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Paper 9
Entered: May 1, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AARDEVO NORTH AMERICA, LLC,
Petitioner,

v.

Agventure B.V.,
Patent Owner.

IPR2025-00136
Patent 11,140,841 B2

Before JEFFREY N. FREDMAN, SUSAN L.C. MITCHELL, and DEVON ZASTROW NEWMAN, *Administrative Patent Judges.*

FREDMAN, *Administrative Patent Judge*.

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

I. INTRODUCTION

AARDEVO North America, LLC ("Petitioner"), filed a Petition (Paper 2, "Pet.") requesting *inter partes* review of claims 1–10 (the "challenged claims") of U.S. Patent No. 11,140,841 B2 (Ex. 1001, "the '841 patent"). Agventure B.V. ("Patent Owner") filed a Patent Owner's Preliminary Response ("Prelim. Resp."). Paper 6. Petitioner then filed a Reply ("Reply"). Paper 7. Patent Owner filed a Sur-Reply ("Sur-Reply"). Paper 8.

We have jurisdiction under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted unless the information presented in the Petition "shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition."

A decision under § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018). In addition, if the Board institutes trial, it will "institute on all grounds in the petition." PTAB Consolidated Trial Practice Guide, 5–6 (Nov. 2019).

Having considered the arguments and evidence presented in the Petition and the Preliminary Response, for the reasons described below, we deny institution of *inter partes* review.

II. REAL PARTIES-IN-INTEREST

Petitioner identifies the Aardevo North America, LLC, Aardevo B.V., the JR Simplot Company, and KWS SAAT SE & Co. KGaA as the real parties-in-interest. Pet. 1. Patent Owner identifies the real party-in-interest as Agventure B.V. Paper 3, 1.

III. RELATED MATTERS

The parties identify no related matters. *See* Pet. 2; Paper 3, 1 (Patent Owner's Mandatory Notices).

IV. THE '841 PATENT

The '841 patent teaches the "present invention now provides in a first aspect a diploid, fertile, self-compatible and essentially homozygous potato line comprising plants having an average tuber yield expressed in grams of fresh weight of at least 200 grams per plant." Ex. 1001, 4:47–51. The'841 patent teaches that, in potato, "inbreeding results in severe inbreeding depression, or the expression of deleterious recessive genes, which expression is revealed by loss of vigour and loss of fertility. Hence, it has hitherto been impossible to produce homozygous pure inbreds in potato." *Id*., 20:44–48.

The '841 patent explains "[r]outes involving doubling of haploids have long been presumed as promising. Non[e]theless, up to the present day the ruling opinion is that inbreeding depression in diploid potato is too strong to ever result in vigorous homozygous plants." *Id.*, 4:1–5. The '841 patent teaches:

> To reduce inbreeding depression a breeder may introduce new genes from a genetically more remote parent such as from wild and primitive species with ploidy levels ranging from diploid to hexaploid. However, when two genetically unrelated potato plants are crossed, the level of heterozygosity may be increased but simultaneously more deleterious genes are also introduced. As a consequence, a breeder will typically make additional crosses with more commercial germplasm to enrich the population for favourable alleles. All together such a multiple crossing breeding programme may take dozens of years as the selection of the favourable genotypes in each generation may already take five years.

> Therefore, potato breeding is currently a predominantly empirical exercise, strongly characterised by trial and error.

Ex. 1001 3:6–20.

The '841 patent teaches the "present inventors discovered that elite breeding lines for potato breeding can be successfully produced. Crossing of two elite breeding lines provides Fl hybrid seeds; such Fl hybrid seeds, when grown into plants, result in plants of superior agronomic performance." *Id*., 19:23–27.

V. ILLUSTRATIVE CLAIMS

Petitioner challenges claims 1–10 of the '841 patent. Claims 1 and 8 are independent. Claim 1 is illustrative and reproduced below:

> 1. [a] A plant of a potato line, wherein said potato line is of the species *Solanum tuberosum* optionally comprising introgression segments of other tuber bearing *Solanum* species crossable to *Solanum tuberosum,*
>
> [b] wherein said potato line is diploid, fertile, self-compatible,
>
> [c] produces at least 200 grams fresh weight of tubers per plant, and
>
> [d] at least 75% of the genomic loci in said potato line are homozygous,
>
> [e] wherein said self-compatibility in said potato line is conferred by the S-locus inhibitor (Sli) gene, and wherein a copy of said gene is present in potato lines AGVD1, AGVD2, AGVD3, and AGVD17, representative seeds of said lines having been deposited with the NCIMB under NCIMB accession number 41663, NCIMB accession number 41664, NCIMB accession number 41665, and NCIMB accession number 41765, respectively.

Ex. 1001, 21:13–32 (formatting modified and brackets added corresponding to Petitioner's labeling of elements of claim 1).

VI. ASSERTED GROUNDS

Petitioner contends that the challenged claims are unpatentable based on the following grounds. Pet. 3–4

Ground	Reference	Basis	Claims Challenged
1	Jong[1]	§ 102	1, 4, 7
2	Jong, Chase,[2] Bamberg[3]	§ 103	1–7
3	Jong, Chase, Bamberg, Springer[4]	§ 103	8–10
4	Phumichai,[5] Jong, Chase, Bamberg, Spooner[6]	§ 103	1–7
5	Phumichai, Jong, Chase, Bamberg, Spooner, Springer	§ 103	8–10
6	US-W4[7]	§ 102	1, 6
7	US-W4, Chase, Bamberg, Springer	§ 103	5–10
8	RH89-039-16	§ 102	1, 4
9	RH89-039-16, Chase, Bamberg, Springer	§ 103	5–10

Petitioner relies on the Declarations of Shelly Jansky, Ph.D., and David Douches, Ph.D. *See* Ex. 1002, 1003, respectively.

VII. CLAIM INTERPRETATION

The Board interprets claim terms in an *inter partes* review using the same claim construction standard that is used to construe claims in a civil

[1] Jong et al, *Inbreeding in cultivated diploid potatoes*, 14 Potato Res. 74–83 (1971) ("Jong"). Ex. 1004.

[2] Chase, S., *ANALYTIC BREEDING IN SOLANUM TUBEROSUM L. – A SCHEME UTILIZING PARTHENOTES AND OTHER DIPLOID STOCKS*, 5 Can. J. Genet. Cytol. 359–363 (1963) ("Chase"). Ex. 1007.

action in federal district court. *See* 37 C.F.R. § 42.100(b)). In construing claims, district courts give claims their ordinary and customary meaning, which is "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

On the current record, there is no controversy over the meaning of any of the claim terms and neither party identifies a claim construction that would impact our analysis. *See* Pet. 28; Prelim. Resp. generally. We therefore find that there are no terms that need claim construction. *See, e.g.*, *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) ("[C]laim terms need only be construed '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)).

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[3] John B. Bamberg et al., *Elite Selections of Tuber-bearing Solanum Species Germplasm, Inter-Regional Potato Introduction Station,* NRSP-6 (1994) ("Bamberg")). Ex. 1009.

[4] Springer et al., *Allelic variation and heterosis in maize: How do two halves make more than a whole?*, 17 Genome Res. 264–275 (2007) ("Springer"). Ex. 1008.

[5] Phumichai et al., *Toward the development of highly homozygous diploid potato lines using the self-compatibility controlling Sli gene*, 48(6) Genome 977–984 (2005) ("Phumichai"). Ex. 1005.

[6] Spooner et al., *Extensive simple sequence repeat genotyping of potato landraces supports a major reevaluation of their gene pool structure and classification*, 104(49) Proc. Nat'l Acad. Sci. USA 19398–19403 (2007) ("Spooner"). Ex. 1006.

[7] US-W4 is a diploid *S. tuberosum* clone "known to be a source of self-compatibility that produced self-fertile and self-compatible offspring. *See* Pet. 15 (citing Ex. 1002 ¶ 72; Ex. 1004 ¶ 6),

VIII. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner asserts:

> A person of ordinary skill in the art ("POSA") would have knowledge of the scientific literature and have skills relating to plant breeding and the use of marker-assisted breeding before October 26, 2009. (EX1002, ¶15.) A POSA also would have knowledge of field, greenhouse, and laboratory techniques and strategies used in plant breeding. (*Id.*) Typically, a POSA would have had a doctoral degree in plant breeding, and possessed experience with plant breeding, including in potatoes. Alternatively, a POSA would be a plant breeder with relatively less educational background but commensurately greater experience working in the field of plant and potato breeding. A POSA would, if necessary, consult with a molecular marker expert for genetic advice regarding the selection of crosses.

Pet. 22.

Patent Owner provides no alternative analysis. *See* Prelim. Resp. generally.

At this stage in the proceeding, we find that Petitioner's analysis reasonably establishes the level of ordinary skill in the art as it directly relates to those involved in food analysis testing based on the prior art references. *See, e.g.,* Ex. 1004–1009. The level of ordinary skill in the art usually is evidenced by the prior art references themselves. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

IX. GROUNDS 6–9 – Printed Publication

"A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications." 35 U.S.C. § 311(b).

Petitioner cites US-W4 and RH89-039-16 as a basis for anticipation in Grounds 6 and 8, and as part of the basis for obviousness in Grounds 7 and 9. *See* Pet. 69–72. Petitioner identifies US-W4 and RH89-039-16 as "diploid, fertile, and self-compatible" lines of *Solanum tuberosum* that were available before 2009. *See* Pet. 69, 71.

Patent Owner asserts "[t]here is no dispute that US-W4 and RH89-039-16 are physical products and do not qualify as 'patents or printed Publications' under Section 311(b)." Prelim. Resp. 11. Patent Owner asserts

> Petitioner improperly introduces experimental results on *physical* samples of US-W4 and RH89-039-16 as support. Specifically, Petitioner relies on declarations of Drs. Jansky and Douches, where Dr. Jansky conducted experiments *physically* growing US-W4 potatoes, and Dr. Douches performed genotyping analysis on *physical* samples of US-W4 and RH89-039-16. Petition at 70–71; Ex. 1002 at ¶ 297; Ex. 1003 at, *e.g.*, ¶¶ 37–41. This is precisely the type of evidence that is excluded in an IPR.

Id. at 12 (citing *Lynk Labs, Inc. v. Samsung Elecs. Co.*, 125 F.4th 1120, 1128 (Fed. Cir. 2025)).

We find that, on the current record, Patent Owner has the better position. In Petitioner's identification of the challenge, Petitioner does not cite any specific printed publication for either ground 6 or ground 8, but rather appears to rely on the physical existence of the two potatoes themselves as the prior art. As Patent Owner correctly states, physical products such as potatoes do not qualify as printed publications under 35 U.S.C. § 311(b) and cannot be the basis of an *inter partes* review.

Accordingly, we find that, on the current record, Petitioner has not shown that it has a reasonable likelihood that it would prevail on grounds 6 and 8. The same reasoning applies to grounds 7 and 9.

X. GROUND 1 – ANTICIPATION

A. Principles of Law

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

"Determining whether claims are anticipated involves a two-step analysis. The first step involves construction of the claims of the patent at issue. Claim construction is a question of law reviewed de novo." *In re Aoyama*, 656 F.3d 1293, 1296 (Fed.Cir.2011). "The second step [of an anticipation analysis] involves comparing the claims to the prior art. Anticipation is a question of fact reviewed for substantial evidence." *In re Aoyama*, 656 F.3d at 1296. "A prior art reference anticipates a patent claim under 35 U.S.C. § 102(b) if it discloses every claim limitation." *In re Montgomery*, 677 F.3d 1375, 1379 (Fed. Cir. 2012). A reference may anticipate inherently if a claim limitation that is not expressly disclosed "is necessarily present, or inherent, in the single anticipating reference." *Verizon Servs. Corp. v. Cox Fibernet Va., Inc*., 602 F.3d 1325, 1337 (Fed. Cir. 2010).

We analyze the asserted anticipation ground of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish a reasonable likelihood of prevailing in showing that at least one of the challenged claims of the '486 patent is unpatentable as anticipated.

B. Overview of Prior Art cited for Anticipation

1. *Jong (Ex. 1004)*

Jong is an article published in the journal *Potato Research* that discusses the "effects of inbreeding in cultivated diploid potatoes." Ex. 1004, 74. Jong teaches "[c]rosses between cultivated diploid species and male-fertile Tuberosum haploids produce vigourous, highly fertile progeny." *Id.* Jong

> describes the effect of inbreeding on populations derived from diploid-haploid hybrids. An inbreeding study with a genetic base of diploid hybrids, has several advantages: 1) since the tetraploid varieties and self-incompatible diploid species may have several recessive genes not normally expressed, these hybrids should be an extremely fertile source of unexplored genetic variability . . . 2) the rate of progress towards homozygosity following selfing is much faster with diploids than with autotetraploids. . . . 3) stocks homozygous for marker genes of potential value for future genetic investigations can be obtained much faster; 4) the segregation ratios obtained for progenies from selfed seed would be much easier to analyze with a disomic inheritance pattern. Progeny analysis based on selfing can be a powerful tool for evaluating potential parents for a crossing programme.

Id., 74–75.

Jong teaches four hybrid families where four different potato strains were crossed with US-W4. *Id*., 75. Jong teaches that "[t]here was little if any depression in the subsequent S_2 and S_3 generations. These populations tuberized fairly well in the field even in the advanced generations of inbreeding." *Id*., 78. Jong teaches, in Table 1, that two of the later S_2 clonal generations, US-W 5309 and US-W 5315, showed over 200 g/hill of potatoes. *Id*., 77. Jong teaches the "diploid S_5 generation probably represents the greatest degree of inbreeding ever imposed upon potatoes." *Id*., 81. Jong teaches that "the diploid S_5 generation is about 97 % homozygous." *Id.*

C. Ground 1 – Anticipation over Jong

1. *Petitioner's position*

Petitioner asserts, as element [a] of claim 1, that "Jong's crosses between US-W4 (*S. tuberosum*) with Phureja or Stenotomum potato plants created progeny that were 'of the species *Solanum tuberosum* optionally comprising introgression segments of other tuber bearing *Solanum* species crossable to *Solanum tuberosum.*'" Pet. 33 (citing Ex. 1002 ¶¶ 130–131).

Petitioner asserts, as to element [b] of claim 1, that the "potato lines described by Jong are diploid, fertile, and self-compatible." *Id.* (citing Ex. 1002 ¶ 132). Petitioner asserts "Jong tested and reported the cross-fertility and self-compatibility of each plant in Table 4" and that "S_2 potato lines had non-zero values for all indicated measurements, demonstrating that the plants were fertile and self-compatible, comporting with the inventors' definition of fertility." *Id.* (citing Ex. 1004, Table 4; Ex. 1002 ¶¶ 134–136).

Petitioner asserts, as to element [c] of claim 1, that "Jong discloses two potato lines, US-W5309 and US-W5315, that exhibit greater than 200g fresh weight of tubers per plant at the S_2 generation" and "POSA would know from the Jong thesis that it was Jong's highest-yielding new plants (USW5309 and US-W5315) that were inbred to the S_5 generation." *Id.* at 34 (citing Ex. 1004, 9, Table 1; Ex. 1034, 10; Ex. 1002 ¶¶ 137–139).

Petitioner asserts, as to element [d] of claim 1, that "the S_2 generation described in Jong would be expected to be at least 75% homozygous" and that "Jong estimated its disclosed S_5 plants to be 97% homozygous." *Id.* at 34–35 (citing Ex. 1004, 7, 12, 13; 1002 ¶¶ 140–143).

Petitioner asserts, as to element [e] of claim 1, that "Jong does not identify the genetic factor conferring self-compatibility, because it had not

yet been discovered, but this was inherently disclosed by the US-W4 plant Jong used to introduce self-compatibility into his new lines. Jong attributes this self-compatibility to US-W4, which was known to be self-compatible." *Id.* at 35 (citing Ex. 1004, 6; Ex. 1002 ¶¶ 145–149). Petitioner asserts "[s]ubsequent analyses confirmed that Jong's W4 necessarily derived its self-compatibility from the S-locus gene inhibitor (*Sli*), as recited in the claims and present in the '841 patent's deposited lines." *Id.* at 35 (citing Ex. 1036, 2). Petitioner asserts "Jong's potato plants have their self-compatibility conferred by the same S-locus inhibitor (*Sli*) employed in the '841 patent and present in the claimed deposited lines." *Id.* at 35 (citing Ex. 1002 ¶¶ 144, 149).

As to claim 4, Petitioner asserts "Jong discloses both seeds and tubers capable of producing plants according to Claim 1." *Id.* at 36 (citing Ex. 1002 ¶¶ 150–151).

As to claim 7, Petitioner asserts "Plants from Jong's US-W5309 and US-W5315 lines anticipate this claim because they exhibit the recited characteristics." *Id.* at 36 (citing Ex. 1002 ¶ 155).

2. *Patent Owner's position*

Patent Owner asserts Petitioner "appears to admit that Jong does not describe all elements of these claims, and instead resorts to arguing that the missing elements were inherently disclosed." Prelim. Resp. 14 (citing Pet. 33–34).

Patent Owner asserts, as to element [d] of claim 1, that "Petitioner appears to admit that Jong does not expressly disclose a potato line that meets Claim 1[d]. Indeed, Petitioner and its expert Dr. Jansky, appear to admit that Jong does not disclose any ***measured*** homozygosity value." *Id.* at

15 (citing Pet. 34–35; Ex. 1002 ¶¶ 140–143). Patent Owner asserts "[t]hat the S_2 generation in Jong 'would be expected to' be at least 75% homozygous based on *theoretical* calculation is no indication that it was *necessarily*, *in fact*, at least 75% homozygous." Prelim. Resp. 15.

Patent Owner asserts that "actual homozygosity rate in subsequent generations are often lower than theoretical calculations because the reduction rate of heterozygosity per generation is often lower than theoretically expected." *Id.* at 16. Patent Owner points to Phumichai as teaching that "[t]he observed average percentage of reduction of heterozygosity per generation (38.4% or 38.5%) was lower than the theoretically expected value of 50%" and that "reproductive traits, such as flowering versus nonflowering and the degree of pollen production, were strongly correlated with heterozygosity, and selection for fertility favored the more heterozygous plants" *Id.* at 16 (citing Ex. 1005, 10).

Patent owner asserts that "[e]ven assuming that Jong was correct on the theoretical homozygosity rate of the S_5 generation, this theoretical rate has no implication on the *actual* homozygosity rate of the S_2 generation." *Id.* at 17. In a footnote, Patent Owner asserts

> Petitioner also appears to improperly conflate the S_2 and the S_5 generations in Jong. . . . But Jong ***does not*** disclose the specific tuber yields of the S_5 generation. In fact, Jong teaches that for traits including tuber yields "the inbreeding depression coincided with a curve calculated on the basis of heterozygosity in a diploid organism," suggesting that in theory, the more homozygous a generation is, the lower tuber yields it would achieve.

Id. at 17 n.10 (citing Pet. 34; Ex. 1002 ¶ 137; Ex. 1004, 11).

> Patent Owner asserts, as to element [e] of claim 1, that
>
> Petitioner (and Dr. Jansky) relies on the US-W4 potato line referenced in Jong, and argues that later analyses in Clot, a 2020

> publication, "confirmed that Jong's W4 necessarily derived its self-compatibility from the S-locus gene inhibitor (*Sli*)" and therefore the *Sli* gene was "inherently disclosed by the US-W4 plant Jong used."

Prelim. Resp. 19 (citing Pet. 35; Ex. 1002 ¶¶ 145–146; Ex. 1036). Patent Owner asserts that "Petitioner should not be allowed to rely on the US-W4 plant described in Jong, or later references regarding the US-W4 plant for anticipation. Rather, the Board should 'consider Petitioner's arguments based solely on the disclosures of' Jong." *Id.* at 20 (citing *Delta Elecs.*, IPR2024-00227, Paper 13 at 25–26).

3. *Analysis*

We find that the evidence currently of record does not support a finding that Jong anticipates the claims. Neither the S_2 generation shown in Tables 1 and 2, nor the S_5 generation are shown to inherently meet all of the limitations recited in the claims of the '841 patent. "Inherency . . . may not be established by probabilities or possibilities." *MEHL/Biophile Int'l. Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999).

As to the S_2 generation, Jong reasonably demonstrates two of the inbred lines, US-W 5309 and US-W 5315, satisfy the recitations in claim 1 for potato lines that are diploid, fertile, self-compatible and produce 200 grams of tubers per plant. *See* Ex. 1004, 77, Table 1. Petitioner provided evidence that the parent US W4 line contains the S-locus gene inhibitor (*Sli*) requirement. Ex. 1002 ¶ 146.

Petitioner relies upon Dr. Jansky's calculations for the 75% homozygosity limitation recited in claim 1, where Dr. Jansky states "a POSA would have understood that, even in the highly unlikely situation where the S_0 plant is 0% homozygous (i.e., 100% heterozygous at each

locus), by S_2, the homozygosity would be at least 75% and subsequent generations would have even higher percentage of homozygosity." Ex. 1002 ¶ 142.

However, neither Petitioner nor Dr. Jansky provide specific data on the record before us showing the actual measured homozygosity of either of the inbred lines, US-W 5309 and US-W 5315. And Phumichai experimentally demonstrates that Dr. Jansky's assumption that theoretical heterozygosity reduction of 50% per generation is not necessarily accurate, stating the "observed average percentage of reduction of heterozygosity per generation (38.4% or 38.5%) was lower than the theoretically expected value of 50%." Ex. 1005, 982. Indeed, Phumichai disclosed that the "SOPH [Section-based observed percentage of heterozygosity] decreased steadily from the original 100% in 99H2–1 (S_0) to the family means of 62.4% in 3H2 (S_1), 37.9% in 3H3 (S_2)." *Id.* at 981. That is, Phumichai experimentally shows that in an S_2 generation of a potato line, the heterozygosity was 37.9%, resulting in homozygosity of about 62.1%, below the 75% theoretically expected and the 75% required by claim 1 of the '841 patent.

Therefore, the evidence of record does not show that the S_2 generation of potato lines in Jong necessarily satisfies the homozygosity recitation in claim 1 of the '841 patent, and so cannot establish on the record before us that Jong inherently teaches this limitation.

As to the S_5 generation, Jong states that "the diploid S_5 generation is about 97 % homozygous." Ex. 1004, 81. The S_5 generation is presumably diploid and self-compatible, though no direct evidence from Jong was adduced for these limitations. More significantly, Petitioner provides no evidence that the S_5 generation potato line "produces at least 200 grams

fresh weight of tubers per plant" as required by claim 1 of the '841 patent. Figure 1 of Jong, reproduced below, shows that average tuber weight per hill is reduced in each generation, with the average being around 100 g in the S_4 generation.

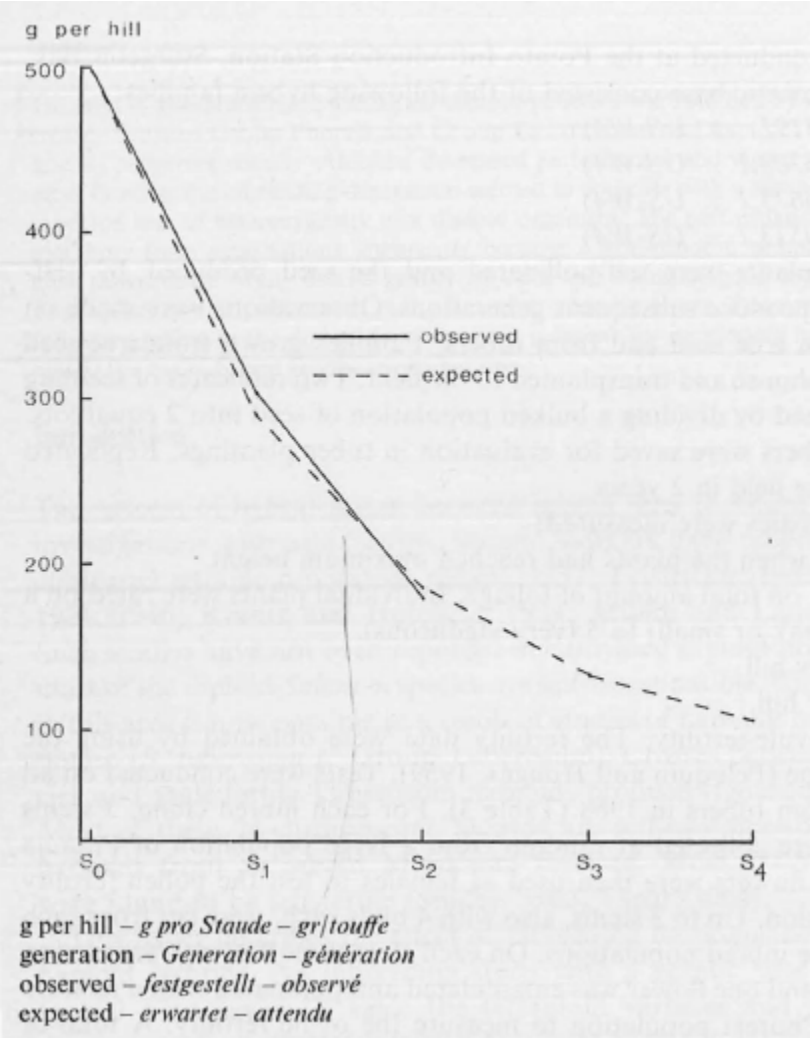


Figure 1 shows "Average tuber weight in g per hill." *Id.* at 76. This same pattern is evident in the tuber weight g/hill shown in Table 1, where the starting lines produce significantly more weight than those in the S_2 generation, only two of which were shown to exceed the requirement of 200 grams of fresh weight of tubers per plant. *Id.* at 77 (Table 1).

We recognize that Dr. Jansky states that "the '841 patent expressly ties 'vigor' to tuber yields of 200 grams or more" and that Jong states "several fairly vigourous S_5 lines have now been obtained." Ex. 1002 ¶ 138; Ex. 1004, 80. However, we are unpersuaded that the definition of "vigorous" recited in the '841 patent necessarily applies to the plants described decades earlier in Jong. And neither Petitioner nor Dr. Jansky provide any direct evidence contradicting Figure 1 of Jong or otherwise showing that the "vigourous S_5 lines" necessarily produced 200 grams as required by claim 1 of the '841 patent.

Therefore, the evidence of record does not show that the S_5 generation of potato lines in Jong necessarily satisfies the "produces at least 200 grams fresh weight of tubers per plant" recitation in claim 1 of the '841 patent. Therefore, Petitioner has not shown that Jong inherently teaches this limitation.

Accordingly, we find that on the current record Petitioner has not shown that it has a reasonable likelihood that it would prevail on this anticipation ground for claim 1, or the additional claims in this ground, which each depend from claim 1.

XI. OBVIOUSNESS GROUNDS

A. Principles of Law

The Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), reaffirmed the framework for determining obviousness set forth in *Graham v. John Deere Co*., 383 U.S. 1 (1966). In *KSR*, the Court summarized the four factual inquiries set forth in *Graham* (383 U.S. at 17–18) that are applied in determining whether a claim is unpatentable as obvious under 35 U.S.C. § 103 as follows: (1) determining the scope and

content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and (4) considering objective evidence indicating obviousness or non-obviousness. *KSR*, 550 U.S. at 406.

"The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 416. "[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious," the answer depends on "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at 417.

> The motivation-to-combine analysis is a flexible one. "*[A]ny* need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed," but the "analysis 'need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.'"

Intel Corp. v. PACT XXP Schweiz AG, 61 F.4th 1373, 1379–80 (Fed. Cir. 2023) (quoting *KSR*, 550 U.S. at 418, 420 (emphasis added)). "[I]f there's a known technique to address a known problem using 'prior art elements according to their established functions,' then there is a motivation to combine," because *KSR* explains that "if a technique has been used to improve one device [or method], and a person of ordinary skill in the art would recognize that it would improve similar devices [or methods] in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *Id.* at 1380 (quoting *KSR*, 550 U.S. at 417; *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797 (Fed. Cir. 2021)). If addressing a known problem, the prior art combination need not be "the *best* option, only

. . . a *suitable* option." *Id.* (quoting *Intel*, 21 F.4th at 800 (emphasis original)).

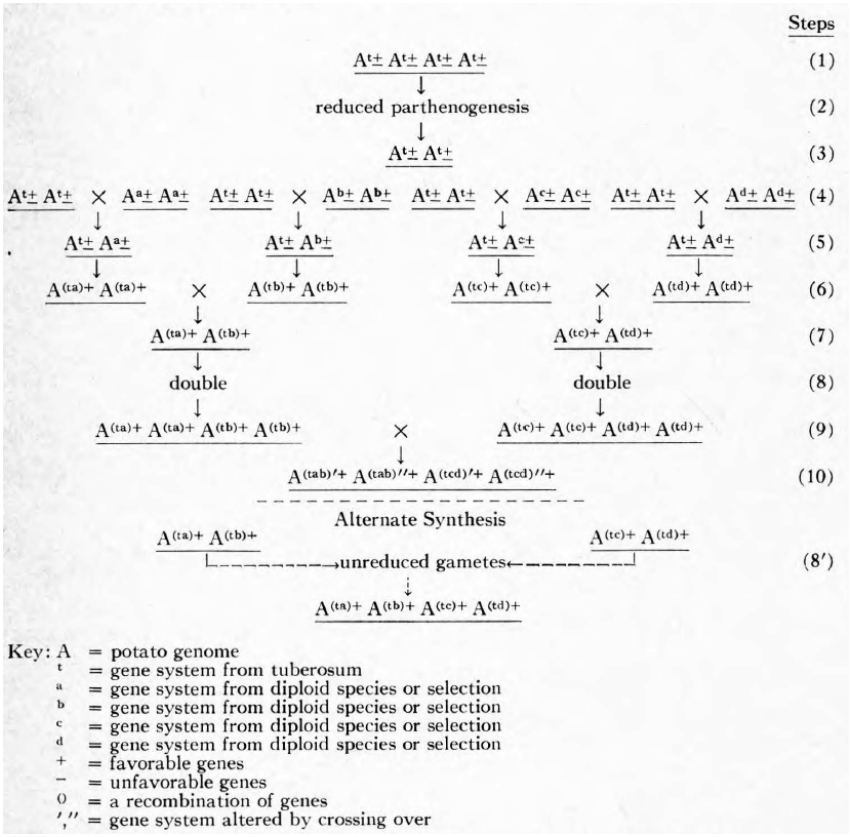
We analyze the asserted obviousness grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish a reasonable likelihood of prevailing in showing that at least one of the challenged claims of the '486 patent is unpatentable as obvious.

B. Prior art cited for Obviousness

1. *Chase (Ex. 1007)*

Chase is a journal article published in the Canadian Journal of Genetics and Cytology where "a hypothetical analytic breeding scheme for the common potato, *Solanum tuberosum* L., is presented." Ex. 1007, 362.

Figure 1 of Chase is reproduced below:



"In Fig. 1 the ten principal steps of a *hypothetical* analytic breeding scheme for the potato are presented. Those steps which have been successfully demonstrated are indicated by solid lines; those presenting some uncertainty are indicated by dashed lines." Ex. 1007, 360.

Chase states the "potato can, with comparative ease, be a) propagated vegetatively, b) reproduced sexually, c) reduced to the diploid state by parthenogenesis, d) crossed with diploids including native forms at the diploid level, and e) polyploidized." *Id.* at 359. Chase states "plant breeding involves, at the genome level, two distinct efforts, i.e., selection of favorable genes within individual chromosome sets and combination of whole sets in physiologically effective systems." *Id*. at 363. Chase states "[s]eparation of the intragenomic and intergenomic phases of plant improvement, through application of the analytic method, affords the potato breeder opportunities for higher levels of genetic control than presently obtained." *Id*. at 363.

2. *Bamberg (Ex. 1009)*

Bamberg is a publication of the potato genebank for the United States titled "Elite Selections of Tuber-bearing *Solanum* Species Germplasm." Ex. 1009, 1; Ex. 1002 ¶ 124. Bamberg "lists scores of accessions of potato germplasm available to the public on request, and it provides data on agronomically desirable traits for the accessions in the collection." Ex. 1002 ¶ 124.

Bamberg identifies particular potato strains by their accession numbers that were reputed to have resistance to ring rot, nematodes, and insect tolerance, among other agronomic traits. *See, e.g.*, Ex. 1009, 22, 25, 33.

3. *Springer (Ex. 1008)*

Springer is a publication in the journal *Genome Research* titled "Allelic variation and heterosis in maize: How do two halves make more than a whole?" Ex. 1008, 264. Springer states "[h]eterosis refers to the phenomenon in which the hybrid F_1 offspring exhibit phenotypic characteristics that are superior to the mean of the two parents (mid-parent heterosis), or the better of the two parents (better parent heterosis)." *Id*. at 264. Springer states "[h]eterosis has been used in the breeding and production of many crop and animal species." *Id.*

Springer states "the reverse of heterosis is inbreeding depression, in which progressive self-pollination or sibling matings reduce the genome-wide heterozygosity and overall fitness of an organism. Inbreeding depression is likely caused by the fixation of deleterious alleles within a lineage." *Id*. at 265.

4. *Phumichai (Ex. 1005)*

Phumichai is a publication in the journal *Genome* titled "Toward the development of highly homozygous diploid potato lines using the self-compatibility controlling *Sli* gene." Ex. 1005, 977. Phumichai states

> specific objectives were as follows: (*i*) to understand the process of inbreeding in terms of inbreeding depression as measured by fertility; (*ii*) to measure the degree of heterozygosity reduction and identify heterozygous loci that resist universal homozygosity; and (*iii*) to discuss the usefulness of *Sli* gene in developing of highly homozygous lines of diploid potato.

Id. at 978.

Phumichai states "[s]ection-based observed percentage of heterozygosity (SOPH) was defined as the percentage of the sections (each

of 12 chromosomes was trisected into sections *a*, *b*, and *c*, based on the map length) containing 1 or more heterozygous RFLP loci." Ex. 1005, 979. Phumichai states the "SOPH decreased steadily from the original 100% in 99H2–1 (S_0) to the family means of 62.4% in 3H2 (S_1), 37.9% in 3H3 (S_2), 9.9% in 2H32 or 10.4% in 2H34 (both S_4), and 6.0–12.2% in each of 3H86, 3H88, and 3H5 (all S_5)." *Id.* at 981. Phumichai teaches "this is the first report that self-fertile S_5 diploid inbreds with more than 90% homozygosity were produced. This demonstrated that highly homozygous and seed-propagated diploid potatoes could be obtained using the *Sli* gene." *Id.* at 982.

Phumichai states "the fact that only 1 of 7 cross combinations reached S_5 generation indicates that serious loss of fertility is typical in most families. Thus, inbreeding depression, typically expressed as reduced pollen viability and tuber yield." *Id.* Phumichai states "[c]ontinuous selfing may eliminate undesirable recessive alleles as they become homozygous and may in turn lead to the recovery of fertility with advancing generations . . . This expectation is not supported by the present study, because there was no indication of fertility recovery even at the S_5 generation." *Id.*

5. *Spooner (Ex. 1006)*

Spooner is a publication in the *Proceedings of the National Academy of Sciences* titled "Extensive simple sequence repeat genotyping of potato landraces supports a major reevaluation of their gene pool structure and classification." Ex. 1006, 19398. Spooner states the "purpose of our study is to reexamine the support for classification categories for land race potatoes, using nuclear SSR markers developed for optimal utility in *S. tuberosum* regarding polymorphism, quality scores, and genomic coverage." *Id.* at 19401.

Spooner states "the SSR data support the reclassification of the cultivated potatoes into four species: (i) *S. tuberosum,* (ii) *S. ajanhuiri* (diploid), (iii) *S. juzepczukii* (triploid), and *(iv) S. curtilobum* (pentaploid). We support dividing *S. tuberosum* into two Cultivar Groups." Ex. 1006, 19401. Spooner states "[f]or the remaining 'species' or Cultivar Groups, consistent and stable identifications are impossible, their classification as Linnean species is artificial, and their maintenance as either species or Cultivar Groups only serves to perpetuate confusion by breeders and gene bank managers, and the instability of names in the literature." *Id.*

C. Obviousness Grounds 2 – 5

1. *Petitioner's positions*

a. Ground 2 - Petitioner's position over Jong, Chase, and Bamberg

In Ground 2, Petitioner challenges claims 1–7 of the '841 patent. Pet. 37–47.

(1) Claim 1

Petitioner asserts "Jong discloses potato plants of the species *Solanum tuberosum*, said plants being diploid, fertile, self-compatible, producing at least 200g of tubers per plant, with at least 75% homozygosity, and wherein self-compatibility is conferred by *Sli*." Pet. 37 (citing Ex. 1002 ¶ 156).

Petitioner asserts "to the extent the 75% homozygosity limitation is not considered to be taught by Jong, it was obvious. Jong reports a "rapid increase in homozygosity following selfing at the diploid level." Pet. 37 (citing Ex. 1004, 6). Petitioner asserts that "[g]iven the stated goal of increasing homozygosity in the inbred diploid lines, a POSA would be motivated to continue to self to obtain inbreds that were at least 75%

homozygous, and given that relatively low threshold would have expected success in only a few generations of selfing." *Id.* (citing Ex. 1002 ¶¶ 157–158).

(2) Claim 2–7

As to claim 2, Petitioner asserts "multiple resistance traits were known to be possessed by the direct parents of US-W5309 and US-W5315 and many would be expected to be maintained in the progeny" and that it would have been "obvious for a POSA to select a plant from the resulting progeny of the US-W5315 or US-W5309-based crosses that maintained at least one of the resistance traits via routine testing." Pet. 38 (citing Ex. 1002 ¶¶ 161–163).

As to claim 3, Petitioner asserts Jong discloses "fairly vigorous lines were obtained even after five rounds of selfing – far beyond the S_2 generations which yielded over 400g tubers" and a "POSA would expect that Jong's lines would have yielded at least approximately 500g foliage." Pet. 3940 (citing Ex. 1002 ¶¶ 166–168). Petitioner also asserts "[t]his is especially true since the parental line of US-W5315 was scored in Bamberg as being an outstanding accession for vine and flowering vigor." *Id.* (citing Ex. 1009, 4, 55, 58).

As to claim 4, Petitioner asserts "Jong discloses multiple seed and clonal (tuber-propagated) generations of potato plants." Pet. 40 (citing Ex. 1002 ¶ 170).

As to claim 5, Petitioner asserts "Jong discloses the potato plants of Claim 1, and, in combination with Chase, describes the hybridization and inbreeding/selfing methods of Claim 5." Pet. 41 (citing Ex. 1002 ¶ 171). Petitioner asserts a "POSA would have found it obvious to apply the well-

known breeding methods disclosed in Chase to lines like Jong's as part of that effort." Pet. 42 (citing Ex. 1002 ¶ 181).

As to claim 6, Petitioner asserts "US-W5309 and US-W5315 are proposed as the first or second potato plants of Claim 5. Both of these proposed lines would be expected to contain agronomically desired traits derived from their parental accessions, and would have been obvious selections for further breeding." Pet. 46–47 (citing Ex. 1002 ¶¶ 194–196).

As to claim 7, Petitioner asserts claim 7 "merely recites a progeny plant produced by the method of Claim 5 that maintains the same performance characteristics recited for the parents of those progeny (and for the plant of Claim 1). (EX1002, ¶198.) Jong and Chase disclose both and render the claim obvious." Pet. 47.

b. Ground 3 - Petitioner's position over Jong, Chase, Bamberg, and Springer

In Ground 3, Petitioner challenges claims 8–10 of the '841 patent. Pet. 47–52.

(1) Claim 8

Petitioner asserts "Jong discloses at least two distinct inbred potato plants displaying the phenotypes recited in the claim, and also describes the hybridization cross that one would use to create hybrids." Pet. 47–48. Petitioner asserts, as to the specific elements of claim 8, that "Jong discloses a US-W5309 'first potato plant'" and "a US-W5315 'second potato plant' comprising the recited limitations." *Id*. at 48. Petitioner asserts "Jong teaches cross-pollination to produce hybrids." *Id.* at 50 (citing Ex. 1004, 7, 13; Ex. 1002 ¶ 209). Petitioner asserts that "Jong's call to cross inbred clones with high combining ability also encompasses the step of collecting the

resulting potato seeds, to grow the resulting hybrid plant." *Id.* (citing Ex. 1004, 11, 13; Ex. 1002 ¶¶ 210–211). Petitioner asserts that "it would have been obvious for a POSA to use parental plants with at least 20% contrasting homozygous loci to elicit hybrid vigor in the progeny." *Id.* at 48 (citing Ex. 1002 ¶ 204).

(2) Claims 9 and 10

Petitioner contends "[c]laim 9, and like claims 2 and 6, recite[] the same list of agronomically desirable traits and is obvious in view of Jong in view of Bamberg for the same reasons." Pet. 51 (citing Ex. 1002 ¶¶ 216–217). Petitioner contends "[c]laim 10 simply recites the "uniform hybrid F1 potato seed" produced according to the obvious method of Claim 8. A POSA in possession of the method of Claim 8 would find any plants produced by that exact process to be obvious." *Id.* at 52 (citing Ex. 1002 ¶ 218).

c. Ground 4 - Petitioner's position over Phumichai, Jong, Chase, Bamberg, and Spooner

In Ground 4, Petitioner challenges claims 1–7 of the '841 patent. Pet. 52–65.

(1) Claim 1

Petitioner asserts, as to element [a] of claim 1, that "Phumichai produced highly inbred plants of a cross between *S. tuberosum* Group Phureja and *S. chacoense*." Pet. 52 (citing Ex. 1005, 7).

Petitioner asserts, as to element [b] of claim 1, that "Phumichai teaches introduction of *Sli* into several *S. tuberosum* Group Phureja cultivated inbred lines that meet the relevant claim limitations" and that "Phumichai maintained fertility and self-compatibility by successfully

selfing until at least the S_5 generation." Pet. 55 (citing Ex. 1002 ¶¶ 224–225, 227; Ex. 1005, 10).

Petitioner asserts, as to element [c] of claim 1, that several inbred lines developed by Phumichai exhibited "'considerable tuber yields" at the S_4 level" and that based on this statement, a POSA would "conclude that Phumichai disclosed inbred lines capable of producing at least 200g of tuber per plant under appropriate grown conditions." Pet. 56 (citing Ex. 1005, 10; Ex. 1022, 3; Ex. 1002 ¶¶ 229–230).

Petitioner asserts, as to element [d] of claim 1, that "Phumichai reported S_4 lines with 89.3% homozygosity (series A, 10.7% heterozygous), and S_5 lines with 91.4% homozygosity (series B, 8.6% heterozygous)." Pet. 56 (citing Ex. 1005, abstract; Ex. 1002 ¶ 232).

Petitioner asserts, as to element [e] of claim 1, that "[b]y their own admission, the '841 inventors believed Phumichai's germplasm was the source for *Sli* in their breeding, employing line 'H' as the *Sli* donor for their crosses." Pet. 57 (citing Ex. 1001, 29:47–53; Ex. 1010, 531).

Petitioner asserts

> a POSA would have been motivated to obtain a diploid, fertile, and self-compatible potato with the relatively meager claimed performance characteristics of 75% homozygosity and 200g tuber yield. Jong disclosed successful creation of such lines, and Phumichai showed that *Sli*-based breeding could be used to undertake several rounds of selfing to obtain highly homozygous and vigorous plants.

Pet. 58 (citing Ex. 1002 ¶ 237).

(2) Claims 2–7

Petitioner relies on the same reasoning as provided in Ground 2 for these claims, which is given above. *See* Pet. 59–65.

d. Ground 5 - Petitioner's position over Phumichai, Jong, Chase, Bamberg, Spooner, and Springer

In Ground 5, Petitioner challenges claims 8–10 of the '841 patent. Pet. 66–69.

Petitioner relies on the same reasoning as provided in Ground 3 for these claims, which is given above. *See id*.

2. *Patent Owner's position*

Patent Owner asserts that "Petitioner, while fully aware of significant evidence of secondary considerations presented during prosecution of the '841 and '436 Patents, fails to adequately address these objective indicia of non-obviousness." Prelim. Resp. 20. Patent Owner asserts that they

> presented extensive secondary considerations evidence during prosecution of the '841 and '436 Patents, including, long-felt need, industry skepticism, failure of others, unexpected results, and industry praise. In support, Agventure cited to prior art references, submitted a declaration from named inventor Dr. Lindhout, and letters from various, world-renowned potato breeding experts. After thoroughly analyzing this evidence, the Examiner found Dr. Lindhout's declaration and the global experts' letters persuasive in overcoming Section 103 rejections during the related '436 Patent.

Id. at 21–22.

a. Long-Felt Need

Patent Owner asserted during prosecution of the '841 patent that "there had been a long-felt need in potato breeding for highly homozygous potato lines that can be used in hybrid breeding to allow the introduction of new, desirable traits." Prelim. Resp. 22 (citing Ex. 2009, 641).

During prosecution, Patent Owner cited to a declaration by Dr. Lindhout which states "despite having been proposed some 51 years

before the priority date of the present application, these diploid *S. tuberosum* breeding programs have never resulted in vigorous fertile homozygous diploid *S. tuberosum* lines due to self-incompatibility and inbreeding depression." Prelim. Resp. 23 (citing Ex. 2009, 682). Patent Owner also "submitted letters from potato breeding experts during prosecution of the '436 Patent that support the long-felt need for such homozygous potato lines." *Id.* Patent Owner quotes from one such letter, which states

> I was surprised by the progress [Solynta/Agventure] made on developing self-compatible homozygous diploid potato with good agronomic performance. ***This research is the breakthrough we have been waiting for since nearly a century*** when the first hybrid maize was developed in the 1920s. This is crucial for the potato breeding worldwide and especially for the food security in China.

Id. at 24 (citing Ex. 2009, 686–687) (emphasis in original).

b. Industry Skepticism

Patent Owner asserts that during prosecution of the '841 patent they submitted evidence that "others in the industry were skeptical of the chance of success in producing such potato lines due to extensive inbreeding depression resulted from increasing homozygosity." Prelim. Resp. 24 (citing Ex. 2009, 650). Patent Owner cited Phumichai during prosecution as stating "the fact that only 1 of 7 cross combinations reached S_5 generation indicates that serious loss of fertility is typical in most families. Thus, in breeding depression, typically expressed as reduced pollen viability and tuber yield . . . will certainly limit continued selfing of the present diploid inbreds." *Id.* at 25 (citing Ex. 1005, 10).

Patent Owner also pointed to a publication by Jansky cited during prosecution of the '841 patent as stating:

> Each generation of self-fertilization reduces heterozygosity by 50%. ***This rate of approach to homozygosity may be too high in potato***, where ***inbreeding depression results in dramatic reductions in fertility and plant vigor*** (Phumichai et al., 2005; Phumichai and Hosaka, 2006). Sib-mating is an attractive alternative that provides a smoother transition to homozygosity.

Prelim. Resp. 26 (citing Ex. 1011, 26). Patent Owner also notes that the same publication states "[w]hile the development of potato cultivars at the diploid level sounds appealing, ***it is not likely to be successful***." *Id.* at 27 (citing Ex. 1011, 17). Patent Owner similarly cites letters by Dr. Jacobsen, Dr. Jan van Loon, and Dr. Koornneef as discussing difficulties and problems in the use of homozygous inbred potato lines. *Id.* at 27–29 (citing Ex. 2009, 684, 688, 690).

c. Failure of Others

Patent Owner asserts that "others have failed in attempts to achieve diploid, fertile, self-compatible, and highly homozygous potato lines, including through a breeding scheme of introducing the *Sli* gene followed by selfing." Prelim Resp. 29 (citing Ex. 2009, 651, 968, 1009). Patent Owner asserts that during prosecution of the '841 patent, they "submitted statements from potato breeding experts demonstrating others' failure in achieving the claimed invention." *Id.* at 30.

Patent Owner quotes from a letter by Dr. Jonathan Jones, stating that during the "mid 2000s we attempted to produce hybrid potato ourselves. ***No successes had ever been reported with S. tuberosum***. . . . However, ***we never succeeded in developing any promising material*** in the form of fertile homozygotes that could be useful for hybrid breeding and that could tolerate recurrent selfing." *Id.* at 30 (citing Ex. 2009, 685). Patent Owner points to a

similar statement in a Declaration by Dr. Jones as well. Prelim. Resp. 31 (citing Ex. 1010, 1054).

d. Unexpected Results

Patent Owner asserts they "presented evidence during prosecution that it was unexpected to successfully develop self-compatible, highly homozygous diploid potatoes lines with vigorous tuber yields as claimed." Prelim. Resp. 31–32 (citing Ex. 2009, 647).

Patent Owner cites a potato breeding expert, Dr. Jan van Loon, as stating that the "***pioneering approach of Solynta with non common techniques in potato breeding has produced surprising results***." *Id.* at 32–33 (citing Ex. 2009, 688). Patent Owner also cites Dr. Koornneef as stating that "[e]ver since Lindhout and his co-workers published their results in Potato Research volume 54 of 2011, showing high yielding hybrids from 87% homozygous F3 inbreds, ***I have been positively surprised that Solynta has managed to challenge this dogma***." *Id.* at 33 (citing Ex. 2009, 690). Patent Owner further cites Dr. Jacobsen as stating "[a]ll commercial potato cultivars are tetraploid and there is a common belief that tetraploids will always outperform diploids. Your F1 hybrid method relies on diploid breeding. ***That your approach is successful is surprising to me.***" *Id.* (citing Ex. 2009, 684).

Patent Owner also points to declarations from the inventor of the '841 patent, Dr. Lindhout, who states "the strategy of using a hybrid potato seed approach as presently disclosed was considered a completely new way of potato breeding and a pioneering approach that produced surprising results." *Id.* at 34 (citing Ex. 2009, 680). Dr. Lindhout also states

> the generation of homozygous (inbred), diploid potato lines by means of introgressing the *Sli*-gene from a *Sli*-gene donor line into diploid *S. tuberosum* plants followed by inbreeding (selfing) and selection for fertile offspring, which led to the unexpected result of the plants as claimed, was the culmination of at least three years of unsuccessful attempts using four alternative methods.

Prelim. Resp. 34–35 (citing Ex. 2009, 989).

e. Industry Praise

Patent Owner asserts they "presented evidence of industry praise of the claimed potato lines and potato seed breeding methods that allows introduction of agronomically desirable traits." Prelim. Resp. 35. Patent Owner asserts they "had the honor to receive from the Dutch government the title of 'National Icon 2014', for its groundbreaking technology in the field of potato breeding." *Id.* at 35 (citing Ex. 2009, 651). Patent Owner states the "award specifically highlighted Agventure's 'new breeding technique with potato seed instead of potatoes.'" *Id.* (citing Ex. 2009, 651).

3. *Analysis*

Based on the record before us, Petitioner did not address the significant and persuasive objective indicia evidence that existed in the present record showing long-felt need, industry skepticism, failure of others, unexpected results and industry praise. *See, generally*, Petitioner's Reply (failing to address Patent Owner's arguments of objective indicia of nonobvious or the relevant evidence, *e.g.*, Ex. 2009, 678, 684, 685, 687, 688). And the PTAB has cautioned petitioners in prior proceedings that known evidence of secondary considerations should be addressed in the Petition. *See, e.g., Omron Oilfield & Marine Inc. v. MD/TOTCO*, IPR2013–

00265 (PTAB, Oct. 31, 2013) (Paper 11) (denying institution for failure to address objective indicia successfully argued in a reexamination).

Further, our Trial Practice Guide explains, "[t]he Board expects that most petitions will raise issues of obviousness. In determining whether the subject matter of a claim would have been obvious over the prior art, the Board will review any objective evidence of nonobviousness proffered by the patent owner where appropriate." *CTPG* 41.[8]; *see also* 37 C.F.R. § 42.107(a) ("a preliminary response . . . can include supporting evidence").

Petitioner's failure to address any objective indicia offered by Patent Owner is telling. Petitioner does not refute Patent Owner's evidence of objective indicia. On the current record, the objective indicia evidence is compelling.

As to long felt need, Patent Owner cited evidence on record before the Examiner that showed a persistent need recognized by ordinarily skilled artisans. *In re Gershon*, 372 F.2d 535, 538 (CCPA 1967). For example, Dr. Huang states "This research is the breakthrough we have been waiting for since nearly a century . . . This is crucial for the potato breeding worldwide." Ex. 2009, 687. There is no evidence that this long-felt need was satisfied by another before Appellant's invention. *See Newell Companies, Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988) ("[O]nce another supplied the key element, there was no long-felt need or, indeed, a problem to be solved . . . ."). Lastly, Dr. Lindhout explains that this invention satisfies the long-felt need, stating "I have discovered, and disclosed in the present application for patent, how a fertile homozygote in

[8] PTAB Consolidated Trial Practice Guide, November 2019 (the "CTPG"), available at: https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf.

potato with good agronomical properties can be produced." Ex. 2009, 681. *See In re Cavanagh*, 436 F.2d 491, 496 (CCPA 1971).

Similarly, Patent Owner points to persuasive evidence of skepticism, including Dr. Jacobsen's letter stating that prior to the claimed invention, "your approach has been considered as unrealistic and unfeasible for the development of commercial cultivars," and "[t]hat your approach is successful is surprising to me." Ex. 2009, 684. Dr. Koornneef states "a project aiming at developing a good performing homozygous potato plant for the purpose of hybrid production is a daring undertaking with very little chance of success." *Id.* at 690.

There is express evidence of failure by others, as Dr. Jones states "we attempted to produce hybrid potato ourselves . . . we never succeeded in developing any promising material in the form of fertile homozygotes that could be useful for hybrid breeding and that could tolerate recurrent selfing." Ex. 2009, 685. And Patent Owner asserts persuasive evidence that the statements of surprise by experts at Patent Owner's success where others failed demonstrates an unexpected result. *See* Prelim. Resp. 31–35. Finally, there is direct evidence of industry praise in the form of a "National Icon 2014" award for the "new breeding technique with potato seed instead of potatoes." Ex. 2009, 651 (emphasis omitted).

We recognize that objective indicia "do not necessarily control the obviousness conclusion." *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1372 (Fed. Cir. 2007). However, as we balance the objective indicia evidence with Petitioner's case of obviousness and failure to address the objective indicia evidence, even if we found Petitioner's case sufficient to establish prima facie obviousness, we are strongly persuaded that the claimed invention

satisfied a long-felt need, overcame skepticism of experts and failure by other inventors, and we find the evidence of record on balance better supports a finding of non-obviousness.

Accordingly, we find that on the current record Petitioner has not shown that it has a reasonable likelihood that it would prevail on these obviousness grounds.

XII. DISCRETIONARY DENIAL – 35 U.S.C. § 325(d)

In view of our determination that the Petitioner does not meet the threshold for instituting review on the merits, we need not address the parties' dispute about whether the Board should exercise its discretion to deny institution under 35 U.S.C. § 325(d). Pet. 74–75; Prelim. Resp. 38–54; Pet. Reply 1–5; PO Sur-Reply 1–5.

XIII. CONCLUSION

After reviewing the information presented in the Petition and the Preliminary Response, we determine that, based on the evidence of record, Petitioner has not established a reasonable likelihood that claims 1–10 of the '841 patent are unpatentable.

XIV. ORDER

Accordingly, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), institution of an *inter partes* review of all challenged claims on all grounds presented in the Petition is denied.

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