

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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INARI AGRICULTURE, INC.,  
Petitioner,

v.

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

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Case No. PGR2024-00020  
Patent No. 11,666,020

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

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| <b>Exhibit</b> | <b>Description</b>                                                                                                                                                                                                                                                                                    |
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| 1055 | U.S. Patent No. 11,659,803                                                                                                                                                                                                                                                                  |
| 1056 | U.S. Patent No. 8,558,083                                                                                                                                                                                                                                                                   |
| 1057 | U.S. Patent No. 8,895,819                                                                                                                                                                                                                                                                   |
| 1058 | U.S. Patent No. 11,723,337                                                                                                                                                                                                                                                                  |
| 1059 | U.S. Patent Publication No. 2005/0257298                                                                                                                                                                                                                                                    |
| 1060 | U.S. Patent No. 10,863,705                                                                                                                                                                                                                                                                  |
| 1061 | U.S. Patent No. 9,596,820                                                                                                                                                                                                                                                                   |
| 1062 | U.S. Patent No. 8,598,433                                                                                                                                                                                                                                                                   |
| 1063 | U.S. Patent No. 8,319,014                                                                                                                                                                                                                                                                   |
| 1064 | U.S. Patent No. 8,273,948                                                                                                                                                                                                                                                                   |
| 1065 | U.S. Patent No. 8,252,989                                                                                                                                                                                                                                                                   |
| 1066 | U.S. Patent No. 8,148,616                                                                                                                                                                                                                                                                   |

U.S. Patent No. 11,666,020  
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|      |                                                                                                                                                             |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1067 | U.S. Patent No. 10,492,410                                                                                                                                  |
| 1068 | U.S. Patent No. 10,492,411                                                                                                                                  |
| 1069 | U.S. Patent No. 10,492,412                                                                                                                                  |
| 1070 | U.S. Patent No. 10,492,413                                                                                                                                  |
| 1071 | U.S. Patent No. 10,492,414                                                                                                                                  |
| 1072 | U.S. Patent No. 10,011,828                                                                                                                                  |
| 1073 | U.S. Patent No. 8,927,214                                                                                                                                   |
| 1074 | 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) |
| 1075 | U.S. Patent No. 5,082,992                                                                                                                                   |
| 1076 | U.S. Patent No. 5,347,081                                                                                                                                   |
| 1077 | U.S. Patent No. 5,444,178                                                                                                                                   |
| 1078 | U.S. Patent No. 5,453,564                                                                                                                                   |
| 1079 | U.S. Patent No. 5,463,173                                                                                                                                   |
| 1080 | U.S. Patent No. 5,491,295                                                                                                                                   |
| 1081 | U.S. Patent No. 5,495,069                                                                                                                                   |
| 1082 | U.S. Patent No. 5,502,272                                                                                                                                   |
| 1083 | U.S. Patent No. 5,506,367                                                                                                                                   |
| 1084 | U.S. Patent No. 5,534,661                                                                                                                                   |
| 1085 | U.S. Patent No. 5,545,813                                                                                                                                   |
| 1086 | U.S. Patent No. 5,557,035                                                                                                                                   |
| 1087 | U.S. Patent No. 5,567,861                                                                                                                                   |
| 1088 | U.S. Patent No. 5,569,822                                                                                                                                   |
| 1089 | U.S. Patent No. 5,633,427                                                                                                                                   |
| 1090 | U.S. Patent No. 5,689,034                                                                                                                                   |
| 1091 | U.S. Patent No. 5,689,036                                                                                                                                   |
| 1092 | U.S. Patent No. 5,159,133                                                                                                                                   |
| 1093 | Comparison between EX1001 ('020 Patent) and EX1006 (Longenberger)                                                                                           |
| 1094 | Comparison between EX1001 ('020 Patent) and EX1055 (U.S. Patent No. 11,659,803)                                                                             |

## **I. INTRODUCTION**

Claims 1-20 (“Challenged Claims”) of U.S. Patent No. 11,666,020 (EX1001, “the ’020 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 “1PFHC43”—by crossing (i.e., breeding) two other corn varieties—“PH1VNA” and “PH1D84.” EX1001, 38:25-28. 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 ’020 Patent’s 7/2/2021 effective filing date. And nothing in the ’020 Patent or elsewhere in the record suggests the claimed 1PFHC43 variety was patentably distinguishable over the PH1VNA variety, the PH1D84 variety, or any other preexisting corn variety. The ’020 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—including one reference describing a closely related corn variety created by crossing PH1D84 (i.e., one of the claimed variety’s two parent varieties) together with a separate preexisting variety. *See, e.g.*, EX1093 (comparison between the ’020 Patent’s specification and EX1006 (Longenberger)).

The only differences of any note between the ’020 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 leaf angle. But the '020 is a *utility* patent—not a plant patent or certificate under the Plant Variety Protection Act (PVPA). And the properties reported by the '020 Patent concerning the claimed 1PFHC43 variety fall well within the mainstream of corn phenotypes known long before the '020 Patent's 7/2/21 effective filing date, and/or have no meaningful utility. Instead, the litany of characteristics included in the '020 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 '020 Patent otherwise suggest any reason why the particular combination of reported properties made the claimed 1PFHC43 variety any better in any respect than any preexisting type of corn for any application. On the contrary, the '020 Patent's "Industrial Applicability" section (EX1001, 36:49-37:26) is essentially a cut-and-paste of a passage PO included in numerous prior art patents—including Longenberger, which shares a parent variety with the claimed 1PFHC43 variety (EX1006, 37:21-65). In sum, while the claimed 1PFHC43 variety may have been different from prior varieties in some respect, it was not inventive under §103 nor useful under §101.

Yet the '020 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 (PH1D84), the Examiner summarily stated that there was "no motivation in the prior art to select the particular other parent." EX1002, 97. And while the Examiner issued a Request for Information under §1.105<sup>1</sup> 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.*, 351-52). The Examiner then allowed the claims without further consideration—notwithstanding that PO had previously used the publicly disclosed PH1D84 variety to create at least **seven** other "sibling" inbred corn varieties protected by other patents (EX1006, EX1036-EX1039, and EX1041-EX1042), five of which are indisputable prior art (EX1006 and EX1036-EX1039). PO failed to disclose any of those siblings during prosecution even though they were directly responsive to another question in the Examiner's Request for Information (*id.*, 106-107). Nor did PO disclose that the other—purportedly "proprietary"—parent had likewise been used for a different cross as

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

reflected in another patent application filed the same day as that for the '020 Patent. EX1043.

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.

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.” EX1026, 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

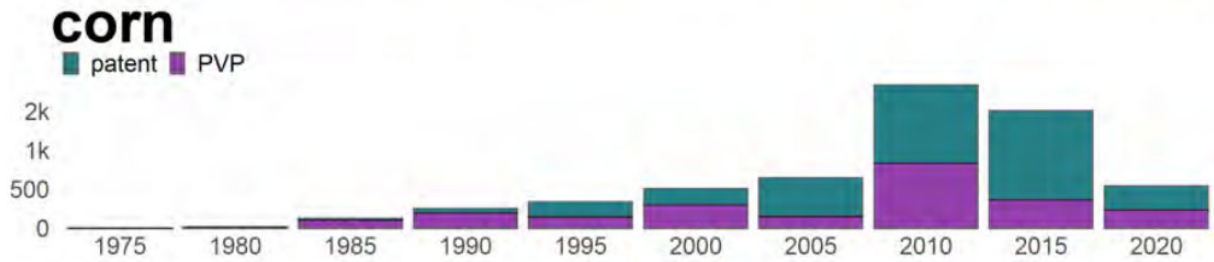
plant must be new, ***useful, and nonobvious***,” whereas “a plant variety may receive a PVP certificate without a showing of usefulness or nonobviousness.” *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc.*, 534 U.S. 124, 142 (2001). The Supreme Court echoed PO’s own emphasis that PVP certificates offered “narrower” protection than utility patents (EX1029, \*13), but likewise had no “requirement of nonobviousness or utility” (*id.*, \*11).

Here, however, PO obtained the ’020 Patent even though the claims fail both the non-obviousness and utility requirements. PO’s disclosures 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. EX1029, \*20-21, \*38, & n.25 (citing *Ex parte C*, 27 U.S.P.Q.2d 1492, 1496 (BPAI 1992)).

The ’020 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 be elevating rather than lowering the bar for patentability and tilting 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.”

EX1025, 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* EX1028, 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”); EX1027, 19; *cf.* 8 Chisum on Patents § 24.05 (2023) (noting that “a particular plant variety may not satisfy the nonobviousness 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 EX1026, 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.” EX1023. 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.” EX1026, 2, 4.

Instituting post-grant review (“PGR”) on the ’020 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 ’020 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 each of §§101, 102, 103, and 112 while raising a fundamental question concerning requests for information pursuant to §1.105. That procedure exists to ensure that examiners are “perform[ing] the best quality examination possible.” *Star Fruits S.N.C. v. United States*, 393 F.3d 1277, 1282 (Fed. Cir. 2005) (quoting 65 Fed. Reg. 54,604 at 54,633 (Sept. 8, 2000)); *see also*

MPEP § 704.11 (explaining that the purpose of Rule 105 “is to improve patent quality, and render better decisions”). That is the same goal underlying the Office’s partnership with the USDA: “to enhance the quality of the patent examination process for innovations related to agricultural products and processes, including opportunities for enhancing prior art search capabilities and providing additional training and guidance to patent examiners.” EX1024; *see also* EX1026, 4 (same).

Requests under §1.105 extend to “proprietary” information, which can be material—indeed, dispositive—to the statutory requirements for patentability under each of §§101, 102, 103, and 112. While the Office has procedures whereby applicants can submit proprietary information “under seal,” Office policies also make plain that such information becomes public upon patent issuance if the material to patentability. MPEP §724.05; EX1033, 26-31.

Here, however, the Examiner misunderstood these procedures and the underlying law. While initially making a Request for Information under §1.105 concerning the PH1VNA variety used as one of the two parents for the claimed cross, the Examiner wrongly allowed the Challenged Claims upon PO’s representation that PH1VNA was “proprietary.” *See infra* §III.C. In so doing, the Examiner created an enormous blind spot that prevented proper examination and violated the bargain underlying the patent system, in which successful applicants

obtain patent protection in exchange for public disclosure of previously confidential information. Contrary to the Examiner’s apparent belief, proprietary information can be dispositive for purposes of patentability.

While the Examiner asserted that there was “no motivation *in the prior art*” to cross PH1D84 (disclosed in indisputable prior art, and used for at least seven other crosses to create different inbred lines—none of which PO disclosed during prosecution) with the purportedly “proprietary” PH1VNA (EX1002, 97), this statement reflects a fundamental error of law. *E.g., National Steel Car, Ltd. v. Canadian Pacific Ry., Ltd.*, 357 F.3d 1319, 1337–39 (Fed. Cir. 2004) (“[T]he motivation to combine need *not be found* in prior art references, but equally can be found ‘in the knowledge generally available to’” POSAs). Indeed, *failing* to consider proprietary information constitutes legal error. *Id.* at 1337 (reversing district court, which had wrongly discounted unpublished internal drawings because they did not constitute prior art: “[T]he prior-art status of the Prichard disclosure and the Lund drawing is not dispositive.”).

Such binding precedent confirms the importance of the §1.105 mechanism and the question presented as Ground 5 herein: **if a patent examiner invokes Rule 105 to secure information “reasonably necessary to properly examine” a patent application, does the burden of production shift to the patent applicant such that the refusal to provide the requested information on the sole basis**

**that it is “secret” or “proprietary” precludes further examination under any of the statutory requirements outstanding at the time of the request?**

Implementing such a policy would avoid future examination errors of the sort that occurred here and likewise ensure a complete record to advance the plant breeding arts. This question is particularly important in the context of utility patent protection for plants, which as the Supreme Court stressed “is *much more difficult* to obtain” than a corresponding “PVP certificate.” *J.E.M.*, 534 U.S. at 142.

Notwithstanding that principle (underlying the Supreme Court’s holding that utility patent protection can exist in parallel with PVP protection), the prosecution history here wrongly suggests that applicants can obtain utility patents on plants merely by keeping an earlier parent variety “proprietary” and then crossing it with some other variety—no matter (1) how similar the resulting cross is to the parents and/or (2) how clearly the properties of the parents commended themselves to a combination. The prosecution history likewise wrongly contradicts the Board’s thorough analysis in *Ex parte C*, which PO previously stressed to the Supreme Court in *J.E.M.* as proof the non-obviousness requirement had teeth for plant utility claims.

Instituting review would facilitate a return to the appropriate balance PO itself stressed to the Supreme Court as 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). It would likewise promote the Office’s partnership with the USDA to implement the President’s Executive Order and “help ensure that competition in agricultural markets remains vigorous and in accord with what is reasonably contemplated by the Patent Act.” EX1026, 2. Granting patents on new plant varieties merely because one of the two parent varieties is “proprietary” wrongly such impairs competition and is not reasonably contemplated by the Patent Act. Instead, it is akin to granting a patent on a baby rabbit pulled out of a hat and having slightly different color fur than its one known parent while maintaining the identity of the other parent in black-hat secrecy.

## **II. REQUIREMENTS FOR POST-GRANT REVIEW**

### **A. Grounds for Standing**

Pursuant to §42.204(a), Petitioner certifies that the ’020 is available for PGR and that Petitioner is not barred or estopped from requesting PGR of the Challenged Claims on the grounds identified herein. The ’020 issued on 6/6/2023, and this Petition is being filed within nine months of that issue date (3/6/2024).

*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 ’020 matured from U.S. Patent Application No. 17/366,059, filed 7/2/2021 (“’059 Application”).

**1. The '020 is Eligible for PGR**

The '020 is eligible for PGR because it does not assert an effective filing date earlier than the '059 Application's actual 7/2/2021 filing date. 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 cancelation of the Challenged Claims on the following grounds:

| Ground | Statute | Basis                                                                             | Claims |
|--------|---------|-----------------------------------------------------------------------------------|--------|
| 1      | §103    | Obviousness based on Smalley (EX1005) and Corresponding PVP Certificate (EX1008)  | 1-20   |
| 2      | §103    | Obviousness based on Longenberger (EX1006)                                        | 1-20   |
| 3      | §103    | Obviousness based on Hoffbeck (EX1007) and Corresponding PVP Certificate (EX1010) | 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 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, 102, 103, & 112 | If a patent examiner invokes Rule 105 to secure information “reasonably necessary to properly examine” a patent application, does the burden of production shift to the patent applicant such that the refusal to provide the requested information on the sole basis that it is “secret” or “proprietary” precludes further examination under any of the statutory requirements outstanding at the time of the request? | 1-20   |

*See infra* §VII.

### III. THE '020 PATENT

#### A. Summary of the '020 Patent

The '020 Patent is directed to an inbred corn variety designated 1PFHC43, which “originated from a cross between inbred line PH1VNA and inbred line PH1D84.” EX1001, 38:26-28. “1PFHC43 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.*, 38:28-34. These techniques were well known to POSAs (Riley, ¶42) and disclosed verbatim

in prior art references—including references disclosing other crosses involving inbred line PH1D84. *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 Longenberger (EX1006) and disclose information already well known to POSAs. Riley, ¶¶43-45; EX1093 (redline comparison between ’020 Patent and Longenberger).

For example, the Background sections of both Longenberger and the ’020 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; Longenberger, 1:23-26.

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

While the data in the ’020 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 USDA forms and fields used with PVP certificates. Riley, ¶47; *see also* EX1008, 6-8; EX1009, 5-11; EX1010, 8-11.

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) and field-side personnel. Alternatively, additional experience could take the place of an advanced degree. Riley, ¶¶19-21.

**C. Prosecution History**

The '059 Application 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. See, e.g., EX1094 (comparison between the '020 Patent and U.S. Patent No. 11,659,803, EX1055).<sup>2</sup>

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<sup>2</sup> The '803 Patent is the subject of PGR2024-00019 previously filed by Petitioner.

PO subsequently filed an Information Disclosure Statement (IDS)—the only IDS filed during prosecution—identifying three issued patents (U.S. Patent Nos. 8,759,636 (Smalley, EX1005); 8,558,083 (EX1056); and 8,895,819 (EX1057)) and two then-pending applications (17/377,529 and 17/382,716). EX1002, 88-89. Smalley discloses corn variety PH1D84 (EX1005, Abstract)—one of the two parental lines identified in the '020 Patent as noted above. The '083 patent discloses corn variety PH1CJB (EX1056, Abstract). The '819 patent discloses corn variety PH1KTF (EX1057, Abstract).

The '529 application, which issued as U.S. Patent No. 11,723,337 (EX1058) discloses maize hybrid X13R124, “made by crossing inbreds 1PFHC43 [*i.e.*, the inbred of the '020] and PH4CRF.” EX1058, 11:16-18. It discloses no data aside from the baseline Variety Description table reflecting PVPA requirements.

The '716 application is currently reported as not available for public inspection, but was identified by the Examiner as “featur[ing] a hybrid in which the instant claimed inbred [of the '020 patent] is one of the parents.” EX1002, 97.

On 11/14/2022, the Examiner mailed a non-final Office Action and associated Request for Information Under §1.105. *Id.*, 94-107.<sup>3</sup>

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<sup>3</sup> Petitioner’s summary focuses on the aspects of the Office Action potentially pertinent to the grounds in the Petition. The Examiner also raised certain

The Examiner stated that the claimed variety 1PFHC43 “appear[ed] to be free of the prior art of record.” EX1002, 103. 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 1PFHC43 and PO’s prior art LH244 (as disclosed in U.S. Patent No. 6,252,148 (EX1040) were “similar in phenotype,” as both include “yellow anthers, light red silk, faint brace root anthocyanin, yellow endosperm, and pink-orange cobs.”<sup>4</sup> EX1002, 104. The Examiner nevertheless reasoned that the claimed 1PFHC43 variety had “flint-dent grain, slightly curved rows, and clear aleurone” whereas the prior art LH244 had “straight rows, white aleurone and dent grain.” EX1002, 104.

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objections and §112 rejections (EX1002, 98-103), which PO later overcame by purportedly perfecting its seed deposit and amending certain claims to remove open-ended “locus conversion” language (*id.*, 347-350).

<sup>4</sup> 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, ¶101, n.10-11. Anther is the part of a flower’s stamen producing and containing pollen. Riley, ¶101. Brace root anthocyanin refers to pigmentation levels in a portion of corn’s root system. Riley, ¶69.

The Examiner likewise noted that the claimed 1PFHC43 was also “similar in phenotype to the maize variety PHACE taught by US Patent Publication No. 2005/0257298” (EX1059), but was different based on “flint-dent grain versus dent grain.” EX1002, 104.<sup>5</sup>

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, Longenberger, or Hoffbeck (the last of which discloses the exact same “flint-dent” grain texture that marked the only distinction the Examiner noted between 1PFHC43 and the prior art PHACE variety).

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 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

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<sup>5</sup> “Flint” and “dent” refer to different grain textures. Riley, ¶101, n.9.

says nothing regarding the significance and relative importance of such criteria as maturity date, shortness of plant, flower color and flowering date”).

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 (PH1D84) was the subject of a prior art patent (EX1005, Smalley). EX1002, 97. 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* §§VII.B.2 & VIII.C.1.

Nevertheless, the Examiner simultaneously issued a Request for Information under §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 ‘1PFHC43.’” EX1002, 106. 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”;
- (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 “parent PH1VNA” (identified in the application, but without any supporting detail, *id.*, 78) in particular. *Id.*, 106. The Examiner also noted 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 PH1VNA and explanation on how to submit proprietary information, PO provided no such information in response aside from describing PH1VNA as “proprietary” and not “publicly available.” *Id.*, 351. Yet MPEP § 724.02—the section identified by the Examiner—provides clear instructions for how applicants can disclose “proprietary material” and maintain its confidentiality during prosecution.

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

Parental line PH1VNA has not been made publicly available.

Parental line PH1D84 was patented as Maize Inbred PH1 D84 in U.S. Patent No. 8,759,636.

EX1002, 351. PO failed to disclose that parental line PH1D84 had been one of the two parental lines for corn varieties claimed in at least **fifteen** other U.S. patents and then-pending applications—including **five** indisputable §102(a)(1) prior art references disclosing inbred lines (EX1006 and EX1036-1039). *See infra* §V.A.3; *see also* Riley, ¶84. PO likewise failed to disclose that parental line PH1VNA had been one of the two parental lines for a different corn variety in an application filed the same day as the instant application. EX1043. *See infra* §V.A.3; *see also* Riley, ¶85. 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 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 “[a] parent is covered by a patent,” while “[t]he other parent is a proprietary line that is not publicly available.” EX1002, 363. 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 1PFHC43 inbred is free of the prior art of record.” *Id.*

The Examiner cited “page 9” [*id.*, 103] 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 LH244 variety and patentably insignificant differences between the flint-dent character, row curvature, and aleurone color. *Id.*, 363.

**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).<sup>6</sup>

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<sup>6</sup> 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

**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 1PFHC43 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 1PFHC43 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 claimed variety satisfies all statutory requirements, including non-obviousness. EX1029, \*20-21, \*38, & n.25. In other words, PO cited *Ex parte C* in successfully arguing that utility patent protection can coexist with PVPA protection because the requirements to obtain a patent are more stringent than those to obtain a PVP certificate.

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scope of any claim term in litigation, or a waiver of any argument in any proceeding that claim terms are indefinite, invalid, or unpatentable.

In *Ex parte C*, as here, the specification was “cryptic” and offered “little more detail than would be” expected in a PVPA disclosure. 27 U.S.P.Q.2d at 1493. 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, likewise, the specification says nothing regarding any such distinctions relative to prior art varieties. Riley, ¶¶58-82, 89-90.<sup>7</sup>

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” and 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. The specification offered no basis even for assessing whether the differences were

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<sup>7</sup> By contrast, PO’s earlier patents had extensive comparative data. *See* Riley, ¶¶161-175. PO stressed these “extensive recitations” to the Supreme Court in *J.E.M.* when likewise citing *Ex Parte C* to the Court as proof the non-obviousness requirement had teeth. EX1029, \*20-21, \*38, & n.25.

“significant and unexpected”; it said nothing regarding the relevance of criteria such as “flower color.” *Id.* The same is true here, as detailed below.

Aside from having been cited by PO to the Supreme Court, the Board’s approach in *Ex Parte C* tracks binding controlling 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 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. Riley, ¶48.

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. EX1013. 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, ¶49

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. EX1011; *see also* Riley, ¶50.

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) (EX1016); Wych et al., Production of Hybrid Seed, Corn and Corn Improvement, Chapter 9 (1988) (EX1017); Lee et al., Handbook of Maize, Modern Maize Breeding (2009) (EX1012); and Andorf et al., Theor Appl Genet. 132(3):817-849 (2019) (EX1015). Such principles and techniques are also well known and routinely practiced by POSAs. Riley, ¶¶51-53.

**b. Prior Art Disclosing Closely Related Inbred Maize Varieties**

Smalley (EX1005), Smalley's related PVP certificate (EX1008), Longenberger (EX1006), Hoffbeck (EX1007), and Hoffbeck's related PVP certificate (EX1010) are indisputable post-AIA §102(a)(1) prior art—all issued over one year before 7/2/2021:

| Reference                                | Issued    |
|------------------------------------------|-----------|
| Smalley                                  | 6/24/2014 |
| Longenberger                             | 6/16/2020 |
| Hoffbeck                                 | 5/5/2009  |
| PVP Certificate Associated with Smalley  | 6/25/2014 |
| PVP Certificate Associated with Hoffbeck | 9/29/2010 |

These references disclose inbred corn lines with characteristics very similar to those of the claimed 1PFHC43 as illustrated below. Riley, ¶59.

|                                               | <b>'020 Patent<br/>(1PFHC43)</b> | <b>Smalley<br/>(PH1D84)</b> | <b>Longenberger<br/>(PH47K2)</b> | <b>Hoffbeck<br/>(PHH5G)</b> |
|-----------------------------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| Grain Texture                                 | Flint-Dent                       | Flint                       | Dent                             | Flint-Dent                  |
| Comparative<br>Relative<br>Maturity<br>(days) | 111                              | N/D                         | 108                              | N/D                         |

|                                                      | <b>‘020 Patent<br/>(1PFHC43)</b> | <b>Smalley<br/>(PH1D84)</b> | <b>Longenberger<br/>(PH47K2)</b> | <b>Hoffbeck<br/>(PHH5G)</b> |
|------------------------------------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| Emergence to 50% plants in silk (days)               | 54                               | N/D (63) <sup>8</sup>       | 51                               | 58                          |
| Emergence to 50% plants in silk (heat units)         | 1325                             | N/D (1311.0)                | 1299                             | 1349                        |
| Emergence to 50% plants in pollen shed (days)        | 55                               | N/D (62)                    | 52                               | 57                          |
| Emergence to 50% plants in pollen shed (heat units)  | 1348                             | N/D (1279.5)                | 1325                             | 1329                        |
| Plant height (to tassel tip) (cm), mean (SE)         | 209.3 (9.26)                     | 179.5 (1.47)                | 207 (6.1)                        | 214.5 (14.45)               |
| Ear height (to base of top ear node) (cm), mean (SE) | 72 (6)                           | 58.4 (1.24)                 | 75.1 (9.31)                      | 72.0 (9.50)                 |
| Length of Top Ear Internode (cm), mean (SE)          | 13.6 (1.43)                      | 14.7 (0.22)                 | 16.7 (1.98)                      | 16.3 (1.99)                 |

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<sup>8</sup> Maturity information in Smalley refers to days and heat units from *planting*, rather than *emergence*. EX1005, Table 1. To facilitate comparison, maturity information from the related PVP Certificate (EX1008, 7) is provided above. *See* Riley, ¶59, n.3.

|                                                                                                | <b>‘020 Patent<br/>(1PFHC43)</b> | <b>Smalley<br/>(PH1D84)</b> | <b>Longenberger<br/>(PH47K2)</b> | <b>Hoffbeck<br/>(PHH5G)</b> |
|------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| Number of Nodes Above Ground, mean (SE)                                                        | 13.3 (1.1)                       | N/D                         | 11.9 (1.77)                      | N/D                         |
| Anthocyanin of Brace Roots (1 = absent, 2 = faint, 3 = moderate, 4 = dark)                     | 2                                | 2                           | 2                                | 1                           |
| Width of Ear Node Leaf (cm), mean (SE)                                                         | 8.1 (0.62)                       | 8.5 (0.10)                  | 9.3 (0.62)                       | 8.6 (0.51)                  |
| Length of Ear Node Leaf (cm), mean (SE)                                                        | 87.2 (2.84)                      | 80.0 (0.54)                 | 83.9 (4.7)                       | 74.4 (4.45)                 |
| Number of Leaves Above Top Ear, mean (SE)                                                      | 6.2 (0.73)                       | 5.8 (0.09)                  | 5.9 (0.85)                       | 7.5 (0.74)                  |
| Leaf Angle (degrees) (at anthesis, 2 <sup>nd</sup> leaf above top ear to the stalk), mean (SE) | 29.8 (7.33)                      | 22.9 (0.64)                 | 26.3 (4.44)                      | 25.4 (3.60)                 |
| Leaf Color                                                                                     | V. Dark Green                    | V. Dark Green               | V. Dark Green                    | V. Dark Green               |

|                                                                      | <b>‘020 Patent<br/>(1PFHC43)</b> | <b>Smalley<br/>(PH1D84)</b> | <b>Longenberger<br/>(PH47K2)</b> | <b>Hoffbeck<br/>(PHH5G)</b> |
|----------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| Leaf Sheaf Pubescence (1 = none to 9 = peach-like fuzz)              | 2                                | 3 <sup>9</sup>              | 4                                | 3                           |
| Number of Primary Lateral Branches, mean (SE)                        | 3 (1.47)                         | 3.1 (0.24)                  | 1.5 (1.24)                       | 1.1 (1.44)                  |
| Branch Angle from Central Spike (degrees), mean (SE)                 | 27 (10.77)                       | 32.4 (1.27)                 | 38.9 (18.73)                     | 11.3 (4.43)                 |
| Tassel Length (from peduncle node to tassel tip) (cm), mean (SE)     | 60.3 (3.45)                      | 54.7 (0.60)                 | 56.5 (4.59)                      | 48.7 (3.35)                 |
| Peduncle Length (from top leaf node to lower branch) (cm), mean (SE) | 25.2 (3.17)                      | 25.1 (0.46)                 | 21.3 (3.74)                      | 21.3 (3.28)                 |
| Central Spike Length (cm), mean (SE)                                 | 30.6 (3.71)                      | N/D                         | 30.9 (3.26)                      | N/D                         |

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<sup>9</sup> Smalley reports this value as “3.” *See* EX1005, Table 1. However, the related PVP Certificate reports a value of “2,” matching that for 1PFHC43. *See* EX1008, 7; Riley, ¶59, n.6.

|                                                                                                     | <b>‘020 Patent<br/>(1PFHC43)</b> | <b>Smalley<br/>(PH1D84)</b> | <b>Longenberger<br/>(PH47K2)</b> | <b>Hoffbeck<br/>(PHH5G)</b> |
|-----------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| Flag Leaf Length (cm) (from flag leaf collar to tassel tip), mean (SE)                              | 45.3 (3.32)                      | N/D                         | 36.4 (4.28)                      | N/D                         |
| Pollen Shed (0 = male sterile to 9 = heavy shed)                                                    | 4                                | 3                           | 7                                | 2                           |
| Bar Glumes (1 = absent, 2 = present)                                                                | 1                                | 1                           | 1                                | 1                           |
| Anther Color                                                                                        | Yellow                           | Pink                        | Pale Yellow                      | Pale Yellow                 |
| Silk Color                                                                                          | Light Red                        | Light Green                 | Light Red                        | Light Green                 |
| Fresh Husk Color                                                                                    | Light Green                      | Med. Green                  | Light Green                      | Med. Green                  |
| Dry Husk Color                                                                                      | White                            | White                       | Buff                             | Buff                        |
| Ear position at dry husk stage (1 = upright, 2 = horizontal, 3 = pedant)                            | 1                                | 1                           | 1                                | 1                           |
| Husk Tightness (1 = very loose to 9 = very tight)                                                   | 6                                | 7                           | 7                                | 6                           |
| Husk Extension (at harvest) (1 = short (ears exposed), 2 = medium (< 8 cm), 3 = long (8-10 cm), 4 = | 2                                | 3                           | 2                                | 2                           |

|                                                               | <b>‘020 Patent<br/>(1PFHC43)</b> | <b>Smalley<br/>(PH1D84)</b> | <b>Longenberger<br/>(PH47K2)</b> | <b>Hoffbeck<br/>(PHH5G)</b> |
|---------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| very long (> 10cm))                                           |                                  |                             |                                  |                             |
| Length of Interior Husk (cm), mean (SE)                       | 21.1 (1.8)                       | N/D                         | 20.2 (2.84)                      | N/D                         |
| Shank Length (cm), mean (SE)                                  | 6.7 (1.66)                       | 6.4 (0.31)                  | 8.9 (1.79)                       | 6.7 (0.70)                  |
| Ear Length (cm), mean (SE)                                    | 16.5 (2.29)                      | 13.5 (0.20)                 | 17 (0.87)                        | 16.7 (0.96)                 |
| Ear Diameter at mid-point (mm), mean (SE)                     | 43.6 (1.38)                      | 36.3 (0.35)                 | 36.1 (2.26)                      | 42.9 (1.10)                 |
| Ear Weight (gm), mean (SE)                                    | 149.7 (26.81)                    | 85.7 (3.06)                 | 107.8 (25.95)                    | 142.3 (13.15)               |
| Number of Kernel Rows, mean (SE)                              | 15.6 (0.99)                      | 13.0 (0.24)                 | 14 (1.3)                         | 16.7 (0.98)                 |
| Number of Kernels Per Row, mean (SE)                          | 30.9 (6.09)                      | N/D                         | 25.4 (4.85)                      | N/D                         |
| Kernel Rows (1 = indistinct, 2 = distinct)                    | 2                                | 2                           | 2                                | 2                           |
| Row Alignment (1 = straight, 2 = slightly curved, 3 = spiral) | 2                                | 1                           | 1                                | 2                           |
| Ear Taper (1 = slight                                         | 2                                | 2                           | 1                                | 2                           |

|                                                                     | <b>‘020 Patent<br/>(1PFHC43)</b> | <b>Smalley<br/>(PH1D84)</b> | <b>Longenberger<br/>(PH47K2)</b> | <b>Hoffbeck<br/>(PHH5G)</b> |
|---------------------------------------------------------------------|----------------------------------|-----------------------------|----------------------------------|-----------------------------|
| cylindrical, 2<br>= average, 3 =<br>extreme<br>conical)             |                                  |                             |                                  |                             |
| Kernel Length<br>(mm), mean<br>(SE)                                 | 11.7 (0.88)                      | 11.2 (0.12)                 | 8.7 (1.27)                       | 11.1 (0.46)                 |
| Kernel Width<br>(mm), mean<br>(SE)                                  | 8 (0.6)                          | 8.5 (0.11)                  | 7.5 (0.68)                       | 8.0 (0.93)                  |
| Kernel<br>Pericarp Color                                            | Clear                            | N/D                         | Colorless                        | N/D                         |
| Aleurone<br>Color Pattern                                           | Homozygous                       | Homo-<br>zygous             | Homozygous                       | Homozygous                  |
| Aleurone<br>Color                                                   | Clear                            | Yellow                      | Clear                            | Yellow                      |
| Hard<br>Endosperm<br>Color                                          | Yellow                           | Yellow                      | Yellow-Orange                    | Yellow                      |
| Weight per<br>100 Kernels<br>(unsized<br>sample) (gm),<br>mean (SE) | 32.5                             | 31.0 (4.24)                 | 24.3                             | 26.7 (1.15)                 |
| Cob Diameter<br>at mid-point<br>(mm), mean<br>(SE)                  | 27.2 (1.42)                      | 21.1 (0.21)                 | 20.3 (1.37)                      | 23.1 (0.64)                 |
| Cob Color                                                           | Pink-Orange                      | White                       | White                            | Red                         |

Smalley, Longenberger, and Hoffbeck 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, 32:41-43; EX1007, 30:33-35.

## **2. Differences Between the Prior Art and the Claimed Invention**

Any differences between the prior art and the claimed invention are insubstantial. Riley, ¶63. Both the claims and the prior art are directed to stable inbred maize varieties for use in industrial applications as well as breeding other inbred and/or hybrid lines. *Id.* Virtually all of the ’020 Patent’s specification is drawn verbatim from Longenberger and is also highly similar to the disclosures in Smalley and Hoffbeck. *Id.* Moreover, the above table illustrates, the disclosed characteristics of the claimed 1PFHC43 plant and its associated crop (i.e., corn ears) closely track those of the identified prior art maize lines. *Id.*, ¶¶64-75. 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 1PFHC43 variety instead fall well within the mainstream of corn phenotypes observed long before the ’020 Patent’s 7/2/2021 effective filing date. Riley, ¶64. Even to the limited extent that certain reported characteristics of the claimed 1PFHC43 vary to some degree from those reported in the prior art on which the petition focuses, other prior art corn varieties—including other prior art sibling varieties—included comparable characteristics. *Id.*, ¶¶65-75.

In particular, there is no basis in the record from which to conclude that the identified traits would have fallen outside the range of expected outcomes from the cross yielding the claimed invention (Riley, ¶¶65-75)—in other words crossing PH1D84 (disclosed in Smalley) with another line such as the PH1VNA 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 never indicates “(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.

### 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 PH1D84 variety (disclosed in Smalley) as one of the parent lines when breeding other corn varieties—as disclosed in at least **fifteen** other patents (EX1006, EX1036-EX1039, and EX1045-1054) that are indisputable §102(a)(1) prior art issued before 7/2/20 and **two** other more recent patents filed before the ’020 Patent’s 7/2/21 filing date (EX1041-EX1042) and further confirming the high level of skill. Riley, ¶84; *In re Epstein*, 32 F.3d 1559, 1563, 1567 (Fed. Cir. 1994). **Seven** of those siblings are inbred lines—including **five** that are indisputable prior art (EX1006 and EX1036-EX1039). Riley, ¶84. For example, U.S. Patent Nos.

9,848,573; 10,165,747; and 10,681,888 recite the use of PH1D84 along with the exact same breeding technique—involving a “doubled haploid” approach—as the ’020 Patent. Compare EX1001, 38:25-34, with EX1006, 38:55-61; EX1036, 18:59-65; and EX1038, 42:64-43:3. The only difference between those prior art patents and the ’020 was the selection of the second parent (PH1VNA), about which PO failed to provide information despite the Examiner’s request. *See supra* §III.C & *infra* VII.<sup>10</sup>

PO also filed a different application on the same day as the ’020 Patent directed to a separate inbred line based on a cross with that second parent (i.e., the purportedly proprietary PH1VNA). EX1043, 37:60-38:3; Riley, ¶85.

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.”).

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<sup>10</sup> There are similar disclosures in PO’s other prior art patents directed to other inbred lines sharing PH1D84 as a parent. *Compare* EX1001, 38:25-34 *with* EX1037, 42:55-61; EX1039, 38:55-61.

As PO's earlier patents confirm, corn breeding 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, ¶86; EX1018. These breeding efforts focused not only on the hybrid varieties sold to farmers, but also the "inbred" varieties used for breeding new hybrids. Riley, ¶86. As stated in both the '020 Patent and the virtually identical Longenberger prior art disclosing an inbred sibling, "[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; EX1006, 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, ¶87.

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 provided 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 '020 Patent). Riley, ¶88; *see also Ex parte Ketkar*, Appeal 2017-008056, 2018 WL 3812708, at \*6 (PTAB July 24, 2018) (affirming obviousness determination as to claimed corn variety: "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, ¶88; EX1005, 16:46-49 ("Desired traits that may be transferred through locus conversion include...grain color (white)"); EX1006, 20:14-17 (same); EX1007, 18:6-9 (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.”<sup>11</sup> *Id.*

#### 4. Secondary Considerations

Nothing in the record suggests any purportedly unexpected results or other potential secondary considerations of non-obviousness. *Riley*, ¶¶89-90. On the contrary, the minor variations between the reported properties of the claimed variety versus 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

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<sup>11</sup> *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.

rejection despite purported 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 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 Smalley (EX1005) and the Corresponding PVPA Certificate (EX1008)**

Smalley and the corresponding PVPA Certificate disclose PH1D84—one of the two parent varieties of the 1PFHC43 variety claimed in the ’020 Patent.

Smalley discloses that PH1D84 can be used “to Develop Another Mazie 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, ¶¶91-93.

Consistent with these disclosures, PH1D84 had repeatedly been used as one of the parents for other maize varieties—including at least seven inbred lines (five of them indisputable §102(a)(1) references). Riley, ¶94; *see also supra* §V.A.1.3.

As Smalley itself discloses and these other crosses confirm, POSAs would have had reason to use PH1D84 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, ¶¶95-96; *see also supra* §V.A.1.3.

POSAs would have had a reasonable expectation of obtaining an inbred maize variety with PH1D84 as a parent, particularly given (1) the routine nature of the breeding techniques involved and (2) the multiple other instances already reported in which PH1D84 had been used to breed other inbred lines. Riley, ¶84.

**1. Claim 1: Variety 1PFHC43**

Claim 1 encompasses a seed, plant part, or plant cell of variety 1PFHC43. 1PFHC43’s disclosed characteristics are highly similar to those in the PH1D84 parent, and nothing in the specification or otherwise in the record suggests any property that POSAs would have viewed as surprising or unexpected over PH1D84. *Supra* §V.A; Riley, ¶¶97-103. 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” PH1D84 variety disclosed in Smalley and touted therein as a potential starting point for future inbred lines. *Id.* at 1497.

For one, statistical analysis of the ’020 Patent data shows that most of the reported characteristics for Smalley’s PH1D84 fall within the 95% confidence interval (i.e., within 1.96 x standard error) of the corresponding 1PFHC43 data reported in the ’020 Patent. *See* Riley, ¶¶76-82 and Appendix B.

It was well-known in the art to cross inbreds to create other inbreds with similar characteristics to the parent inbred. Riley, ¶ 83. Comparing the ’020 Patent’s 1PFHC43 to other varieties having Smalley’s PH1D84 variety as a parent confirm that 1PFHC43’s characteristics fall within the range that was predictable for crosses of PH1D84.

For example, where the ’020 Patent reports 1PFHC43 had a comparative relative maturity of 111 days, inbred siblings reported 108 to 113 days and hybrid siblings reported 105 to 113 days. Riley, ¶68. Where the ’020 Patent reports 1PFHC43 had a mean plant height of 209.3 cm, inbred siblings reported heights of 202.4, 207, and 248.2 cm. Riley, ¶69. Where the ’020 Patent reports 1PFHC43 had a length of interior husk of 21.1 cm, inbred siblings had reported heights of 17.5 to 23.2 cm. Riley, ¶72. Where the ’020 Patent reports 1PFHC43 had an ear

weight of 149.7 g, inbred siblings had ear weights of 105.8 to 127.4 g and hybrid siblings had ear weights of 167.9 to 210.0 g. Riley, ¶73.

None of these small differences have any material commercial significance. Riley, ¶¶97-103. In particular, none of them are relevant to the underlying goal identified in the '020 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, ¶98. Nor are they relevant to the nature of the '020 Patent’s disclosed “Industrial Applicability.” EX1001, 36:49-37:26; Riley, ¶¶98-99.

For example, Smalley’s PH1D84 has a flint grain texture, whereas 1PFHC43 has a flint-dent grain texture (just like that in Hoffbeck, as detailed in §V.D). EX1001, 38:46; EX1005, 34:40. Siblings of 1PFHC43 include dent textured inbreds and hybrids with flint, dent, flint-dent, flint to flint-dent, and flint-dent to dent grain texture. Riley, ¶101, *also* ¶¶66-67.

For another example, while the '020 patent’s 1PFHC43 has a yellow anther color, Smalley’s PH1D84 has a pink anther color. EX1001, 39:36; EX1005, 35:10. Anther color is immaterial to any of corn’s industrial uses. Riley, ¶101; *see also* EX1028, 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 Smalley and the corresponding PVPA Certificate.

**2. Claims 2-20: Variations and Hybrids Related to 1PFHC43**

Claims 2-20 likewise would have been obvious over Smalley 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 (EX1067—EX1071) directed to other inbred corn varieties—confirming that using and/or modifying the 1PFHC43 inbred line in those ways would have been obvious. Riley, ¶¶104-105. PO indeed filed the applications for other earlier patents on the same day, and they all issued on 12/3/19—making them indisputable §102(a) references.

**a. Claim 2: Ovule or Pollen From 1PFHC43**

Claim 2 depends from claim 1 and requires that “the plant part” be “an ovule” or “pollen.” EX1001, 40:30-31. Smalley discloses that a “plant part” includes “pollen” and “ovules.” EX1005, 9:6-9. POSAs would have recognized that inbred lines created from PH1D84 likewise include both ovules and pollen. Riley, ¶106; *see also* EX1067, 44:5-6 (“wherein the plant part is an ovule or pollen”).

**b. Claims 3-8: Hybrids and Related Uses Derived From 1PFHC43**

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, 40:32-33. Smalley discloses that hybrids are generated by crossing two inbred varieties (such as PH1D84 itself and/or other inbred lines such as those Smalley discloses can be created using PH1D84, see EX1005, 12:48-49, 28:30-35), and further that “F1” hybrids—the “first generation” of the cross—are desired 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 1PFHC43 inbred variety using PH1D84 as the starting point, and would further have had reason to use that inbred variety to create F1 hybrid seeds for commercialization. Riley, ¶107.

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, 40:34-36. 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, ¶108.

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, 40:37-40. Claim 5 would have been obvious given Smalley’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, ¶109.

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, 40:41-45. Claim 6 would have been obvious for the same reasons as claim 5 and in further view of Smalley’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, ¶110. Smalley’s claim 8 likewise parallels challenged claim 6 and further confirms the obviousness of crossing an inbred maize line with an inducer variety to produce haploid seed. EX1005, 42:32-36.

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, 40:46-49. Claim 7 would have been obvious for the same reasons as claim 4 in further view of Smalley’s disclosure “of harvesting the grain of the F1 plant of variety PH1D84 and using the grain in a commodity,” such as “starches, syrups, proteins, and sugars.” EX1005, 34:3-7. 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, ¶111.

Claim 8 concerns “[a] method of producing a maize seed derived from the variety 1PFHC43” 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 1PFHC43.” EX1001, 40:50-57. 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 1PFHC43 using an F1 hybrid as the first-generation plant. Riley, ¶112; *see also* EX1005, 42:8-26 (Smalley’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 1PFHC43 variety (itself obvious as detailed in V.A.B.1) for hybridization purposes as claims 3-8 specify:

| <b>Claim in '020 Patent</b> | <b>Analogous Claim in<br/>each of Exhibits 1067-1071</b> |
|-----------------------------|----------------------------------------------------------|
| 3                           | 3                                                        |
| 4                           | 5                                                        |
| 5                           | 6                                                        |

| Claim in '020 Patent | Analogous Claim in<br>each of Exhibits 1067-1071 |
|----------------------|--------------------------------------------------|
| 6                    | 7                                                |
| 7                    | 8                                                |
| 8                    | 9 <sup>12</sup>                                  |

See Riley, ¶113.

**c. Claim 9: Nucleic Acids Isolated From 1PFHC43**

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, 40:58-60. Claim 9 would have been obvious for the same reasons as claim 1 in view of POSAs’ knowledge that it was routine to isolate nucleic acids from inbred maize lines—as confirmed by Smalley. Riley, ¶114; EX1005, 8:52-54 (defining nucleic acid as “[a]n acidic, chainlike biological macromolecule...”); *see also* EX1067, 44:42-44 (“method for producing nucleic acids, the method comprising isolating nucleic acids from the seed, plant, plant part, or plant cell of claim 1”); EX1072, Abstract (“isolating DNA from biological materials such as seeds”);

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<sup>12</sup> 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.

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EX1073, Title (“Method and compositions for dual extraction of protein and nucleic acid”).

**d. Claims 10-17: Converted Seeds of 1PFHC43**

Claim 10 concerns “[a] converted seed, plant, plant part or plant cell of inbred maize variety 1PFHC43” 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 1PFHC43 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.” EX1001, 39:61-41:10.

Claim 10 would have been obvious for the same reasons as claim 1 (concerning variety 1PFHC43) in further view of POSAs’ 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 Smalley’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); 42:51-57 (claim to inbred variety PH1D84 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, ¶¶115-116. Moreover, prior art patents EX1067-1071 all include essentially identical claims, including the same list of properties and limitation on the number of locus conversions—further confirming the obviousness of incorporating such locus conversions into inbred lines such as 1PFHC43. *E.g.*, EX1067, 44:45-61; Riley, ¶117.

Claim 11 depends from claim 10 and requires that the “fewer than six locus conversions confer a property selected from the group consisting of herbicide tolerance, insect resistance and disease resistance.” EX1001, 41:11-14. 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 three properties—in PO’s other prior art patents. EX1067, 44:62-65; EX1068, 44:59-62; EX1069, 44:49-52; EX1070, 44:53-56; EX1071, 44:51-54; Riley, ¶118.

Claims 12-17 depend directly or indirectly from claim 10 and otherwise parallel the limitations of claims 3-7 and 9, respectively. EX1001, 41:15-42:7. 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, ¶119. PO's other prior art patents likewise include analogous dependent claims. *E.g.*, EX1067, 44:62-45:11.

**e. Claims 18-20: F1 Hybrid Derived From 1PFHC43 with a Transgene**

Much like dependent claim 3, claim 18 recites an F1 hybrid seed produced by crossing a plant or plant part of 1PFHC43 with another variety. However, it also requires that (1) “1PFHC43 further comprises a transgene and otherwise comprises all of the physiological and morphological characteristics of maize variety 1PFHC43 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, 42:8-19. As Smalley 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. Smalley 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 Smalley. Riley, ¶120. PO's other prior art patents likewise include

claims directed to the inclusion of a “transgene” incorporated “by backcrossing or genetic transformation.” *E.g.*, EX1067, 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, 42:20-22. 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, ¶121. In particular, POSAs would have understood that Smalley’s disclosure of crossing 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, ¶122.

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, 42:23-27. Claim 20 would have been obvious for the same reasons as claim 7. Riley, ¶123.

**C. Ground 2: Claims 1-20 Are Unpatentable as Obvious Over Longenberger (EX1006)**

Longenberger discloses PH47K2—a prior art inbred variety with properties very similar to those of the 1PFHC43.

Indeed, Longenberger is a sibling of the '020 patent's 1PFHC43 because they each share the parent PH1D84. EX1001, 38:25-34; EX1006, 38:55-61.

Longenberger was not of record during prosecution despite sharing a common parent with the '020 Patent and even though its disclosures are substantially identical to those in the '020 Patent, aside from the identity of the claimed variety, its other parent, and certain details of the reported properties in the “Variety Description” table imported from PVPA practice. Riley, ¶¶43, 124, 149; *see also* EX1093 (redline comparison).

Longenberger discloses that PH47K2 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.” EX1006, 32:38-43. It also discloses specific cross breeding techniques for producing such “new inbred” varieties. *Id.*, 5:38-45; Riley, ¶¶125-126.

Consistent with these disclosures, PH47K2 was previously used as one of the parents for another maize variety. EX1060, 11:19-24; Riley, ¶126; *see also supra* §V.A.3.

As Longenberger itself discloses and the other prior art cross confirms, POSAs would have had reason to use PH47K2 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 PH47K2 as the starting point. Riley, ¶127; *see also* §V.A.3 (citing *DyStar*).

POSAs would have had a reasonable expectation of obtaining an inbred maize variety with PH47K2 as a parent, particularly given (1) the routine nature of the breeding techniques involved, (2) Longenberger’s disclosure that its claimed variety can be “used to develop new maize inbred varieties” (EX1006, 32:38-43) and (3) the previous instance already reported in which PH47K2 had been used as a parent to obtain another line. Riley, ¶128.

### **1. Claim 1**

Claim 1 encompasses a seed, plant part, or plant cell of variety 1PFHC43. 1PFHC43’s disclosed characteristics are highly similar to PH47K2’s as disclosed in Longenberger, and nothing in the ’020 Patent’s specification or otherwise in the intrinsic record suggests any property of 1PFHC43 that POSAs would have viewed as surprising or unexpected over PH47K2. *Supra* §V.A.2; Riley, ¶¶82, 129-130. 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” PH47K2 variety disclosed in

Longenberger 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, ¶¶131-133. In particular, none of them are relevant to the underlying goal identified in the '020 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, ¶131. Nor are they relevant to the nature of the '020 Patent’s disclosed “Industrial Applicability.” EX1001, 36:49-37:26; Riley, ¶131.

Accordingly, claim 1 would have been obvious over Longenberger. Riley, ¶¶132-133.

## **2. Claims 2-20**

Claims 2-20 are likewise unpatentable as obvious over Longenberger 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 Smalley. Longenberger indeed has disclosures paralleling the disclosures in Smalley identified in §V.B.2 concerning claims 2-20. Riley, ¶¶134-135. In particular:

|         | <b>Relevant Disclosures in Longenberger (EX1006)</b>    |
|---------|---------------------------------------------------------|
| Claim 2 | 12:40-47 (“plant part” includes “pollen” and “ovules”); |

|                      | <b>Relevant Disclosures in Longenberger (EX1006)</b>                                                                                                                                                                                                                                                                                     |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | 41:14-15 (“The plant part of claim 1, wherein the plant part is an ovule or pollen”)                                                                                                                                                                                                                                                     |
| Claims 3-4 and 12-13 | 18:20-28 (“F1 hybrids” sought as “commercial hybrids” because they “are more vigorous than their inbred parents”)                                                                                                                                                                                                                        |
| Claims 5, 14, and 19 | 18:67-19:1 (disclosing crossing “F1 hybrid” with “third inbred”)                                                                                                                                                                                                                                                                         |
| Claims 6 and 15      | 34:22-26 (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 | 37:60-65 (“The seed of maize variety PH47K2, 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              | 18:67-19:1 (disclosing crossing “F1 hybrid” with “third inbred”);<br>41:22-25 (claim 5)                                                                                                                                                                                                                                                  |

|          | <b>Relevant Disclosures in Longenberger (EX1006)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 10 | <p>18:12-13 (“locus conversion of PH47K2 for herbicide tolerance”); 18:15-16 (“locus conversion for insect or disease resistance”); 19:45-51 (“PH47K2 represents a new base genetic variety into which a new locus may be introgressed”);</p> <p>11:28-36 (“A locus conversion refers to plants within a variety that have been modified in a manner that retains the overall genetics of the variety and further comprises one or more loci with a specific desired trait, such as male sterility, insect resistance, disease resistance or herbicide tolerance or resistance.”); 42:11-17 (“locus conversion confers a property selected from the group consisting of male sterility, site-specific recombination, abiotic stress tolerance, altered phosphate, altered antioxidants, altered fatty acids, altered essential amino acids, altered carbohydrates, herbicide tolerance, insect resistance and disease resistance”)</p> |
| Claim 11 | <p>20:35-43 (“At least one, at least two or at least three and less than ten, less than nine, less than eight, less than seven, less than six, less than five or less than four locus conversions may be</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

|          | <b>Relevant Disclosures in Longenberger (EX1006)</b>                                                                                                                                                                                                                           |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | introduced into the plant by backcrossing, introgression or transformation to express the desired trait”)                                                                                                                                                                      |
| Claim 18 | 11:34-36 (“Examples of single locus conversions include... transgenes”); 20:48-50 (“Transgenes transferred via backcrossing typically function as a dominant single gene trait and are relatively easy to classify.”); 26:4-32:37 (identifying particular types of transgenes) |

Longenberger’s own claims 2-20 likewise parallel Challenged Claims 2-10 and 12-20:

| <b>Claim in '020</b> | <b>Corresponding Claim in Longenberger</b> |
|----------------------|--------------------------------------------|
| 2                    | 2 (EX1006, 41:15-16)                       |
| 3                    | 3 (41:17-18)                               |
| 4                    | 4 (41:19-21)                               |
| 5                    | 5 (41:22-25)                               |
| 6                    | 6 (41:26-30)                               |
| 7                    | 7 (41:31-34)                               |
| 8                    | 8 (41:35-42)                               |
| 9                    | 9 (41:43-45)                               |

| Claim in '020 | Corresponding Claim in Longenberger |
|---------------|-------------------------------------|
| 10            | 10 and 11 (41:46-42:17)             |
| 12            | 12 (42:18-19)                       |
| 13            | 13 (42:20-22)                       |
| 14            | 14 (42:23-26)                       |
| 15            | 15 (42:27-31)                       |
| 16            | 16 (42:32-35)                       |
| 17            | 17 (42:36-38)                       |
| 18            | 18 (42:39-46)                       |
| 19            | 19 (42:47-49)                       |
| 20            | 20 (42:50-54)                       |

The unpatentability of claims 2-20 is further confirmed by PO's other prior art patents (EX1067—1071) with analogous claims (including claims paralleling claim 11) related to other inbred corn lines. *E.g.*, EX1067, 44:62-65.

**D. Ground 3: Claims 1-20 Are Unpatentable as Obvious Over Hoffbeck (EX1007) and the Corresponding PVPA Certificate (EX1010)**

Hoffbeck discloses PHH5G—a prior art inbred variety with properties very similar to those of the 1PFHC43 variety claimed in the '020 Patent. Hoffbeck was not of record during prosecution even though its disclosures are highly similar to

those in the '020 Patent including the disclosure of the PHH5G variety having similar characteristics to the 1PFHC43 variety, as explained by Dr. Riley. *See* Riley, ¶136; *see also* ¶¶59, 66-75, 82, 141-145, Appendix B. Notably, Hoffbeck's Table 1 reports "flint-dent" grain texture—identical to that disclosed in the '020 Patent even though the texture disclosed in the patent was the Examiner's sole basis for distinguishing other prior art during prosecution. EX1002, 104 ("flint-dent grain versus dent grain").

Hoffbeck discloses that PHH5G 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." EX1007, 30:29-35. It also discloses specific cross breeding techniques for producing such "new inbred" varieties. *Id.*, 2:52; Riley, ¶137.

Consistent with these disclosures, PHH5G was previously used as one of the parents for at least six inbred and hybrid corn varieties. EX1061, 18:49-50; EX1062, 13:3-4; EX1063, 12:60-65; EX1064, 12:60-62; EX1065, 40:17-18; EX1066, 39:53-54; Riley, ¶138.

As Hoffbeck itself discloses, POSAs would have had reason to use PHH5G 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 PHH5G as the starting point. Riley, ¶139; *see also* §V.A.3 (citing *DyStar*).

POSAs would have had a reasonable expectation of obtaining an inbred maize variety with PHH5G as a parent, particularly given (1) the routine nature of the breeding techniques involved, (2) Hoffbeck’s disclosure of preparing new inbred varieties (EX1007, 30:29-35), and (3) the previous instances already reported in which PHH5G had been used as a parent to obtain other lines. Riley, ¶140.

**1. Claim 1**

Claim 1 encompasses a seed, plant part, or plant cell of variety 1PFHC43. 1PFHC43’s disclosed characteristics are highly similar to PHH5G’s as disclosed in Hoffbeck, and nothing in the ’020 Patent’s specification or otherwise in the intrinsic record suggests any property of 1PFHC43 that POSAs would have viewed as surprising or unexpected over PHH5G. *Supra* § V.A.2; Riley, ¶141. 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” PHH5G variety disclosed in Hoffbeck 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,

¶¶142-145. In particular, none are relevant to the underlying goal identified in the '020 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, ¶143. Nor are they relevant to the nature of the '020 Patent's disclosed “Industrial Applicability.” EX1001, 36:49-37:26; Riley, ¶¶143-44.

Accordingly, claim 1 would have been obvious over Hoffbeck.

## **2. Claims 2-20**

Claims 2-20 are likewise unpatentable as obvious over Hoffbeck 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 Smalley. Hoffbeck has disclosures paralleling Challenged Claims 2-20 and/or disclosures in Smalley identified in §V.B.2 concerning claims 2-20. Riley, ¶146. In particular:

|                 | <b>Relevant Disclosures in Hoffbeck (EX1007)</b>                                                             |
|-----------------|--------------------------------------------------------------------------------------------------------------|
| Claim 2         | 8:61-64 (“plant part” includes “pollen” and “ovules”)                                                        |
| Claims 3 and 12 | 52:32-33 (“An F1 hybrid maize seed produced by crossing the plant of claim 3 with a different maize plant”)  |
| Claims 4 and 13 | 52:32-33 (“An F1 hybrid maize seed produced by crossing the plant of claim 3 with a different maize plant.”) |

|                         | <b>Relevant Disclosures in Hoffbeck (EX1007)</b>                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claims 5, 14,<br>and 19 | 52:38-41 (“A method for developing a second maize plant in a maize plant breeding program comprising applying plant breeding techniques to a first maize plant, or parts thereof”)                                                                                                                                                                                                             |
| Claims 6 and<br>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,<br>and 20 | 35:35-48 (“Maize is used as human food, livestock feed, and as raw material in industry. ...The maize wet-milling industry can provide maize starch, maize syrups, and dextrose for food use. ... non-grain portions of the [maize] plant, [are] also used extensively as livestock feed.”)                                                                                                    |
| Claim 8                 | 52:32-50 (“10. An F1 hybrid maize seed produced by crossing the plant of claim 3 with a different maize plant. 11. A maize plant produced by growing the F1 hybrid maize seed of claim 10. 14. A method for developing a second maize plant in a maize plant breeding program comprising applying plant breeding techniques to a first maize plant, or parts thereof, wherein said first maize |

|                  | <b>Relevant Disclosures in Hoffbeck (EX1007)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | plant is the plant of claim 11 and wherein application of said techniques results in development of said second maize plant.”)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Claims 9 and 17  | Producing nucleic acid from the seed, plant, plant part, or plant cell of claim 1 was well known in the art. <i>See</i> EX1067, 44:42-44; EX1072, Abstract; EX1073, Title.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Claims 10 and 11 | 15:33-34 (“locus conversion of PHH5G for herbicide tolerance”); 15:36-37 (“locus conversion for insect or disease resistance”); 18:21-24 (“The seed industry commonly markets “triple stacks” of base genetics; which can be varieties comprising a locus conversion of at least 3 loci.”); 17:39-46 (“A locus conversion of PHH5G will retain the genetic integrity of PHH5G.”); 18:6-15 (“Desired traits that may be transferred through backcross 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, |

|          | <b>Relevant Disclosures in Hoffbeck (EX1007)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | <p>disease resistance, bacterial, fungal or viral), insect resistance, herbicide resistance and yield enhancements.”).</p> <p><i>See also</i> EX1067, 44:62-65 (“wherein the fewer than six locus conversions confer a property selected from the group consisting of herbicide tolerance, insect resistance and disease resistance”)</p>                                                                                                                                                                                                       |
| Claim 18 | <p>22:1-2 (“In some embodiments of the invention, a transformed variant of PHH5G may comprise at least one transgene”);</p> <p>22:36-38 (“a backcrossing approach is commonly used to move a transgene from a transformed maize plant to an elite inbred variety, and the resulting progeny would then comprise the transgene(s)”); 18:47-49 (“Transgenes transferred via backcrossing typically function as a dominant single gene trait and are relatively easy to classify.”); 23:53-30:27 (identifying particular types of transgenes).</p> |

The unpatentability of claims 2-20 is further confirmed by PO’s other prior art patents (EX1067-EX1071) including analogous claims related to other inbred corn lines.

## 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 ’020 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 (EX1027, 14)<sup>13</sup>—including the three detailed in §V above. EX1025, 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

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<sup>13</sup> PO merged with another entity to become Corteva. EX1027, 11.

“monopoly of knowledge” not “clearly commanded by the statute.” *Brenner*, 383 U.S. at 534.

In particular, it is immaterial under §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 (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 '020 Patent “only disclosed general uses for its claimed [1PFHC43 variety], not specific ones that satisfy §101.” *Fisher*, 421 F.3d at 1374. The specification’s “Industrial Applicability” section is essentially identical to that in Longenberger and very similar to those in Smalley and Hoffbeck. See EX1001, 36:49-37:26; EX1005, 34:1-37; EX1006, 37:21-65; EX1007, 35:33-36:3; Riley, ¶¶147-149. Nothing in the record suggests any utility specific to the 1PFHC43 variety itself beyond that generic to any species of corn. Riley, ¶¶149-152; *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 '020 Patent suggests particular phenotypical differences between the claimed 1PFHC43 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, ¶150. 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, ¶150. 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 '020 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, 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 '020 Patent suggests any reason why the claimed variety's properties have such characteristics and provide significant value as compared to preexisting corn varieties. Riley, ¶¶151-176. 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 length of ear node leaf somehow established the variety's specific utility because

POSAs would recognize some alleged benefit (despite the length 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, ¶¶151-176.

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 FAVORABLE RESOLUTION OF STATUTORY COMPLIANCE DURING EXAMINATION DESPITE A REFUSAL TO COMPLY WITH §1.105 TO FACILITATE NECESSARY EXAMINATION**

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 '020 Patent presents a "novel or unsettled legal question that is important to other patents or patent applications," including but not limited to other utility patents and utility patent applications related to methods of breeding maize (subclass 275.000 within class 800) and other essential agricultural crops. §324(b).

The question stems from:

- (1) the Examiner’s Request for Information under §1.105 concerning the PH1VNA parental variety (i.e., that which PO used along with PH1D84—previously used to create at least seven other inbred lines—to create the claimed 1PFHC43 variety); and
- (2) and PO’s subsequent refusal to provide a substantive response on the ground that the PH1VNA variety was “proprietary” to PO and had “not been made publicly available.”

EX1002, 106-107, 351; *see also supra* §III.C. In particular, PO’s refusal to provide a response to the Examiner’s Request for Information under §1.105 and the Examiner’s subsequent allowance of the claims raises a novel and unsettled question as to whether:

**If a patent examiner invokes Rule 105 to secure information “reasonably necessary to properly examine” a patent application, does the burden of production shift to the patent applicant such that the refusal to provide the requested information on the sole basis that it is “secret” or “proprietary” precludes further examination under any of the statutory requirements outstanding at the time of the request?**

The Office can and should answer this question affirmatively.

Proprietary information not publicly available falls within the scope of §1.105, and the Office provides applicants with mechanisms for protecting it

during the pendency of the application while still complying with Office requests.

*See infra* §VII.A. Moreover, proprietary information can be highly relevant when determining whether patent claims satisfy the statutory requirements for patentability, including §§101, 102, 103, and 112. *See infra* §VII.B.

In such situations (i.e., where the proprietary information is “material to patentability”), the Office refuses to grant petitions to expunge the information under §1.59(b). *See infra* §VII.B (discussing MPEP §724.05 & EX1033). Instead, if applicants desire utility patent protection, they must publicly disclose all information material to patentability—regardless of its purportedly “proprietary” status—prior to patent issuance. Sacrificing confidentiality in return for the right to exclude is the central bargain underlying utility patents; applicants cannot maintain trade secret protection after obtaining patent protection. *Atl. Rsch. Mktg. Sys., Inc. v. Troy*, 659 F.3d 1345, 1357 (Fed. Cir. 2011) (“A trade secret is secret. A patent is not. That which is disclosed in a patent cannot be a trade secret.”). Such disclosures are critical for proper examination and also important for enabling third parties to pursue PGR challenges on statutory grounds such as §§101, 102, 103, and 112. *See infra* §VII.C.

Enabling such review and applying such statutory requirements is particularly important in connection with plant utility patents given the President’s mandate that the Office collaborate with the USDA and ensure that the patent

system does not “unnecessarily reduce competition in seed and other input markets beyond that reasonably contemplated by the Patent Act.” EX1023. And §1.105 takes on heightened importance when examining plant utility patent applications given the particular limitations of traditional prior art searching in this field. EX1025, 4 (noting concerns that “incomplete searching has led to patents that covered existing plant varieties” and “characteristics”); *id.*, 22 (noting that plant-related prior art searches for purposes of assessing non-obviousness present “an inherently complex” task “that requires significant time and resources, as prior art for plants may not be as immediately accessible as for other types of inventions”).

An affirmative answer to the above question would further the purpose of the joint USPTO-USDA working group announced by the Director and Secretary of Agriculture Vilsack in response to the President’s executive order and for the stated purpose of “enhanc[ing] the quality of the patent examination process for innovations related to agricultural products.” EX1024. One of the Working Group’s initiatives is “to *enhance the quality of the patent examination process* for innovations related to agricultural products and processes, including opportunities for *enhancing prior art search capabilities and providing additional training and guidance to patent examiners.*” EX1024; *see also* EX1026 at 4 (same).

**A. Rule 105 Is an Important Examination Tool for Enhancing Patent Quality**

§1.105 exists to serve that very same purpose of enhancing patent examination quality—a point the Office stressed when promulgating the rule and the Federal Circuit later reiterated when applying it. The Request for Information procedure is intended to ensure examiners are “perform[ing] the *best quality examination possible*.” *Star Fruits*, 393 F.3d at 1282 (quoting 65 Fed. Reg. 54,604 at 54,633 (Sept. 8, 2000)); *see also* MPEP § 704.11 (noting purpose of Rule 105 “to improve patent quality, and render better decisions”).

**1. Rule 105 Empowers the Office to Request Factual Information When Reasonably Necessary for Proper Examination**

§1.105 authorizes Examiners to require applicants to disclose “such information as may be reasonably necessary to properly examine or treat the matter,” including “factual information.” §1.105. It codifies the Office’s “inherent authority” during the examination process to “encourage” the exercise of such authority “so that the Office can perform the best quality examination possible.” 65 Fed. Reg. at 54,634 (Sept. 8, 2000). The authority exists “to address legitimate concerns that may arise during the examination of an application or consideration of some matter.” *Id.* When amending the rule to clarify that it encompasses “factual information known to applicant,” the Office reiterated that the purpose of

the procedure “is to improve patent quality, and render better decisions.” 69 Fed. Reg. 56,482, 56,512 (Sept. 21, 2004).

To this end, applicants must respond to requests for information even if they disagree whether the information is relevant. *Star Fruits*, 393 F.3d at 1284. Any other approach would wrongly “forc[e] the Office to make patentability determinations on insufficient facts” and threaten “the systemic inefficiencies that attend the issue of invalid patents.” *Id.*

Yet such a determination on insufficient facts—yielding an invalid patent and the associated unfair tax on the public—plainly occurred here following applicant’s refusal to provide the information on the ground that it was “proprietary” and in particular that “[p]arental line PH1VNA” had “not been made publicly available.” EX1002, 351.

## **2. Rule 105 Extends to “Proprietary” Information**

As the Office has stressed, §1.105 encompasses “proprietary” material.” 69 Fed. Reg. at 56,514 (expressly *rejecting* suggestion that §1.105 should exclude “confidential” materials). Such proprietary information indeed can be highly relevant—even dispositive—to the examination process. *See infra* §VII.B.

The Office has likewise specified ways for applicants to protect “proprietary” information during prosecution, including submitting materials in a sealed, clearly labeled container. MPEP § 724.02. Applicants are likewise free to

petition under §1.59(b) to expunge confidential information. *See* 69 Fed. Reg.

56,514. Indeed, in a 2018 presentation (EX1032), the Supervisory Primary Examiner for the art unit responsible for the '020 Patent (1663) stressed these procedures for handling proprietary information in response to §1.105 requests. EX1033, 20-30. Nevertheless, applicant here did not pursue such options when faced with the Examiner's Request for Information concerning allegedly "proprietary" information. Applicant instead cited that purported status as a basis for withholding the information entirely. EX1002, 351. The Examiner then 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 non-obviousness under §103 as well as utility under §101, novelty under §102, and compliance with §112.

**B. "Proprietary" Information Not Publicly Available Can Be Dispositive in Determining Whether Patent Claims Comply With the Statutory Patentability Requirements—Including Those Distinguishing Utility Patents From PVP Certificates**

Office policy expressly contradicts the Examiner's approach and instead recognizes that proprietary information *is* often material to patentability. Indeed, while applicants are free to petition for expungement of proprietary information from the record prior to patent issuance, the Office will only entertain such petitions if the information has been "found *not* to be material to patentability." MPEP §724.02 (emphasis original); *id.* §724.04 (same); *id.*, §724.05 (same); *see*

*also* MPEP § 719.01 (“37 CFR 1.59 provides that certain documents may be expunged if they...contain proprietary information which has not been made public and is not important to a decision of patentability.”)

If instead the proprietary “information is found to be material to patentability, any petition to expunge the information will be denied.” MPEP §724.05; *see also* EX1033, 24 (Office presentation citing MPEP §724.04 concerning handling of petitions to expunge); MPEP §724.06 (noting that decisions on petitions to expunge may be held in abeyance: “During prosecution on the merits, the examiner will determine whether or not the identified document is considered to be ‘material.’”).

To the extent the Examiner may have believed the purported “proprietary” status of the PH1VNA parental line obviated the need for the originally requested information, this constituted plain legal error. Proprietary information concerning ancestral species can be highly material when assessing whether patent claims comply with all statutory requirements—including but not limited to those such as utility, non-obviousness, and enablement, which distinguish utility patents from PVPA certificates.

### **1. Proprietary Information Can Be Dispositive Under §102**

For one, PO’s representation that the PH1VNA 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—constitutes 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.

The Board made the same point concerning public use in *Ex parte C*—the very case PO cited to the Supreme Court in *J.E.M.* when distinguishing the requirements for utility patent protection from those for PVP protection.

EX1029, \*20-21, \*38, & n.25 (citing *Ex parte C*). See *Ex parte C*, 27 U.S.P.Q. at 1499 (“Even if there was an obligation of secrecy and confidentiality this does not necessarily avoid the public use bar.”)

## **2. Proprietary Information Can Be Dispositive Under §103**

Confidential prior art such as that discussed in *supra* §VII.B.1 is also plainly relevant for purposes of obviousness.

For one, confidential references and activities are applicable to the scope and content of prior art for purposes of §103—not just §102. *E.g.*, *Tyco Healthcare Grp. LP v. Ethicon Endo-Surgery, Inc.*, 774 F.3d 968, 976 (Fed. Cir. 2014).

Accordingly, PO’s representation that the PH1VNA parental line was “proprietary” and had “not been made publicly available” (EX1002, 351) does not resolve the question whether PH1VNA 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 PH1VNA parental line would likewise constitute prior art even if subject to a commercial offer for sale—regardless whether it was accepted. *Quest Integrity USA, LLC v. Cokebusters USA Inc.*, 924 F.3d 1220, 1227 (Fed. Cir. 2019) (citing *Helsinn*).

Even aside from prior art status, purely internal activities (i.e., within PO's sole control, subject to confidentiality obligations and without any related commercial activity) concerning "proprietary inbred line PH1VNA" (EX1002, 351) would still have been highly material in allowing the Examiner to determine whether PO's claims were non-obvious over prior art such as PH1D84 (i.e., the claimed variety's other parent, which had been the subject of at least fifteen different crosses with other varieties, *see supra* §V.A.3).

Such internal activities are relevant when assessing the level of ordinary skill in the art. *Thomas & Betts Corp. v. Litton Sys., Inc.*, 720 F.2d 1572, 1581 (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 POSAs 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’” POSAs.

*National Steel*, 357 F.3d at 1337–39.

As such, ***failing*** to consider 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.”).

### **3. Proprietary Information Can Be Dispositive Under §101**

Proprietary materials likewise can be highly relevant to lack of utility under §101 regardless whether the materials constitute “prior art.” *See Application of Langer*, 503 F.2d 1380, 1391 (CCPA 1974) (affirming in relevant respect lack of utility rejection even though materials cited by examiner were not “‘prior art’ references”).

#### **4. Proprietary Information Can Be Dispositive Under §112**

Similarly, proprietary materials can be dispositive in assessing compliance with the statutory enablement and written description requirements under §112. *See, e.g., White Consolidated Indus. v. Vega Servo-Control, Inc.*, 713 F.2d 788, 790 (Fed. Cir. 1983) (holding that failure to disclose computer code rendered specification non-enabling when no equivalent component was publicly available).

#### **C. Refusal to Provide Proprietary Information On Request Wrongly Impedes the Examination Process and Violates the Bargain Underlying the Patent System**

Given the numerous ways in which “proprietary” information can be material to patentability, the Office can and should treat an examiner’s request for such information pursuant to §1.105 (as occurred here, *see supra* §III.C) as presenting applicants with three options:

**First**, applicants can respond to the request—thereby advancing prosecution and enabling consideration of whether the requested information is material to patentability, in which case it must become publicly available should the patent application issue. *See* MPEP §724.05; *see also* EX1033, 24 (Office presentation citing MPEP §724.04 concerning handling of petitions to expunge). Notably, such petitions pursuant to §1.59 to expunge proprietary materials submitted under MPEP §724.02 are handled by ***TC Directors***—not examiners. MPEP §1002.02(c).

**Second**, applicants may petition the ***Director*** under §1.181 and argue that the “trade secret, proprietary, and/or protective order materials being requested to be submitted are unnecessary.” 69 Fed. Reg. at 56,514.

**Finally**, applicants naturally may elect to abandon the application—electing to preserve the proprietary status of the materials rather than face the prospect that the TC Director will deem them material to patentability and deny a petition to expunge. Applicants cannot obtain patent protection while maintaining trade secret protection. *Atl. Rsch. Mktg. Sys.*, 659 F.3d at 1357.

Taken collectively, these procedures amount to a shifting burden of production. If an examiner determines that information is “reasonably necessary to properly examine” an application under §1.105, the applicant must do one of three things: (1) provide the requested information, (2) file a petition to be heard by the Director or a suitably experienced official under the Director’s supervision (e.g., the TC Director) familiar with the numerous reasons why “proprietary” information can be relevant to the statutory patentability requirements, or (3) abandon the application.

Under no circumstances, however, should applicants be able to achieve what PO accomplished here: (1) fail to respond to the request for information, (2) never file an appropriate petition, and yet (3) nevertheless obtain a patent. On the contrary, the ’020 Patent’s prosecution history exemplifies the problems examiners

considering plant utility applications face in applying statutory requirements such as non-obviousness under §103 and utility under §101, which distinguish utility patents from PVPA certificates. *J.E.M. Ag Supply*, 534 U.S. at 131. Following PO’s arguments to this effect (EX1029), the Supreme Court held that while utility patents on plants can exist in parallel with PVPA protection, “[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.” *J.E.M. Ag Supply*, 534 U.S. at 142.

Instituting review and clarifying the appropriate use of §1.105—including in connection with “proprietary” information—would ensure the Office’s ability to examine plant utility applications consistent with the Patent Statute and the Supreme Court’s mandate in *J.E.M.* despite the challenges the USDA has noted concerning “incomplete” searching in this field (EX1025, 4).

Instituting review would also enable Petitioner to make a suitable discovery request and obtain information regarding “proprietary inbred line PH1VNA”—eliminating the blind spot the Examiner created during prosecution by failing to follow through on the original Request for Information. That blind spot wrongly denies Petitioner and other third parties a complete basis from which to assess the question the Board stressed in *Ex parte C*: “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. Such lack of information is unfair to petitioners in any case. It would be particularly untenable if the blind spot inured to the benefit of PO, which itself previously cited *Ex parte C* to the Supreme Court in *J.E.M.* as proof the non-obviousness requirement had teeth as applied to plant utility claims such that utility patent protection should be available alongside PVP protection in appropriate instances. EX1029, \*20-21, \*38, & n.25 (citing *Ex parte C*). Having previously stressed this authority to the Supreme Court, PO should not be permitted to rely on the absence of information concerning PH1VNA and thereby argue that it would not have been obvious to cross PH1VNA together with PH1D84—particularly when PG1D84 had been used for at least fifteen earlier crosses (five disclosed in indisputable prior art references concerning inbred lines) and PH1VNA itself was the subject of at least one other cross.

To be sure, the “more likely than not standard” for institution under §324(a) ensures that PGR petitioners “present a complete case at the outset, and are not relying on obtaining information in discovery.” 157 Cong. Rec. S1375 (daily ed. Mar. 8, 2011) (statement of Sen. Kyl). Petitioner’s Grounds 1-4 do precisely that. *See supra* §§ V-VI. But Ground 5 is presented under §324(b), which recognizes that a PGR petition may “raise[] a novel or unsettled legal question” justifying institution even without considering whether the petition on its own demonstrates that it is more likely than not that at least one challenged claim is unpatentable.

Thus, even if the absence of information regarding PH1VNA led the Board to question whether it is more likely than not that the Challenged Claims are unpatentable, such uncertainty would simply buttress the case for institution under §324(b) and further illustrate the Examiner's error in permitting PO to evade the original Request for Information.

## **VIII. NO BASIS EXISTS FOR DISCRETIONARY DENIAL**

### **A. §314(a)**

There is no previous petition concerning the '020 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 '020 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 Longenberger and Hoffbeck references were not 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 Smalley was cited, “specific teachings [in Smalley] 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 [Smalley] was not [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 PH1D84 variety (disclosed in Smalley), 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, 97. For one, “**motivation to combine need not be found in prior art references**, but equally can be found ‘in the knowledge generally available to’” POSAs. *National Steel Car*, 357 F.3d at 1337–39 (reversing district court). Separately, “motivation”

per se is not even a requirement for obviousness. *KSR*, 550 U.S. at 419. 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 provide information in response to the Examiner’s request concerning the parental line “PH1VNA.” *See supra* §III.C. In particular, the Examiner allowed the claims immediately after PO’s assertion that parental line PH1VNA was “proprietary” and not “publicly available.” EX1002, 351, 362. But there are multiple reasons why “proprietary” information (e.g., concerning the PH1VNA parental line) is highly relevant when assessing whether patent claims are non-obvious as required by §103. *See supra* §VII.B.2.

Indeed, ***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. 357 F.3d 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 ’020 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, 351), 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.

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.” The *Ex parte C* specification did not disclose “the characteristics possessed by each parent variety” and in particular failed to disclose “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. Ground 4 (Lack of Specific Utility)**

**The lack of utility argument in Ground 4 is 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.”).

**3. Ground 5 (Unsettled Legal Question Implicating All Statutory Grounds)**

**The novel and unsettled legal question in Ground 5 (implicating §§101, 102, 103, and 112) is not the same or substantially the same as arguments considered during prosecution.** Nothing in the record suggests any consideration as to appropriate procedures following a §1.105 request. Even if the Examiner had considered such issues—despite the lack of any such indication in the record—the allowance of the Challenged Claims following PO’s assertion that the requested information was “proprietary” (EX1002, 351) would reflect plain error under part two of *Advanced Bionics* given the numerous ways in which such “proprietary” information can be material to patentability (*see supra* §VII.B).

## **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) as well as issued following a plainly inadequate examination process that did not reflect proper consideration of any statutory requirement for patentability (Ground 5) 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 '020 is accordingly requested in accord with §§321-329 and §42.200 et seq.

Dated: March 6, 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**

No U.S. patent applications claim the benefit of the priority of the filing date of U.S. Patent No. 11,666,020.

**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<br>Zhiyun Ge, Reg. No. 73,869<br>Thomas F. Foley, Reg. No. 76,384<br>Charles T. Steenburg, pending admission <i>pro hac vice</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Service Information | <u>E-mail:</u> <a href="mailto:SMcKeown-PTAB@WolfGreenfield.com">SMcKeown-PTAB@WolfGreenfield.com</a><br><a href="mailto:OJohnstone-PTAB@WolfGreenfield.com">OJohnstone-PTAB@WolfGreenfield.com</a><br><a href="mailto:Jean.Ge@WolfGreenfield.com">Jean.Ge@WolfGreenfield.com</a><br><a href="mailto:TFoley-PTAB@WolfGreenfield.com">TFoley-PTAB@WolfGreenfield.com</a><br><a href="mailto:Charles.Steenburg@WolfGreenfield.com">Charles.Steenburg@WolfGreenfield.com</a><br><br><u>Post and hand delivery:</u> Wolf, Greenfield & Sacks, P.C.<br>600 Atlantic Avenue<br>Boston, MA 02210-2206<br><br><u>Telephone:</u> 617-646-8000 <u>Facsimile:</u> 617-646-8646 |

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

## **XI. CLAIM LISTING**

|                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 1</b>                                                                                                                                                                                                                                       |
| A seed, plant, plant part, or plant cell of inbred maize variety 1PFHC43, representative seed of the variety having been deposited under NCMA accession number 202212064.                                                                            |
| <b>Claim 2</b>                                                                                                                                                                                                                                       |
| The plant part of claim 1, wherein the plant part is an ovule or the plant part is pollen.                                                                                                                                                           |
| <b>Claim 3</b>                                                                                                                                                                                                                                       |
| An F1 hybrid maize seed produced by crossing the plant or plant part of claim 1 with a different maize plant.                                                                                                                                        |
| <b>Claim 4</b>                                                                                                                                                                                                                                       |
| 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.                                                                               |
| <b>Claim 5</b>                                                                                                                                                                                                                                       |
| 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.                                                                    |
| <b>Claim 6</b>                                                                                                                                                                                                                                       |
| 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. |
| <b>Claim 7</b>                                                                                                                                                                                                                                       |
| 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.                                            |
| <b>Claim 8</b>                                                                                                                                                                                                                                       |
| A method of producing a maize seed derived from the variety 1PFHC43, 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 1PFHC43.                                                                       |

|                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 9</b>                                                                                                                                                                                                                                                                                                                                                                       |
| A method for producing nucleic acids, the method comprising isolating nucleic acids from the seed, plant, plant part, or plant cell of claim 1.                                                                                                                                                                                                                                      |
| <b>Claim 10</b>                                                                                                                                                                                                                                                                                                                                                                      |
| A converted seed, plant, plant part or plant cell of inbred maize variety 1PFHC43, representative seed of the maize variety 1PFHC43 having been deposited under NCMA accession number 202212064,                                                                                                                                                                                     |
| 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 1PFHC43 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 acids, altered essential amino acids, altered carbohydrates, herbicide tolerance, insect resistance and disease resistance. |
| <b>Claim 11</b>                                                                                                                                                                                                                                                                                                                                                                      |
| The converted seed, plant, plant part or plant cell of claim 10, wherein the fewer than six locus conversions confer a property selected from the group consisting of herbicide tolerance, insect resistance and disease resistance.                                                                                                                                                 |
| <b>Claim 12</b>                                                                                                                                                                                                                                                                                                                                                                      |
| A maize seed produced by crossing the plant or plant part of claim 10 with a different maize plant.                                                                                                                                                                                                                                                                                  |
| <b>Claim 13</b>                                                                                                                                                                                                                                                                                                                                                                      |
| 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.                                                                                                                                                                                                                           |
| <b>Claim 14</b>                                                                                                                                                                                                                                                                                                                                                                      |
| 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.                                                                                                                                                                                                      |

|                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 15</b>                                                                                                                                                                                                                                       |
| 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. |
| <b>Claim 16</b>                                                                                                                                                                                                                                       |
| 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.                                            |
| <b>Claim 17</b>                                                                                                                                                                                                                                       |
| A method for producing nucleic acids, the method comprising isolating nucleic acids from the seed, plant, plant part, or plant cell of claim 10.                                                                                                      |
| <b>Claim 18</b>                                                                                                                                                                                                                                       |
| An F1 hybrid seed produced by crossing a plant or plant part of inbred maize variety 1PFHC43, representative seed of the inbred maize variety 1PFHC43 having been deposited under NCMA accession number 202212064 with a different maize plant,       |
| wherein inbred maize variety 1PFHC43 further comprises a transgene and otherwise comprises all of the physiological and morphological characteristics of maize variety 1PFHC43 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 1PFHC43 by backcrossing or genetic transformation.                                                                                                                                     |
| <b>Claim 19</b>                                                                                                                                                                                                                                       |
| 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.                                                                                     |
| <b>Claim 20</b>                                                                                                                                                                                                                                       |
| 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 March 6, 2024, I will cause a copy of the foregoing document, including any exhibits or appendices filed therewith, to be served via Priority Mail Express at the following correspondence address of record for the patent:

Pioneer Hi-Bred International, Inc.  
7250 NW 62<sup>nd</sup> Avenue  
PO Box 552  
Johnston, IA 50131-0552

Date: March 6, 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 18,686 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: March 6, 2024

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