

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTIF FOODWORKS, INC.,

Petitioner,

v.

IMPOSSIBLE FOODS INC.,
Patent Owner.

U.S. Patent No. 11,224,241

**“METHODS AND COMPOSITIONS FOR
AFFECTING THE FLAVOR AND AROMA
PROFILE OF CONSUMABLES”**

Inter Partes Review No. 2023-00207

**PETITIONER’S REHEARING REQUEST
PURSUANT TO 37 C.F.R. § 42.71(d)**

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Pursuant to 37 C.F.R. § 42.71(d), Petitioner Motif FoodWorks, Inc. (“Petitioner”) requests rehearing of the portion of the Board’s June 16, 2023 Decision Denying Institution (“Decision”) (Paper 22) finding that Petitioner failed to show a reasonable likelihood that at least one claim of U.S. Patent No. 11,224,241 (“the ’241 patent”) is unpatentable in view of International Publication WO/2013/010042 (“Brown”). Decision, 9-17.

Petitioner respectfully submits that the Board overlooked the second of Petitioner’s two arguments concerning how Brown teaches the claimed “one or more plant proteins” limitation. When properly considered, this missed argument resolves the Board’s concern that the plant protein in Brown that satisfies the “one or more plant proteins” limitation is the sole source of the claimed sulfur-containing amino acids/compounds. As this was the only basis in the Decision denying the ground based on Brown alone, Petitioner requests that the Board institute *inter partes* review of the ’241 patent.

I. BACKGROUND

On December 7, 2022, Petitioner filed a petition for *inter partes* review against the ’241 patent. IPR2023-00207, Paper 6 (“’241 Petition”). The first ground (Ground 1A) alleges that “Brown discloses or renders obvious every limitation of

the independent claims.” ’241 Petition, 27, 41.¹ Hence, Petitioner argued that Brown alone discloses (*i.e.*, anticipates) or renders obvious independent claims 1 and 22 (referred to herein as the “Brown-only ground”).²

Petitioner additionally filed a separate petition for *inter partes* review against U.S. Patent No. 9,943,096 (“the ’096 patent”), which is the parent of the ’241 patent. IPR2023-00206, Paper 7 (“’096 Petition”). There, Petitioner also argued that Brown alone anticipates independent claim 1 of the ’096 patent. ’096 Petition, 13, 20-23.

As shown in the table below, claim 1 of the ’096 patent and claim 22 of the ’241 patent have substantially similar limitations.

’096 Patent, claim 1	’241 Patent, claim 22
1. A food flavor additive composition comprising: a) an isolated heme-containing protein; b) a compound selected from glucose, ribose, fructose, lactose, xylose, arabinose, glucose-6-phosphate, maltose, maltodextrin, and galactose, and mixtures of two or more thereof; and	22. A meat-like-food product produced by a method comprising: providing one or more plant proteins; and combining, with the one or more plant proteins: a heme-containing protein; one or more of glucose, ribose, fructose, lactose, xylose, arabinose, glucose-6-phosphate, maltose, and

¹ Ground 1A also *separately* alleges that the combination of Brown and Giacino (U.S. Patent No. 3,519,437) render the challenged claims obvious. ’241 Petition, 26-42. That sub-ground is not at issue in this rehearing request.

² Petitioner also alleged that Brown alone teaches or renders obvious dependent claims 2-9, 12-21, and 23. *See* ’241 Petition, 34-42.

c) a compound selected from cysteine, cystine, thiamine, methionine, and mixtures of two or more thereof; wherein the flavor additive composition contains no animal products; and wherein cooking the food flavor additive composition results in the production of at least two volatile compounds which have a meat-associated aroma.	galactose; and one or more of cysteine, cystine, thiamine, and methionine; wherein the meat-like food product is free of animal heme-containing protein; wherein cooking the meat-like-food-product results in the production of at least two volatile compounds which have a meat-associated aroma; and wherein the meat-like food product is in a form selected from the group consisting of a hotdog, a burger, ground meat, a sausage, a steak, a filet, a roast, a meatball, a meatloaf, or bacon.
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In the '096 IPR proceeding, the Board found that a reasonable likelihood exists that at least claim 1 of the '096 patent is unpatentable in view of Brown. IPR2023-00206, Paper 23 (Institution Decision), 19-24. In particular, the Board found persuasive Petitioner's contention that: Brown's leghemoglobin satisfies the claimed "heme-containing protein" limitation; Brown's glucose satisfies the claimed sugar compound limitation; Brown's pea flour satisfies the claimed sulfur-containing amino acid compound limitation; and that Brown's composition does not include animal products and produces volatiles having a meat-associated aroma when cooked. *Id.*, 21, 24. Petitioner mapped the same features above in Brown (*e.g.*, leghemoglobin, glucose, and pea flour) to the corresponding claim limitations in the '241 patent IPR. '241 Petition, 28 (leghemoglobin for heme-containing

protein), 29 (glucose for sugar compound), 29 (proteins in pea flour for sulfur-containing compound). Petitioner also made substantively similar arguments for why Brown satisfies the claimed “free of animal heme-containing protein” and “meat-associated aroma” limitations found in the ’241 patent claims as it had advanced for the ’096 patent claims. *Compare* ’096 Petition, 23 *with* ’241 Petition, 33.

For the ’241 patent IPR, however, the Board denied the Brown-only ground because the Board focused exclusively on Petitioner’s argument that Brown’s pea flour satisfied both the claimed “providing one or more plant proteins” and “combining, with the one or more plant proteins [the amino acid or amino acid mixture]” limitations. Decision, 11-12. The Decision did not cite any other reason for denying the Brown-only ground. *See generally* Decision.

As explained below, Petitioner had advanced an alternative mapping for the claimed “providing one or more plant proteins” that mapped this limitation to isolated, purified plant proteins disclosed in Brown. Respectfully, this alternative mapping was overlooked and not addressed by the Institution Decision.

II. APPLICABLE STANDARDS

Pursuant to 37 C.F.R. § 42.71(d), Petitioner may request rehearing of a decision not to institute a trial. The party requesting rehearing has the burden of showing that the decision from which rehearing is sought should be modified, and

“[t]he request must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply.” 37 C.F.R. § 42.71(d). When rehearing a decision on a petition, the Board will review the decision for an abuse of discretion. 37 C.F.R. § 42.71(c).

III. ARGUMENT

A. **“providing one or more plant proteins” and “combining, with the one or more plant proteins ... [one or more sulfur-containing compounds]”**

Petitioner respectfully requests that the Board grant Petitioner’s rehearing request because the Board overlooked an argument that, if considered, would have wholly addressed the Board’s sole reason for denying institution based on Brown.

As shown in the annotated excerpt of the Petition below, Petitioner presented two alternative arguments for how Brown disclosed the claimed “providing one or more plant proteins” limitation found in claims 1 and 22 of the ’241 patent. The first argument is highlighted in green, while the second is highlighted in yellow. The Board did not address the second argument in its Decision.

(b) 1[a] (“*plant protein(s)*”)

Brown’s muscle replica comprises “pea flour,” which contains pea protein, *i.e.* a plant protein. EX1012, [00364]; EX1067(Meng), 235-236; EX1003(Tarte), ¶¶140-41. Brown also discloses that “any of the...muscle tissue replica[s]” comprise a “protein component” such as “the 8S globulin from Moong bean seeds, or the albumin or globulin fraction of pea seeds,” *i.e.*, plant proteins. EX1012, [00299], [00307]; EX1003(Tarte), ¶142.

’241 Petition, 28 (annotations added).

The same is true for Dr. Tarté’s supporting declaration. As shown below, paragraph 141 supports the first argument in the Petition (highlighted green), while paragraph 142 supports Petitioner’s second argument (highlighted yellow).

141. Brown discloses an exemplary muscle replica that is prepared by mixing **pea flour**, sunflower oil, and glucose and then heating the mixture in the presence of leghemoglobin to provide volatile compounds that “are often associated with the aroma of cooked meat.” *Id.*, [00364]. A POSITA would understand that pea flour contains globulin proteins and albumin proteins from peas and therefore contains one or more plant proteins, *e.g.* pea proteins. *See, e.g.*, EX1067(Meng), 235 (“Like other legume seeds, pea seeds contain high amounts of protein (20–30%). Pea proteins mainly exist as **globulins** (65–80%).”).

142. Brown also discloses that “any of the ... muscle tissue replica[s] ... comprise one or more isolated, purified proteins,” *i.e.* a “protein component.” EX1012, [00299]. Such protein components “can comprise the 8S globulin from Moong bean seeds, or the albumin or globulin fraction of pea seeds,” *i.e.* plant proteins. *Id.*, [00307]. Such proteins could also be derived from “soybeans.” *Id.*, [00300]. A POSITA would therefore understand that Brown teaches the muscle replica from [00364] can further include a bean seed or pea seed protein component.

Ex. 1003, ¶ 142 (annotations added).

In view of the foregoing, Petitioner’s first argument (green) mapped Brown’s proteins in Brown’s “pea flour” to the claimed “providing one or more plant proteins” limitation. However, Petitioner also advanced a second argument (yellow) that this claim limitation was satisfied by Brown’s disclosure that its muscle replicas could include a “protein component” as “one or more *isolated, purified proteins.*” ’241 Petition, 28 (citing Brown, [00299], [00307]); Ex. 1003, ¶ 142 (citing Brown [00299], [00300], [00307]). As examples of such isolated, purified proteins, Petitioner specifically identified 8S globulin from Moong bean seeds, albumins and globulins from pea seeds, or proteins from soybeans. ’241 Petition, 28; Ex. 1003, ¶ 142. Hence, as an alternative to the proteins in pea flour, Petitioner separately mapped the claimed “one or more plant proteins” limitation to isolated, purified proteins obtained from Moong bean seeds, albumins and globulins from pea seeds, or proteins from soybeans.

Moreover, Brown supports Petitioner's contention that all of Brown's muscle replicas, including the muscle replica described at paragraph [00364], may include such isolated, purified proteins. In particular, Brown teaches that "*any* of the ... muscle tissue replica[s] ... comprise one or more isolated, purified proteins." Brown, [00299]. Brown also discloses that such isolated, purified proteins can comprise only a *portion* of the "protein component" present in the muscle replica. *Id.* (identifying various percentages ranging from 0.1% to 99% of isolated, purified plant proteins that make up the protein component present in the muscle replica); *id.*, [00307] (same). Petitioner cited to these specific paragraphs in Brown in support of its arguments. '241 Petition, 28 (citing Brown, [00299], [00307]); Ex. 1003, ¶ 142 (citing Brown, [00299], [00300], [00307]). Hence, Brown supports Petitioner's contention that "[a] POSITA would therefore understand that Brown teaches the muscle replica from [00364] can further include a bean seed or pea seed protein components" (Ex. 1003, ¶ 142) and that such isolated, purified proteins satisfy the claimed "one or more plant proteins" limitation. '241 Petition, 28 ("Brown *also* discloses ... '8S globulin from Moong bean seeds or albumin or globulin fraction of pea seeds,' *i.e., plant proteins.*").

Accordingly, Petitioner's Brown-only ground was not limited to mapping the claimed "providing one or more plant proteins" limitation and "combining, with the one or more plant proteins ... one or more of cysteine, cystine, thiamine, and

methionine” limitation to the same “pea flour.” Instead, Petitioner mapped, in the alternative, the claimed “providing one or more plant proteins” to isolated, purified proteins that are sourced from Moong bean seeds, pea seeds, or soybeans. These isolated, purified proteins are different than the (non-isolated) proteins in “pea flour” that separately supplies (and satisfies) the claimed “one or more of cysteine, cystine, thiamine, and methionine.”³ The Board’s Decision overlooked this argument and did not address it in its Decision.

This argument is highly relevant because it resolves the Board’s concern that the same plant protein relied on for the “one or more plant proteins” limitation is also the sole source for the claimed sulfur-containing amino acids/compounds. Said differently, “[t]his argument does not suffer from the same flaw as Petitioner’s [pea flour only] argument ... because it does not rely on amino acids naturally present in a plant protein to satisfy claim limitations that require the presence of additional amino acid above and beyond that naturally present in the plant protein. Instead, this argument relies on ... a composition that contains a plant protein as well as additional amino acid.” Decision, 13.

The Board has previously granted rehearing and reversed a denial of institution decision in cases like this where the Board overlooked an argument in the

³ PO has taken the position in litigation that the sulfur-containing compound term is not limited to free compounds (*i.e.*, compounds not chemically bound to the structure of another compound). *See* ’241 Petition, 21-22.

Petition. In *Handi Quilter, Inc. v. Tacony Corp.*, the petitioner presented a number of different arguments as to why a POSITA would have combined the teachings of two prior art references to render obvious the challenged claims. IPR2014-00270, Paper 1 (Petition), 48-50. The Board denied institution, finding that the petitioner's expert had failed to persuasively show why a POSITA would have combined the references' teachings. See IPR2014-00270, Paper 17 (Rehearing Decision), 23. The petitioner requested rehearing on the basis that the Board overlooked a *single* sentence in the Petition that argued that one of the prior art references itself, without supporting expert testimony, provided sufficient rationale to combine the references' teachings. *Id.*, 24. The Board granted the petitioner's request due to the overlooked argument and instituted IPR because the overlooked argument (*i.e.*, that the reference itself disclosed a rationale to combine) addressed the Board's concern that the petitioner's expert had failed to proffer a persuasive rationale to combine.

As in *Handi Quilter*, Petitioner presented two different arguments that explained how Brown satisfied the claimed "providing one or more plant proteins" limitation. Respectfully, the Board overlooked the second of those two arguments, which mapped the "providing one or more plant proteins" limitation to isolated, purified proteins that are sourced from Moong bean seeds, pea seeds, or soybeans. Like *Handi Quilter*, the overlooked argument is directly pertinent to the Board's decision not to institute the IPR because it alleviates the Board's concern that the

same plant protein is mapped to both the “providing one or more plant proteins” limitation and the “combining, with the one or more plant proteins ... one or more of cysteine, cystine, thiamine, and methionine” limitation.

In view of the foregoing, Petitioner respectfully requests that the Board consider Petitioner’s alternative argument that Brown teaches meat-like-food products that include “one or more plant proteins” in the form of isolated, purified plant proteins.

B. Remaining Claim Limitations

While the Board did not address the remaining limitations of claims 1 and 22, Petitioner advanced substantively the same arguments for the Brown-only ground for the claimed sugar compound, heme-containing protein, free of animal heme-containing protein/no animal products, and meat-associated aroma limitations in the ’241 patent IPR as it did for the instituted ’096 patent IPR. *Compare* ’096 Petition, 22-23 *with* ’241 Petition, 28-29, 33, 41. Hence, the Board should similarly conclude that Brown discloses those limitations.

Claims 1 and 22 of the ’241 patent additionally include a limitation that specifies the form of the meat-like-food product: “wherein the meat-like food product is in a form selected from the group consisting of a hotdog, a burger, ground meat, a sausage, a steak, a filet, a roast, a meatball, a meatloaf, or bacon.” As explained in the Petition, Brown also discloses this limitation because Brown’s meat

substitute (meat-like-food product) “may be visually similar to or indistinguishable from ground beef or a particular cut of beef.” ’241 Petition, 34; Ex. 1003, ¶¶ 193-94.

Claim 22 does not recite concentration limitations for the heme-containing protein (*e.g.*, at least 60%) or sulfur-containing compounds (*e.g.*, at least 1.5 mM), which are found in claim 1. Hence, the Board need not determine whether Brown discloses these limitations to institute the petition. However, as explained in the Petition, Brown discloses the “at least 60%” heme-containing protein limitation. ’241 Petition, 28-29; Ex. 1003, ¶¶ 147-48. Brown also need not disclose the “at least 1.5 mM” limitation because, as a product-by-process claim, this limitation lacks patentable weight for patentability purposes. ’241 Petition, 19-20, 29; Ex. 1003, ¶¶ 123-31.

IV. CONCLUSION

Petitioner respectfully requests that the Board grant Petitioner’s request for rehearing and institute *inter partes* review of the ’241 patent because Petitioner has shown—as it did for the ’096 patent—that there exists a reasonable likelihood that Brown discloses or renders obvious every limitation of at least one challenged claim of the ’241 patent.

DATED: July 17, 2023

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned hereby certify that Petitioner's Opposition to Patent Owner's Motion Pursuant to § 1.323, and all exhibits and other documents filed together with the Petitioner's Opposition, were served on Patent Owner on July 17, 2023 by e-mailing copies to:

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