

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTIF FOODWORKS, INC.,
Petitioner,

v.

IMPOSSIBLE FOODS INC.,
Patent Owner.

IPR2023-00322
Patent 10,273,492 B2

Before ULRIKE W. JENKS, CHRISTOPHER M. KAISER, and
KIMBERLY McGRAW, *Administrative Patent Judges*.

McGRAW, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Motif Foodworks, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–14 of U.S. Patent No. 10,273,492 B2 (Ex. 1001, “the ’492 patent”). Impossible Foods Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314(b); 37 C.F.R. § 42.4(a). 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 “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

After considering the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail with respect to at least one challenged claim. Accordingly, we do not institute an *inter partes* review of any challenged claim on any asserted ground.

II. BACKGROUND

A. Related Matters

The parties identify *Impossible Foods Inc. v. Motif FoodWorks, Inc.*, No. 22-cv-00311 (D. Del.) and IPR2023-00321, involving U.S. Patent No. 10,689,656 B2, as related matters. Pet. 71; Paper 4 (Patent Owner’s Mandatory Notice), 1–2. Patent Owner also identifies IPR2022-00887 (involving U.S. Patent No. 10,863,761), IPR2023-00206 (involving U.S. Patent No. 9,943,096), IPR2023-00207 (involving U.S. Patent No. 11,224,241), IPR2023-00208 (involving U.S. Patent No. 11,013,250),

IPR2023-00209 (involving U.S. Patent No. 10,039,306), and opposition proceedings in EP2943072 as related matters. Paper 4, 1–2

B. Real Parties-in-Interest

Petitioner identifies its real party in interest as Motif FoodWorks, Inc. Pet. 71. Patent Owner identifies Impossible Foods Inc. as its real party in interest. Paper 4, 1.

C. Overview of the '492 patent

The Summary section of the '492 patent states that it relates to the use of *Pichia pastoris* yeast strains that overexpress the transcriptional activator called methanol expression regulator 1 (“Mxr1” or “Mxr1p”) from an alcohol oxidase 1 (“AOX1”) promoter to increase expression of transgenes that also are expressed from the AOX1 promoter. *See* Ex. 1001, 1:37–40. The Specification explains that expression of the Mxr1 from the AOX1 promoter creates a positive feedback loop that allows for expression of other transgenes from the AOX1 promoter in the absence of methanol when repressing carbon sources are depleted. Thus, expression of Mxr1 results in a significant increase in the amount of protein expressed. Ex. 1001, 1:42–46.

D. The Challenged Claims

Petitioner challenges claims 1–14 of the '492 patent. Pet. 1. Claim 1 is the only independent claim and is reproduced below with bracketing and lettering added for reference convenience:

1. A methylotrophic *Pichia* yeast cell comprising:

[a] a nucleic acid molecule encoding a heme-containing protein operably linked to a promoter element from *P. pastoris* and a Mxr1 transcriptional activator sequence from *P. pastoris*; and

[b] a nucleic acid molecule encoding at least one polypeptide involved in heme biosynthesis operably linked to a promoter element from *P. pastoris* and a Mxr1 transcriptional activator sequence from *P. pastoris*.

Ex. 1001, 77:1–6.

E. Evidence

Petitioner submits evidence including:

Evidence	Exhibit No.
Declaration of Dr. Carl Batt, Ph.D.	1003
Declaration of Dr. Geoffrey P. Lin-Cereghino, Ph.D.	1004
Regulation of <i>Pichia pastoris</i> promoters and its consequences for protein production, New Biotechnology, Vol. 30:4, May 2013 (“Vogl”)	1005
Mxr1p, a Key Regulator of the Methanol Utilization Pathway and Peroxisomal Genes in <i>Pichia pastoris</i> , Molecular and Cellular Biology, Feb. 2006 (“Lin-Cereghino”)	1006
U.S. Patent No. 5,824,511 (Oct. 20, 1998) (“Mattoon”)	1008
U.S. Appl. Pub. No. 2011/0287467 A1 (published Nov. 24, 2011) (“Crane”)	1010
U.S. Appl. Pub. No. 2011/0129874 A1 (published June 2, 2011) (“Tsutsumi”)	1024
Optimizing cofactor availability for the production of recombinant heme peroxidase in <i>Pichia pastoris</i> Microbial Cell Factories 14:4 (2015) (“Krainer”)	1031

F. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §	Reference(s)
1, 4–11	103 ¹	Mattoon and Vogl
2–3, 12–13	103	Mattoon, Vogl, and Crane
14	103	Mattoon, Vogl, and Lin-Cereghino
1–13	103	Crane and Vogl
14	103	Crane, Vogl, and Lin-Cereghino

G. The Prior Art

1. Mattoon (Ex. 1008)

Mattoon is a 1998 U.S. Patent titled “Method for Enhancing the Production of Hemoproteins.” Ex. 1008, (54). Mattoon states that its invention is directed to a method of improving production of hemoproteins in yeast cells. Ex. 1008, 1:5–11. In one disclosed embodiment, yeast cells are transfected with a vector that encodes both a heme-rate limiting enzyme as well as a heme-binding agent. *See* Ex. 1008, 5:34–46.

2. Vogl (Ex. 1005)

Vogl is a 2013 review article titled “Regulation of *Pichia pastoris* promoters and its consequences for protein production.” Ex. 1005, 1.² Vogl discusses “Classic *P. pastoris* promoters” including the methanol-inducible

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. The earliest claimed priority date for the ’492 patent is after the effective date of the applicable AIA amendment. *See* Ex. 1001, (60). Thus, we refer to the AIA version of 35 U.S.C. § 103.

² This Decision refers to the page number of the Exhibit added by Petitioner in the lower right hand corner of the page.

AOX1 promoter and the constitutive³ GAP promoter (Ex. 1005, 1–8), and “[a]lternative promoters” including the methanol-inducible DAS promoter (Ex. 1005, 8–11).

3. *Lin-Cereghino (Ex. 1006)*

Lin-Cereghino is a 2006 article titled “Mxr1p, a Key Regulator of the Methanol Utilization Pathway and Peroxisomal Genes in *Pichia pastoris*.” Ex. 1006, 1. The article identifies genes required for the expression of AOX1, including the gene encoding Mxr1. Ex. 1006, 1. Lin-Cereghino concludes that Mxr1 is a transcription factor that is necessary for the activation of a number of genes whose products are involved in the metabolism of methanol by *P. pastoris*. *Id.* Lin-Cereghino describes *P. pastoris* strains with Mxrp under the control of methanol-inducible promoters P_{AOX1} or P_{PEX8}. *Id.* at 11 (stating a strain produced with Mxr1p under control of “the strong methanol-regulated AOX1 promoter” did not grown on methanol and did not induce Mxr1p in response to methanol but that a strain expressing Mxr1 under control of the less strongly methanol regulated P_{PEX8} gene was able to grow on methanol).

4. *Crane (Ex. 1010)*

Crane is a 2011 U.S. Patent Publication that discloses methods of producing recombinant heme-binding proteins. Ex. 1010, (54). In one disclosed embodiment, yeast cells are transfected with a vector that encodes both a recombinant heme-binding protein and recombinant ferro-chelataase. *See* Ex. 1010 ¶¶ 34, 35, 74.

³ Petitioner explains that promoters can be either “constitutive” (active regardless of external stimuli) or “inducible” (more or less active in response to external stimuli, such as a chemical (e.g., methanol)). *See* Pet. 7.

III. ANALYSIS

A. Claim Construction

Neither party proposes express constructions for any claim terms in this proceeding. *See generally* Pet.; Prelim. Resp. 2. For purposes of this Decision, we determine that no claim terms need to be construed to resolve any controversies in dispute. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (stating only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy).

B. Level of Skill in the Art

Petitioner asserts that a person of ordinary level of skill in the art (“POSITA”) would have at least a Bachelor of Science in biochemistry, chemistry, biological sciences, or an equivalent area of study and at least three years of graduate study or professional experience with recombinant techniques for protein production or general genetic modification experience. Pet. 26–27 (citing Ex. 1003 ¶ 35; Ex. 1004 ¶ 29). Patent Owner does not dispute Petitioner’s definition.

We adopt Petitioner’s definition of a POSITA, except that we delete the qualifier “at least” to eliminate vagueness as to the appropriate level of education or experience. The qualifier expands the range without an upper bound (e.g., encompassing a Ph.D. degree and beyond) and thus does not meaningfully indicate the level of ordinary skill in the art. This definition of a person of ordinary skill in the art is supported by the testimony of Dr. Batt and Dr. Lin-Cereghino and appears to be commensurate with the level of ordinary skill as reflected in the prior art and the ’492 patent. *See* Ex. 1003 ¶ 35; Ex. 1004 ¶ 29.

C. Asserted Unpatentability of Claims 1 and 4–11 over Mattoon and Vogl (Ground 1A)

Petitioner contends that independent claim 1 and dependent claims 4–11 are unpatentable under 35 U.S.C. § 103 over Mattoon and Vogl. Pet. 27–45. For the reasons set forth below, we determine Petitioner has not shown a reasonable likelihood that any of the challenged claims are unpatentable under Ground 1A.

1. Claim 1

[a] a nucleic acid molecule encoding a heme-containing protein operably linked to a promoter element from *P. pastoris* and a Mxr1 transcriptional activator sequence from *P. pastoris*

Claim element 1[a] requires the claimed yeast cell to comprise a nucleic acid molecule that encodes both “a heme-containing protein operably linked to a promoter element from *P. pastoris*” (i.e., the “first nucleic acid”) as well as “a Mxr1 transcriptional activator sequence from *P. pastoris*” (i.e., the “second nucleic acid”).

Petitioner relies on Mattoon as well as Mattoon and Vogl as teaching the first nucleic acid of claim element 1[a]. Petitioner asserts that Mattoon teaches the first nucleic acid (i.e., “a nucleic acid molecule encoding a heme-containing protein operably linked to a promoter element from *P. pastoris*”) because Mattoon discloses (1) transforming yeast cells with pCTT1, a plasmid comprising CTT1, the gene encoding catalase T, a cytoplasmic hemoprotein, to produce catalase T as well as (2) inducible or constitutive promoters operatively linked to the nucleic acid sequences of interest to transform *P. pastoris* host cells. Pet. 28–29 (citing Ex. 1008, 7:37–41, 7:56–8:10, Figs. 6–7; Ex. 1003 ¶ 124); *see also* Ex. 1003 ¶ 127 (stating that a POSITA would have understood that “the expression levels of the genes

encoding proteins of interest can be under the control of a promoter using the preferable *P. pastoris* host cell”); *see also* Pet. 29 (stating Mattoon discloses that the vectors used to transform *P. pastoris* yeast cells are “controllable by inducible or constitutive ***promoters***” that are “***operatively linked***” to the nucleic acid sequences encoding proteins-of-interest and citing Ex. 1008, 2:41–44, 5:4–10, 5:46–59, 6:9–63).

Petitioner also relies on Vogl’s teachings of particular promoters and asserts that a POSITA would have combined Mattoon with Vogl to “select suitable promoters” to control the expression of the nucleic acid encoding hemoprotein in *P. pastoris* and would have had a reasonable expectation of success in doing so using Vogl’s teachings, routine techniques, and available materials.” Pet. 31 (citing Ex. 1003 ¶¶ 133–139). For example, Petitioner points to Vogl’s teaching that “strong constitutive promoters such as P_{TEF1} and P_{GAP}, or strong methanol-inducible promoters such as P_{AOX1} and P_{DAS} have been used to provide high levels of protein expression.” Pet. 31 (citing Ex. 1005, 8–11). Petitioner further asserts that a POSITA would have been motivated to select promoters such as P_{AOX1} and P_{GAP} to control the expression of a nucleic acid encoding hemoprotein and have a reasonable expectation of success because “both Mattoon and Vogl provide numerous examples of using promoters such as P_{AOX1} and P_{GAP} to regulate the expression of recombinant proteins.” Pet. 32 (citing Ex. 1003 ¶ 139; Ex. 1008, 5:60–62 (stating “high yield promoters” can be used)).

Petitioner admits that Mattoon does not expressly disclose the second nucleic acid (i.e., “Mxr1 transcriptional activator sequences from *P. pastoris*”) recited in claim element 1[a], but asserts that Vogl teaches this claim limitation. Pet. 30 (citing Ex. 1005, 6–7; Ex. 1003 ¶¶ 128–132).

Petitioner asserts a POSITA would have combined Mattoon and Vogl to engineer a nucleic acid molecule encoding both a heme-containing protein operably linked to a promoter element from *P. pastoris* and a Mxr1 transcriptional activator sequence from *P. Pastoris*. Pet. 30 (citing Ex. 1003 ¶ 128). Petitioner further asserts that a POSITA would have been motivated to express Mxr1p under P_{GAP} to regulate P_{AOX1} controlled expression of hemoprotein and would have had a reasonable expectation of success in doing so using Vogl's teachings, routine techniques, and readily available, well known materials. Pet. 33 (citing Ex. 1003 ¶¶ 137–139; Pet. § V.A.).

To support this argument, Petitioner points to Vogl's review of "commonly used *P. pastoris* constitutive and methanol inducible promoters, regulation of inducible promoters by known transcriptional activator Mxr1p" (Pet. 30) as well as Vogl's teaching that Mxr1p is a "key regulator of methanol inducible genes," was "the only well-characterized transcriptional activator of methanol-inducible promoters from *P. pastoris*" (Pet. 32). Petitioner also relies on Vogl's teaching that Mxr1 is "crucial for the activation of numerous genes involved in MUT [methanol utilization pathway]." Pet. 32. Additionally, Petitioner relies on Vogl's discussion of "studies, such as Takagi" in which Mxr1 was expressed under the strong constitutive promoter P_{GAP}, resulting in improved protein production as compared to the non MXr1 expressing strain. Pet. 33 (citing Ex. 1005, 11; Ex. 1003 ¶ 133; Ex. 1004 ¶¶ 47–48, 51).

Petitioner thus concludes that:

a POSITA would have been motivated to (1) select a promoter from *P. pastoris* such as P_{AOX1} to control the expression of a heme-containing protein, thus providing "***a nucleic acid molecule encoding a heme-containing protein operably linked to a promoter element from P. pastoris***," and (2) include in the

same nucleic acid molecule “*a Mxr1 transcriptional activator sequence from P. pastoris*” that is expressed under the control of a promoter, such as P_{GAP}, where the expressed Mxr1p further regulates a methanol-inducible promoter such as P_{AOX1} in *P. pastoris*, including any methanol-inducible promoter that drives the expression of heme-containing protein.

Pet. 33–34 (citing Ex. 1003 ¶¶ 137–139; Ex. 1004 ¶¶ 76–79; Ex. 1005, 11; Ex. 1008, 5:43–46. Petitioner further asserts that a POSITA would have had a reasonable expectation of success following the well-known techniques disclosed in these prior studies to construct similar *P. pastoris* expression systems. Pet. 34 (citing Ex. 1003 ¶ 139; Ex 1004 ¶¶ 76–86).

a) Analysis

Petitioner’s arguments are not persuasive. Petitioner has not sufficiently shown *why* a POSITA would have been motivated to produce a nucleic acid that encodes both (1) a heme-containing protein operably linked to a promoter element as well as (2) a Mxr1 transcriptional activator sequence as required by claim element 1[a] with a reasonable expectation of success.

Petitioner ultimately asserts that a POSITA would have modified Mattoon’s nucleic acid encoding the heme-containing protein CTT1 by (1) placing the CTT1 gene under the control of a methanol-inducible promoter P_{AOX1}, which is regulated by Mxr1, and (2) including the nucleic acid sequence encoding Mxr1 under control of the promoter element P_{GAP} to regulate P_{AOX1} controlled expression of the hemoprotein to arrive at the nucleic acid recited in claim element 1[a]. *See* Pet. 33–34, 37.

The record before us does not support Petitioner’s contention that a POSITA would have been motivated to make such a modification or that a

POSITA would have had a reasonable expectation of success in making the modification.

First, Petitioner does not sufficiently show that a POSITA would have been motivated to select, among the many options for promoters, a methanol-inducible promoter that is regulated by Mxr1, such as P_{AOX1}, to control expression of the CTT1 hemoprotein. Contrary to Petitioner's assertions, Mattoon does not specifically identify the use of P_{AOX1} or of any other methanol-inducible promoter. *See* Pet. 32 (stating a POSITA would have had a reasonable expectation of success in selecting a promoter such as P_{AOX1} and P_{GAP} "because both Mattoon and Vogl provide numerous examples of using promoters such as P_{AOX1} and P_{GAP} to regulate the expression of recombinant proteins" in *P. pastoris* systems).

Petitioner also points to teachings in Vogl that P_{AOX1} has been used in *P. pastoris* systems to provide high levels of protein expression. *See, e.g.*, Pet. 31 (citing Ex. 1005, 8–11); *see also* Pet. 4–11 (discussing the background technology of recombinant DNA and *P. pastoris* gene expression systems, and promoters and transcriptional activators). Petitioner also asserts that Vogl teaches P_{AOX1} is a commonly used promoter for heterologous protein expression in *P. pastoris*, and that a POSITA would have been motivated to select P_{AOX1} to control expression of nucleic acid encoding hemoprotein in *P. pastoris*. Pet. 31–32.

Petitioner, however, does not sufficiently show that a POSITA would have understood such general teachings regarding the use of P_{AOX1} to express certain proteins would apply to the expression of the hemoprotein recited in claim element 1[a] or the CTT1 protein of Mattoon, with a reasonable expectation of success. Indeed, Vogl itself expressly states that

“strong expression from P_{AXO1} . . . is not always the most favorable condition for heterologous protein production.” Ex. 1005, 8; *see also id.* at 12 (stating that “the combination of promoter and protein of interest can have a strong influence on the expression levels”). Petitioner has not shown that substituting promoter elements in *P. pastoris* yeast systems to express polypeptides under the control of P_{AOX1} was a matter of simple substitution with predictable results. Petitioner fails to persuasively explain how a POSITA, looking at Vogl’s discussion of prior studies using promoters and transcription factors from *P. pastoris*, would have a reasonable expectation of success in producing a *Pichia* yeast cell comprising the nucleic acid molecule recited in claim element 1[a].

Second, claim element 1[a] further requires that the nucleic acid molecule also contain a Mxr1 transcriptional activator sequence. Petitioner relies on Vogl’s teaching that Mxr1 is a “key regulator” of methanol-inducible genes, that Mxr1 is “crucial for the activation” of genes involve the methanol utilization pathway, and that Takagi’s studies, reported in Vogl, teach that Mxr1p expressed under a strong constitutive promoter P_{GAP} resulted in improved production of recombinant protein. Pet. 32–33 (citing *inter alia* (citing Ex. 1005, 7; Ex. 1003 ¶ 133; Ex. 1004 ¶¶ 47–48, 51).

Petitioner has not sufficiently shown that a POSITA, looking at Vogl’s disclosures regarding the use of Mxr1 in *P. pastoris*, would have been motivated to incorporate the nucleic acid sequence encoding a Mxr1 transcriptional activator into a nucleic acid molecule encoding a heme-containing protein operably linked to a promoter element from *P. pastoris* with a reasonable expectation of success.

Notably, neither Petitioner nor Petitioner's declarant persuasively show that the choice of promoters for driving gene expression in yeast cells or the use of Mxr1 to regulate the PAOX1-controlled gene expression was a matter of simple substitution with predicable results. Vogl expressly states that "strong expression from P_{AXO1} . . . is not always the most favorable condition for heterologous protein production." Ex. 1005, 8; *see also id.* at 12 (stating that "the combination of promoter and protein of interest can have a strong influence on the expression levels"). Petitioner cites to Vogl's discussion of successful results reported in Takagi. *See* Pet. 33. However, Vogl itself notes that Takagi's successful results were inconsistent with results obtained in a different study by Lin-Cereghino (Ex. 1006) which showed that yeast strains expressing Mxr1p under a strong promoter, i.e., P_{AOX1}, did not grow on methanol and that further investigation is required to clarify the mechanisms of Mxr1p. Ex. 1005, 7 (stating that the finding by Takagi and Lin-Cereghino "are not entirely consistent and would require further investigation to clarify the activating mechanism of Mxr1p").

Petitioner cites to Dr. Lin-Cereghino's⁴ testimony stating that this teaching would not deter a POSITA from "attempting to improve heterologous protein expression in *P. pastoris* by overexpressing Mxr1p under strong promoters" such as P_{AOX1}. Ex. 1004 ¶ 41 (cited, *inter alia*, at Pet. 17–18). Dr. Lin-Cereghino further testifies that a POSITA would recognize that "further investigation would be needed" to determine the reason why a strain expressing Mxr1 under control of the P_{AOX1} promoter did not grow and provides examples of other studies that were able to express

⁴ Dr. Lin-Cereghino is the named author of the Lin-Cereghino reference (Ex. 1006). *See* Ex. 1004 ¶ 33.

Mxr1 under control of other strong (albeit constitutive) promoters. Ex. 1004 ¶¶ 37–41.

Dr. Lin-Cereghino’s testimony does not establish that a POSITA would have had a reasonable expectation of success of expressing Mxr1p under a strong promoter, such as P_{GAP}. At best, it shows that a POSITA would have had a reason to investigate and to try the use of different promoters to control the expression of Mxr1. However, attempting to try is not the standard when determining obviousness. Indeed, the very art cited by Petitioner shows that transcription pathways in *P. pastoris* was not well understood. See, e.g., Ex. 1005, 17 (discussing transcription in *P. pastoris* and stating that the “majority of molecular mechanisms investigated up to now, are still art from being completely understood”); *id.* at 7 (stating data of various authors was “not entirely consistent and would require further investigation to clarify the activating mechanism of Mxr1p”).

Nor are we persuaded by Petitioner’s argument, made in connection with claim 14⁵, that a POSITA would have found it obvious to grow cells to a high density and only then express the genes under control of the methanol-induced promoter. See Pet. 52 (citing Ex. 1003 ¶ 203; Ex. 1004 ¶¶ 69–72). Petitioner provides no persuasive analysis as to why such general teachings would be applicable to the particular combination of genes and promoters recited in claim 1. Rather, from the record before us, it

⁵ Claim 14 depends from claim 1 and recites “further comprising a nucleic acid molecule encoding a Mxr1 transcriptional activator operably linked to a promoter element from *P. pastoris* and Mxr1 transcriptional activator sequence from *P. pastoris*. To the extent Petitioner’s arguments regarding claim 14 could arguably be used to establish unpatentability of claim 1, we address these arguments here.

appears that is only with the benefit of hindsight that a person of skill in the art would have had a reasonable expectation of success in modifying the art as asserted by Petitioner.

Thus, for the foregoing reasons, Petitioner does not show that the combination of Mattoon and Vogel teaches or suggests a nucleic acid encoding a heme-containing protein operably linked to a promoter element from *P. pastoris* and a Mxr1 transcriptional activator sequence from *P. pastoris* as required by claim element 1[a]. Thus, Petitioner does not establish a reasonable likelihood of prevailing that claim 1 would have been obvious over Mattoon and Vogl.

2. *Claims 4–11*

Petitioner presents no persuasive arguments or evidence with respect to dependent claims 4–11 that would remedy the defects noted above with respect to independent claim 1. *See* Pet. 38–44. Thus, Petitioner has failed to demonstrate a likelihood that the subject matter of claims 4–11 would have been obvious over the combination of Mattoon and Vogl.

D. Asserted Unpatentability of Claims 2–3 and 12–13 over Mattoon, Vogl, and Crane (Ground 1B) and of Claim 14 over Mattoon, Vogl, and Lin-Cereghino (Ground 1C)

Petitioner contends that dependent claims 2–3 and 12–13 are unpatentable over Mattoon, Vogl, and Crane (Ground 1B) and that claim 14 is unpatentable over Mattoon, Vogl, and Lin-Cereghino (Ground 1C). *See* Pet. 45–54. Each of these challenged claims depend upon claim 1. Petitioner’s arguments regarding these dependent claims do not remedy the deficiencies regarding independent claim 1 set forth above. Accordingly, Petitioner does not show a reasonable likelihood of prevailing on either Ground 1B or 1C.

E. Asserted Unpatentability of Claims 1–13 over Crane and Vogl (Ground 2A)

Petitioner contends that independent claim 1 and dependent claims 2–13 are unpatentable under 35 U.S.C. § 103 over Crane and Vogl. Pet. 54–68. For the reasons set forth below, we determine Petitioner has not shown a reasonable likelihood that any challenged claims are unpatentable under Ground 2A.

1. Claim 1

Petitioner's obviousness analysis for Ground 2A largely follows the same analysis with respect to Ground 1, except Mattoon is replaced with Crane. *See, e.g.*, Pet. 54. Petitioner asserts that Crane discloses every limitation of claim 1 except a Mxr1 transcriptional activator sequence from *P. pastoris*, which Petitioner asserts is taught by Vogl. Pet. 54. Petitioner's arguments as to why a POSITA would have modified the teachings of Crane to select a methanol-inducible promoter, such as P_{AOX1} to control the expression of a heme-binding protein and a polypeptide involved in heme biosynthesis, and further would select Mxr1, expressed using P_{GAP} to regulate P_{AOX1}, are largely the same as that asserted in Ground 1A. Petitioner's arguments set forth in connection with Ground 2A are not persuasive for the same reasons set forth above.

For at least this reason, Petitioner has not shown a reasonable likelihood that claim 1, or the claims that depend therefrom, would have been obvious over Crane and Vogl.

F. Asserted Unpatentability of Claim 14 over Crane, Vogl, and Lin-Cereghino (Ground 2B)

Petitioner contends that claim 14, which depends from claim 1, is unpatentable under 35 U.S.C. § 103 as obvious over Crane, Vogl, and Lin-

Cereghino. Pet. 68–69. Petitioner’s contentions do not cure the deficiency noted above with respect to independent claim 1. Therefore, for the same reasons discussed above, we determine that the information presented in the Petition fails to establish a reasonable likelihood that Petitioner would prevail in showing that dependent claim 14 is unpatentable over Crane, Vogl, and Lin-Cereghino.

G. Discretion under 35 U.S.C. § 325(d)

Patent Owner requests that the Board exercise its discretion under 35 U.S.C. § 325(d) to deny institution because the same or substantially the same prior art or arguments were previously presented to the Office. Prelim. Resp. 22. Because we deny institution on the merits, we do not reach Patent Owner’s § 325(d) argument.

IV. CONCLUSION

For the reasons set forth above, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one challenged claim of the ’492 patent. Accordingly, we do not institute an *inter partes* review on any challenged claims.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to all challenged claims and no trial is instituted.

IPR2023-00322
Patent 10,273,492 B2

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