rovaart.

It is undisputed that Rovaart teaches methods for producing a porous, soy-based food product having a meat-like flavor. Pet. 48; Prelim Resp. 33; Ex. 1125, 1:38–43. These methods include using the same sugar/sulfur compound combination recited in the ’306 patent. Pet. 49; Ex. 1125, 1:38–46, 1:66–2:1. Thus, to the extent Rovaart “generally motivates” a person of

ordinary skill in the art to provide meaty flavor in its products, as Petitioner asserts (Pet. 50), the evidence of record establishes that a skilled artisan would have understood how to accomplish that based on Rovaart alone. Accordingly, Petitioner does not demonstrate persuasively that a person of ordinary skill would have had a reason to look beyond Rovaart itself, i.e., to Conrad, to provide meaty flavor in its products.

We reach a similar result with regard to Petitioner’s argument that a person of ordinary skill in the art would be “generally motivated by Rovaart itself to use techniques and ingredients that *enhance* the meaty flavor of Rovaart’s food products.” Pet. 50–51. This argument is based on Petitioner’s characterization of Rovaart as teaching methods of *enhancing* meaty flavor of its food product—not just *producing* products having a meaty flavor. Pet. 50. But what Petitioner directs us to as evidence of Rovaart’s methods of enhancing flavor are simply the steps Rovaart discloses for “preparing an expanded porous food product having a meat-like flavour.” Ex. 1125, 1:38–40.

For example, as evidence that Rovaart teaches methods of enhancing meaty flavor, Petitioner directs us to Rovaart’s statements that “heating [Rovaart’s composition] at a temperature below 150°C does not produce the desired [meaty] flavour” and that changing Rovaart’s process, by substituting one sugar for another, “can produce ‘less pronounced’ meaty flavors.” Pet. 50 (citing Ex. 1125, 2:46–51, 6:16–28). Although it is true, as Petitioner notes, that Rovaart teaches that heating the mixture at too low a temperature “does not produce the desired flavour and texture” (Ex. 1125, 2:49–51), this is just a teaching that, in order to get a meaty flavor, a certain minimum temperature is required. Ex. 1125, 1:38–48 (“This process

comprises forming a mixture . . . [and] heating the mixture to a temperature of at least 150°C . . .”).

Similarly, Rovaart discloses that its starting mixture includes, *inter alia*, at least one pentose or hexose, which may be xylose or glucose. Ex. 1125, 1:42–44, 1:66–68. Rovaart prepares one example, Example 2, using xylose, and another example, Example 4, using glucose. Ex. 1125, 5:10–36, 6:16–28. Although Rovaart reports that Example 4 had a “slightly less pronounced” flavor of boiled beef, both examples use components that Rovaart teaches one to use to provide a meat-like flavor, and Rovaart confirms that using these components does result in providing a beef flavor. Ex. 1125, 1:42–44, 1:66–68, 5:10–36, 6:16–28. Thus, Petitioner’s attempts to distinguish between Rovaart teaching methods of *producing* a meaty flavor and *enhancing* a meaty flavor are unavailing.

Even if we were to agree with Petitioner that Rovaart teaches methods of enhancing meaty flavor, Petitioner does not explain persuasively why a person of ordinary skill in the art would look to a *different reference* (i.e., Conrad) to enhance the meaty flavor of Rovaart’s products when Rovaart already teaches how to do that. This is especially true considering, in Petitioner’s own words, “Rovaart . . . teaches that changing its processes (e.g., by sugar substitution) can produce ‘less pronounced’ meaty flavors” Pet. 50 (quoting Ex. 1125, 6:16–28). This statement implies that a person of ordinary skill in the art, seeking to enhance the meaty flavor of Rovaart’s products, would *not make changes* to Rovaart’s process, as doing so could produce a *less pronounced* meaty flavor, as opposed to enhancing the meaty flavor of the product. At the very least, Petitioner’s arguments here cast doubt on its conclusory statement that a person of ordinary skill in the art would have had a reasonable expectation of successfully achieving desirable

meat-like properties by combining the teachings of Conrad and Rovaart.
Pet. 51.

Furthermore, on the present record, there is insufficient evidence supporting Petitioner's assertion that "[t]o further enhance **Rovaart's** products' meaty flavor, **Conrad** teaches a POSITA that adding 'up to' about 5% heme-protein by weight would contribute meaty flavor in addition to other benefits." Pet. 51. First, this assertion is based on Petitioner's arguments regarding enhancing the meaty flavor in Rovaart's products, which we determine to be unpersuasive for the reasons discussed above. Next, Conrad's disclosure that the "addition of blood/hemoglobin further gives a desired taste improvement" is made in the context of adding blood/hemoglobin to a grain/wheat meat product that does not contain the sulfur/sugar components known to impart meaty flavor. Ex. 1013, 2:1–46, 4:14–16; Pet. 22. As Petitioner points out, however, these ingredients are included in Rovaart's products. Pet. 49; Ex. 1125, 1:42–46. This distinction, along with the fact that Rovaart's products already possess a full meat flavor on their own, undermines Petitioner's assertion that a person of ordinary skill in the art would have understood that adding blood/hemoglobin to Rovaart's products would enhance and/or contribute to the meaty flavor of Rovaart's products.

As to Rovaart's discussion of "suitable flavouring agents," Rovaart uses this specific phrase only when describing prior art processes that Rovaart distinguishes and seeks to improve upon. Ex. 1125, 1:24–29. Beyond stating they "may be natural or synthetic," Rovaart does not elaborate on what these "suitable flavouring agents" might be in the context of these prior art processes. Ex. 1125, 1:27–28. To the extent Petitioner contends Conrad's hemoglobin part of slaughtered-animal blood is a

“suitable flavouring agent,” Rovaart at best suggests it would have been suitable for use in the prior art processes disclosed in Rovaart.

Rovaart makes clear, however, that in these prior art processes the product is forced, “while hot and under pressure, through an extrusion die,” and “subsequently given a flavouring treatment.” Ex. 1125, 1:19–26. This prior art process is distinct from Rovaart’s claimed invention that involves “a process for preparing an expanded porous food product having a meat-like flavour that is particularly simple and in which the desired texture and taste are obtained *in a single operation*.” Ex. 1125, 1:38–42 (emphasis added). Rovaart’s process includes forming a mixture of (a) a finely divided food material, (b) at least one pentose or hexose, (c) at least one sulphur-containing amino acid or an amino-acid and a substance containing sulfur, and (d) water. Ex. 1125, 1:42–46. Rovaart states that “flavouring and/or texturing agents such as sodium glutamate, inosine or guanosine monophosphate, lactic acid, calcium chloride, or sodium chloride, may also be added to the mixture” formed as part of its claimed process. Ex. 1125, 2:18–22.

Petitioner does not address the differences between Rovaart’s claimed process and the prior art process Rovaart distinguishes. Nor does Petitioner address sufficiently whether Conrad’s hemoglobin part of slaughtered-animal blood could be added to Rovaart’s mixture and used in Rovaart’s single step process, as opposed to being used as a “suitable flavouring agent” in the subsequent flavoring treatment step according to prior art processes. Petitioner’s failure is particularly problematic here, where, according to Petitioner, “Rovaart . . . teaches that changing its processes (e.g., by sugar substitution) can produce ‘less pronounced’ meaty flavors.” Pet. 50.

Finally, Petitioner contends that a person of ordinary skill in the art would have combined the teachings of Rovaart with Conrad in view of “other benefits” that Conrad’s hemoglobin/blood could contribute. Pet. 51. The only “other benefit” Petitioner discusses in the section of the Petition labeled “Motivation to Combine with Conrad” is Conrad’s teaching that the color of the grain/wheat meat replica product “can advantageously be transferred into meat colour by adding thereto . . . blood.” Pet. 51 (emphasis omitted). Although this may be beneficial for Conrad’s product, particularly because its grain/wheat product has a brown/yellow color and is intended to be mixed with and replace real meat, the same is not necessarily true for Rovaart’s products. Ex. 1013, 1:25–40, 4:3–10. Petitioner does not direct us to sufficient evidence suggesting that a person of ordinary skill in the art would have understood color was a concern in Rovaart or that adding blood to Rovaart per Conrad’s teachings would have been viewed as beneficial. Furthermore, we agree with Patent Owner that Petitioner’s arguments fail to account for the differences between the Conrad’s wheat-based product and Rovaart’s soy-based products, especially in terms of how adding blood would affect the color of the different materials.

For all of the foregoing reasons, we agree with Patent Owner that Petitioner’s arguments as to why a person of ordinary skill in the art would have had reason to combine the teachings of Rovaart and Conrad are not sufficiently supported, and appear to be driven by hindsight. As a result, we are not persuaded by Petitioner’s argument that a person of ordinary skill in the art would have had reason to combine the teachings of Conrad and Rovaart to arrive at the invention recited in the challenged claims. Accordingly, we determine Petitioner has failed to establish a reasonable likelihood of prevailing on its challenge that claims 1, 14, and 27 are

unpatentable as obvious in view of Rovaart and Conrad, and further in view of Crane and Proulx.

b) Dependent Claims 3–11, 13, 16–24, 26, and 29–33

Claims 3–11 and 13 depend from independent claim 1, claims 16–24 and 26 depend, directly or indirectly, from independent claim 14, and claims 29–33 depend from independent claim 27. For its challenges of these claims, Petitioner relies on the arguments presented for independent claims 1, 14, and 27. *See, e.g.*, Pet. 57 (reciting “As explained above (claims 1, 4, 27)” in its analysis of claims 5, 18, and 31). Nothing in Petitioner’s analysis of the additional references relied upon for its challenges of the dependent claims cures the deficiencies discussed above regarding the proposed combination of Rovaart and Conrad. Therefore, for the same reasons discussed above for independent claims 1, 14, and 27, we determine Petitioner has failed to establish a reasonable likelihood of prevailing on its challenges that claims 3–11, 13, 16–24, and 29–33 are unpatentable as obvious in view of Rovaart and Conrad, further in view of Crane, Proulx, Cho, and Boye.

III. CONCLUSION

Upon consideration of the Petition, the Preliminary Response, and the evidence presented, we determine that Petitioner has not shown a reasonable likelihood that it will prevail in showing that at least one of the challenged claims is unpatentable. Accordingly, we do not institute an *inter partes* review of any challenged claim based on any ground asserted in the Petition.

IV. ORDER

For the reasons given, it is:

ORDERED that, pursuant to 35 U.S.C. § 314, the Petition is denied, and no *inter partes* review is instituted.

IPR2023-00209
Patent 10,039,306 B2

FOR PETITIONER:

Joseph M. Paunovich
James Glass
Sandra Haberny
Razmig Messerian
Quincy Lu
QUINN EMANUEL URQUHART & SULLIVAN, LLP
joepaunovich@quinnemanuel.com
jinglass@quinnemanuel.com
sandrahaberny@quinnemanuel.com
razmesserian@quinnemanuel.com
quincylu@quinnemanuel.com

FOR PATENT OWNER:

Michael Rosato
Lorelei Westin
Wendy Devine
Matthew Reed
Tasha Thomas
WILSON SONSINI GOODRICH & ROSATI
mrosato@wsgr.com
lwestin@wsgr.com
wdevine@wsgr.com
mreed@wsgr.com
tthomas@wsgr.com