

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.

Case No. PGR2024-00019
Patent No. 11,659,803

**PETITION FOR POST-GRANT REVIEW
UNDER 35 U.S.C. §§ 321-329 AND 37 C.F.R. § 42.1 et seq**

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	REQUIREMENTS FOR POST-GRANT REVIEW	9
	A. Grounds for Standing	9
	B. Identification of Challenge	9
	1. The '803 is Eligible for PGR.....	10
	2. Statutory Grounds on Which the Challenge is Based	10
III.	THE '803 PATENT	11
	A. Summary of the '803 Patent	11
	B. Level of Ordinary Skill in the Art	13
	C. Prosecution History	13
	D. Challenged Claims.....	20
IV.	CLAIM INTERPRETATION	20
V.	GROUND 1-3: CLAIMS 1-20 ARE UNPATENTABLE AS OBVIOUS OVER THE PRIOR ART	21
	A. <i>Graham</i> Factor Analysis Relevant to Grounds 1-3	23
	1. Scope and Content of the Prior Art	24
	a. General State of the Art	24
	b. Prior Art Disclosing Closely Related Inbred Maize Varieties	25
	2. Differences Between the Prior Art and the Claimed Invention	31
	3. Level of Ordinary Skill in the Art.....	33
	4. Secondary Considerations	38
	B. Ground 1: Claims 1-20 Are Unpatentable as Obvious Over Chifflet (EX1005) and the Corresponding PVPA Certificate (EX1008)	39
	1. Claim 1: Variety 1PFLQ21	40
	2. Claims 2-20: Variations and Hybrids Related to 1PFLQ21	42
	a. Claim 2: Ovule or Pollen	42

b. Claims 3-8: Hybrids and Related Uses Derived From the Inbred Line of Claim 1	42
c. Claim 9: Nucleic Acids Isolated From 1PFLQ21	46
d. Claims 10-17: Converted Seeds of 1PFLQ21	46
e. Claims 18-20: F1 Hybrid Derived From Variety 1PFLQ21 with a Transgene	49
C. Ground 2: Claims 1-20 Are Unpatentable As Obvious Over Smalley (EX1006) and the Corresponding PVPA Certificate (EX1009)	50
1. Claim 1	51
2. Claims 2-20	55
D. Ground 3: Claims 1-20 Are Unpatentable as Obvious Over Gadlage (EX1007)	58
1. Claim 1	59
2. Claims 2-20	60
VI. GROUND 4: CLAIMS 1-20 LACK SPECIFIC UTILITY	63
A. The '803 Patent Fails to Disclose Any Specific Utility for the Claimed Variety	63
B. The '803 Patent Fails to Disclose Any Characteristics Markedly Different From Those Found in Other Varieties	66
VII. GROUND 5: THE PETITION PRESENTS A NOVEL AND UNSETTLED QUESTION CONCERNING WHAT IS REQUIRED TO DETERMINE WHETHER PLANT UTILITY CLAIMS HAVE THE REQUISITE SPECIFIC UTILITY UNDER §101	69
A. Requiring a Specific Statement Concerning Benefits of the Claimed Plant Variety as Compared to Other Varieties Would Ensure Application of Longstanding §101 Precedent	71
B. PO Previously Included Such Specific Statements and Comparative Data as a Matter of Course in Earlier Plant Utility Patents— Including Those of Record for the Supreme Court in <i>J.E.M.</i>	74
VIII. NO BASIS EXISTS FOR DISCRETIONARY DENIAL	77
A. §314(a)	77
B. §324(a)	77

C. §325(d).....	77
1. Ground 1-3 (Obviousness)	77
2. Grounds 4-5 (Lack of Specific Utility)	84
IX. CONCLUSION.....	84
X. MANDATORY NOTICES	85
A. Real Party-In-Interest	85
B. Related Matters.....	85
1. United States Patent & Trademark Office	85
C. Counsel and Service Information - §42.8(b)(3) and (4).....	85
XI. CLAIM LISTING	86

TABLE OF AUTHORITIES

Cases

<i>Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH</i> , IPR2019-01469, Paper 6 (Feb. 13, 2020)	77, 78
<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (Mar. 20, 2020)	77
<i>Application of Payne</i> , 606 F.2d 303 (CCPA. 1979)	23
<i>Brenner v. Manson</i> , 383 U.S. 519 (1966)	passim
<i>Cellco P’ship v. Huawei Device Co.</i> , IPR2020-01117, Paper 10 (Feb. 3, 2021)	78
<i>Dayco Prod., Inc. v. Total Containment, Inc.</i> , 329 F.3d 1358 (Fed. Cir. 2003)	19, 35
<i>Diamond v. Chakrabarty</i> , 447 U.S. 303 (1980)	66, 67
<i>DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.</i> , 464 F.3d 1356 (Fed. Cir. 2006)	passim
<i>Ex parte C</i> , 27 U.S.P.Q.2d 1492 (BPAI 1992)	passim
<i>Ex Parte Fisher</i> , 72 U.S.P.Q.2d 1020 (BPAI 2004)	65, 72
<i>Ex parte Frohberg</i> , Appeal 2018-002288, 2019 WL 3033154 (PTAB July 3, 2019)	38
<i>Ex parte Ketkar</i> , Appeal 2017-008056, 2018 WL 3812708 (PTAB July 24, 2018)	36, 38
<i>Ex parte Kropp</i> , 143 U.S.P.Q. 148 (PBA 1959)	65, 66, 71

<i>Ex parte Reid</i> , Appeal 2010-004943, 2010 WL 4876440 (BPAI Nov. 29, 2010)	37, 38
<i>Ex parte Uchiyama</i> , Appeal No. 2017-005387, 2018 WL 1378136 (PTAB Mar. 12, 2018)	67
<i>General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha</i> , IPR2016-01357, Paper 19 (Sept. 6, 2017).....	77
<i>Graham v. John Deere Co.</i> , 383 U.S. 1 (1966).....	23, 81
<i>Helsinn Healthcare S.A. v. Teva Pharms. USA, Inc.</i> , 139 S. Ct. 628 (2019).....	80, 81
<i>Hybrigenics v. Forma Therapeutics</i> , PGR2018-00098, 2019 WL 1308262 (PTAB Mar. 20, 2019)	84
<i>In re Dillon</i> , 919 F.2d 688 (Fed. Cir. 1990) (en banc)	23
<i>In re Epstein</i> , 32 F.3d 1559 (Fed. Cir. 1994)	33
<i>In re Fisher</i> , 421 F.3d 1365 (Fed. Cir. 2005)	63, 64, 65, 71
<i>In re GPAC Inc.</i> , 57 F.3d 1573 (Fed. Cir. 1995)	13
<i>In re Hibberd</i> , 227 U.S.P.Q. 443 (BPAI 1985)	67
<i>In re Kirk</i> , 376 F.2d 936 (CCPA 1967).....	65, 72
<i>In re Kubin</i> , 561 F.3d 1351 (Fed. Cir. 2009)	37
<i>In re Roslin Institute (Edinburgh)</i> , 750 F.3d 1333 (Fed. Cir. 2014)	67

<i>J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc.</i> , 534 U.S. 124 (2001).....	passim
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	4, 24, 37, 78
<i>Madey v. Duke Univ.</i> , 307 F.3d 1351 (Fed. Cir. 2002)	73, 74
<i>Medtronic Vascular Inc. v. Abbott Cardiovascular Sys., Inc.</i> , 614 F. Supp. 2d 1006 (N.D. Cal. 2009).....	81
<i>National Steel Car, Ltd. v. Canadian Pacific Ry., Ltd.</i> , 357 F.3d 1319 (Fed. Cir. 2004)	78, 82
<i>Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.</i> , 868 F.3d 1013 (Fed. Cir. 2017)	20
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	20
<i>Quest Integrity USA, LLC v. Cokebusters USA Inc.</i> , 924 F.3d 1220 (Fed. Cir. 2019)	81
<i>Special Devices, Inc. v. OEA, Inc.</i> , 270 F.3d 1353 (Fed. Cir. 2001)	80
<i>Thomas & Betts Corp. v. Litton Sys., Inc.</i> , 720 F.2d 1572 (Fed. Cir. 1983)	81
<i>Tyco Healthcare Grp. LP v. Ethicon Endo-Surgery, Inc.</i> , 774 F.3d 968 (Fed. Cir. 2014)	80
<i>Woodland Tr. v. Flowertree Nursery, Inc.</i> , 148 F.3d 1368 (Fed. Cir. 1998)	80
<i>Yeda Rsch. v. Mylan Pharms. Inc.</i> , 906 F.3d 1031 (Fed. Cir. 2018)	82
Constitutional Provisions	
U.S. Const., Art. I, § 8, cl. 8.....	4, 64, 74

Statutes

35 U.S.C §§ 321-329	84
35 U.S.C. § 101	passim
35 U.S.C. § 102	passim
35 U.S.C. § 103	passim
35 U.S.C. § 112	14
35 U.S.C. § 282(b)	20
35 U.S.C. § 314(a)	76
35 U.S.C. § 324	passim
35 U.S.C. § 325(d)	77, 78
7 U.S.C. § 2544	73

Regulations

37 C.F.R. § 1.105	3, 14, 17, 82
37 C.F.R. § 42.200	20, 84
37 C.F.R. § 42.204	9, 10
37 C.F.R. § 42.208(c)	7

Other Authorities

8 Chisum on Patents § 24.05 (2023)	6
MPEP § 2004	35
MPEP § 724.02	18, 19, 82

APPENDIX LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 11,659,803
1002	Prosecution History of U.S. Patent No. 11,659,803
1003	Declaration of Dr. Ray Riley
1004	Curriculum Vitae of Dr. Ray Riley
1005	U.S. Patent No. 8,907,160 (“Chifflet”)
1006	U.S. Patent No. 8,466,351 (“Smalley”)
1007	U.S. Patent No. 10,405,509 (“Gadlage”)
1008	Plant Variety Protection Certificate No. 201300302
1009	Plant Variety Protection Certificate No. 201000366
1010	Lundmark, C. Genetically Modified Maize. <i>BioScience</i> 2007, 57, 996
1011	Lee, E.A.; Tracy, W.F. <i>Modern Maize Breeding</i> , in <i>Handbook of Maize: Genetics and Genomics</i> ; Bennetzen, J.L., Hake, S., Eds.; Springer: New York, NY, USA, 2009; pp. 141–160. ISBN 978-0-387-77863-1
1012	Byerlee, D., <i>The Globalization of Hybrid Maize</i> , 1921–1970. <i>J. Glob. Hist.</i> , 15:101–122 (2020)
1013	Varshney, R.K.; Tuberosa, R. <i>Genomics-Assisted Crop Improvement: An Overview</i> , in <i>Genomics-Assisted Crop Improvement: Vol. 1: Genomics Approaches and Platforms</i> ; Varshney, R.K., Tuberosa, R., Eds.; Springer Netherlands: Dordrecht, The Netherlands, 2007; pp. 1–12. ISBN 978-1-4020-6295-7.
1014	Androf et al., <i>Technological advances in maize breeding: past, present and future</i> , <i>Theor Appl Genet.</i> , 132(3):817-849 (2019)
1015	Fehr et al., <i>Principles of Cultivar Development</i> (1987)
1016	U.S. Patent No. 10,206,365 (“Montpetit”)
1017	Executive Order 14036: Promoting Competition in the American Economy, 86 Fed. Reg. 36987 (July 9, 2021)
1018	Thomas J. Vilsack, Secretary of Agriculture, and Kathi Vidal, Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office, Increasing transparency, boosting competition, and supporting innovation can deliver better choices for farmers in the seed marketplace (March 3, 2023), https://www.uspto.gov/subscription-center/2023/increasing-transparency-boosting-competition-and-supporting-innovation-can

1019	USDA Agricultural Marketing Service, More and Better Choices for Farmers: Promoting Fair Competition and Innovation in Seeds and Other Agricultural Inputs (March 2023), https://www.ams.usda.gov/sites/default/files/media/SeedsReport.pdf
1020	March 7, 2023 Letter from USPTO Director Katherine K. Vidal to Secretary of Agriculture Thomas J. Vilsack and Undersecretary for Marketing and Regulatory Programs Jenny Lester Moffitt, https://www.uspto.gov/sites/default/files/documents/uspto-usda-letters03072023.pdf
1021	W. Lesser, <i>From Penury to Prodigious: Protection Creep for U.S. Plant Varieties</i> , 14 Va. J. L. & Tech. 235 (2009)
1022	Brief for Respondent Pioneer Hi-Bred Int'l, <i>J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.</i> , 534 U.S. 124 (2001) (No. 99-1996) (filed June 2001), 2001 WL 674228
1023	Brief for the United States as Amicus Curiae Supporting Respondent, <i>J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.</i> , 534 U.S. 124 (2001) (No. 99-1996) (filed June 2001)
1024	Brief for the United States as Amicus Curiae, <i>J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.</i> , 534 U.S. 124 (2001) (No. 99-1996) (filed January 2001)
1025	Wych et al., <i>Production of Hybrid Seed, Corn and Corn Improvement</i> , Chapter 9 (1988)
1026	U.S. Patent No. 10,492,410
1027	U.S. Patent No. 10,492,411
1028	U.S. Patent No. 10,492,412
1029	U.S. Patent No. 10,492,413
1030	U.S. Patent No. 10,492,414
1031	MacDonald, J.M., Dong, X., & Fuglie, K.O. (2023). <i>Concentration and competition in U.S. agribusiness</i> . U.S. Department of Agriculture, Economic Research Service, EIB-256, https://www.ers.usda.gov/webdocs/publications/106795/eib-256.pdf?v=7459
1032	USPTO Biotech/Chemical Partnership (BCP) Meetings: Biotechnology, Chemical and Pharmaceutical (BCP) Partnership Meeting, September 24, 2018, https://www.aipla.org/resources/uspto-bcp-meetings/uspto-bcp-meetings/uspto-bcp-meetings/2018/09/24/biotechnology-chemical-and-pharmaceutical-(bcp)-partnership-meeting-september-24-2018

U.S. Patent No. 11,659,803
Petition for Post-Grant Review – PGR2024-00019

1033	BCP September 2018 37 CFR 1.105 Slides, https://www.aipla.org/docs/default-source/committee-documents/bcp-files/2018/bcp-105-slides
1034	Comparison between EX1001 ('803 Patent) and EX1007 (Gadlage)
1035	Schnable et al., <i>The B73 Maize Genome: Complexity, Diversity, and Dynamics</i> , Science, 326:1112-1115 (2009)
1036	Amended Complaint for Patent Infringement, <i>Pioneer Hi-Bred Int'l, Inc. v. J.E.M. AG Supply, Inc. et al</i> , No. C98-4016 (N.D. Iowa September 11, 1998)
1037	U.S. Patent No. 5,082,992
1038	U.S. Patent No. 5,347,081
1039	U.S. Patent No. 5,444,178
1040	U.S. Patent No. 5,453,564
1041	U.S. Patent No. 5,463,173
1042	U.S. Patent No. 5,491,295
1043	U.S. Patent No. 5,495,069
1044	U.S. Patent No. 5,502,272
1045	U.S. Patent No. 5,506,367
1046	U.S. Patent No. 5,534,661
1047	U.S. Patent No. 5,545,813
1048	U.S. Patent No. 5,557,035
1049	U.S. Patent No. 5,567,861
1050	U.S. Patent No. 5,569,822
1051	U.S. Patent No. 5,633,427
1052	U.S. Patent No. 5,689,034
1053	U.S. Patent No. 5,689,036
1054	U.S. Patent No. 10,130,062
1055	U.S. Patent No. 10,660,290
1056	U.S. Patent No. 10,687,499
1057	U.S. Patent No. 9,282,702
1058	U.S. Patent No. 9,456,566
1059	U.S. Patent No. 10,201,146
1060	U.S. Patent No. 9,877,456
1061	U.S. Patent No. 9,226,468
1062	U.S. Patent No. 9,326,475
1063	U.S. Patent No. 9,084,408
1064	U.S. Patent No. 10,051,810
1065	U.S. Patent No. 9,737,023
1066	U.S. Patent No. 10,028,464

U.S. Patent No. 11,659,803
Petition for Post-Grant Review – PGR2024-00019

1067	U.S. Patent No. 10,028,465
1068	U.S. Patent No. 9,867,358
1069	U.S. Patent No. 9,686,948
1070	U.S. Patent No. 9,807,956
1071	U.S. Patent No. 9,426,959
1072	U.S. Patent No. 9,398,751
1073	U.S. Patent No. 9,374,964
1074	U.S. Patent No. 9,445,572
1075	U.S. Patent No. 9,374,963
1076	U.S. Patent No. 9,326,471
1077	U.S. Patent No. 9,277,707
1078	U.S. Patent No. 9,861,061
1079	U.S. Patent No. 9,872,464
1080	U.S. Patent No. 9,737,024
1081	U.S. Patent No. 9,307,718
1082	U.S. Patent No. 10,779,499
1083	U.S. Patent No. 11,439,099
1084	U.S. Patent No. 11,470,805
1085	U.S. Patent No. 11,559,018
1086	U.S. Patent No. 10,716,280
1087	U.S. Patent No. 11,439,100
1088	U.S. Patent No. 11,419,295
1089	U.S. Patent No. 11,399,492
1090	U.S. Patent No. 11,659,801
1091	U.S. Patent No. 11,582,938
1092	U.S. Patent No. 11,672,227
1093	U.S. Patent No. 11,771,031
1094	U.S. Patent No. 11,632,928
1095	U.S. Patent No. 11,622,520
1096	U.S. Patent No. 11,659,802
1097	U.S. Patent No. 9,826,708
1098	U.S. Patent No. 9,084,401
1099	U.S. Patent No. 8,618,376
1100	U.S. Patent No. 10,470,401
1101	“A Brief History of Corn – From Domestication to 1995,” Pioneer Hi-Bred International, Inc. (Dec. 19, 2022), https://www.pioneer.com/us/agronomy/domestication-of-corn.html
1102	Geiger, <i>Doubled Haploids in Hybrid Maize Breeding</i> , Maydica 54:485-99 (2009)

1103	Weber, <i>Today's Use of Haploids in Corn Plant Breeding</i> in <i>Advances in Agronomy</i> , Volume 123 (2014)
1104	Excerpts from Merriam-Webster's Collegiate Dictionary (11th ed. 2006)
1105	Altman, <i>Standard deviations and standard errors</i> , Brit. Med. J., 331:903 (2005)
1106	U.S. Patent No. 9,456,570
1107	U.S. Patent No. 9,504,221
1108	Hostetler, <i>Bracing for sustainable agriculture</i> , Curr. Opin. Plant. Biol. 59:101985 (2021)
1109	U.S. Patent No. 5,159,133
1110	Comparison between EX1001 ('803 Patent) and EX1090 (U.S. Patent No. 11,659,801, filed same day as '803 Patent)
1111	Comparison between EX1001 ('803 Patent) and EX1091 (U.S. Patent No. 11,582,938, filed same day as '803 Patent)
1112	Comparison between EX1001 ('803 Patent) and EX1092 (U.S. Patent No. 11,672,227, filed same day as '803 Patent)
1113	Comparison between EX1001 ('803 Patent) and EX1093 (U.S. Patent No. 11,771,031, filed same day as '803 Patent)
1114	Comparison between EX1001 ('803 Patent) and EX1094 (U.S. Patent No. 11,632,928, filed same day as '803 Patent)
1115	Comparison between EX1001 ('803 Patent) and EX1095 (U.S. Patent No. 11,622,520, filed same day as '803 Patent)
1116	Comparison between EX1001 ('803 Patent) and EX1096 (U.S. Patent No. 11,659,802, filed same day as '803 Patent)
1117	U.S. Patent No. 11,730,120

I. INTRODUCTION

Claims 1-20 (“Challenged Claims”) of U.S. Patent No. 11,659,803 (EX1001, “the ’803 Patent”) are utility patent claims to a plant—specifically, a particular variety of corn.

Patent Owner Pioneer Hi-Bred International (“PO”) obtained the claimed corn variety— designated “1PFLQ21”—by crossing (i.e., breeding) two other corn varieties—“PH1V5T” and “PH2F7K.” EX1001, 37:61-64. But such crosses were well within the level of skill for a person of ordinary skill (“POSA”) in the corn breeding field as of the ’803 Patent’s 7/2/2021 effective filing date. And nothing in the ’803 Patent or elsewhere in the record suggests the claimed 1PFLQ21 variety was patentably distinguishable over the PH1V5T variety, the PH2F7K variety, or any other preexisting corn variety. The ’803 Patent’s specification does not undertake any such comparison. On the contrary, it is largely identical to the specifications of other patents owned by PO and constituting indisputable prior art. *See, e.g.*, EX1034 (comparison between the ’803 Patent’s specification and EX1007 (Gadlage)).

The only differences of any note between the ’803 Patent and the indisputable prior art are the recitations of different codes (corresponding to different corn varieties) and different parental lines (corresponding to how the

varieties were bred), along with tables reporting patentably insignificant differences in properties such as the color of the corn silk, the level of pigmentation in the corn's roots, and the average angle of the corn's branches. But the '803 is a *utility* patent—not a plant patent or certificate under the Plant Variety Protection Act (PVPA). And the properties reported by the '803 Patent concerning the claimed 1PFLQ21 variety fall well within the mainstream of corn phenotypes known long before the '803 Patent's 7/2/21 effective filing date, and/or have no meaningful utility. Instead, the litany of characteristics included in the '803 Patent mirror the characteristics required to be identified in PVP certificates, which unlike utility patents do not require identified plant varieties to be useful or non-obvious.

Nor does the '803 Patent otherwise suggest any reason why the particular combination of reported properties made the claimed 1PFLQ21 variety any better in any respect than any preexisting type of corn for any application. On the contrary, the '803 Patent's "Industrial Applicability" section (EX1001, 36:21-65) is essentially a cut-and-paste of a passage PO included in numerous prior art patents—including that covering one of the claimed 1PFLQ21 variety's parents (EX1005, 33:38-34:10). In sum, while the claimed 1PFLQ21 variety may have been different from prior varieties in some respect, it was not inventive for purposes of §103 or useful for purposes of §101.

Yet the '803 Patent's prosecution history does not reflect the necessary level of consideration of §103 or §101. While noting that a prior art patent disclosed one of the claimed variety's parents (PH1V5T), the Examiner summarily stated that there was "no motivation in the prior art to select the particular other parent." EX1002, 98. And while the Examiner issued a Request for Information under §1.105¹ seeking information regarding the other parent variety that he deemed reasonably necessary to perform his examination (*id.*, 106-107), PO declined to provide such information on the ground that the other parent was "proprietary" and had "not been made publicly available" (*id.*, 126). The Examiner then allowed the claims without further consideration—notwithstanding that PO had previously used the publicly disclosed PH1V5T variety to create at least **45** other "sibling" corn varieties protected by other patents. PO failed to disclose any of those siblings during prosecution, despite their existence being directly responsive to another question raised in the Examiner's Request for Information (*id.*, 106-107).

The Examiner's improvident acquiescence left an enormous blind spot that prevented fulsome examination of the Challenged Claims in view of the statutory non-obviousness requirement for utility patent protection.

¹ Section cites are to 35 U.S.C. or 37 C.F.R. as context indicates, and all emphasis/annotations added unless noted.

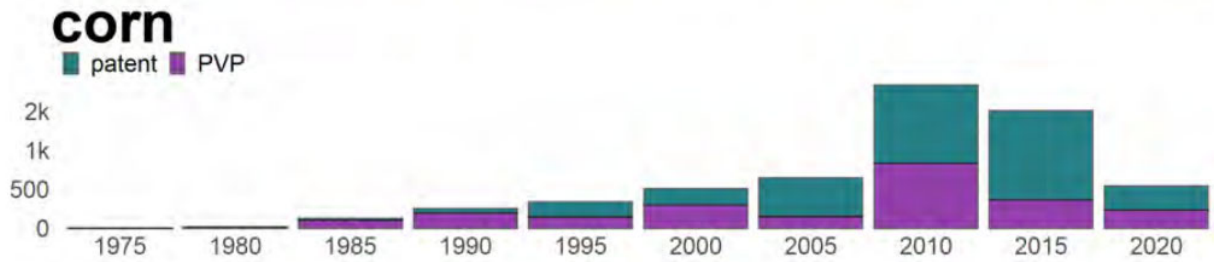
Indeed, under the legally erroneous approach suggested by PO and improvidently embraced by the Examiner, plant breeders could obtain utility patent protection for **any** new species merely by taking one publicly disclosed variety and crossing it with some private variety to the point of getting a stable and consistently reproducing new variety—regardless of whether it offers any features better than the earlier varieties. But utility patent protection is not available for such “ordinary innovation,” which if monopolized would “stifle, rather than promote, the progress of useful arts.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 427 (2007) (citing U.S. Const., Art. I, § 8, cl. 8).

PO and other plant breeders who invest the time in such breeding remain free to pursue PVP certificates, which as the Director has explained “strike a different balance from patents in permitting farmers to save seeds and for plant breeders to engage in continued research on the protected variety.” EX1020, 4. Indeed, as the Supreme Court has stressed, “[i]t is ***much more difficult*** to obtain a utility patent for a plant than to obtain a PVP certificate because a utility patentable plant must be new, ***useful, and nonobvious***,” whereas “a plant variety may receive a PVP certificate without a showing of usefulness or nonobviousness.” *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc.*, 534 U.S. 124, 131 (2001). The Supreme Court echoed PO’s own emphasis that PVP certificates offered

“narrower” protection than utility patents (EX1022, *13), but likewise had no “requirement of nonobviousness or utility” (*id.*, *11).

Here, however, PO obtained the ’803 Patent even though the claims fail both the non-obviousness and utility requirements. Both the specification and the prosecution history are at best consistent with PVP-type protection—not the more rigorous requirements for utility patent protection. The situation is similar to that the Board faced in an earlier case that affirmed an obviousness rejection for a plant variety and which PO itself cited to the Supreme Court in *J.E.M.* as proof the non-obviousness requirement had teeth as applied to plant utility claims. EX1022, *20-21, *38, & n.25 (citing *Ex parte C*, 27 U.S.P.Q.2d 1492, 1496 (BPAI 1992)).

The ’803 Patent indeed reflects a broader trend in which PO and other breeders have shifted their focus *away* from PVP certificates and toward utility patents—notwithstanding that the ever-increasing level of skill in the art should gradually increase rather than decrease the bar for patentability and tilt the balance in the opposite direction. As the U.S. Department of Agriculture (USDA) noted in a recent report, “[a]cross all crops, IP composition generally shifted from mostly PVP certificates in the 1990s to a higher percentage of utility patents in 2020.” EX1019, 20. This trend was particularly pronounced for corn-related IP, which also saw a dramatic concentration of “IP ownership” during the period “by the top four firms,” including PO. *Id.*, 20 & n.25; *see also id.* at 21:



See also EX1021, 236 (noting that “the protection available for new plant varieties exceeds that for other patentable subject matter,” particularly given “the interpretation of nonobviousness by the Patent Office”); EX1031, 19; *cf.* 8 Chisum on Patents § 24.05 (2023) (noting that “a particular plant variety may not satisfy the nonobviousness requirement” of the utility patent statute, whereas the PVPA does not include such a requirement: “Protection for undefined size or color improvements of seed plants is more easily obtained and enforced under the PVPA....”)

The USDA prepared its report in consultation with the Office (see EX1020, 2) as part of broader partnership efforts following the President’s Executive Order tasking the Director together with the Secretary of Agriculture to collaborate on strategies for ensuring that the patent system does not “unnecessarily reduce competition in seed and other input markets beyond that reasonably contemplated by the Patent Act.” EX1017. The Director subsequently reiterated this as a “priority” and pledged that the Office would “[e]xplore initiatives to enhance the

quality of the patent examination process for innovations related to agricultural products and processes.” EX1020, 2, 4.

Instituting post-grant review (“PGR”) on the ’803 Patent would further this priority, enhance patent quality in this vital space, and add some much needed “teeth” to the Office’s partnership with the USDA. Notwithstanding the President’s mandate (issued the week after PO filed the application at issue here), the ’803 Patent wrongly reduces competition in the corn seed market beyond that reasonably contemplated by the Patent Act.

Even aside from the evidence indicating it is more likely than not claims 1-20 are unpatentable as obvious (Grounds 1-3) and lacking specific utility (Ground 4), the petition also includes Ground 5, which raises a “novel or unsettled legal question that is important to other patents or patent applications” to plants in general and corn varieties in particular. §324(b); §42.208(c).

Ground 5 is rooted in §101 (like Ground 4) while raising a fundamental question concerning how §101 should be applied in the context of plant utility patents. Specifically, in the context of plant utility claims, **does §101 require a statement of distinct utility explaining at least one benefit the claimed plant provides over and above other plants?** All of PO’s earlier patents at issue in *J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred* included such statements. Indeed, they included extensive comparative data. As the Office itself stressed to the Supreme

Court when submitting an amicus brief supporting PO in *J.E.M.*, PO's earlier patents disclosed "***readily identifiable benefits to farmers.***" EX1023, 28. But the '803 Patent differs fundamentally from these earlier patents that formed the basis of the Supreme Court's determination in *J.E.M.* that while utility patent protection for plants is available in principle, "it is ***much more difficult*** to obtain a utility patent for a plant than to obtain a PVP certificate." 534 U.S. at 142. Unlike PO's earlier patents, the '803 Patent fails to articulate any distinct benefit of the claimed corn variety as compared to other corn varieties. As such, the Examiner had no basis from which to assess whether the claims had the requisite specific utility required for utility patent protection. Instead, the contents of Table 1 ("Variety Description Information") constitute the only distinction of any sort between the information provided in the '803 Patent and the information provided by PO's numerous earlier patents. But the fields recited therein (e.g., "width of ear node leaf") are drawn essentially verbatim from USDA paperwork required for PVP certificates, which as the Supreme Court stressed in *J.E.M.* can issue "***without*** a showing of usefulness." 534 U.S. at 131. Indeed, as the Office had previously emphasized to the Supreme Court in connection with *J.E.M.*, "utility patents under Section 101 requires usefulness, whereas the PVPA does not." EX1024, 9. To assess whether a particular claimed plant satisfies that statutory usefulness requirement, the Office naturally needs more information from plant breeders than

the USDA requires when evaluating applications for PVP certificates. But PO failed to provide any such information identifying any reason why the 1PFLQ21 corn variety covered by the '803 Patent serves any purpose whatsoever not already provided by pre-existing corn varieties.

Instituting review would facilitate a return to the appropriate balance the Office and ultimately the Supreme Court stressed between PVPA protection (not subject to non-obviousness and utility requirements, but subject to statutory exceptions) and utility patent protection (subject to non-obviousness and utility requirements, but not subject to the PVPA's carveouts).

II. REQUIREMENTS FOR POST-GRANT REVIEW

A. Grounds for Standing

Pursuant to §42.204(a), Petitioner certifies that the '803 is available for PGR and that Petitioner is not barred or estopped from requesting PGR of the Challenged Claims of the '803 on the grounds identified herein. The '803 issued on 5/30/2023, and this Petition is being filed within nine months of that issue date (2/29/2024). See also §II.B.1 below regarding eligibility for PGR.

B. Identification of Challenge

Pursuant to 37 C.F.R. §§42.204(b) and (b)(1), Petitioner requests PGR of the Challenged Claims and that the Board cancel the same as unpatentable. The '803 matured from U.S. Patent Application No. 17/366,126, filed 7/2/2021 ("126 Application").

1. The '803 is Eligible for PGR

The '803 is eligible for PGR because it does not assert an effective filing date earlier than the actual 7/2/2021 filing date of the '126 Application. It is unquestionably therefore an AIA “first-to-file” patent filed on or after 3/16/2013.

2. Statutory Grounds on Which the Challenge is Based

Petitioner respectfully requests institution of PGR and cancellation of the Challenged Claims on the following grounds:

Ground	Statute	Basis	Claims
1	§103	Obviousness based on Chifflet (EX1005)	1-20
2	§103	Obviousness based on Smalley (EX1006)	1-20
3	§103	Obviousness based on Gadlage (EX1007)	1-20

Ground	Statute	Basis	Claims
4	§101	Lack of utility	1-20

The information required by §§42.204(b)(4)-(5) is provided in Sections V-VI. As explained therein—including with supporting citations to the declaration of Dr. Raymond Riley (EX1003)—the information presented in the petition demonstrates that is more likely than not that at least one of claims 1-20 is unpatentable. *See* §324(a).

Furthermore, institution can and should be granted under §324(b) for the separate and independent reason that the petition raises a “novel or unsettled legal question”:

Ground	Statute	Legal Question	Claims
5	§101	Whether plant utility patent claims should be found unpatentable for lack of specific utility if the specification lacks any distinct statement concerning one or more specific benefits of the claimed plant as compared to known varieties?	1-20

See infra §VII.

III. THE '803 PATENT

A. Summary of the '803 Patent

The '803 Patent is directed to an inbred corn variety designated 1PFLQ21, which “originated from a cross between inbred line PH1V5T and inbred line PH2F7K.” EX1001, 37:61-64. “From this cross, ears were selected based on genetic analysis predicting disease, insect, and agronomic phenotypic performance. Inbred 1PFLQ21 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.” *Id.*, 37:64-38:3. These techniques were well known to POSAs (Riley, ¶42) and indeed disclosed verbatim in prior art

references—including references disclosing other crosses involving inbred line PH1V5T. *See infra* §V.A.3.

Aside from the designation itself, the “Abstract,” “Background,” and “Summary” sections indeed are essentially identical to those in multiple prior art patents such as Gadlage (EX1007) and disclose information already well known to POSAs. Riley, ¶¶43-45; EX1034 (redline comparison between ’803 Patent and Gadlage).

For example, the Background sections of both Gadlage and the ’803 Patent conclude by identifying a “continuing goal of maize breeders...to develop stable, high yielding maize varieties and hybrids that are agronomically sound with maximal yield over one or more different conditions and environments.” EX1001, 1:23-26; Gadlage, 1:23-26.

The “Detailed Description” section likewise closely tracks multiple prior art patents such as Gadlage. Riley, ¶45.

While the data in the ’803 Patent’s “Table 1” (“Variety Description Information”) varies slightly from that in the prior art tables, the differences are insubstantial. Riley, ¶46. Moreover, the fields themselves (e.g., “branch angle” and “tassel length”) are taken verbatim from a USDA form used with PVP certificates. Riley, ¶47; *see also* EX1008, 6-8; EX1009, 8-9. The characteristics in

question facilitate assessing distinctiveness for purposes of the PVP—not utility or non-obviousness for purposes of the Patent Act.

B. Level of Ordinary Skill in the Art

The level of ordinary skill in the art is evidenced by the prior art. *See In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (determining that Board did not err in adopting the approach that the level of skill in the art was best determined by references of record). The prior art discussed herein and in the declaration of Dr. Riley demonstrates that POSAs as of July 2021 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 as along with genetics specialists) as well as field-side personnel. Alternatively, additional experience could take the place of an advanced degree. Riley, ¶¶19-21.

C. Prosecution History

U.S. Application 17/366,126, which matured into the '803 Patent, was filed on 7/2/2021 along with numerous other applications with virtually identical specifications filed on the same day but claiming purportedly different inbred corn varieties identified by different codes. For example, PO filed at least seven other applications on 7/2/2021 that disclosed crossing PH1V5T—one of the two parental lines identified in the '803 Patent (EX1001, 37:61)—with other inbred varieties.

EX1090, 37:55-64; EX1091, 38:25-33; EX1092, 38:22-30; EX1093, 37:61-38:7;
EX1094, 37:53-61; EX1095, 38:23-32; EX1096, 38:21-30; see also EX1110-
EX1116 (redline comparisons).

PO subsequently filed an Information Disclosure Statement (IDS)—the only
IDS filed during prosecution—identifying one issued patent (U.S. Patent No.
8,907,160, EX1005) and one then-pending application (17/377,534). EX1002, 88-
89. The '160 patent discloses corn variety PH1V5T (EX1005, Abstract)—one of
the two parental lines identified in the '803 Patent as noted above. The '534
application discloses a “hybrid in which the instant claimed inbred [i.e., in what
became the '830 Patent] is one of the parents.” EX1002, 98.²

On 11/8/2022, the Examiner mailed a non-final Office Action and associated
Request for Information Under §1.105. *Id.*, 94-107.³

² The '534 application later issued as U.S. Patent No. 11,730,120 (EX1117).

³ Petitioner's summary focuses on the aspects of the Office Action potentially
pertinent to the grounds and related contentions in the Petition. The Examiner also
raised certain objections and §112 rejections (EX1002, 99-104), which PO later
overcame by purportedly perfecting its deposit of seeds for the claimed variety and
also amending certain claims to remove what the Examiner had viewed as open-
ended “locus conversion” language (*id.*, 123-124).

The Examiner stated that the claimed variety 1PFLQ21 “appear[ed] to be free of the prior art of record.” EX1002, 104-105. The Examiner nevertheless observed significant similarities in appearance between the claimed variety and multiple prior art varieties. For example, the Examiner noted that both the claimed 1PFLQ21 and PO’s prior art PH42SY (as disclosed in Montpetit, EX1016) were “similar in phenotype,” as both include “green-yellow glumes, light red anthers, faint brace root anthocyanin, very dark green leaves, buff husks, slightly curved rows, husk colors, and pink-orange cobs.” EX1002, 104-105. The Examiner nevertheless reasoned that the claimed 1PFLQ21 variety had “yellow-orange endosperm and clear aleurone,” whereas the prior art PH42SY variety had “yellow endosperm and yellow aleurone.”⁴ The Examiner also noted that the varieties were different “on the basis of parental lines.” *Id.*, 105.

The Examiner likewise noted that the claimed 1PFLQ21 variety was also “similar in phenotype to the maize variety PH18KJ taught by US Patent No.

⁴ Endosperm refers to a corn seed’s starchy interior, and aleurone refers to a separate internal layer closer to the surface, but still not exposed. Riley, ¶¶48-49.

8,466,351” [EX1006, Smalley], but was different based on “anther color and brace root anthocyanin.”⁵ EX1002, 105.

There is no indication from this discussion—nor elsewhere in the record—that the Examiner ever considered the prospect of an obviousness rejection based on Smalley and/or Montpetit. In particular, there is no indication the Examiner ever assessed whether the “differences between the claimed variety and the [prior art varieties] are so significant and unexpected that they should weigh more heavily than the numerous similarities between the claimed variety and the varieties of the cited prior art.” *Ex parte C*, 27 U.S.P.Q.2d 1492, 1497 (BPAI 1992) (affirming examiner’s obviousness determination concerning plant utility claims). Nor is there any indication the Examiner assessed PO’s specification to determine whether it provided “a base for judging whether differences” between the claimed variety and the prior art varieties were “in fact, significant and unexpected.” *Id.* (noting that “specification says nothing regarding the significance and relative importance of such criteria as maturity date, shortness of plant, flower color and flowering date”).

⁵ Anther is the part of a flower’s stamen producing and containing pollen. Brace root anthocyanin refers to pigmentation levels in a portion of corn’s root system. Riley, ¶¶50-51.

Indeed, the only indication in the record of any obviousness assessment by the Examiner came earlier in the Office Action, when the Examiner noted that one of the claimed variety's two parental lines (PH1V5T) was the subject of a prior art patent (EX1005, Chifflet). EX1002, 98. The Examiner stated that “[n]o rejection under 35 USC 103 is made because there is no motivation in the prior art to select the particular other parent.” *Id.* This statement reflects plain error and a misunderstanding of applicable law. *See infra* §VIII.A. Nevertheless, the Examiner simultaneously issued a Request for Information under 37 C.F.R. § 1.105 as an “attachment” to the Office Action given that the specification was “silent about some of the starting materials and methods...used to produce plant variety ‘1PFLQ21.’” EX1002, 106-107. In particular, the Examiner sought information that was “reasonably necessary to the examination” of the application, including:

- (a) “all the designations/denominations used for the original parental lines”;
- (b) “information pertaining to the public availability of the original parental lines”
- (c) “[t]he breeding method,” including “whether single seed descent, bulk method, backcross method, or some other method was used”;
- (d) “[t]he filial generation in which the instant plant was chosen”;
- (e) “[i]nformation pertaining to the homozygosity or heterozygosity of the parents as well as the instant plant;” and

- (f) Whether there were “any patent applications or patents in which sibs of the instant plant are claimed.”

Id., 106. The Examiner singled out “parental line PH2F7K” (identified in the application, but without any supporting detail, *id.*, 78) in particular. *Id.*, 106. The Examiner also reminded PO that the procedures specified in MPEP §724.02 were available if PO considered “any or all of the above requested information as a Trade Secret.” *Id.*

Despite this specific Request for Information concerning parental line PH2F7K and explanation on how to submit proprietary information for consideration, PO provided no such information in response aside from describing PH2F7K as “proprietary” and not “publicly available.” *Id.*, 126. Yet MPEP § 724.02—the section identified by the Examiner—provides clear instructions for how applicants can disclose “proprietary material” and maintain its confidentiality.

Moreover, in connection with the Examiner’s request concerning ***sibling*** varieties, PO provided only a non-responsive answer identifying the claimed variety’s ***parents***:

There are no patents or pending applications for parent inbred line PH2F7K. Parental line PH1V5T was patented as Maize Inbred PH1V5T in U.S. Patent No. 8,907,160.

EX1002, 127. PO failed to disclose that parental line PH1V5T had been one of the two parental lines for corn varieties claimed in at least **45** other U.S. patents and

then-pending applications—including **30** patents that constituted indisputable §102(a)(1) prior art issued more than one year before the application’s 7/2/21 effective filing date, as well as at least **6** applications filed the same day (7/2/2021) and disclosing crosses of PH1V5T with other inbred lines as part of breeding histories **word-for-word identical** to that in the ’803 Patent aside from the identification of the second parent (i.e., the purportedly “proprietary” line in the case of the ’803 Patent). *See infra* §V.A.3; *see also* Riley, ¶87. PO indeed was obligated to disclose those highly material applications separate and apart from the Examiner’s request. *See Dayco Prod., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1365-69 (Fed. Cir. 2003).

Despite PO’s failure to provide a complete response to the Request for Information, the Examiner accepted the incomplete submission and in turn allowed the claims. In doing so the Examiner did not follow the Office guidelines he cited to PO in his Rule 105 request or enforce such guidelines against the PO. MPEP §724.02. The Examiner’s Statement of Reasons for Allowance referenced PO’s response to the request for information and noted that “[o]ne parent is covered by a patent,” while “[t]he other parent is a proprietary line that is not publicly available.” EX1002, 138. Without further explanation or analysis, the Examiner stated that “[t]his parentage is free of the prior art.” *Id.* The Examiner in turn stated that “the claimed 1PFLQ21 inbred is free of the prior art of record.” *Id.* The

Examiner cited “pages 9-10” [*id.*, 104-105] of the earlier Office Action, in which the Examiner had noted patentably insignificant color and pigmentation-related differences between the claimed variety and the prior art varieties. *Id.*, 138.

D. Challenged Claims

Claims 1-20 are reproduced in the Claim Listing (*infra* §XI).

IV. CLAIM INTERPRETATION

Claim terms subject to PGR are to be “construed using the same claim construction standard that would be used to construe the claim in a civil action under §282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” §42.200(b). Because Petitioner’s grounds plainly render the claims unpatentable under any plausible construction, no outer boundary constructions are necessary. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).⁶

⁶ See generally *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005); 37 C.F.R. §42.200(b). This claim-construction analysis is not a concession as to the scope of any claim term in litigation, or a waiver of any argument in any proceeding that claim terms are indefinite, invalid, or unpatentable.

V. GROUNDS 1-3: CLAIMS 1-20 ARE UNPATENTABLE AS OBVIOUS OVER THE PRIOR ART

Claims 1-20 are demonstrated herein as more likely than not unpatentable as obvious over one or more of multiple prior art corn varieties that are structurally and phenotypically similar to the claimed 1PFLQ21 variety. And nothing in the specification or otherwise in the record suggests any basis for overcoming the obviousness showing herein. On the contrary, the specification suggests no reason why color differences or other distinctions between 1PFLQ21 and prior art varieties were at all significant.

The Challenged Claims parallel those the Board rejected in *Ex parte C*, 27 U.S.P.Q.2d 1492, which concerned utility patent claims to a soybean plant. PO itself cited *Ex parte C* to the Supreme Court in *J.E.M.* when successfully arguing that utility patent protection should be available for plant varieties if—and only if—the particular claimed variety satisfies all statutory requirements—including non-obviousness. EX1022, *20-21, *38, & n.25. In other words, PO cited *Ex parte C* in successfully making the case that utility patent protection can coexist with PVPA protection because the requirements for utility patent protection are more stringent than those for PVPA protection.

In *Ex parte C*, as here, the specification was “cryptic” and offered “little more detail than would be” expected in a PVPA disclosure. *Id.* at 1493. In particular, the *Ex parte C* specification had “little specific language which

distinguishes the claimed soybean variety from other soybean varieties and [did] not explain the significance of any differences in attributes between the novel variety and varieties that are old in the art.” *Id.* Here, the specification says nothing whatsoever concerning the purported significance of any such distinctions relative to prior art varieties. Riley, ¶¶58-60, 91-92.⁷

The Board in *Ex parte C* affirmed obviousness rejections over prior art plants that were similar to the claimed plant in many respects despite certain variations in “color” as well as resistance to a particular kind of rot. *Id.* at 1496-1498. Nothing in the record explained why such differences were “so significant and unexpected that they should weigh more heavily than the numerous similarities between the claimed variety and the varieties of the cited prior art.” *Id.* at 1497. Indeed, the specification offered no basis even for assessing whether the differences were “significant and unexpected”; it said nothing regarding the relevance of criteria such as “flower color.” *Id.* The same is true here, as detailed below.

⁷ By contrast, PO’s earlier patents had extensive comparative data. *See infra* §VII.B & Riley, ¶¶184-188. PO stressed these “extensive recitations” to the Supreme Court in *J.E.M.* at the same time it was citing *Ex Parte C* to the Court as proof the non-obviousness requirement had teeth. EX1022, *20-21, *38, & n.25.

Aside from having been cited by PO to the Supreme Court, the Board’s approach in *Ex Parte C* tracks binding Federal Circuit and CCPA precedent concerning the obviousness of other types of claims—for example, those to chemical compounds—based on structurally similar prior art. *See, e.g., In re Dillon*, 919 F.2d 688, 697 (Fed. Cir. 1990) (en banc); *Application of Payne*, 606 F.2d 303, 314 (CCPA 1979) (“The similarity in chemical structures and properties between the prior art and claimed compounds is sufficiently close to support a *prima facie* case of obviousness.”).

Here, likewise, that approach confirms the obviousness of claims 1-20, which concern corn varieties with properties insubstantially different from those disclosed in prior art references.

A. *Graham* Factor Analysis Relevant to Grounds 1-3

Obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; (4) any secondary considerations identified by PO. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

Obviousness may be found, for example, where “a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way...unless the actual

application of the technique is beyond that person’s skill.” *KSR*, 550 U.S. at 401.

Additionally, in cases where “a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product [was] not of innovation but of ordinary skill and common sense.” *Id.* at 421.

1. Scope and Content of the Prior Art

a. General State of the Art

As one of the world’s most important staple crops, Maize (*Zea mays*; commonly known as corn) has been the subject of well-developed breeding and selection techniques dating back roughly nine thousand years ago to its origins. Riley, ¶52.

Modern cross techniques date back to 1867, when plant breeders began directing pollen from one maize plant to another. In 1878–1881, crossing maize varieties to grow the production of commercial cultivars was proposed. Maize genes important for commercially relevant traits also began to be discovered. A revolutionary step in maize breeding began with the discovery of ‘hybrid vigor’ or heterosis in 1909. EX1012. This was the first step toward maize scientific breeding. In 1933, the first hybrid maize created by crossing inbred lines to be introduced, and maize breeding started entering the “hybrid era.” Riley, ¶53

Employment of modern genetics and molecular biology techniques in maize breeding started in the 1970s–1980s with the first regenerated plant from a cell culture and sequencing the first maize genes. These modern techniques aided the identification of genes conferring desirable traits such as disease and/or insect resistance. Transgenic maize varieties began to emerge in the late 1990s, and transgenic hybrids that could confer insect resistance, herbicide tolerance, high lysine content, and drought-resistance were commercialized. EX1010; *see also* Riley, ¶54.

Principles and methods of maize breeding and cultivar development to produce maize varieties with desirable traits have been described in various textbooks and publications including, e.g., Fehr et al., *Principles of Cultivar Development*, (1987) (EX1015); Wych et al., *Production of Hybrid Seed, Corn and Corn Improvement*, Chapter 9 (1988) (EX1025); Lee et al., *Handbook of Maize, Modern Maize Breeding* (2009) (EX1011); and Andorf et al., *Theor Appl Genet.* 132(3):817-849 (2019) (EX1014). Such principles and techniques are also well known and routinely practiced by those skilled in the art of maize breeding. Riley, ¶¶55-57.

b. Prior Art Disclosing Closely Related Inbred Maize Varieties

Chifflet (EX1005), Chifflet’s related PVP certificate (EX1008), Smalley (EX1006), Smalley’s related PVP certificate (EX1009), and Gadlage (EX1007) are

post-AIA §102(a)(1) prior art not subject to any exception—all issued over one year before 7/2/2021:

Reference	Issued
Chifflet	12/9/14
Smalley	6/18/13
Gadlage	9/10/19

All of these references disclose inbred corn lines with characteristics very similar to those of the claimed 1PFLQ21 as illustrated in the table below. Riley, ¶¶62-68.

	'803 Patent (1PFLQ21)	Chifflet (PH1V5T)	Smalley (PH18KJ)	Gadlage (PH2SNA)
Grain Texture	Dent	Dent	Flint	Dent
Comparative Relative Maturity (Days)	110	N/D	N/D	103
Emergence to 50% of plants in silk (days)	52	62	63	60
Emergence to 50% of plants in silk (heat units)	1286	1349	1293	1272
Emergence to 50% of plants in pollen shed (days)	52	62	63	61
Emergence to 50% of plants in pollen shed (heat units)	1286	1349	1293	1302

	'803 Patent (1PFLQ21)	Chifflet (PH1V5T)	Smalley (PH18KJ)	Gadlage (PH2SNA)
Plant height (cm), mean (SE)	193.9 (6.61)	182.5 (6.25)	216.2 (5.87)	214.4 (2.11)
Ear height (cm), mean (SE) (-1std)	73.8 (9.6)	62.3 (6.1)	83.1 (7.73)	91 (9.7)
Length of top ear internode (cm), mean (SE)	13.6 (1.5)	12.7 (1.35)	14.8 (1.04)	17 (1.63)
Number of nodes above ground, mean (SE)	13.3 (0.9)	13.6 (0.77)	N/D	12 (0)
Anthocyanin of Brace Roots (1 = absent, 2 = faint, 3 = moderate, 4 = dark)	2	2	3	2
Width of Ear Node Leaf (cm), mean (SE)	10.4 (0.85)	10.2 (0.89)	8.4 (0.51)	9.3 (0.54)
Length of ear node leaf (cm), mean (SE)	76.6 (5.59)	69.4 (3.12)	79.4 (4.27)	79.6 (2.11)
Number of leaves above top ear, mean (SE)	6 (0.45)	5.3 (0.57)	6.2 (0.71)	5.4 (0.48)
Leaf Angle (degrees), mean (SE)	48 (7.48)	33 (4.31)	20.8 (3.93)	28.8 (6.87)
Leaf Color	V. Dark Green	V. Dark Green	V. Dark Green	V. Dark Green

	'803 Patent (1PFLQ21)	Chifflet (PH1V5T)	Smalley (PH18KJ)	Gadlage (PH2SNA)
Leaf Sheath Pubescence (1 - none to 9 - peach-like fuzz)	3	4	3	4
Number of primary lateral branches, mean (SE)	13.1 (1.53)	8.2 (2.24)	8.0 (1.85)	13.8 (2.79)
Number of secondary branches, mean (SE)	1.4 (0.91)	0.6 (0.6)	N/D	1.3 (1.09)
Branch angle from central spike (degrees), mean (SE)	35.5 (19.36)	39 (16.72)	26.1 (4.39)	15.3 (6.8)
Tassel Length (from peduncle node to tassel tip) (cm), mean (SE)	52.7 (4.63)	52.2 (4.38)	53.1 (3.33)	59.9 (3.39)
Peduncle Length (from top leaf node to lower branch) (cm), mean (SE)	17.5 (2.46)	19.1 (2.7)	20.7 (2.78)	26.1 (3.04)
Central Spike Length (cm), mean (SE)	24.2 (1.93)	26 (2.99)	N/D	22.6 (3.04)
Flag Leaf Length (from flag leaf collar to tassel tip)	37.7 (3.77)	39 (3.35)	N/D	46.4 (2.26)

	'803 Patent (1PFLQ21)	Chifflet (PH1V5T)	Smalley (PH18KJ)	Gadlage (PH2SNA)
(cm), mean (SE)				
Pollen Shed (0 - male sterile, 9 - heavy shed)	8	7	6	6
Bar Glumes (glume bands) (1 = absent, 2 = present)	1	1	1	1
Anther Color	Green- Yellow	Green-Yellow	Buff	Pale Yellow
Silk Color	Light Red	Pink	Red	Light Green
Fresh Husk Color	Med. Green	Med. Green	Med. Green	Med. Green
Dry Husk Color	Buff	White	Med. Green	White
Husk Tightness (1 - very loose, 9 - very tight)	4	2	3	5
Husk Extension (at harvest) (1 = short, ear exposed; 2 = medium, <8cm; 3 = long, 8-10cm; 4 = very long, >10cm)	2	2.7 (1.03)	2	2
Length of interior husk (cm), mean (SE)	16.5 (1.71)	21.3 (1.33)	N/D	22 (0.93)
Shank Length (cm), mean (SE)	10.5 (1.89)	11.7 (2.68)	10.8 (2.01)	9.8 (1.32)

	'803 Patent (1PFLQ21)	Chifflet (PH1V5T)	Smalley (PH18KJ)	Gadlage (PH2SNA)
Ear Length (cm), mean (SE)	16.2 (1.66)	16.7 (0.83)	14.2 (1.31)	17.6 (0.61)
Ear Diameter at mid-point (mm), mean (SE)	43.8 (2.71)	44.1 (1.29)	46.6 (1.58)	39 (2.24)
Ear Weight (gm), mean (SE)	133.5 (31.02)	135.9 (18.65)	150.7 (24.77)	99.6 (18.75)
Number of Kernel Rows, mean (SE)	15.7 (1)	19.5 (1.28)	16.8 (1.40)	13.9 (1.68)
Number of Kernels per Row, mean (SE)	26.3 (3.32)	30.3 (3.67)	N/D	25.8 (1.5)
Kernel Rows (1 = indistinct, 2 = distinct)	2	2	2	2
Row Alignment (1 - straight, 2 - slightly curved, 3 - spiral)	2	1	2	2
Kernel Length (cm), mean (SE)	11.2 (0.8)	11.6 (0.7)	12.5 (0.71)	10.2 (0.71)
Kernel Width (mm), mean (SE)	7.9 (0.77)	7.9 (0.39)	8.0 (0.77)	8.9 (0.74)
Kernel Pericarp Color	Clear	N/D	N/D	Clear
Aleurone Color Pattern	Homozygous	Homozygous	Homozygous	Homozygous
Aleurone Color	Clear	Yellow	Yellow	Yellow

	'803 Patent (1PFLQ21)	Chifflet (PH1V5T)	Smalley (PH18KJ)	Gadlage (PH2SNA)
Hard Endosperm Color	Yellow-Orange	Yellow	Yellow	Yellow
Cob Diameter at mid point (mm), mean (SE)	28.6 (2.26)	24.2 (1.41)	27.0 (1.03)	25.3 (1.46)
Cob Color	Pink-Orange	White	Pink-Orange	Pink-Orange

Chifflet, Smalley, and Gadlage likewise disclose that the disclosed inbred lines provide “source[s] of breeding material that may be used to develop new maize inbred varieties.” EX1005, 28:33-35; EX1006, 28:56-58; EX1007, 36:33-36.

2. Differences Between the Prior Art and the Claimed Invention

Any differences between the prior art and the claimed invention are insubstantial. Riley, ¶¶69. Both the claims and the prior art are directed to stable inbred maize varieties for use in a variety of industrial applications as well as breeding other inbred and/or hybrid lines. *Id.* Indeed, virtually all of the '803 Patent's specification is drawn verbatim from Gadlage and is also highly similar to the disclosures in Smalley and Chifflet. *Id.* Moreover, as illustrated in the above table, the disclosed characteristics of the claimed 1PFLQ21 plant and its associated crop (i.e., corn ears) are highly similar to the disclosed characteristics of the identified prior art maize lines. *Id.*, ¶¶70-80. Simply put, “[t]he claimed plant does not appear to differ significantly from the prior art plants as measured by numerous

characteristics.” *Ex parte C*, 27 U.S.P.Q.2d at 1496. The disclosed properties concerning the claimed 1PFLQ21 variety instead fall well within the mainstream of corn phenotypes observed long before the ’803 Patent’s 7/2/2021 effective filing date. *Id.*, ¶70. Even to the limited extent that certain reported characteristics of the claimed 1PFLQ21 vary to some degree from those reported in the Chifflet, Smalley, and/or Gadlage prior art on which the petition focuses, other prior art corn varieties included comparable characteristics. *Id.*, ¶¶71-80.

In particular, there is no basis in the ’803 Patent from which to conclude that the identified traits would have fallen outside the range of expected outcomes from the cross that yielded the claimed invention (Riley, ¶¶70-80)—in other words crossing PH1V5T (as disclosed in Chifflet and the corresponding PVPA Certificate) with another line such as the PH2F7K variety that PO used to obtain the claimed variety but about which PO refused to provide information during prosecution. *See supra* §III.C. Like that in *Ex parte C*, the specification here offers no indication as to “(1) the characteristics possessed by each parent variety, (2) which of these characteristics were expected to be passed on to progeny plants, and (3) what inheritable characteristics (goals) were sought in the progeny.” 27 U.S.P.Q.2d at 1493-94.

Statistical analysis confirms the lack of unexpected results—even if taking the very conservative approach of (1) focusing solely on the data sets in the ’803

Patent and Chifflet (i.e., without any data concerning the second parent, for which no data is available) and (2) assuming for the sake of analysis that the data sets are comparable (despite the different growing conditions). Riley, ¶¶81-86 (discussing Appendix B to Dr. Riley’s declaration).

3. Level of Ordinary Skill in the Art

The level of skill in the art is high, as exemplified by PO’s repeated use of the PH1V5T variety (disclosed in Chifflet) as one of the parent lines when breeding other maize varieties—as disclosed in at least **30** other patents (EX1054-1081 and 1106-1107) that are indisputable §102(a)(1) prior art issued before 7/2/20 and **15** other more recent patents filed on or before the ’803 Patent’s 7/2/21 filing date (EX1082-1096) and further confirming the high level of skill. Riley, ¶87; *In re Epstein*, 32 F.3d 1559, 1563, 1567 (Fed. Cir. 1994). 18 of those sibling varieties are inbred lines—including 3 that are indisputable prior art (EX1054, EX1055, and EX1056). Riley, ¶87. For example, U.S. Patents 10,130,062 (EX1054) and 10,660,290 (EX1055) recite the use of PH1V5T along with the exact same breeding technique—involving a “doubled haploid” approach—as the ’803 Patent. The only difference between those prior art patents and the ’803 was the selection of the second parent, about which PO failed to provide any information at all even during prosecution:

Breeding History (Claimed Variety)	Breeding History (Prior Art)
<p>EX1001, 37:62-38:3 (“1PFLQ21 is an elite corn inbred line originated from a cross between <i>inbred line PH1V5T</i> and inbred line PH2F7K....</p> <p>Inbred 1PFLQ21 <i>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.”)</i></p>	<p>EX1054, 42:55-61 (“Inbred Maize variety PH4257 was developed by the following method. A cross was made between inbred line PH1M2W and <i>inbred line PH1V5T....</i></p> <p>Inbred PH4257 <i>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.”)</i></p> <p>EX1055, 38:58-64 (“Inbred Maize variety PH47CK was developed by the following method. A cross was made between inbred line PH1TWW and <i>inbred line PH1V5T.</i></p> <p>Inbred PH47CK <i>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.”)</i></p>

Likewise, PO filed at least six other applications the same day as that for the '803 Patent on other inbred lines with breeding histories word-for-word identical to that in the '803 Patent aside from the identification of the second parent (i.e., the other variety paired with inbred line PH1V5T). *Compare* EX1001, 37:62-38:3 with EX1090, 37:55-64; EX1091, 38:25-33; EX1092, 38:22-30; EX1094, 37:53-61; EX1095, 38:23-32; EX1096, 38:21-30. Yet PO did not disclose any of these sibling varieties during prosecution—even after Examiner made a specific request for such information. *See supra* §III.C; see also MPEP § 2004 (citing *Dayco*: “Do not rely on the examiner of a particular application to be aware of other applications belonging to the same applicant or assignee.”)

As PO’s own earlier patents confirm, corn breeding indeed was a sophisticated science by 2021, with multi-disciplinary teams harnessing computational biology and sophisticated understandings of the corn genome (which had been sequenced in 2009) to create new varieties incorporating desired phenotypical features. Riley, ¶88; EX1035. These breeding efforts focused not only on the hybrid varieties sold to farmers, but also the “inbred” varieties used as the basis to create future hybrids. Riley, ¶88. As stated in both the '803 Patent and the virtually identical Gadlage prior art, “[a] continuing goal of maize breeders is to develop stable, high yielding maize varieties and hybrids that are agronomically sound with maximal yield over one or more different conditions and

environments.” EX1001, 1:23-26; EX1007, 1:23-26. Given the competitive nature of the market, constant evolution and improvement of a company’s inbred lines was a commercial imperative. Riley, ¶89.

In sum, “the desire to enhance commercial opportunities by improving [inbred corn varieties] is universal—and even common-sensical.” *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006). Accordingly, “the proper question” when assessing obviousness “is whether the ordinary artisan possesses knowledge and skills rendering him *capable* of combining the prior art references.” *Id.* (emphasis original). And the high level of skill in the modern corn breeding field confirms such capability. POSAs were capable of breeding inbred lines to incorporate essentially any desired inbred phenotypical trait in descendent inbred lines so long as it was within the scope of corn’s existing gene pool as confirmed by the existence of the trait in one or more preexisting corn varieties (as is the case with all of the identified characteristics in the ’803 Patent). Riley, ¶90; *see also Ex parte Ketkar*, Appeal 2017-008056, 2018 WL 3812708, at *6 (PTAB July 24, 2018) (affirming determination that claims to corn variety were unpatentable as obvious: “The art in this case presents one skilled in the art with a finite number of known possibilities for crossing corn plants to produce the desired results.”).

It would constitute legal error “to discount the significant abilities of [POSAs] in” this “advanced area of art.” *In re Kubin*, 561 F.3d 1351, 1360 (Fed. Cir. 2009) (affirming obviousness rejection and “declin[ing] to cabin *KSR*” only to ostensibly “predictable arts”); *see also Ex parte Reid*, Appeal 2010-004943, 2010 WL 4876440, at *3 (BPAI Nov. 29, 2010) (addressing obviousness rejection of plant utility claims and analogizing to *Kubin*: “In our opinion, *Kubin* applies in these circumstances.”).

For example, changes in grain color could be incorporated via established techniques such as locus conversions. *Riley*, ¶90; EX1005, 16:46-49 (“Desired traits that may be transferred through locus conversion include...grain color (white)”; EX1006, 16:65-17:1 (same); EX1007, 24:2-5 (same); *See Ex parte Reid*, 2010 WL 4876440, at *3 (addressing obviousness rejection of utility claims to cotton plant: “The ordinary skilled worker would have routinely selected progeny desirable cotton fiber length and strength. It was therefore unnecessary for the Examiner to show that a plant with the physical attributes of Sicala 350B would have been predicted or suggested by the prior art.”). As in *Kubin*,

obviousness did not require that the structure—or physical attributes here—be “suggested by the prior art.”⁸

4. Secondary Considerations

Neither the specification nor the file history suggests any purportedly unexpected results or other potential secondary considerations of non-obviousness. Riley, ¶¶91-92. On the contrary, the minor variations reflected in the reported properties of the claimed variety as compared to prior art varieties are well within the bounds of what a POSA would expect in the ordinary course of plant breeding. *Id.*. Moreover, nothing in the specification or elsewhere in the record provides any comparative data—much less an analysis relative to the closest prior art. *See Ex parte Frohberg*, Appeal 2018-002288, 2019 WL 3033154, at *5 (PTAB July 3, 2019) (affirming obviousness rejection despite allegations of unexpected results: “[T]he data is not compared to the closest prior art, the 0% amylose rice plant of Hu.”); *Ex parte Ketkar*, 2018 WL 3812708, at *6 (noting that applicants had “presented no objective evidence,” and further that specification did “not identify [asserted] result as unexpected or surprising in any way”); *cf. Ex parte Reid*, 2010

⁸ *Reid* ultimately reversed the obviousness rejection based on secondary considerations, whereas the record here does not suggest any such indicia. *See infra* §V.A.4.

WL 4876440, at *5 (reversing obviousness rejection based on evidence that cotton fiber from the claimed cotton plant variety was “unexpectedly better than the closest prior art”).

B. Ground 1: Claims 1-20 Are Unpatentable as Obvious Over Chifflet (EX1005) and the Corresponding PVPA Certificate (EX1008)

Chifflet and the corresponding PVPA Certificate disclose PH1V5T—one of the two parent varieties of the 1PFLQ21 variety claimed in the ’803 Patent.

Chifflet discloses that PH1V5T 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.” EX1005, 28:30-35. It also discloses specific cross breeding techniques for producing such “new inbred” varieties. *Id.*, 2:43-49; Riley, ¶¶93-95.

Consistent with these disclosures, PH1V5T had repeatedly been used as one of the parents for other maize varieties—including at least 18 inbred lines. Riley, ¶96; *see also supra* §V.A.1.3.

As Chifflet itself discloses and these other crosses—including but not limited to those disclosed in indisputable prior art references—confirm, POSAs would have had reason to use PH1V5T as the starting point to create other inbred lines. The nature of the maize market and the “desire to enhance commercial opportunities” (*DyStar*, 464 F.3d at 1368) confirms the reasons to create a wide

array of new varieties using PH1V5T as the starting point. Riley, ¶97; *see also supra* §V.A.1.3.

POSAs would have had a reasonable expectation of obtaining an inbred maize variety with PH1V5T as a parent, particularly given (1) the routine nature of the breeding techniques involved and (2) the multiple other instances already reported in which PH1V5T had been used as a parent to obtain other inbred lines. Riley, ¶98.

1. Claim 1: Variety 1PFLQ21

Claim 1 encompasses a seed, plant part, or plant cell of variety 1PFLQ21. Variety 1PFLQ21's disclosed characteristics are highly similar to those in the PH1V5T parent, and nothing in the specification or otherwise in the intrinsic record suggests any property that a POSA would have viewed as surprising or unexpected over PH1V5T. *Supra* §V.A; Riley, ¶99. Instead, as with the claims the Board found unpatentable in *Ex parte C*, the record does “not explain the significance of any differences in attributes between the novel variety and varieties that are old in the art.” 27 U.S.P.Q.2d at 1493. To the extent such differences exist, there is no basis from which to conclude they are “so significant and unexpected that they should weigh more heavily than the numerous similarities between the claimed variety and the” PH1V5T variety disclosed in Chifflet and touted therein as a potential starting point for future inbred lines. *Id.* at 1497.

Indeed, none of the differences have any material commercial significance.

Riley, ¶100-109. In particular, none of them are relevant to the underlying goal identified in the '803 Patent of developing “stable, high yielding maize varieties and hybrids that are agronomically sound with maximal yield over one or more different conditions and environments.” EX1001, 1:23-26; Riley, ¶100. Nor are they relevant to the nature of the '803 Patent's disclosed “Industrial Applicability.” EX1001, 36:20-65; Riley, ¶¶100-110.

For example, while Chifflet discloses that PH1V5T has a “white” cob color (EX1005, 34:66) whereas the '830 Patent discloses that 1PFLQ21 has a “pink-orange” cob color (EX1001, 39:26), the only use for the cob suggested in either Chifflet or the '803 Patent is “for fuel and to make charcoal.” EX1001, 36:58-59; EX1005, 34:3-4. Cob color is immaterial for such applications. Riley, ¶101; *see also* EX1021, 265 (“[F]ood consumers are the ultimate losers when low nonobviousness standards are applied to plant varieties.”); *id.*, 272 (“Proposed here is the designation of a limited number of plant characteristics, all of practical agronomic importance, which might be achieved to establish nonobviousness.”)

Accordingly, claim 1 would have been obvious over Chifflet and the corresponding PVPA Certificate.

2. Claims 2-20: Variations and Hybrids Related to 1PFLQ21

Claims 2-20 likewise would have been obvious over Chifflet and the corresponding PVPA Certificate. They recite variations, hybrids, and related methods concerning the claimed inbred line. Claims 2-20 indeed essentially mirror analogous claim sets in multiple prior art patents (EX1026—EX1030) directed to other inbred corn varieties—confirming that using and/or modifying the 1PFLQ21 inbred line in those ways likewise would have been obvious. Riley, ¶¶111-112. PO indeed filed the applications for other earlier patents on the same day, and they all issued on December 3, 2019—making them indisputable §102(a) references published more than a year before the '803 Patent's July 2, 2021 filing date.

a. Claim 2: Ovule or Pollen

Claim 2 depends from claim 1 and requires that “the plant part” be “an ovule” or “pollen.” EX1001, 39:34-3. Chifflet discloses that a “plant part” includes “pollen” and “ovules.” EX1005, 9:6-10. POSAs would have recognized that inbred lines created from PH1V5T likewise include both ovules and pollen. Riley, ¶113; *see also* EX1026, 44:5-6 (“wherein the plant part is an ovule or pollen”).

b. Claims 3-8: Hybrids and Related Uses Derived From the Inbred Line of Claim 1

Claim 3 is to “[a]n F1 hybrid maize seed produced by crossing the plant or plant part of claim 1 with a different maize plant.” EX1001, 39:36-37. Chifflet

discloses that hybrids are generated by crossing two inbred varieties (such as PH1V5T itself and/or other inbred lines such as those Chifflet discloses can be created using PH1V5T as the starting point, see EX1005, 28:30-35), and further that “F1” hybrids—meaning the “first generation” of the cross—are the focus when developing “commercial hybrids” because they are “more vigorous than their inbred parents.” EX1005, 14:42-50. Claim 3 is obvious in view of these disclosures in addition to the above-discussed reasons concerning claim 1. POSAs would have had reason to create the 1PFLQ21 inbred variety using PH1V5T as the starting point, and would further have had reason to use that inbred variety to create F1 hybrid seeds for commercialization. Riley, ¶114.

Claim 4 is to a plant or plant part produced by growing the F1 hybrid seed of claim 3, and in particular to “at least one cell of the F1 hybrid maize plant.” EX1001, 39:38-40. It is obvious for the same reasons as claim 3 given that the purpose of creating an F1 hybrid seed is to grow an F1 hybrid plant. Riley, ¶115.

Claim 5 concerns “[a] method for producing a second maize plant” by “applying plant breeding techniques to the F1 plant or plant part of claim 4.” EX1001, 39:41-44. Claim 5 would have been obvious given Chifflet’s disclosure that plant breeding techniques can be used to cross an “F1 hybrid” with either another F1 hybrid or another inbred line. EX1005, 15:14-24; Riley, ¶116.

Claim 6 concerns “[a] method for producing a second maize plant or plant part, the method comprising doubling haploid seed generated from a cross of the plant or plant part of claim 4 with an inducer variety.” EX1001, 39:45-49. Claim 6 would have been obvious for the same reasons as claim 5 and in further view of Chifflet’s disclosure of the use of “Haploid induction systems” for maize in which “haploid plants from any genotype” may be created “by crossing a selected variety (as female) with an inducer variety.” EX1005, 30:24-38; Riley, ¶117. Chifflet’s claim 8 likewise parallels challenged claim 6 and further confirms the obviousness of cross an inbred maize line with an inducer variety to produce haploid seed. EX1005, 41:38-43.

Claim 7 concerns “a method of making a commodity plant product comprising silage, starch, fat, syrup or protein, the method comprising producing the commodity plant product from the maize plant or plant part of claim 4.” EX1001, 39:50-53. Claim 7 would have been obvious for the same reasons as claim 4 in further view of Chifflet’s disclosure that the invention included a “method of harvesting the grain of the F1 plant of variety PH1V5T and using the grain in a commodity,” such as “starches, syrups, proteins, and sugars.” EX1005, 33:41-45. POSAs would have understood that F1 hybrids created from the inbred line of claim 1 (which would have been obvious as discussed above) could be used for the same generic application. Riley, ¶118.

Claim 8 concerns “[a] method of producing a maize seed derived from the variety 1PFLQ2” that includes (1) “crossing the plant of claim 1 with itself or a second plant; (2) “growing the progeny seed to produce a progeny plant,” then (3) “crossing the progeny plant with itself or a different plant to produce maize seed derived from the variety 1PFLQ21.” EX1001, 39:54-61. Claim 8 would have been obvious for the same reasons as claim 5, which concerns a more specific method of generating a second-generation progeny plant derived from 1PFLQ21 in which the first-generation plant is an F1 hybrid. Riley, ¶119; *see also* EX1005, 41:17-34 (Chifflet’s claims 3-6).

Claims 3-8 likewise mirror analogous claim sets in multiple prior art patents directed to other inbred corn varieties—further confirming that it would have been obvious to use the 1PFLQ21 variety (itself obvious as detailed in V.A.B.1) for hybridization purposes as claims 3-8 specify:

Claim in '803 Patent	Analogous Claim in each of Exhibits 1026-1030
3	3
4	5
5	6
6	7
7	8

8	9 ⁹
---	----------------

See Riley, ¶120.

c. Claim 9: Nucleic Acids Isolated From 1PFLQ21

Claim 9 concerns “[a] method for producing nucleic acids” by “isolating nucleic acids from the seed, plant, plant part, or plant cell of claim 1.” EX1001, 39:62-64. Claim 9 would have been obvious for the same reasons as claim 1 in view of a POSA’s knowledge that it was routine to isolate nucleic acids from inbred maize lines—as confirmed by Chifflet. Riley, ¶121; EX1005, 42:10-14 (“method of collecting molecular data comprising isolating nucleic acids from the seed, plant, plant part, or cell of claim 10,” which concerned inbred variety PH1V5T); see also EX1026, 44:42-44 (same language).

d. Claims 10-17: Converted Seeds of 1PFLQ21

Claim 10 concerns “[a] converted seed, plant, plant part or plant cell of inbred maize variety 1PFLQ21” with “fewer than six locus conversions” such that the plant or plant grown from such seed “comprises the physiological and morphological characteristics of maize variety 1PFLQ21 when grown under the

⁹ Claim 9 in the prior art discloses an additional step of an additional cross to create a subsequent generation, but encompasses the steps of challenged claim 8.

same environmental conditions, and further wherein the fewer than six locus conversion confer a property selected from the group consisting of male sterility, a site for site-specific recombination, abiotic stress tolerance altered phosphate, altered antioxidants, altered fatty acid, altered essential amino acids, altered carbohydrates, herbicide tolerance, insect resistance and disease resistance.”

EX1001, 40:1-18.

Claim 10 would have been obvious for the same reasons as claim 1 (concerning variety 1PFLQ21) in further view of a POSA’s knowledge that locus conversions such as those recited in claim 10 were a routine technique to incorporate desirable traits into inbred maize lines—as further confirmed by Chifflet’s disclosure that “[o]ne or more locus conversion traits” such as “male sterility, insect control, disease control or herbicide tolerance” can “be introduced into a single corn variety.” EX1005, 7:43-52; *see also id.*, 16:46-60; 16:60-64 (“triple stacks” of loci); 42:3-9 (claim to inbred variety PH1V5T with “a locus conversion” that “confers a trait selected” from the same group of traits recited in challenged claim 10). Further, locus conversion technology was sufficiently advanced such that the additional trait(s) could be introduced without impacting the plant’s “physiological and morphological characteristics.” Riley, ¶¶122-23. Moreover, prior art patents EX1026-1030 all include essentially identical claims, including the same list of properties and the same limitation on the number of

locus conversions—further confirming the obviousness of incorporating such locus conversions into inbred lines such as 1PFLQ21. EX1026, 44:45-61; EX1027, 44:42-58; EX1028, 44:32-48; EX1029, 44:36-52; EX1030, 44:34-50; Riley, ¶124.

Claim 11 depends from claim 10 and requires that the “fewer than six locus conversions confer herbicide tolerance, insect resistance and disease resistance.” EX1001, 40:19-22. Claim 11 would have been obvious for the same reasons as claim 10, as further confirmed by the inclusion of analogous dependent claims—reciting the exact same triad of properties—in PO’s other prior art patents. EX1026, 44:62-65; EX1027, 44:59-62; EX1028, 44:49-52; EX1029, 44:53-56; EX1030, 44:51-54; Riley, ¶125.

Claims 12-17 depend directly or indirectly from claim 10 and otherwise parallel the limitations of claims 3-7 and 9, respectively. EX1001, 40:23-44. They would have been obvious for the same reasons as claim 10 and in further view of the above-discussed reasons why dependent claims 3-7 and 9 would have been obvious. The above discussions apply equally to converted seeds incorporating locus conversions, which impart additional properties but otherwise do not impact the variety or how it can be used. Riley, ¶126. PO’s other prior art patents likewise include analogous dependent claims. E.g., EX1026, 44:62-45:11.

**e. Claims 18-20: F1 Hybrid Derived From Variety
1PFLQ21 with a Transgene**

Much like dependent claim 3, claim 18 recites an F1 hybrid seed produced by crossing a plant or plant part of 1PFLQ21 with another variety. However, it includes the additional requirement that (1) “1PFLQ21 further comprises a transgene and otherwise comprises all of the physiological and morphological characteristics of maize variety 1PFLQ21 when grown under the same environmental conditions, wherein the transgene is inherited by the F1 hybrid seed; and (2) the transgene be incorporated by “backcrossing or genetic transformation.” EX1001, 40:44-56. As Chifflet discloses, incorporating a transgene into a corn variety is one particular technique for incorporating a locus conversion (as discussed in connection with claim 10). EX1005, 7:43-52. Chifflet also discloses that backcrossing is a technique for incorporating locus conversions in general and transgenes in particular. *Id.*, 16:14-36. Claim 18 would have been obvious for the same reasons as above-discussed claims 3 and 10 and in further view of these additional disclosures in Chifflet. Riley, ¶127. PO’s other prior art patents likewise include claims directed to the inclusion of a “transgene” incorporated “by backcrossing or genetic transformation.” *E.g.*, EX1026, 44:9-14.

Claim 19 concerns “[a] method of producing progeny seed” by “crossing a plant grown from the seed of claim 18 with itself or a second plant to produce progeny seed.” EX1001, 40:56-59. It parallels above-discussed claim 5 aside

from (1) the more specific requirement concerning the nature of the starting F1 hybrid seed; and (2) the fact that claim 19 refers to “progeny seed” rather than a “plant” itself. Claim 19 accordingly would have been obvious for the reasons discussed above in connection with claims 5 and 19. Riley, ¶128. In particular, POSAs would have understood that Chifflet’s disclosure that plant breeding techniques can be used to cross an “F1 hybrid” with either another F1 hybrid or another inbred line (EX1005, 15:14-24) was applicable to F1 hybrids created by crossing inbred varieties incorporating transgenes. Riley, ¶129.

Claim 20 parallels claim 7 (i.e., “[a] method of making a commodity plant product....”) aside from reciting the plant of claim 18 rather than claim 4. EX1001, 40:60-63. Claim 20 would have been obvious for the same reasons as claim 7. Riley, ¶130.

C. Ground 2: Claims 1-20 Are Unpatentable As Obvious Over Smalley (EX1006) and the Corresponding PVPA Certificate (EX1009)

Smalley and the corresponding PVPA Certificate disclose PH18KJ—a prior art inbred variety with properties very similar to those of the 1PFLQ21 variety claimed in the ’803 Patent.

Smalley discloses that PH18KJ can be used “[t]o develop another Maize Plant” and in particular is a “source of breeding material that may be used to develop new maize inbred varieties.” EX1006, 28:52-54. It also discloses specific

cross breeding techniques for producing such “new inbred” varieties. *Id.*, 2:43-49; Riley, ¶¶131-132.

Consistent with these disclosures, PH18KJ was previously used as one of the parents for other maize varieties—including an inbred line disclosed in indisputable prior art. EX1097, 18:59-61; Riley, ¶133; *see also supra* §V.A.3.

As Smalley itself discloses and these other crosses—including but not limited to that disclosed in indisputable prior art—confirm, POSAs would have had reason to use PH18KJ as the starting point to create other inbred lines. The nature of the maize market confirms the reasons to create a wide array of new varieties using PH18KJ as the starting point. Riley, ¶134; *see also* §V.A.3 (citing *DyStar*).

POSAs would have had a reasonable expectation of obtaining an inbred maize variety with PH18KJ as a parent, particularly given (1) the routine nature of the breeding techniques involved and (2) the previous instance already reported in which PH1V5T had been used as a parent to obtain other inbred lines. Riley, ¶135.

1. Claim 1

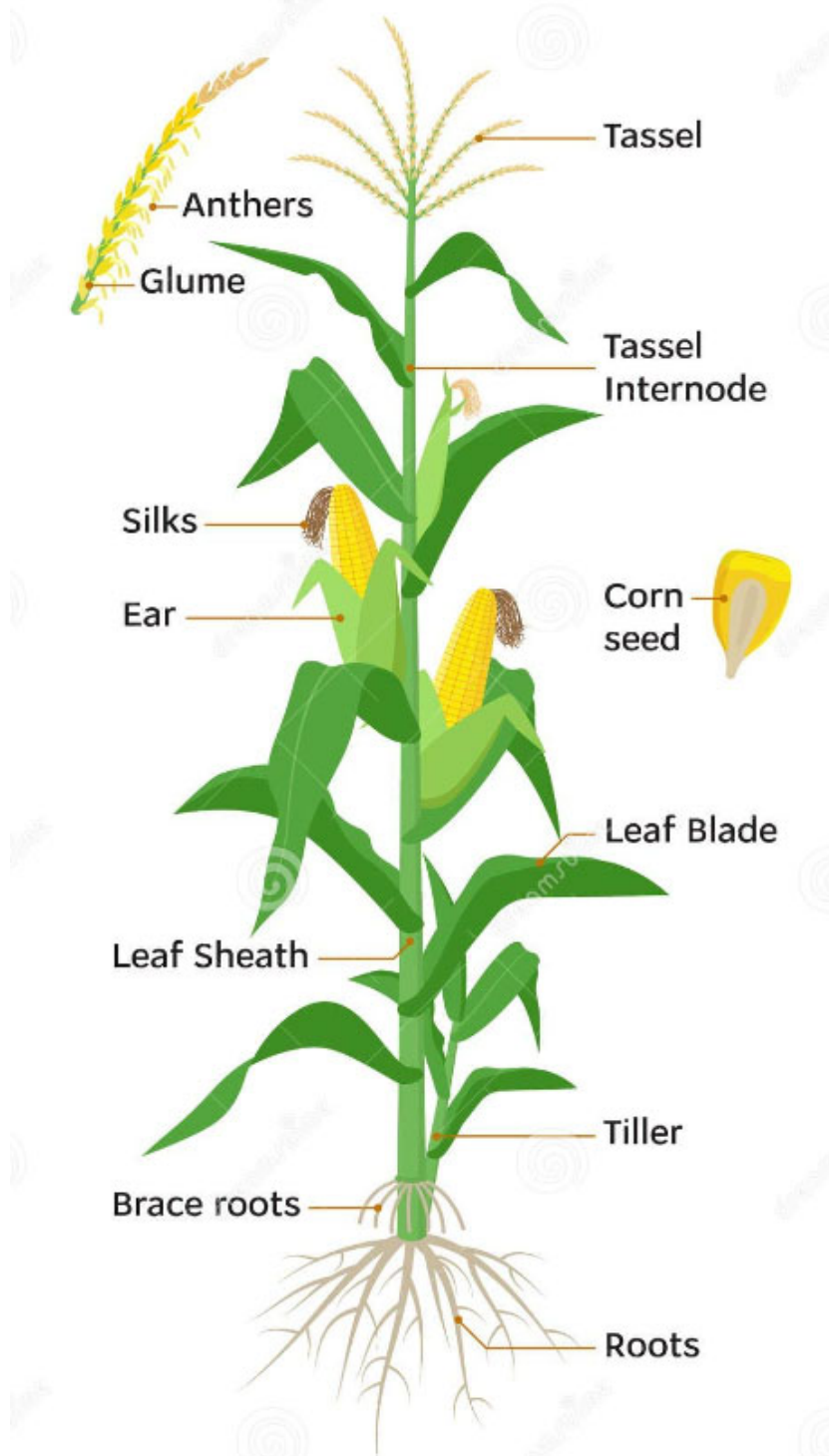
Claim 1 encompasses a seed, plant part, or plant cell of variety 1PFLQ21. 1PFLQ21’s disclosed characteristics are highly similar to PH18KJ’s as disclosed in Smalley, and nothing in the ’803 Patent’s specification or otherwise in the intrinsic record suggests any property of 1PFLQ21 that POSAs would have viewed as

surprising or unexpected over PH18KJ. *Supra* §V.A.2; Riley, ¶136. Instead, as with the claims the Board found unpatentable in *Ex parte C*, the record does “not explain the significance of any differences in attributes between the novel variety and varieties that are old in the art.” 27 U.S.P.Q.2d at 1493. To the extent such differences exist, there is no basis from which to conclude they are “so significant and unexpected that they should weigh more heavily than the numerous similarities between the claimed variety and the” PH18KJ variety disclosed in Smalley and touted therein as a potential starting point for future inbred lines. *Id.* at 1497. Indeed, none of the differences have any material commercial significance. Riley, ¶¶137-141. In particular, none of them are relevant to the underlying goal identified in the ’803 Patent of developing “stable, high yielding maize varieties and hybrids that are agronomically sound with maximal yield over one or more different conditions and environments.” EX1001, 1:23-26; Riley, ¶137. Nor are they relevant to the nature of the ’803 Patent’s disclosed “Industrial Applicability.” EX1001, 36:20-65; Riley, ¶140.

During prosecution, the Examiner cited Smalley and acknowledged that 1PFLQ21 and PH18KJ were “somewhat similar in phenotype.” EX1002, 105. The Examiner nevertheless reasoned that they could “be distinguished” based on “anther color and brace root anthocyanin.” *Id.* But such distinctions at best confirm novelty under §102 (or distinctiveness for purposes of a PVP certificate).

Nothing in the record suggests any consideration by Examiner of whether Smalley rendered the claims obvious under the standards the Board articulated in *Ex parte C* and which PO later cited to the Supreme Court in *J.E.M.* to show that the requirements for obtaining a utility patent were greater than those for getting a PVP certificate (EX1022, *20-21, *38, & n.25).

There is no practical difference between the “green-yellow” anther color of claimed 1PFLQ21 (as well as the prior art PH1V5T parent disclosed in Chifflet and discussed in supra §V.B) versus the “buff” anther color of the prior art PH18KJ disclosed in Smalley. Riley, ¶138. The anther is simply the pollen-containing structure within a male flower (called a “tassel”). Riley, ¶138:



The color of such structure is immaterial to maize's practical utility. Riley, ¶139.

In particular, nothing in the '803 Patent discloses any reason why it is relevant. *Id.*

The situation here parallels that in *Ex parte C*, which stressed the lack of any basis to assess whether differences in “flower color” were significant. 27 U.S.P.Q.2d at 1496-97.

Nor is there any practical difference between the “faint” anthocyanin pigmentation levels in the branch root system (assessed at 2 on a scale of 4) of the claimed 1PFLQ21 (as well as the prior art parent discussed in supra §XX) versus the “moderate” level (3 on a scale of 4) of the prior art PH18KJ disclosed in Smalley. Riley, ¶140. These variations have no bearing on developing “stable, high yielding maize varieties and hybrids that are agronomically sound with maximal yield over one or more different conditions and environments.” EX1001, 1:23-26; Riley, ¶140. Nor are they relevant to the nature of the ’803 Patent’s disclosed “Industrial Applicability.” EX1001, 36:20-65; Riley, ¶140.

Accordingly, claim 1 would have been obvious over Smalley. Riley, ¶¶141-2.

2. Claims 2-20

Claims 2-20 are likewise unpatentable as obvious over Smalley for the same reasons detailed immediately above concerning claim 1 and for the additional reasons explained in §V.B.2 concerning why claims 2-20 are obvious over Chifflet. The unpatentability of claims 2-20 is further confirmed by PO’s other prior art patents (EX1026—1030) including analogous claims related to other

inbred corn lines. Smalley has disclosures paralleling the disclosures in Chifflet identified in §V.B.2 concerning claims 2-20. Riley, ¶143. In particular:

	Relevant Disclosures in Smalley (EX1006)
Claim 2	9:4-7 (“plant part” includes “pollen” and “ovules”)
Claims 3-4 and 12-13	14:65-15:1 (“F1 hybrids” sought as “commercial hybrids” because they “are more vigorous than their inbred parents”)
Claims 5, 14, and 19	15:34-44 (disclosing crossing “F1 hybrid” with “third inbred”)
Claims 6 and 15	30:53-57 (disclosing “[h]aploid induction systems” in which “haploid plants from any genotype” may be created “by crossing a selected variety (as female) with an inducer variety”)
Claims 7, 16, and 20	32:62-67 (“The seed of maize variety PH18KJ, the plant produced from the seed, the hybrid maize plant produced from the crossing of the variety, hybrid seed, and various parts of the hybrid maize plant and transgenic versions of the foregoing, can be utilized for human food, livestock feed, and as a raw material in industry.”)
Claim 8	15:34-44 (disclosing crossing “F1 hybrid” with “third inbred”); 38:20-24 (claim 5)

	Relevant Disclosures in Smalley (EX1006)
Claim 10	<p>14:55-56 (“locus conversion of PH18KJ for herbicide tolerance”); 14:58-59 (“locus conversion for insect or disease resistance”); 16:28-38 (“PH18KJ represents a new base genetic variety into which a new locus may be introgressed....A locus conversion of PH 18KJ will retain the genetic integrity of PH18KJ. A locus conversion of PH18KJ will comprise at least 90%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% of the genetic identity of PH18KJ as determined by using SSR markers or SNP markers.”); 16:65-17:6 (“Desired traits that may be transferred through locus conversion include, but are not limited to, waxy starch, sterility (nuclear and cytoplasmic), fertility restoration, grain color (white), nutritional enhancements, drought resistance, enhanced nitrogen utilization efficiency, altered nitrogen responsiveness, altered fatty acid profile, increased digestibility, low phytate, industrial enhancements, disease resistance (bacterial, fungal or viral), insect resistance, herbicide tolerance and yield enhancements.”)</p>

	Relevant Disclosures in Smalley (EX1006)
Claim 11	17:12-14 (“The seed industry commonly markets ‘triple stacks’ of base genetics; which can be varieties comprising a locus conversion of at least 3 loci”)
Claim 18	7:48-49 (“Examples of single locus conversions include... transgenes”); 17:32-34 (“Transgenes transferred via backcrossing typically function as a dominant single gene trait and are relatively easy to classify.”); 22:4-27:56 (identifying particular types of transgenes)

D. Ground 3: Claims 1-20 Are Unpatentable as Obvious Over Gadlage (EX1007)

Gadlage discloses PH2SNA—a prior art inbred variety with properties very similar to those of the 1PFLQ21 variety claimed in the ’803 Patent. Gadlage was not of record during prosecution even though its disclosures are essentially identical to those in the ’803 Patent aside from the identity of the claimed variety, its parentage, and the specifics of the claimed properties. Riley, ¶144; see also EX1034 (redline comparison).

Gadlage discloses that PH2SNA can be used “[t]o Develop Another Maize Plant” and in particular is a “source of breeding material that may be used to develop new maize inbred varieties.” EX1007, 36:31-35. It also discloses specific

cross breeding techniques for producing such “new inbred” varieties. *Id.*, 5:54-60; Riley, ¶145.

Consistent with these disclosures, PH2SNA was previously used as one of the parents for a different corn variety. EX1100, 15:19-21; Riley, ¶146.

As Gadlage itself discloses, POSAs would have had reason to use PH2SNA as the starting point to create other inbred lines. The nature of the maize market confirms the reasons to create a wide array of new varieties using PH2SNA as the starting point. Riley, ¶147; *see also* §V.A.3 (citing *DyStar*).

POSAs would have had a reasonable expectation of obtaining an inbred maize variety with PH2SNA as a parent, particularly given (1) the routine nature of the breeding techniques involved and (2) the previous instance already reported in which PH2SNA had been used as a parent to obtain other lines. Riley, ¶148.

1. Claim 1

Claim 1 encompasses a seed, plant part, or plant cell of variety 1PFLQ21. 1PFLQ21’s disclosed characteristics are highly similar to PH2SNA’s as disclosed in Gadlage, and nothing in the ’803 Patent’s specification or otherwise in the intrinsic record suggests any property of 1PFLQ21 that POSAs would have viewed as surprising or unexpected over PH2SNA. *Supra* §XX; Riley, ¶149. Instead, as with the claims the Board found unpatentable in *Ex parte C*, the record does “not explain the significance of any differences in attributes between the novel variety

and varieties that are old in the art.” 27 U.S.P.Q.2d at 1493. To the extent such differences exist, there is no basis from which to conclude they are “so significant and unexpected that they should weigh more heavily than the numerous similarities between the claimed variety and the” PH2SNA variety disclosed in Gadlage and touted therein as a potential starting point for future inbred lines. *Id.* at 1497. Indeed, none of the differences have any material commercial significance. Riley, ¶¶150-51. In particular, none of them are relevant to the underlying goal identified in the ’803 Patent of developing “stable, high yielding maize varieties and hybrids that are agronomically sound with maximal yield over one or more different conditions and environments.” EX1001, 1:23-26; Riley, ¶150. Nor are they relevant to the nature of the ’803 Patent’s disclosed “Industrial Applicability.” EX1001, 36:20-65; Riley, ¶¶150-152.

Accordingly, claim 1 would have been obvious over Gadlage.

2. Claims 2-20

Claims 2-20 are likewise unpatentable as obvious over Gadlage for the same reasons detailed immediately above concerning claim 1 and for the additional reasons explained in §V.B.2 concerning why claims 2-20 are obvious over Gadlage. The unpatentability of claims 2-20 is further confirmed by PO’s other prior art patents (EX1026—1030) including analogous claims related to other inbred corn lines. Gadlage has disclosures paralleling Challenged Claims 2-20

and/or disclosures in Chifflet identified in §V.B.2 concerning claims 2-20. Riley,

¶153. In particular:

	Relevant Disclosures in Gadlage (EX1007)
Claim 2	45:15-16 (“The plant part of claim 1, wherein the plant part is an ovule or pollen”)
Claims 3 and 12	45:17-18 (“An F1 hybrid maize seed produced by crossing the plant or plant part of claim 1 with a different maize plant”)
Claims 4 and 13	45:24-26 (“An F1 hybrid maize plant or plant part produced by growing the maize seed of claim 3, wherein the plant part comprises at least one cell of the F1 hybrid maize plant”)
Claims 5, 14, and 19	45:27-30 (“A method for producing a second maize plant, the method comprising applying plant breeding techniques to the F1 plant or plant part of claim 5 to produce the second maize plant”)
Claims 6 and 15	45:31-35 (“A method for producing a second maize plant or plant part, the method comprising doubling haploid seed generated from a cross of the plant or plant part of claim 5 with an inducer variety, thereby producing the second maize plant or plant part.”)
Claims 7, 16, and 20	45:36-39 (“A method of making a commodity plant product

	Relevant Disclosures in Gadlage (EX1007)
	comprising silage, starch, fat, syrup or protein, the method comprising producing the commodity plant product from the maize plant or plant part of claim 5.”)
Claim 8	45:40-46 (“A method of producing a maize plant derived from the variety PH2SNA, comprising: a) crossing the plant of claim 1 with itself or a second plant to produce progeny seed; b) growing the progeny seed to produce a progeny plant and crossing the progeny plant with itself or a different plant to produce further progeny seed”)
Claims 9 and 17	45:50-52 (“A method for producing nucleic acids, the method 50 comprising isolating nucleic acids from the seed, plant, plant part, or plant cell of claim 1”)
Claim 10	45:53-46:14 (“A converted seed, plant, plant part or plant cell of inbred maize variety PH2SNA, representative seed of the maize variety PH2SNA having been deposited under ATCC accession number PTA-124809, wherein the converted seed, plant, plant part or plant cell comprises a locus conversion, and wherein the plant or a plant grown from the converted seed, plant part or plant cell comprises the locus conversion and otherwise

	Relevant Disclosures in Gadlage (EX1007)
	comprises the phenotypic characteristics of maize variety PH2SNA listed in Table 1 when grown under the same environmental conditions.”)
Claim 18	45:18-23 (“The F1 hybrid seed of claim 3, wherein the plant of maize variety PH2SNA further comprises a trans gene that is inherited by the seed, wherein the transgene was introduced into inbred maize variety PH2SNA by backcrossing or genetic transformation.”)

VI. GROUND 4: CLAIMS 1-20 LACK SPECIFIC UTILITY

Aside from being obvious, claims 1-20 are unpatentable for the separate and independent reason that the claimed invention “lacks a specific and substantial utility” as required by §101. *In re Fisher*, 421 F.3d 1365, 1367 (Fed. Cir. 2005) (affirming Board’s finding that claims lacked utility).

A. The ’803 Patent Fails to Disclose Any Specific Utility for the Claimed Variety

Nothing in the specification suggests any “specific benefit” provided by the claimed invention consistent with “[t]he basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly.” *Brenner v. Manson*, 383 U.S. 519, 534 (1966) (reversing CCPA and upholding Office’s

determination that claim to chemical compound lacked disclosed utility). Corn breeding has a long history, and PO alone controls over 3000 corn-related utility patents (EX1031, 14)¹⁰—including but not limited to the three detailed in §V above. EX1019, 77. Nothing in the specification of *this particular patent* establishes that claims 1-20 are a “useful improvement” over earlier corn varieties. Accordingly, there is no basis to conclude that issuance and maintenance of *this particular patent* “promote[s] the Progress of Science and useful Arts.” U.S. Const. art. I, § 8, cl. 8. It serves no purpose but to inflate PO’s patent estate and create an unjustified “monopoly of knowledge” not “clearly commanded by the statute.” *Brenner*, 383 U.S. at 534.

In particular, it is immaterial for purposes of §101 that the claimed corn variety is similar to those disclosed in earlier corn varieties. In *Brenner*, the Supreme Court reversed the CCPA and reinstated the Office’s utility rejection concerning claims to methods of producing a steroid even though published literature confirmed that a closely related “homologue” had “tumor-inhibiting effects.” 383 U.S. at 531. *Fisher* likewise affirmed a Board rejection that had cited *Brenner* and reasoned by the same logic that claimed expressed sequence tags

¹⁰ Assignee of record Pioneer merged with another entity to become Corteva.

EX1031, 11.

(ESTs) lacked substantial utility because they required “further research” to “confirm” any “real world” benefit. 421 F.3d at 1368-69. While the applicant suggested various potential uses, “[n]othing about [applicant’s] uses” distinguished them “from any EST derived from any organism.” *Id.* at 1374; *see also Ex parte Kropp*, 143 U.S.P.Q. 148, 151 (PBA 1959) (affirming rejection for lack of utility of claims to process for producing antibiotic because applicant had not shown the claimed antibiotic had “any particular value or utility” aside from the generic function “of inhibiting some bacteria,” as would be true for any antibiotic generically).

It is likewise immaterial that the claimed inbred corn lines may be “useful as building blocks of value to” plant breeders in developing future hybrid varieties. *In re Kirk*, 376 F.2d 936, 945 (CCPA 1967). On the contrary, §101 requires a “substantial” utility—“one that provides a ***specific benefit in currently available form.***” *Ex Parte Fisher*, 72 U.S.P.Q.2d 1020, 1025 (BPAI 2004) (citing *Brenner*).

Here, however, the ’803 Patent “only disclosed general uses for its claimed [1PFLQ21 variety], not specific ones that satisfy §101.” *Fisher*, 421 F.3d at 1374. The specification’s “Industrial Applicability” section of the specification indeed is essentially identical to those in the Chifflet, Smalley, and Gadlage prior art references. See EX1001, 36:20-65; EX1005, 33:38-34:11; EX1006, 32:32-67; EX1007, 41:14-57; Riley, ¶¶154-156. Nothing in the record suggests any utility

specific to the 1PFLQ21 variety itself beyond that generic to any species of corn.

Riley, ¶¶154-156; *Ex parte Kropp*, 143 U.S.P.Q. at 151 (affirming finding that claims to production of a particular antibiotic was unpatentable “when there is no showing, or even assertion, of the production of other than routine or ordinary results”).

Likewise, to the extent the ’803 Patent suggests particular phenotypical differences between the claimed 1PFLQ21 variety and prior art varieties, it never even expressly identifies such differences—much less explains why they confer some specific benefit not already available from the prior art. Riley, ¶157. The relevant table (“Variety Description Information”) instead is drawn essentially verbatim from a form prepared by the USDA and used in connection with PVP certificates. Riley, ¶157. But the claimed inventions in utility patents must be “useful” whereas “a plant variety may receive a PVP certificate without a showing of usefulness.” *J.E.M.*, 534 U.S. at 142.

**B. The ’803 Patent Fails to Disclose Any Characteristics
Markedly Different From Those Found in Other Varieties**

As the Supreme Court noted in *J.E.M.* when upholding the availability of utility patent protection for new plant varieties if—and only if—they satisfy all patentability requirements including utility, the Office’s rationale for issuing such plant utility patents flows from the Supreme Court’s earlier decision in *Diamond v. Chakrabarty*, 447 U.S. 303 (1980). *J.E.M.*, 534 U.S. at 145, (“[T]he Board...relied

heavily on this Court's decision in *Chakrabarty* when it interpreted the subject matter of § 101 to include plants.”) (discussing *In re Hibberd*, 227 U.S.P.Q. 443 (BPAI 1985)).

Chakrabarty held that utility patents are available for living organisms if—and only if—the organism has “markedly different characteristics from any found in nature.” 447 U.S. at 310. In particular, the Supreme Court held that utility patent protection was available for a “human-made, genetically engineered bacterium...capable of breaking down multiple components of crude oil”—a property that “no naturally occurring bacteria” possessed and which suggested “significant value for the treatment of oil spills.” *Id.* at 305. Specifically, “[b]y breaking down multiple components of oil, Chakrabarty’s micro-organism promis[ed] more efficient and rapid oil-spill control” than was possible with “naturally occurring bacteria.” *Id.* at 305 n.2.

By contrast, man-made organisms are not patentable if they lack such “markedly different characteristics” and corresponding “significant utility” as compared to naturally occurring organisms. *In re Roslin Institute (Edinburgh)*, 750 F.3d 1333, 1336 (Fed. Cir. 2014) (affirming §101 rejection of claims directed to cloned animal, which did not possess “markedly different characteristics from any found in nature”); *Ex parte Uchiyama*, Appeal No. 2017-005387, 2018 WL 1378136, at *4 (PTAB Mar. 12, 2018) (affirming §101 rejection of claims to

composition of bacteria because appellants had not cited “evidence showing that the viable bacteria in the claimed composition are ‘markedly different’ from the viable bacteria naturally found in human stools”) (quoting *Chakrabarty*, 447 U.S. at 310).

Nothing in the ’803 Patent suggests any reason why the claimed variety’s properties have such characteristics and provide significant value as compared to preexisting corn varieties. Riley, ¶¶158-67. Any argument by PO to that effect would instead necessarily flow from POSAs’ preexisting knowledge rather than being based on the specification’s actual disclosures. Aside from being insufficient as a matter of law for purposes of §101, such preexisting knowledge would simply further confirm the obviousness of claims 1-20 as detailed in Grounds 1-3. For example, if one assumed *arguendo* that the claimed variety’s leaf angle somehow established the variety’s specific utility because POSAs would recognize some alleged benefit (despite the angle falling within the range defined by PO’s own prior art patents), such a conclusion would simply confirm the obviousness of claims. Achieving such phenotypical variations through breeding techniques was well within the level of ordinary skill in the art as of July 2021. Riley, ¶¶159-167.

Accordingly, claims 1-20 are unpatentable under §101 for lack of substantial utility.

VII. GROUND 5: THE PETITION PRESENTS A NOVEL AND UNSETTLED QUESTION CONCERNING WHAT IS REQUIRED TO DETERMINE WHETHER PLANT UTILITY CLAIMS HAVE THE REQUISITE SPECIFIC UTILITY UNDER §101

Review should be instituted because the above-discussed grounds establish it is more likely than not claims 1-20 are unpatentable as obvious (Grounds 1-3) and lacking substantial utility (Ground 4). §324(a).

Review should also be instituted for the separate and independent reason that the '803 Patent presents a “novel or unsettled legal question that is important to other patents or patent applications,” and in particular other utility patents and utility patent applications related to methods of breeding maize (subclass 275.000 within class 800) and other agricultural crops critical to our national food supply. §324(b).

The question arises under §101 and concerns the '803 Patent's lack of any disclosure concerning benefits of the claimed corn variety over other corn varieties. The question is:

Whether plant utility patent claims should be found unpatentable for lack of specific utility if the specification lacks any distinct statement concerning one or more specific benefits of the claimed plant as compared to known varieties?

The Office can and should answer this question affirmatively—consistent with the objective of the joint Office-USDA Working Group to “enhance the

quality of the patent examination process for innovations related to agricultural products” and also “enhance the transparency of IP information” for such innovations. EX1018. Such a policy would likewise track the President’s mandate that the Office ensure the patent system does not “unnecessarily reduce competition in seed and other input markets beyond that reasonably contemplated by the Patent Act.” EX1017. The Patent Act does not contemplate reducing competition in seed markets based on applications failing even to identify any specific benefit of the purported new plant in comparison to other varieties already known.

An affirmative answer would also restore the balance between utility patents and PVP certificates the Supreme Court stressed in *J.E.M.* (at the urging of PO as well as the Office) when holding that utility patent protection in addition to PVP protection may be available for new plant varieties if they satisfy the statutory utility and non-obviousness requirements. 534 U.S. at 131 (stressing that “[i]t is ***much more difficult*** to obtain a utility patent for a plant than to obtain a PVP certificate because a utility patentable plant must be new, ***useful, and nonobvious***,” whereas “a plant variety may receive a PVP certificate without a showing of usefulness or nonobviousness”).

Indeed, unlike the ’803 Patent here, the patents PO asserted in *J.E.M.* included distinct statement concerning one or more specific advantages of the

claimed plant as compared to other varieties and in particular disclosing disclosed “*readily identifiable benefits to farmers.*” EX1023, 28. Such statements facilitated the examination process. By contrast, the ’803 Patent includes no such statement despite being based on an application filed over two decades later, with numerous intervening disclosures.

A. Requiring a Specific Statement Concerning Benefits of the Claimed Plant Variety as Compared to Other Varieties Would Ensure Application of Longstanding §101 Precedent

Answering the question affirmatively would provide clear rules for examiners enabling them to apply longstanding precedent concerning the specific utility requirement under §101. *E.g.*, *Brenner*, 383 U.S. at 531 (reversing CCPA and reinstating Office’s utility rejection concerning claims to methods of producing a steroid even though published literature confirmed that a closely related “homologue” had “tumor-inhibiting effects”); *Fisher*, 421 F.3d at 1374 (noting that “[n]othing about [applicant’s suggested] uses” distinguished them “from any EST derived from any organism”); *Kropp*, 143 U.S.P.Q. at 151 (affirming rejection for lack of utility of claims to process for producing antibiotic because applicant had not shown the claimed antibiotic had “any particular value or utility” aside from the generic function “of inhibiting some bacteria,” as would be true for *any* antibiotic).

Answering the question affirmatively would likewise restore the appropriate balance between utility patents and PVP certificates the Supreme Court articulated in *J.E.M.* In the particular case of inbred plant varieties, for example, there is no basis for awarding a utility patent in addition to a PVPA based merely on speculation that a particular disclosed inbred variety “*may* be used to produce hybrid” plants (EX1001, 18:19) absent evidence that a particular hybrid obtained based on the inbred actually has desirable properties. Section 101 instead requires a “substantial” utility—that is, “one that provides a *specific benefit in currently available form.*” *Ex Parte Fisher*, 72 U.S.P.Q.2d at 1025. (citing *Brenner*, 383 U.S. at 534-35). “[V]ague, general disclosures or arguments of ‘useful in research’ or ‘useful as building blocks of value to the researcher’” are insufficient as a matter of law. *Kirk*, 376 F.2d at 1128-29 (discussing *Brenner*). And as the ’803 Patent itself concedes, it is the hybrid varieties—not the inbred lines—that are actually used in commercial agriculture (as opposed to open-ended research and development). EX1001, 18:12-16 (“In the development of commercial hybrids in a maize plant breeding program, only the F1 hybrid plants are sought. F1 hybrids are more vigorous than their inbred parents.”); Riley, ¶¶160-166.

If plant breeders desire utility patent protection—as opposed only to PVPA protection—for inbred lines, they need to identify a specific benefit in the form of breeding at least one hybrid with substantial utility. Indeed, as detailed below, PO

previously took that approach as a consistent practice. Now, however, PO wrongly seeks utility patents on inbred lines despite identifying them as nothing more than potential building blocks or hypothetical research tools.¹¹ “But a patent is not a hunting license.” *Brenner*, 383 U.S. at 536. While PVP certificates may be available under such circumstances, one of the crucial differences between the Patent Statute and the PVPA is the PVPA’s statutory research exemption. 7 U.S.C. § 2544; contrast with *Madey v. Duke Univ.*, 307 F.3d 1351 (Fed. Cir. 2002). If a breeder obtains a PVP certificate on a new plant without disclosing any specific utility, others are free to research potential uses for the new variety. EX1020, 4 (Director’s emphasis that PVP certificates “strike a different balance from patents in permitting farmers to save seeds and for plant breeders to engage in continued

¹¹ While PO *later* filed a separate application on one particular hybrid line in which the ’803 Patent’s claimed 1PFLQ21 inbred variety was “one of the parents” (EX1002, 98), even that belated disclosure (EX1117) fails to disclose any specific utility. The hybrid application’s “Industrial Applicability” section instead mirrors that of prior art “Industrial Applicability” sections, including in other patents on hybrids. Compare EX1117, 29:37-30:13 with, e.g., EX1064, 36:17-36:44. And the hybrid application includes no data at all aside from the “Variety Description Information” fields drawn from the PVP certificate application process.

research on the protected variety.”). By contrast, if a breeder obtained a utility patent under such circumstances, Federal Circuit precedent would deter any such research with the slightest hint of “commercial” applications. *Madey*, 307 F.3d at 1362.

B. PO Previously Included Such Specific Statements and Comparative Data as a Matter of Course in Earlier Plant Utility Patents—Including Those of Record for the Supreme Court in *J.E.M.*

PO’s own past practices confirm the reasonableness of requiring a distinct statement concerning one or more specific benefits of the claimed plant as compared to other varieties. Indeed, PO’s earlier utility patents on plant varieties—in particular, those PO asserted in the *J.E.M.* case heard by the Supreme Court (EX1036)—consistently included comparative data as between the claimed corn variety versus other known corn varieties. EX1037—EX1053; Riley, ¶¶184; *see also* Riley, ¶¶168-183 (discussing patents asserted in *J.E.M.*). Such disclosures established the specific utility of the claimed inventions—that is, the particular benefit PO had identified (and was disclosing to the public) in return for PO obtaining the “exclusive Right” to the claimed variety for a “limited time,” after which the public would be able to use the claimed variety as well. U.S. Const. art. I, § 8, cl. 8. In the Office’s own words supporting PO at the time, PO’s patents being considered by the Supreme Court indicated “*readily identifiable benefits to farmers.*” EX1023, 28.

For example, U.S. Patent No. 5,491,295 (EX1042)—the very first patent identified in PO’s *J.E.M.* complaint (EX1036, 4), and naming Petitioner’s expert Dr. Riley as one of the inventors—concerned a hybrid corn plant “characterized by superior yield for maturity, excellent seedling vigor, very good roots and stalks, and exceptional stay green,” with best performance “in the Central and Eastern Com Belt.” EX1042, 2:66-3:3. The patent included detailed “Research Comparisons” and “Strip Test Data” assessing the claimed hybrid against nine others—all grown at the same time and under the same conditions. *Id.*, 8:15-21.4. It provided detailed statistical analysis and expressly defined a series of comparisons (dubbed “PERCENT WINS”) based on a handful of commercially significant criteria (e.g., “greater income per acre”). *Id.*, 4:50-55. Dr. Riley’s patent also highlighted how the claimed species had a particular “unique characteristic” with the potential benefit of dropping corn ears “free from the husk.” *Id.*, 5:36-45.

When claiming inbred varieties, PO’s earlier utility patents also consistently compared economically significant properties not only of the inbred lines themselves, but also hybrid lines bred using the claimed inbred versus other hybrid lines bred using other closely related inbred lines. Riley, ¶187. For example, U.S. Patent No. 5,444,178 disclosed that the claimed inbred line afforded “more yield in hybrids than either parental line” and also had numerous other highly desirable

properties, including the fact that hybrids did “well in both dry and wet years

compared to the closest prior art, but are especially better in wet years.”

EX1039, 7:16-21. Indeed, the value of an inbred line lies with its ability to generate better hybrids, as opposed to the inbred line’s own yield or other characteristics. Riley, ¶¶187-188, 191; *see also* Riley, ¶¶160-166.

While the details across PO’s other patents asserted in the *J.E.M.* case vary, *all* include detailed tables comparing the claimed varieties to other corn varieties and indicating to POSAs particular commercially significant benefits of the claimed varieties. Riley, ¶¶188, 181-182. PO included these tables ***in addition to*** the initial “Variety Description Information” table specific to the claimed variety and mirroring the information required for PVP certificates. Riley, ¶188.

By contrast, PO failed to include any such comparative data or particularized analysis in the ’803 Patent distinguishing the claimed 1PFLQ21 variety over other corn varieties. Yet in the twenty-five years that had passed between the most recent of PO’s earlier patents (i.e., those at issue in the *J.E.M.* case) and the filing of the ’803 Patent in July 2021, the corn variety landscape became even more crowded (Riley, ¶¶189-190)—making it even more important for applicants to provide particularized information regarding new plant varieties in order to obtain utility patent protection as opposed merely to PVPA protection.

VIII. NO BASIS EXISTS FOR DISCRETIONARY DENIAL

A. §314(a)

There is no previous petition concerning the '803 Patent that would warrant discretionary denial of this Petition based on the factors in *General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (Sept. 6, 2017) (precedential).

B. §324(a)

There is no co-pending litigation involving the '803 Patent that would warrant discretionary denial of this Petition based on the factors in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (Mar. 20, 2020) (precedential)

C. §325(d)

Considering the two-part framework discussed in *Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH*, IPR2019-01469, Paper 6 (Feb. 13, 2020) (precedential), the Board should not exercise its §325(d) discretion to deny institution based on any obviousness or utility arguments herein.

1. Ground 1-3 (Obviousness)

The obviousness arguments in Grounds 1-3 are not the same or substantially the same as arguments considered during prosecution. For this reason, the *Advanced Bionics* inquiry ends at the first step. For one, the Gadlage reference was not even of record during prosecution. Nor did the Examiner ever

conduct an obviousness analysis in line with *Ex parte C*, 27 U.S.P.Q.2d 1492 (BPAI 1992) as detailed in §V above.

Even if the Board reached part two of *Advanced Bionics* because Chifflet and Smalley were cited, “specific teachings of [both references] impact[ing] patentability of the Challenged Claims” were “misapprehend[ed] or overlook[ed].” *Cellco P’ship v. Huawei Device Co.*, IPR2020-01117, Paper 10 at 12 (Feb. 3, 2021). The “fact that” neither Chifflet nor Smalley formed a “basis of rejection weighs strongly against exercising [the Board’s] discretion to deny institution under 35 U.S.C. § 325(d).” *Id.* at 13.

Moreover, the Examiner plainly erred legally when acknowledging the existence of prior art disclosing the parent PH1V5T variety (disclosed in Chifflet), but justifying the lack of a §103 rejection on the ground that “there is no motivation in the prior art to select the particular other parent.” EX1002, 98. For one, “**motivation to combine need not be found in prior art references**, but equally can be found ‘in the knowledge generally available to’” a POSA. *National Steel Car, Ltd. v. Canadian Pacific Ry., Ltd.*, 357 F.3d 1319, 1337–39 (Fed. Cir. 2004) (reversing district court). Separately, “motivation” per se is not even a requirement for obviousness. *KSR*, 550 U.S. at 419 (rejecting “formalistic conception of the words teaching, suggestion, and motivation” as well as “overemphasis on the importance of published articles and the explicit content of

issued patents”). In the relevant field, and as detailed in §V.A.3, “the desire to enhance commercial opportunities by improving [inbred corn varieties] is universal—and even common-sensical.” *DyStar*, 464 F.3d at 1368. Accordingly, “the proper question” when assessing obviousness “is whether the ordinary artisan possesses knowledge and skills rendering him *capable* of combining the prior art references.” *Id.* (emphasis original). The Examiner erred in failing to consider that question.

The Examiner likewise erred when allowing the claims despite PO’s failure to respond fulsomely to the Examiner’s request for information and in particular the Examiner’s request for information concerning the parental line “PH2F7K.” *See supra* §III.C. In particular, the Examiner allowed the claims immediately after PO’s assertion that parental line PH2F7K was “proprietary” and not “publicly available.” EX1002, 126. But there are multiple reasons why “proprietary” information (e.g., information about the PH2F7K parental line) is highly relevant when assessing whether patent claims are non-obvious as required by §103.

For one, even purely internal, confidential varieties can constitute prior art for purposes of the obviousness assessment. PO’s representation that the PH2F7K parental line was “proprietary” and had “not been made publicly available” is not dispositive as to the question whether it constitutes prior art. Even a secret sale—under a non-disclosure agreement, and without any indication of what was being

sold—would constitute prior art. *Helsinn Healthcare S.A. v. Teva Pharms. USA, Inc.*, 139 S. Ct. 628, 633 (2019) (“[A] sale or offer of sale need not make an invention available to the public.”)

Indeed, it has long been the law that “an inventor's own prior commercial use, albeit kept secret, may constitute a public use or sale” that bars a patent. *Woodland Tr. v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1370 (Fed. Cir. 1998); *see also Special Devices, Inc. v. OEA, Inc.*, 270 F.3d 1353, 1357 (Fed. Cir. 2001) (rejecting proposed “supplier exception” to on-sale bar, which “would apply even if a patentee's commercial activities took place in secret”). The same is true under post-AIA §102. *Helsinn*, 139 S. Ct. at 633-34 (citing “settled pre-AIA precedent on the meaning of ‘on sale’” and “presum[ing] that when Congress reenacted the same language in the AIA, it adopted the earlier judicial construction of that phrase”). Accordingly, “an inventor's sale of an invention to a third party who is obligated to keep the invention confidential can qualify as prior art under §102(a).” *Id.* at 634.

Confidential prior art is also plainly relevant for purposes of obviousness. *E.g., Tyco Healthcare Grp. LP v. Ethicon Endo-Surgery, Inc.*, 774 F.3d 968, 976-77 (Fed. Cir. 2014).

Accordingly, PO’s representation that the PH2F7K parental line was “proprietary” and had “not been made publicly available” (EX1002, 126) does not

resolve the question whether PH2F7K is prior art for purposes of assessing whether the Challenged Claims were non-obvious as of the 7/2/2021 effective filing date. Indeed, a product could be “proprietary” and not made “publicly available” (*id.*), yet sold “to a third party who is obligated to keep the invention confidential” (*Helsinn*, 139 S. Ct. at 634). The PH2F7K parental line would likewise constitute prior art even if subject to a commercial offer for sale—regardless of whether it was accepted. *Quest Integrity USA, LLC v. Cokebusters USA Inc.*, 924 F.3d 1220, 1227 (Fed. Cir. 2019) (citing *Helsinn*)

Separately, even if internal activities do not rise to the level of prior art, they can still be highly relevant to other aspects of the assessment under *Graham*—for example, when determining the level of ordinary skill in the art and in particular assessing whether a POSA would have had reason to modify prior art. *E.g., Thomas & Betts Corp. v. Litton Sys., Inc.*, 720 F.2d 1572, 1580-81 (Fed. Cir. 1983) (holding that “unpublished internal criteria....though not technically prior art, were, in effect, properly used as indicators of the level of ordinary skill in the art to which the invention pertained”); *Medtronic Vascular Inc. v. Abbott Cardiovascular Sys., Inc.*, 614 F. Supp. 2d 1006, 1028 (N.D. Cal. 2009) (holding that “secret” internal designs were relevant to show “the ordinary level of skill in the art” even though they had “never been made public and were kept from public disclosure”).

The Federal Circuit indeed has held that the Board may “rely on evidence other than just prior art” for precisely this purpose even in the context of IPRs.

Yeda Rsch. v. Mylan Pharms. Inc., 906 F.3d 1031, 1041 (Fed. Cir. 2018) (noting that such evidence may reflect “the level of ordinary skill in the art,” quoting *Dominion Dealer Sols., LLC v. AutoAlert, Inc.*, IPR2014-00684, 2014 WL 5035359, at *5 (PTAB Oct. 6, 2014)).

In particular, such level of ordinary skill can be highly pertinent when assessing whether a POSA would have had reason to modify actual prior art references. “[T]he motivation to combine need not be found in prior art references, but equally can be found ‘in the knowledge generally available to’” a POSA. *National Steel Car*, 357 F.3d at 1337–39 (quoting *In re Jones*, 958 F.2d 347, 351 (Fed. Cir. 1992)).

As such, ***failing*** to constitute proprietary information constitutes legal error. In *National Steel*, for example, the Federal Circuit reversed the district court because the district court had wrongly discounted unpublished internal drawings on the ground that they did not constitute prior art. *Id.* at 1337 (“[T]he prior-art status of the Prichard disclosure and the Lund drawing is not dispositive.”). The Office’s procedures for submitting proprietary information (as detailed in MPEP § 724.02) exist for this very reason.

The Examiner erred in failing to require PO to follow these procedures, which the Supervisory Primary Examiner for the art unit responsible for the '803 Patent (1663) had stressed in a 2018 presentation (EX1032; EX1033, 32) concerning the handling of proprietary information in response to §1.105 requests (EX1033, 18-31). Instead, when PO cited the purported “proprietary” status of the other parent variety as a basis for withholding the information entirely (EX1002, 127), the Examiner issued a notice of allowance without the information in hand—creating a pronounced blind spot that prevented full consideration whether the pending claims satisfied all conditions for patentability, including §103.¹²

The Board’s analysis in *Ex Parte C*—affirming that plant utility claims were unpatentable as obvious—further confirms the importance of information regarding both of the claimed variety’s parents, regardless of whether one was “proprietary.” In particular, the specification at issue did not disclose “the characteristics possessed by each parent variety” and in particular failed to disclose

¹² When “proprietary” information is material to whether pending claims would have been obvious, it must be publicly disclosed prior to patent issuance. EX1033, 24 (Office presentation citing MPEP §724.04 concerning handling of petitions to expunge).

“whether or not *each* parent variety crossed to develop the claimed variety was possessed of desirable characteristics.” 27 U.S.P.Q.2d at 1497.

2. Grounds 4-5 (Lack of Specific Utility)

The lack of utility arguments in Grounds 4-5 are not the same or substantially the same as arguments considered during prosecution. Nothing in the record suggests any consideration of whether claims 1-20 satisfy the specific utility requirement under §101. *Cf. Hybrigenics v. Forma Therapeutics*, PGR2018-00098, 2019 WL 1308262, at *9 (PTAB Mar. 20, 2019) (instituting review based on written description ground: “[T]he mere absence of a written description rejection does not establish that the Examiner considered the arguments presented in the Petition.”).

IX. CONCLUSION

Substantial, new, and noncumulative technical teachings have been presented for each Challenged Claim, which are unpatentable as obvious (Grounds 1-3) and lacking substantial utility (Ground 4) for the reasons set forth above. It is more likely than not that Petitioner will prevail as to each of these Challenged Claims. In addition, the petition raises novel and unsettled legal questions. PGR of claims 1-20 of the '803 is accordingly requested in accord with §§321-329 and §42.200 et seq.

Dated: February 29, 2024

Respectfully submitted,
Inari Agriculture, Inc.

By: /Scott A. McKeown/
Scott A. McKeown, Reg. No. 42,866
WOLF, GREENFIELD & SACKS, P.C

X. MANDATORY NOTICES

A. Real Party-In-Interest

Pursuant to §42.8(b)(1), Petitioner identifies Inari Agriculture, Inc. as real party-in-interest. No other party had access to or control over the present Petition, and no other party funded or participated in preparation of the present Petition.

B. Related Matters

A decision in this proceeding could affect or be affected by the following:

1. United States Patent & Trademark Office

The following U.S. patent applications claim the benefit of the priority of the filing date of U.S. Patent No. 11,659,803:

- U.S. Patent Application No. 18/401,164, filed December 29, 2023
- U.S. Patent Application No. 18/401,230, filed December 29, 2023.

C. Counsel and Service Information - §42.8(b)(3) and (4)

Lead Counsel	Scott A. McKeown, Reg. No. 42,866
Backup Counsel	Oona M. Johnstone, Reg. No. 68,177 Zhiyun Ge, Reg. No. 73,869 Thomas F. Foley, Reg. No. 76,384 Charles T. Steenburg, pending admission <i>pro hac vice</i>

Service Information	<p><u>E-mail:</u> SMcKeown-PTAB@WolfGreenfield.com OJohnstone-PTAB@WolfGreenfield.com Jean.Ge@WolfGreenfield.com TFoley-PTAB@WolfGreenfield.com Charles.Steenburg@WolfGreenfield.com</p> <p><u>Post and hand delivery:</u> Wolf, Greenfield & Sacks, P.C. 600 Atlantic Avenue Boston, MA 02210-2206</p> <p><u>Telephone:</u> 617-646-8000 <u>Facsimile:</u> 617-646-8646</p>
---------------------	---

A power of attorney is submitted with the Petition. Counsel for Petitioner consents to service of all documents via electronic mail.

XI. CLAIM LISTING

Claim 1
A seed, plant, plant part, or plant cell of inbred maize variety 1PFLQ21, representative seed of the variety having been deposited under NCMA accession number 202212046.
Claim 2
The plant part of claim 1, wherein the plant part is an ovule or the plant part is pollen.
Claim 3
An F1 hybrid maize seed produced by crossing the plant or plant part of claim 1 with a different maize plant.
Claim 4
An F1 hybrid maize plant or plant part produced by growing the maize seed of claim 3, wherein the plant part comprises at least one cell of the F1 hybrid maize plant.
Claim 5
A method for producing a second maize plant, the method comprising applying plant breeding techniques to the F1 plant or plant part of claim 4 to produce the second maize plant.
Claim 6

A method for producing a second maize plant or plant part, the method comprising doubling haploid seed generated from a cross of the plant or plant part of claim 4 with an inducer variety, thereby producing the second maize plant or plant part.
Claim 7
A method of making a commodity plant product comprising silage, starch, fat, syrup or protein, the method comprising producing the commodity plant product from the maize plant or plant part of claim 4.
Claim 8
A method of producing a maize seed derived from the variety 1PFLQ21, comprising
a) crossing the plant of claim 1 with itself or a second plant to produce progeny seed; and
b) growing the progeny seed to produce a progeny plant and crossing the progeny plant with itself or a different plant to produce maize seed derived from the variety 1PFLQ21.
Claim 9
A method for producing nucleic acids, the method comprising isolating nucleic acids from the seed, plant, plant part, or plant cell of claim 1.
Claim 10
A converted seed, plant, plant part or plant cell of inbred maize variety 1PFLQ21, representative seed of the maize variety 1PFLQ21 having been deposited under NCMA accession number 202212046,
wherein the converted seed, plant, plant part or plant cell comprises fewer than six locus conversions,
and wherein the plant or a plant grown from the converted seed, plant part or plant cell comprises the fewer than six locus conversions and otherwise comprises the physiological and morphological characteristics of maize variety 1 PFLQ21 when grown under the same environmental conditions,
and further wherein the fewer than six locus conversion confer a property selected from the group consisting of male sterility, a site for site-specific recombination, abiotic stress tolerance altered phosphate, altered antioxidants, altered fatty acid, altered essential amino acids, altered carbohydrates, herbicide tolerance, insect resistance and disease resistance.
Claim 11

The converted seed, plant, plant part or plant cell of claim 10, wherein the fewer than six locus conversions confer herbicide tolerance, insect resistance and disease resistance.

Claim 12

A maize seed produced by crossing the plant or plant part of claim 10 with a different maize plant.

Claim 13

A hybrid maize plant or plant part produced by growing the seed of claim 12, wherein the plant part comprises at least one cell of the hybrid maize plant.

Claim 14

A method for producing a second maize plant, the method comprising applying plant breeding techniques to the plant or plant part of claim 13 to produce the second maize plant.

Claim 15

A method for producing a second maize plant or plant part, the method comprising doubling haploid seed generated from a cross of the plant or plant part of claim 13 with an inducer variety, thereby producing the second maize plant or plant part.

Claim 16

A method of making a commodity plant product comprising silage, starch, fat, syrup or protein, the method comprising producing the commodity plant product from the maize plant or plant part of claim 13.

Claim 17

A method for producing nucleic acids, the method comprising isolating nucleic acids from the seed, plant, plant part, or plant cell of claim 10.

Claim 18

An F1 hybrid seed produced by crossing a plant or plant part of inbred maize variety 1 PFLQ21, representative seed of the inbred maize variety 1PFLQ21 having been deposited under NCMA accession number 202212046 with a different maize plant,

wherein inbred maize variety 1PFLQ21 further comprises a transgene and otherwise comprises all of the physiological and morphological characteristics of maize variety 1PFLQ21 when grown under the same environmental conditions,

wherein the transgene is inherited by the F1 hybrid seed

wherein the transgene was introduced into inbred maize variety 1PFLQ21 by backcrossing or genetic transformation

Claim 19

A method of producing progeny seed, the method comprising crossing a plant grown from the seed of claim 18 with itself or a second plant to produce progeny seed.

Claim 20

A method of making a commodity plant product comprising silage, starch, fat, syrup or protein, the method comprising producing the commodity plant product from the maize plant or plant part of claim 18.

CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (E)(4)

I certify that on February 29, 2024, I will cause a copy of the foregoing document, including any exhibits or appendices filed therewith, to be served via Priority Express Mail at the following correspondence address of record for the patent:

PIONEER HI-BRED INTERNATIONAL, INC.
7250 NW 62nd Avenue
PO Box 552
Johnston, IA 50131-0552

Date: February 29, 2024

/MacAulay Rush/
MacAulay Rush
Paralegal
WOLF, GREENFIELD & SACKS, P.C.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned certifies that the foregoing Petition for Post-Grant Review contains 17,110 words excluding a table of contents, a table of authorities, Mandatory Notices under §42.8, a certificate of service or word count, or appendix of exhibits or claim listing. Petitioner has relied on the word count feature of the word processing system used to create this paper in making this certification.

Date: February 29, 2024

/MacAulay Rush/
MacAulay Rush
Paralegal
WOLF, GREENFIELD & SACKS, P.C.