

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INARI AGRICULTURE, INC.,
Petitioner,

v.

PIONEER HI-BRED INTERNATIONAL, INC.,
Patent Owner.

PGR2024-00025
Patent 11,707,033 B1

Before ULRIKE W. JENKS, ZHENYU YANG, and JEFFREY W.
ABRAHAM, *Administrative Patent Judges*.

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DECISION
Denying Institution of Post-Grant Review
35 U.S.C. § 324

I. INTRODUCTION

Inari Agriculture, Inc. (“Petitioner”) filed a Petition requesting a post-grant review of claims 1–20 (“the challenged claims”) of U.S. Patent No. 11,707,033 B1 (Ex. 1001, “the ’033 patent”). Paper 2 (“Pet.”). Pioneer Hi-Bred International, Inc. (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 12 (“Prelim. Resp.”). In addition, after receiving authorization from the Board (*see* Ex. 3001), Petitioner filed a Reply to Patent Owner’s Preliminary Response (“Reply”), Paper 13) and Patent Owner filed a Sur-reply (“Sur-reply”), Paper 14).

Institution of a post-grant review is authorized by statute when “the information presented in the petition filed under [35 U.S.C. §] 321 . . . demonstrates that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable.” 35 U.S.C. § 324(a). For the reasons set forth below, we determine that Petitioner has failed to demonstrate that it is more likely than not that at least one of claims 1–20 of the ’033 patent is unpatentable. Accordingly, we deny institution of a post-grant review of claims 1–20 based on the grounds set forth in the Petition.

A. Real Parties-in-Interest

Petitioner identifies itself, Inari Agriculture, Inc., as the real party-in-interest. Pet. 92. Patent Owner identifies itself, Pioneer Hi-Bred International, Inc., as the real party-in-interest. Paper 3, 1.

B. Related Matters

The parties identify no related matters for the ’033 patent, filed as U.S. Patent Application No. 17/366,121 (the ’121 application). Pet. 93; Paper 3, 1. According to Petitioner, “[n]o U.S. patent applications claim the benefit of the priority of the filing date of” the ’033 patent. Pet. 93. Patent Owner states that the ’121 application “does not claim priority to any other

patent applications or have any applications claiming priority to it.” Paper 3,

1. Patent Owner further states that the ’033 patent “is not involved in any related litigation matters.” Paper 4, 1.

C. The ’033 patent (Ex. 1001)

The ’033 patent is titled “Maize Inbred 1PNZQ23.” Ex. 1001, code (54). The ’033 patent discloses “[a] new and distinctive maize inbred variety designated 1PNZQ23, which has been the result of years of careful breeding and selection in a comprehensive maize breeding program.” Ex. 1001, 4:41–44.

The ’033 patent discloses that “[t]he breeder’s goal is to combine in a single variety or hybrid, various desirable traits.” Ex. 1001, 1:11–12. In developing a desirable maize variety for field crops, such desirable “traits may include resistance to diseases and insects, resistance to heat and drought, reducing the time to crop maturity, greater yield, altered fatty acid profile, abiotic stress tolerance, improvements in compositional traits, and better agronomic characteristics and quality.” Ex. 1001, 1:12–17. The ’033 patent seeks to “develop stable, high yielding maize varieties and hybrids that are agronomically sound with maximal yield over one or more different conditions and environments.” Ex. 1001, 1:24–26.

The ’033 patent describes that the maize inbred variety designated 1PNZQ23 “originated from a cross between inbred line PH1VKM and inbred line PH2DYM.” Ex. 1001, 37:63–64. First generation or F1 ears were then “selected based on genetic analysis predicting disease, insect, and agronomic phenotypic performance.” Ex. 1001, 37:64–66. The ’033 patent describes that “a doubled haploid” was produced “from the F1 plants, selfing and using pedigree selection amongst the D1 lines, and selfing and bulking from the subsequent generations.” Ex. 1001, 37:67–38:3. A deposit “of at

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least 625 seeds of Maize Variety 1PNZQ23” was made “with the Provasoli-Guillard National Center for Marine Algae and Micro biota (NCMA) . . . with NCMA Accession Number 202301024.” Ex. 1001, 37:32–36.

The inbred maize variety 1PNZQ23 “may be used as a male or female in the production of the first generation F1 hybrid” with demonstrated phenotypic “uniformity and stability within the limits of environmental influence for all the traits as described in the Variety Description Information” listed in Table 1. Ex. 1001, 15:2–6. According to the ’033 patent, “[t]he variety has been self-pollinated and ear-rowed a sufficient number of generations with careful attention paid to uniformity of plant type to ensure sufficient homozygosity and phenotypic stability for use in commercial hybrid seed production.” Ex. 1001, 15:7–11.

The ’033 patent also discloses that “1PNZQ23 is substantially homozygous. This homozygosity can be characterized at the loci shown in a marker profile. An F1 hybrid made with 1PNZQ23 would substantially comprise the marker profile of 1PNZQ23.” Ex. 1001, 15:19–22. According to the ’033 patent, “[m]aize variety 1PNZQ23, being substantially homozygous, can be reproduced by planting seeds of the variety, growing the resulting maize plants under self-pollinating or sib-pollinating conditions with adequate isolation, and harvesting the resulting seed using techniques familiar to the agricultural arts.” Ex. 1001, 38:4–9.

D. Illustrative Claim

Independent claim 1 of the ’033 patent is illustrative and is reproduced below.

1. A seed, plant, plant part, or plant cell of inbred maize variety 1PNZQ23, representative seed of the variety having been deposited under NCMA accession number 202301024.

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Ex. 1001, 39:32–34.

E. Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1–20 of the '033 patent on the following grounds:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–20	103	Ross ¹ , Carlone ²
1–20	103	Heffner ³
1–20	101	Lack of Utility
1–20	112(b)	Indefiniteness
1–20	324(b), 112(b)	Novel or unsettled legal question, Indefiniteness
1–20	324(b), 112(b)	Novel or unsettled legal question, Indefiniteness

Pet. 12–13. Petitioner also relies on the Declaration of Raymond D. Riley, Ph.D. (Ex. 1003) to support its assertions. Patent Owner relies on the Declarations of Patrick S. Schnable, Ph.D. (Ex. 2004) and Jason Wheeler (Ex. 2028).

F. Eligibility for Post-Grant Review

The AIA’s post-grant review provisions apply to patents that “contain[] or contained at any time . . . a claim to a claimed invention that has an effective filing date . . . that is on or after [March 16, 2013].” Leahy-Smith America Invents Act (AIA) §§ 3(n)(1), 6(f)(2)(A) (2011). In addition, “[a] petition for a post-grant review may only be filed not later than the date that is 9 months after the date of the grant of the patent or of the issuance of a reissue patent (as the case may be).” 35 U.S.C. § 321(c) (2012); *see* 37 C.F.R. § 42.202(a) (2019).

¹ Ross, US 9,572,319 B1, issued Feb. 21, 2017 (Ex. 1005).

² Carlone, Jr., US 9,706,732 B1, issued July 18, 2017 (Ex. 1006).

³ Heffner, US 10,653,095 B1, issued May 19, 2020 (Ex. 1007).

Here, there is no dispute that the '033 patent is eligible for post-grant review. Petitioner filed the Petition within nine months of the '033 patent's issue date and the effective filing date of the '033 patent is after March 16, 2013 (the effective date for the first inventor to file provisions of the Leahy-Smith America Invents Act). Ex. 1001, code (45) (showing an issue date of July 25, 2023), code (22) (showing a filing date of July 2, 2021); Pet. 12 (explaining that the '033 patent “does not assert an effective filing date earlier than the '121 Application's actual [July 2, 2021] filing date.”); Paper 5 (according the Petition a filing date of April 25, 2024).

II. ANALYSIS

A. Person of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art “had a high level of skill, with a doctoral degree in plant breeding or a related field, at least five years of experience with corn breeding, and additional experience interfacing with laboratory-side personnel (including a computational biologist along with genetics specialists) and field-side personnel.” Pet. 15 (citing Ex. 1003 ¶¶ 19–22, 44–45). Petitioner also states that, “[a]lternatively, additional experience could take the place of an advanced degree.” Pet. 15.

Patent Owner states that it “does not dispute Petitioner's definition of the qualifications of person of skill in the art” and “reserves its right to challenge Petitioner's definition and to provide its own definition, should trial be instituted.” Prelim. Resp. 25.

Petitioner's unopposed proposed definition is consistent with the cited prior art and the disclosure of the '033 patent, and we adopt it for purposes of this Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that the prior art itself may “reflect[] an appropriate level”

of ordinary skill in the art) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

B. Claim Construction

In this post-grant review, we construe the claims of the '033 patent “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R.

§ 42.200(b) (2019). Under that standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Petitioner does not offer a specific construction for any claim terms. Pet. 19–20. Rather, Petitioner contends that “the outer boundary of the Challenged Claims lacks reasonable certainty,” and, therefore, “the Challenged Claims are unpatentable as indefinite under § 112(b).” Pet. 20. Petitioner further contends that the challenged claims are unpatentable as obvious “regardless of the outer boundary of the claims.” Pet. 21.

Patent Owner disagrees with Petitioner’s arguments regarding indefiniteness, and does not construe any claim terms. *See generally* Prelim. Resp.

As explained in detail below, based on the record before us, we are not persuaded by Petitioner’s indefiniteness arguments, and determine that none of the claim terms require an explicit construction to determine whether to institute post-grant review. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary

to resolve the controversy.” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Claims 1–20: Alleged Obviousness over Ross (Ex. 1005) and Carlone (Ex. 1006)

Petitioner contends claims 1–20 are unpatentable as obvious in view of Ross and Carlone. *See* Pet. 40–53. Patent Owner opposes. Prelim. Resp. 47–53. After reviewing the parties’ arguments and supporting evidence with respect to claims 1–20, we determine that Petitioner has not shown it is more likely than not that claims 1–20 would have been obvious in view of Ross and Carlone. We begin with a review of the relevant references and then address the parties’ contentions.

1. Prior Art

a) Overview of Ross (Ex. 1005)

Ross, U.S. Patent No. 9,572,319 B1, is assigned to Pioneer Hi-Bred International, Inc. and titled “Maize Inbred PH1VKM.” Ex. 1005, codes (54), (73). Ross describes that inbred maize variety PH1VKM was developed by crossing “inbred line PH12PO and inbred line PHPCW,” selfing the resulting F1 plants and “using ear-to-row (pedigree) selection from the F2 to F11 generation, and bulking the F12 seed.” Ex. 1005, 18:57–61. The inbred line is “substantially homozygous.” Ex. 1005, 18:62–63. A deposit “of at least 2,500 seeds of Maize Variety PH1VKM” was made “with the American Type Culture Collection (ATCC) . . . with ATCC Deposit No. PTA-123680.” Ex. 1005, 43:14–18.

Ross’s Table 1 contains a description of some of the variety’s phenotypic characteristics. Ex. 1005, 43:43–45:21. Ross’s Table 2 contains a “general combining ability report” (Ex. 1005, 23:33, 45:23–52), and Table

3 “compare[s] a specific hybrid for which PH1VKM is a parent with other hybrids” (Ex. 1005, 23:50–51, 45:54–46:39).

b) Overview of Carlone (Ex. 1006)

Carlone, U.S. Patent No. 9,706,732 B1, is assigned to Pioneer Hi-Bred International, Inc. and titled “Maize Inbred PH2DYM.” Ex. 1006, codes (54), (73). Carlone discloses that inbred line PH2DYM was the product of a “cross . . . made between inbred line PHVNV and inbred line PHPCW.” Ex. 1006, 18:48–49. Carlone describes that inbred maize variety “PH2DYM was developed by producing a doubled haploid from the F1 plants, selfing and using pedigree selection amongst the D1 lines, and selfing and bulking from the subsequent generations.” Ex. 1006, 18:49–53. The inbred line is “substantially homozygous.” Ex. 1006, 18:54–55. A deposit “of at least 2,500 seeds of Maize Variety PH2DYM” was made “with the American Type Culture Collection (ATCC) . . . with ATCC Deposit No. PTA-124094.” Ex. 1006, 43:16–20.

Carlone’s Table 1 contains a description of some of the variety’s phenotypic characteristics. Ex. 1006, 43:35–45:66. Carlone’s Table 2 contains a “general combining ability report” (Ex. 1006, 23:23–24, 46:1–30), and Table 3 “compare[s] a specific hybrid for which PH2DYM is a parent with other hybrids” (Ex. 1006, 23:40–41, 46:34–48:21).

2. Petitioner’s Contentions

Petitioner contends that the ’033 patent discloses that 1PNZQ23 originated from a cross between PH1VKM and PH2DYM, and that Ross discloses PH1VKM and Carlone discloses PH2DYM, i.e., the two parent varieties of 1PNZQ23. Pet. 40. Petitioner further contends that “Ross and Carlone disclose that each of PH1VKM and PH2DYM can be used ‘to Develop another Maize Plant’ and in particular is a ‘source of breeding

material that may be used to develop new maize inbred varieties.” Pet. 40 (quoting and citing Ex. 1005, 36:63–37:1; Ex. 1006, 36:58–63). In addition, Petitioner contends that Ross and Carlone each “discloses specific cross breeding techniques for producing such ‘new inbred’ varieties.” Pet. 40 (citing Ex. 1005, 5:54–60; Ex. 1006, 5:57–63; Ex. 1003 ¶¶ 64–66, 94–97).

Petitioner contends that PH1VKM and PH2DYM had repeatedly been used as one of the parents for other maize varieties, and a person of ordinary skill in the art would have looked to use PH1VKM and PH2DYM as a starting point to create other inbred lines because of a “desire to enhance commercial opportunities.” Pet. 40–41 (quoting *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006)). Additionally, Petitioner contends a person of ordinary skill in the art would have had a reasonable expectation of success “of obtaining an inbred maize variety with PH1VKM and PH2DYM as parents.” Pet. 41 (citing Ex. 1003 ¶ 100).

According to Petitioner, “1PNZQ23’s disclosed characteristics are highly similar to those in the PH1VKM and PH2DYM parents, and nothing in the specification or otherwise in the record suggests any property that [persons of ordinary skill in the art] would have viewed as surprising or unexpected over PH1VKM and PH2DYM.” Pet. 42. Petitioner urges us to follow the reasoning set out in *Ex parte C*, where the Board affirmed an obviousness rejection, because “the record does ‘not explain the significance of any differences in attributes between the novel variety and varieties that are old in the art.’” Pet. 42 (quoting *Ex parte C*, 27 USPQ2d 1492, 1493 (BPAI 1992)).

3. *Patent Owner's Contentions*

Patent Owner argues that Petitioner's obviousness arguments are deficient because Petitioner fails to assess what is actually claimed. Prelim. Resp. 32–33. Patent Owner emphasizes that the claims of the '033 patent are directed to “inbred maize variety 1PNZQ23, representative seed of the variety having been deposited under NCMA accession number 202301024.” Prelim. Resp. 39; *see, e.g.*, Ex. 1001, Claim 1. According to Patent Owner, however, Petitioner's obviousness arguments are directed to whether “it would have been obvious to make *a hypothetical maize inbred* with similar phenotypical characteristics to those described in Table 1 of the '033 Patent” instead of “whether it would have been obvious to obtain *the maize inbred variety 1PNZQ23* based on the asserted prior art.” Prelim. Resp. 39–40.

Patent Owner also contends that the seed deposit not only describes the phenotype but also the genotype of the claimed inbred maize. Prelim. Resp. 41–42. Patent Owner argues that “Petitioner ignores the full scope of the Challenged Claims by not accounting for 1PNZQ23's unique genetic composition and its obviousness analysis necessarily fails as a result.” Prelim. Resp. 42; *see also* Prelim. Resp. 44 (noting that “Petitioner, in challenging the validity of the patent, could have performed a genetic analysis comparing 1PNZQ23's genome to those of the asserted prior art varieties to truly understand the differences between them and whether it was even possible for a [person of ordinary skill in the art] to modify those references to arrive at 1PNZQ23.”). Patent Owner contends that Petitioner relies strictly on phenotypic characteristics in asserting that the combination of Ross and Carlone renders 1PNZQ23 obvious. Prelim. Resp. 50.

Patent Owner further contends that “[t]he breeding of 1PNZQ23 was unpredictable even with both parents being known in the art.” Prelim. Resp.

47. According to Patent Owner, “1PNQZ23 is not simply the result of crossing PH1VKM and PH2DYM and Petitioner fails to connect the necessary dots between crossing the parents and ultimately arriving at 1PNZQ23.” Prelim. Resp. 48.

4. Analysis

Based upon our review of the arguments and evidence, we determine that Petitioner has not shown it is more likely than not that the challenged claims would have been obvious over the cited references.

a) Claim 1

Claim 1 recites “[a] seed, plant, plant part, or plant cell of inbred maize variety 1PNZQ23, representative seed of the variety having been deposited under NCMA accession number 202301024.” Ex. 1001, 39:32–34. When claims are directed to biological material and words alone cannot sufficiently describe the invention, our rules allow for such biological material to be deposited. 37 C.F.R. §§ 1.801–1.809; *see also* MPEP 2402–2410.

The ’033 patent provides:

Applicant has made a deposit of at least 625 seeds of Maize Variety 1PNZQ23 with the Provasoli-Guillard National Center for Marine Algae and Microbiota (NCMA) Upon issuance of any claims in the application, the Applicant will make the deposit available to the public pursuant to 37 C.F.R. § 1.808. This deposit of the Maize Variety 1PNZQ23 will be maintained in the NCMA depository, which is a public depository, for a period of 30 years, or 5 years after the most recent request, or for the enforceable life of the patent, whichever is longer, and will be replaced if it becomes nonviable during that period.

Ex. 1001, 37:32–51.

By depositing the seeds, Patent Owner is making the genetic sequence (genotype) of 1PNZQ23 maize variety available. As Patent Owner notes,

1PNZQ23's genetic make-up is described in the specification via the seed deposit. *See, e.g., Enzo Biochem, Inc. v. Gen-Prove Inc.*, 323 F.3d 956, 965 (Fed. Cir. 2002) (“[R]eference in the specification to a deposit in a public depository, which makes its contents accessible to the public when it is not otherwise available in written form, constitutes an adequate description of the deposited material sufficient to comply with the written description requirement of § 112 ¶1.”); *see also Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1336 (Fed. Cir. 2006) (failure to disclose a specific DNA sequence for genus claim did not render claim invalid where POSA could determine the DNA sequence based on the identification of the genus and publicly available biological deposits referenced in the patent specification).

Prelim Resp. 41–42. Thus, claim 1, which is directed to inbred maize variety 1PNZQ23 as described by the exemplary seed “deposited under NCMA accession number 202301024,” encompasses both the genotype and phenotype associated with that particular seed.

Patent Owner is correct that Petitioner focuses its obviousness challenge on 1PNZQ23's phenotype, and does not address its genotype. Prelim. Resp. 41–42; *see* Pet. 26–32 (comparing 1PNZQ23's phenotype with the phenotypes of the asserted prior art). Petitioner does not direct us to, nor do we discern, any information in the Petition or Reply regarding 1PNZQ23's genotype that supports Petitioner's arguments regarding obviousness.

Furthermore, Patent Owner offers information suggesting that “the breeding of 1PNZQ23 was unpredictable even with both parents being known in the art.” Prelim. Resp. 47. Dr. Schnable addresses unpredictability in the breeding process, stating:

[e]ach progeny of an F1 plant is genetically and phenotypically distinct even when the F1 plant itself results from a cross of two inbreds. A [person of ordinary skill in the art] would not expect that a cross of the same parents will produce F2 or D1 progeny identical to 1PNZQ23. . . . [T]he genome of a progeny plant is the result of genetic segregation and recombination in the F1 plant of the two parental genomes and the chance of the exact same child resulting from that initial biparental cross is infinitesimally small.

Ex. 2004 ¶ 123. This information undermines Petitioner's arguments regarding an expectation of success in achieving the claimed invention.

Petitioner urges us to follow *Ex parte C*, 27 USPQ2d 1492 (BPAI 1992). Pet. 41. We decline. We are not persuaded by Petitioner's arguments and agree with Patent Owner that Petitioner's reliance on *Ex parte C* ignores the significance of the biological deposit of the seed recited in claim 1. *See* Prelim Resp. 32. Additionally, irrespective of the outcome in *Ex parte C*, which addressed an examiner's rejection of a proposed claim, in this proceeding Petitioner bears the burden of demonstrating claim 1 is unpatentable as obvious. Petitioner, however, attempts to satisfy its burden by focusing on a hypothetical maize inbred with similar phenotypical characteristics to those described in Table 1 of the '033 Patent instead of the phenotypic and genotypic properties of maize inbred variety 1PNZQ23.

For all of the foregoing reasons, we determine Petitioner has not shown that it is more likely than not that claim 1 would have been obvious over the cited references.

b) Claim 2–20

Petitioner contends claims 2–20 are unpatentable as obvious in view of Ross and Carlone. Pet. 44–53.

Claims 2–9 depend from claim 1. Ex. 1001, 39:35–40:3. Nothing in Petitioner’s analysis of these claims cures the deficiencies discussed above regarding Petitioner’s analysis of claim 1. Therefore, for the same reasons discussed above for independent claim 1, we determine Petitioner has failed to show that it is more likely than not that claims 2–9 would have been obvious in view of Ross and Carlone.

Claim 10 is an independent claim, reciting

A converted seed, plant, plant part or plant cell of inbred maize variety 1PNZQ23 . . . wherein the converted seed, plant part or plant cell comprises a locus conversion, and wherein the plant or a plant grown from such the converted seed, plant part or plant cell comprises the locus conversion and otherwise comprises all of the physiological and morphological characteristics of maize variety 1PNZQ23 when grown under the same environmental conditions.

Ex. 1001, 40:4–14. Claims 11–17 depend from claim 10.

Petitioner contends that claim 10 would have been obvious “for the same reasons as claim 1 (concerning variety 1PNZQ23)” and because a person of ordinary skill in the art would have known that “locus conversions such as those recited in claim 10 were a routine technique to incorporate desirable traits into inbred maize lines.” Pet. 49. Nothing in Petitioner’s analysis of claims 10–17 cures the deficiencies discussed above regarding Petitioner’s analysis of claim 1. Therefore, for the same reasons discussed above for independent claim 1, we determine Petitioner has failed to show that it is more likely than not that claims 10–17 would have been obvious in view of Ross and Carlone.

Claim 18 is an independent claim that recites “an F1 hybrid seed produced by crossing a plant or plant part of inbred maize variety 1PNZQ23 further comprising a transgene . . . with a different maize plant,” and also

requires that “the transgene is inherited by the F1 hybrid seed” and the transgene be incorporated by “backcrossing or genetic transformation.”

Ex. 1001, 40:45–54. Claims 19 and 20 depend from claim 18.

Petitioner contends claim 18 would have been obvious for the same reasons as claims 3 (dependent on claim 1) and 10. Pet. 50–51. Nothing in Petitioner’s analysis of claim 18, however, cures the deficiencies discussed above regarding Petitioner’s analysis of claim 1 or 10. Therefore, for the same reasons discussed above for independent claims 1 and 10, we determine Petitioner has failed to show that it is more likely than not that claims 18–20 would have been obvious in view of Ross and Carlone.

5. *Summary*

In sum, we determine that Petitioner has not shown it is more likely than not that claims 1–20 would have been obvious over the combination of Ross and Carlone.

D. Claims 1–20: Alleged Obviousness over Heffner (Ex. 1007)

Petitioner contends claims 1–20 are unpatentable as obvious in view of Heffner. *See* Pet. 53–59. Patent Owner opposes. Prelim. Resp. 53–55. After reviewing the parties’ arguments and supporting evidence with respect to claims 1–20, we determine that Petitioner has not shown it is more likely than not that claims 1–20 would have been obvious in view of Heffner. We begin with a review of the relevant reference and then address the parties’ contentions.

1. Prior Art

a) Overview of Heffner (Ex. 1007)

Heffner, U.S. Patent No. 10,653,095 B1, is assigned to Pioneer Hi-Bred International, Inc. and titled “Maize Inbred PH487D.” Ex. 1007, codes

(54), (73). Heffner describes that inbred maize variety PH487D was developed by crossing “inbred line PH1VKM and inbred line PH2DYM, . . . producing a doubled haploid from the F1 plants, selfing and using pedigree selection amongst the D1 lines, and selfing and bulking from the subsequent generations.” Ex. 1007, 38:56–61. The inbred line is “substantially homozygous.” Ex. 1007, 38:62. A deposit “of at least 625 seeds of Maize Variety PH487D” was made “with the American Type Culture Collection (ATCC) . . . with ATCC Deposit No. PTA-126657.” Ex. 1007, 38:26–30.

Heffner’s Table 1 contains a description of some of the variety’s phenotypic characteristics. Ex. 1007, 39:1–40:16.

2. *Petitioner’s Contentions*

Petitioner contends that “Heffner discloses PH487D—a prior art inbred variety created by crossing the same two parents . . . as were crossed to create the claimed 1PNZQ23 and having very similar properties to those of . . . 1PNZQ23.” Pet. 53. Petitioner thus argues that Heffner teaches persons of ordinary skill in the art “to prepare an inbred variety, similar to the claimed variety, by crossing the same two parent varieties.” Pet. 53. Petitioner additionally contends “Heffner discloses that PH487D can be used ‘to Develop Another Maize Plant’ and in particular is a ‘source of breeding material that may be used to develop new maize inbred varieties.’” Pet. 54 (quoting Ex. 1007, 32:36–51). According to Petitioner, “1PNZQ23’s disclosed characteristics are at minimum highly similar to its sibling, PH487D’s characteristics as disclosed in Heffner.” Pet. 55. Petitioner also raises arguments similar to those discussed above in connection with its challenge based on Ross and Carlone. Pet. 54–55 (referring to a reasonable expectation of obtaining an inbred maize variety with PH487D as a parent and comparing the present facts to those in *Ex parte C*).

3. *Patent Owner's Contentions*

Patent Owner contends that Petitioner relies on the same flawed arguments here as it did for its challenge based on Ross and Carlone. Prelim. Resp. 53. Patent Owner contends that Petitioner's arguments are directed to "obtaining ***additional maize varieties*** with PH487D as a parent" instead of whether a person of ordinary skill in the art would and could "modify Heffner (PH487D) to create 1PNZQ23," specifically. Prelim. Resp. 53 (quoting Pet. 54). Patent Owner also contends that a person of ordinary skill in the art "would have no reasonable expectation of success in creating 1PNZQ23 using only PH487D as a 'starting point' and would understand PH487D alone could not be modified to create 1PNZQ23." Prelim. Resp. 54 (citing Ex. 2004 ¶¶ 146–151).

Patent Owner additionally contends that "Heffner shows that 1PNZQ23 would not have been obvious because Heffner derives from the same initial cross of PH1VKM and PH2DYM, but is distinct, genetically and phenotypically, from 1PNZQ23." Prelim. Resp. 54. Patent Owner points to Petitioner's failure to conduct a genotype analysis, and Dr. Schnable's testimony that 1PNZQ23 and PH487D differ at about 5% of genotyped genetic markers and are "different" genotypically. Prelim. Resp. 55 (quoting Ex. 2004 ¶ 149).

4. *Analysis*

Based upon our review of the arguments and evidence, we determine that Petitioner has not shown it is more likely than not that the challenged claims would have been obvious over Heffner.

a) *Claim 1*

As discussed above, claim 1, which is directed to inbred maize variety 1PNZQ23 as described by the exemplary seed "deposited under NCMA

accession number 202301024,” encompasses both the genotype and phenotype associated with that particular seed. Petitioner, however, again focuses its obviousness challenge on 1PNZQ23’s phenotype, and does not address its genotype. *See* Pet. 53–55 (asserting that 1PNZQ23’s disclosed characteristics are very similar to PH487D’s as disclosed in Heffner).

Petitioner does not direct us to, nor do we discern, any information in the Petition or Reply regarding 1PNZQ23’s genotype that supports Petitioner’s arguments regarding obviousness. To the contrary, Patent Owner and Dr. Schnable present evidence suggesting genotypic differences between 1PNZQ23 and PH487D. Prelim. Resp. 55; Ex. 2004 ¶ 149. This information, coupled with Patent Owner’s information suggesting that “the breeding of 1PNZQ23 was unpredictable even with both parents being known in the art” (Prelim. Resp. 47; Ex. 2004 ¶ 123), and Petitioner’s lack of information regarding 1PNZQ23’s genotype, undermines Petitioner’s obviousness challenge, despite the fact that both 1PNZQ23 and PH487D are derived from the same initial cross of PH1VKM and PH2DYM.

Petitioner’s also fails to demonstrate sufficiently that a person of ordinary skill in the art would have had a reasonable expectation of success in developing 1PNZQ23 based on Heffner’s disclosure alone. Although we agree with Petitioner that a person of ordinary skill in the art would have understood, based on disclosures in Heffner, that the parental line PH487D could have been used as a starting point to arrive at other inbred lines generally, Petitioner fails to demonstrate sufficiently how or why a person of ordinary skill in the art would have had a reasonable expectation of success in developing 1PNZQ23, specifically.

Additionally, for reasons similar to those discussed above, we are not persuaded by Petitioner’s arguments regarding *Ex parte C*.

For all of the foregoing reasons, we determine Petitioner has not shown it is more likely than not that claim 1 would have been obvious over Heffner.

b) Claim 2–20

Petitioner contends claims 2–20 are unpatentable as obvious in view of Heffner for the same reasons it presents for claim 1, and for the reasons it presented in its challenge based on Ross and Carlone. Pet. 56. Petitioner also contends that Heffner contains additional disclosures relevant to the limitations in claims 2–20. Pet. 56–59.

We have reviewed Petitioner’s arguments and information regarding claims 2–20. Nothing in Petitioner’s analysis of these claims cures the deficiencies discussed above regarding Petitioner’s analysis of claim 1. Therefore, for the same reasons discussed above for independent claim 1, we determine Petitioner has failed to show it is more likely than not that claims 2–20 would have been obvious in view of Heffner.

5. Summary

In sum, we determine that Petitioner has not shown it is more likely than not that claims 1–20 would have been obvious over Heffner.

E. Claims 1–20: Alleged Lack of Utility under 35 U.S.C. § 101

Petitioner contends that claims 1–20 of the ’033 patent are unpatentable because “the claimed invention ‘lacks a specific and substantial utility’ as required by §101.” Pet. 59. According to Petitioner, “[n]othing in the specification of **this particular patent** establishes that claims 1–20 are a ‘useful improvement’ over earlier corn varieties.” Pet. 60; *see also* Pet. 62 (“Nothing in the record suggests any utility specific to 1PNZQ23 beyond that generic to **any** corn variety.”). Petitioner also argues that nothing in the ’033 patent suggests any reason why the claimed variety has “markedly

different characteristics” and “corresponding ‘significant utility’” as compared to naturally occurring, preexisting corn varieties. Pet. 63–64 (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 310 (1980); *In re Roslin Institute (Edinburgh)*, 750 F.3d 1333, 1336 (Fed. Cir. 2014)).

Patent Owner disputes Petitioner’s contentions, arguing that Petitioner “invites the Board to create a new utility standard exclusive to plant utility patents,” and also “conflates the law of patent eligibility with the law of utility.” Prelim. Resp. 56–57. According to Patent Owner, [u]nder the proper utility test, the ’033 patent easily meets the utility requirement.” Prelim. Resp. 56.

After considering the parties’ arguments and information presented at this stage of the proceeding, we agree with Patent Owner that the ’033 patent satisfies the utility requirement of 35 U.S.C. § 101.

Under § 101, “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor.” 35 U.S.C. § 101. Thus, contrary to Petitioner’s argument, compliance with the utility requirement of § 101 does not require showing a “useful improvement” over existing subject matter. Rather, as the Federal Circuit explained, “a patent has utility if the alleged invention is capable of providing some identifiable benefit presently available to the public.” *Grunenthal GmbH v. Alkem Lab ’ys Ltd.*, 919 F.3d 1333, 1345 (Fed. Cir. 2019). Additionally, the court explained that “[a] patent fails to satisfy the utility requirement under 35 U.S.C. § 101 only if the invention is ‘totally incapable of achieving a useful result.’” *Id.*

The ’033 patent lists several uses for the claimed subject matter sufficient to satisfy the utility requirement of § 101. For example, the ’033

patent contains a section titled “INDUSTRIAL APPLICABILITY,” which states:

Examples of maize grain or plant material as a commodity plant product include, but are not limited to oils, meals, flour, starches, syrups, proteins, cellulose, silage, and sugars. Maize grain is used as human food, livestock feed, and as raw material in industry. The food uses of maize, in addition to human consumption of maize kernels, include both products of dry-and wet-milling industries. The principal products of maize dry milling are grits, meal and flour. The maize wet-milling industry can provide maize starch, maize syrups, and dextrose for food use.

Ex. 1001, 36:27–36.

These recitations constitute “identifiable benefit[s] presently available to the public,” sufficient to satisfy the utility requirement of § 101.

Grunenthal, 919 F.3d at 1345. They also distinguish the facts here from those in the cases, such as *In re Fisher*, 421 F.3d 1365, 1371 (Fed. Cir. 2005), Petitioner relies upon to support its contentions. *See* Pet. 67–69. For example, in *Fisher* the Federal Circuit determined that the asserted uses of the claimed invention were “merely hypothetical possibilities,” and there was no evidence of actual use in the real world. *In re Fisher*, 421 F.3d at 1373. The court also determined that the claimed invention was “not an end of [the inventor’s] research effort, but only [a] tool[] to be used along the way in the search for a practical utility.” *Id.* at 1377.

Here, in contrast, the ’033 patent identifies specific, real-world uses for the claimed invention. Thus, unlike the patent in *Fisher*, the ’033 patent disclosure demonstrates that its invention “has a significant and presently available benefit to the public” and discloses “a use which is not so vague as to be meaningless.” *Id.* at 1371. Thus, the ’033 patent discloses, respectively, both a “‘specific and substantial utility’ as required by § 101.”

Pet. 59; *see In re Fisher*, 421 F.3d at 1371; *see also* Pet. 59–63 (arguing, in view of *Fisher*, that § 101 compliance requires showing a “substantial” utility and “specific” benefit).

We turn next to Petitioner’s argument that claims 1–20 lack “substantial utility” because nothing in the ’033 patent suggests any reason why the claimed variety has “markedly different characteristics” as compared to naturally occurring, preexisting corn varieties. Pet. 63–65. We agree with Patent Owner that this argument conflates the issue of patent eligible subject matter with the utility requirement under § 101. Prelim. Resp. 65.

The language Petitioner relies upon comes from the Supreme Court decision in *Diamond v. Chakrabarty*, where the Court addressed the question of whether living organisms constitute a “manufacture” or “composition of matter” under § 101. *Chakrabarty*, 447 U.S. at 307. There, the Court determined that living organisms can constitute patentable subject matter if they have “markedly different characteristics from any found in nature.” *Id.* at 310. Petitioner has not directed us to persuasive evidence or authority demonstrating that the holding in *Chakrabarty* applies to the question of whether the claimed variety satisfies the utility requirement of § 101. To the contrary, the two cases Petitioner cites in the Petition, *In re Roslin Institute (Edinburgh)*, 750 F.3d at 1336 and *Ex parte Uchiyama*, Appeal No. 2017-005387, 2018 WL 1378136, at *4 (PTAB Mar. 12, 2018), addressed rejections under § 101 regarding patentable subject matter, not utility.

For all of the above reasons, we find that Petitioner has not shown that it is more likely than not that the challenged claims are unpatentable for failing to satisfy the utility requirement of § 101.

F. Claims 1–20: Alleged Indefiniteness

Petitioner argues that the challenged claims are indefinite “because (1) the claims were drafted to extend *beyond* seed actually deposited, yet (2) the record fails to delineate the outer boundary of that coverage.” Pet. 65 (citing 35 U.S.C. § 112(b) and *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898 (2014)). Specifically, Petitioner contends that the independent claims each recite “inbred maize variety 1PNZQ23” and “representative seed,” but “the intrinsic evidence fails to establish the boundaries of these terms, which are not well-known phrases in the art.” Pet. 65–66. Patent Owner opposes. Prelim. Resp. 67–75.

1. Inbred Maize Variety 1PNZQ23

According to Petitioner, “[i]nbred maize variety 1PNZQ23,’ reflects an arbitrary codename without any preexisting meaning to” persons of ordinary skill in the art. Pet. 67. Petitioner argues that the ’033 patent does not “establish the boundaries” of 1PNZQ23 and “never defines the scope of what this variety constitutes.” Pet. 67. Petitioner contends that “[a]side from the different codename, the specification [of the ’033 patent] is largely identical to that of Heffner,” and none of the distinctions between the two offer a person of ordinary skill in the art “reasonable certainty as to whether or not a given seed or plant actually constitutes ‘inbred maize variety 1PNZQ23’ as opposed to ‘inbred variety PH487D’ as claimed in Heffner.” Pet. 67–68.

Patent Owner contends that “the name ‘1PNZQ23’ is simply used to identify the new inbred maize variety,” and “the name 1PNZQ23 is new because the variety itself is new.” Prelim. Resp. 68. Patent Owner further contends “[t]his new variety is described in the specification in words and exemplars of the variety were deposited for inspection. Those seeds and that

description provide the [person of ordinary skill in the art] with the reasonable certainty that Petitioner alleges is lacking.” Prelim. Resp. 69.

To satisfy the definiteness requirement under 35 U.S.C. § 112(b), the specification must “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor . . . regards as the invention.” In *Nautilus*, the Supreme Court held that “a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus*, 572 U.S. at 901.

Although the name 1PNZQ23 itself is new, we agree with Patent Owner that persons of skill in the art “do not look to the new variety name for ‘reasonable certainty’; rather, they look to the specification and the deposited seeds.” Prelim. Resp. 69. Here, Patent Owner has made a seed deposit and included information in the specification about the claimed variety. Ex. 1001, 37:31–39:27. For example, the ’033 patent specification includes information about phenotypic and genotypic properties, pedigree, breeding history, and a table listing “variety description information.” Ex. 1001, 15:1–50 (capitals omitted), 18:8–21:37, 32:5–22, 37:31–39:27. This evidence weighs against Petitioner’s arguments that a person of ordinary skill in the art would not understand, with reasonable certainty, the scope of the claimed invention.

Further, we are not persuaded by Petitioner’s arguments regarding similarities between the ’033 patent specification and Heffner. Pet. 67–68. These arguments are misplaced in view of the holding in *Nautilus*, which instructs us to look to the specification of the ’033 patent in conducting an indefiniteness analysis. *Nautilus*, 572 U.S. at 901. Petitioner does not direct

us to persuasive authority supporting its arguments regarding comparing the '033 patent specification with the prior art to determine whether the '033 patent satisfies the requirements of § 112(b). *See* Pet. 67–71.

2. Representative Seed

Petitioner also criticizes the '033 patent's reference to a “representative” seed deposit in the claims. In particular, Petitioner argues that “representative seed” is not a well-known term in the art, and the intrinsic evidence fails to establish the boundaries of this term. Pet. 66, 72. Petitioner further argues that “inclusion of ‘representative seed’ is a transparent attempt to expand the scope of the Challenged Claims such that ‘inbred maize variety 1PNZQ23’ covers more than the deposited seed and plants derived from that seed.” Pet. 74.

Petitioner's arguments are not persuasive. Contrary to Petitioner's position, the plain language of the claims suggests the deposited seeds “represent,” i.e., serve as a specimen of, the claimed variety. Moreover, we agree with Patent Owner that “the written description of the '033 patent discloses that [Patent Owner] deposited at least 625 seeds of 1PNZQ23 at a certified international depository, and that those seeds represent both the genotype and phenotype (when grown) of the claimed inbred maize variety 1PNZQ23.” Prelim. Resp. 72. We thus disagree that the inclusion of “representative seed” is an attempt to expand the scope of the claims beyond the deposited seed or plants derived from that seed, or that the language injects ambiguity into the claims. Pet. 74. To the contrary, the evidence of record favors Patent Owner's position that the claims, in view of the specification of the '033 patent (which includes the deposited seeds and description of genotypic and phenotypic properties), “inform, with reasonable certainty, those skilled in the art about the scope of the

invention.” *Nautilus*, 572 U.S. at 901. Additionally, we note that although Petitioner contends “representative seed” is not a term of art, evidence of record shows Petitioner itself has used the term in the same fashion as it is used here. Ex. 2032, Claim 1; Prelim. Resp. 74; *see also* Exs. 2029–2037 (containing additional examples of patents using “representative seed” in patent claims).

For all of the foregoing reasons, we determine Petitioner has not demonstrated it is more likely than not that the challenged claims are indefinite.

G. Institution of Post-Grant Review under § 324(b)

Petitioner contends that “institution can and should be granted under §324(b) for the separate and independent reason that the petition raises multiple ‘novel or unsettled legal question[s].’” Pet. 13, 77.

According to Petitioner, the first novel and unsettled legal question is:

Are plant utility claims unpatentable as indefinite where the specification is silent as to terms of degree necessary to construe the claims in light of the “representative” seed deposit and prior art?

Pet. 77 (emphasis omitted). Petitioner contends “[t]he Office can and should answer this question affirmatively” to enhance the quality of the patent examination process related to agricultural products, “‘enhance the transparency of IP information’ for such innovations,” and ensure the patent system does not reduce competition in the seed market. Pet. 77–78.

Petitioner also argues that “[t]he Challenged Claims implicate the same problems the Federal Circuit has repeatedly stressed when holding that means-plus-function claims were indefinite for lack of adequate supporting structure.” Pet. 79–83 (arguing, *inter alia*, that the claim terms “inbred

maize variety 1PNZQ23” and “representative seed” are “merely ‘verbal constructs’ which [Patent Owner] has linked to the deposit of seeds”).

We are not persuaded by Petitioner’s arguments, and agree with Patent Owner that this question presents neither a novel or unsettled legal question. Prelim. Resp. 76. Instead, it appears to be a repackaged version of Petitioner’s earlier indefiniteness challenge, which, for the reasons explained above, we determined was unsuccessful. As Patent Owner correctly notes, the Supreme Court set the standard for indefiniteness in *Nautilus*, and to the extent Petitioner is seeking to change that for plant utility patents, that is not for us to decide. Furthermore, Petitioner’s means-plus-function arguments appear to be based, at least in part, on the premise that “by the ordinary meaning of ‘representative’ itself, [Patent Owner] sought claims sweeping beyond the actual deposited seed.” Pet. 80 (internal citation omitted); Reply 10. As noted above, we disagree with this assertion.

For all of these reasons, we determine that Petitioner’s first question does not raise a novel or unsettled legal question warranting institution of a post-grant review proceeding under 35 U.S.C. § 324(b).

We turn next to Petitioner’s second allegedly novel and unsettled legal question, which is:

Whether patent claims should be found unpatentable as indefinite in post-grant review proceedings if the claims contain words or phrases whose meaning is unclear (per *In re Packard*, 751 F.3d 1307 (Fed. Cir. 2014)), as the Office previously explained to the Federal Circuit (EX 1061) was appropriate to protect the public in patentability assessments?

Pet. 77, 78 (emphasis omitted).

Answering Petitioner’s second question in the affirmative would require the Board to ignore the Supreme Court’s *Nautilus* standard for

indefiniteness in favor of the standard set forth in *Packard*. Doing so would also require the Board contravene the binding guidance from the Director’s January 6, 2021 memorandum that “the Board shall . . . use the approach set forth by the Supreme Court in *Nautilus* . . . for assessing questions of indefiniteness in AIA post-grant proceedings.” Ex. 1063, 1–2. We decline to take such action here.

Furthermore, it is the Director, not the Board, who is “responsible for providing policy direction and management supervision for the Office and for the issuance of patents.” 35 U.S.C. § 3(2)(A). Accordingly, a post-grant review proceeding is not the proper vehicle for addressing Petitioner’s question.

In view of the foregoing, the Petition does not raise a novel or unsettled legal question warranting institution of a post-grant review proceeding under 35 U.S.C. § 324(b).

H. Discretionary Denial Under § 325(d)

In view of our determination to deny institution on the merits, we do not need to address the parties’ arguments regarding discretionary denial.

III. CONCLUSION

For all of the foregoing reasons, we deny institution of a post-grant review of claims 1–20 of the ’033 patent.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* and no trial is instituted.

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PETITIONER:

Scott A. McKeown
Oona M. Johnstone
Thomas F. Foley
Zhiyun Ge
WOLF, GREENFIELD & SACKS, P.C.
smckeown-ptab@wolfgreenfield.com
ojohnstone-ptab@wolfgreenfield.com
tfoley-ptab@wolfgreenfield.com
jean.ge@wolfgreenfield.com

PATENT OWNER:

Michael Kane
Katie E. Hyma
Dexter Whitley
Yong (Lucien) Wang
Jonathan Singer
FISH & RICHARDSON P.C.
kane@fr.com
hyma@fr.com
PGR58032-0003PS1@fr.com