PROTECTIVE ORDER MATERIAL

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COLLEGE PRODUCTS, INC.,

Petitioner,

v.

INTIRION CORPORATION,

Patent Owner.

Case No. PGR2024-00003

Patent No. 11,674,745

PATENT OWNER'S RESPONSE TO PETITION

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I. INTRODUCTION

College Products, Inc. ("Petitioner") has not carried its burden of demonstrating by a preponderance of the evidence that Claims 1-28 of U.S. Patent No. 11,674,745 B2 (the "'745 Patent" Ex. 1001) are unpatentable.

Compact combination microwave-fridge appliances, linked together with a power control unit having switching technology, USB-ports, a microwave with internal smoke sensors, and reset functionality have become the appliance of choice in dormitories, hotels and other establishments through Patent Owner Intirion Corporation's ("Patent Owner" or "Intirion") innovations. The invention of the '745 Patent, which has been implemented across flagship products, has been essential to this widespread adoption in dormitories at colleges and universities across the United States.

Intirion's invention overcame regulation and solved unique needs of dorms, hotels, and similar locations—it is important to effectively manage current load. Intirion's system also provided the capability to cut cooking power immediately at the first detection of a fire or related event. Intirion identified that, in locations where large numbers of individuals cohabitate, not only is it more important for the building manager (e.g., a school) to catch dangerous conditions prior to spreading, it is also important to catch and cease potentially dangerous conditions prior to detection by the building's system. Indeed, false or unnecessary fire alarms in the

building would mean mass evacuations, which can be costly and disruptive to residents' daily lives.

Addressing these issues, Intirion created something entirely new, and has enjoyed great commercial success. Now, when colleges and universities issue requests for proposals for microwave-fridge combination appliances, their specifications require internal smoke sensors, and are even commonly set to Intirion's MicroFridge product, which embodies the '745 Patent.

The Patent teaches a microwave that manage the current supplied between various electrical connections the appliances to avoid overload conditions. In many embodiments, these appliances are a linked microwave and minifridge. This is advantageous, allowing for the use of a single plug and managing the current draw from the wall outlet by ensuring that peak power is not demanded by both linked appliances at the same time. When the microwave oven draws cooking power, the refrigerator will not. The Patents also describe embodiments where the microwave oven draws cooking power, auxiliary outlets that may have the draw sensed, limited power draw, or will wholly prevent power draw. As a result, the peak current drawn from the linked appliances and auxiliary outlets never exceeds the breaker rating for the wall outlet. Further, the Patent teaches a smoke sensor within the microwave, in operative connection with a control circuit, configured to cause cooking power to the microwave to be withdrawn upon sensing a predetermined level of smoke

indicative of a dangerous condition. Ex. 1001, 14:15-19. The Patent also describes a fault indicator, which may be coupled to the control circuit, and activating a fault indicator in response to the smoke detector tripping, such as by activating a buzzer and/or fault message (e.g., "E-1"). *Id.*, 14:64-15:22, 17:55-18:40. The smoke sensor "may be reset automatically responsive to the [sensor]...no longer detecting gas indicative of the dangerous condition. Alternatively, or in addition, the [sensor]...may be reset upon a sensor sensing opening of the door[] of the microwave oven." E.g., *id.*, 15:23-32. These teachings ensure safe, low-power draw appliances that are convenient for use in college dormitories, hotels, offices, and other establishments.

Petitioner does not argue any claim is anticipated. Instead, the Petition attempts to cobble together references concerning disparate technologies that suffer numerous flaws, which do not all qualify as prior art. As Dr. Emad Tanbour, Professor of Mechanical Engineering at Eastern Michigan University, explains in detail (supported by patent disclosure, industry experience, real-world documents, and Petitioner's cited references), claims 1, 12-15, 19, 20, 22-26 (the "challenged Claims") were not obvious to a POSITA.

Petitioner proposes to combine references concerning fundamentally different, and incompatible, references that a POSITA would have had no reason to combine nor a reasonable expectation of success, and others that are not prior art.

Put simply, the references would not be used to solve the challenge. Petitioner's cited art varies from saying nothing about, to teaching away from, utilizing smoke sensors in microwaves. A POSITA would not have been motivated to put a smoke sensor in a microwave, let alone in a combination appliance with power management technology. The cited references teach away from Petitioner's suggested combinations. For example, the ISDU was not operational, by its own admission, and regardless, does not qualify as a printed publication under 35 U.S.C. § 102. A POSITA would not have combined Smith as Petitioner proposed because the sensor is inconsistent with Smith's teachings of a humidity sensor and creates excess power draw, cutting against the purpose of the inventions. The smoke detector in Butt would not have been combined inside of a microwave and would not have functioned. Petitioner and its expert, Dr. Horenstein, intentionally disregard the many inconsistencies and contradictions between these references.

Regardless, the references do not teach or disclose all required limitations for the asserted claims. For example, Smith does not teach the "smoke sensor," instead reciting a humidity sensor used for automatic cooking. Additionally, Petitioner and Dr. Horenstein concede, and the Board recognized, that Smith does not disclose the "reset enable function" limitation. Butt is even less helpful, as it does not teach a smoke sensor inside a microwave (teaching against such), along with many other

necessary elements. This is unsurprising, as it is essentially a system made up of a typical wall outlet, standard smoke detector, and panic button installed into a wall.

Petitioner's final Ground (Ground 9) asserts claims 1-28 are invalid as indefinite based on the phrase "in operative connection." Ground 9 fails because this is a common term in patent claims and is sufficiently definite. Petitioner's arguments otherwise ignore the plain language of the claims and explicit teaching in the specification.

Petitioner has not shown any challenged claim was prima facie obvious. Strong evidence of objective indicia further undercuts the Petition's assertions. The Board should find that Petitioner has not shown any challenged claim of the '745 Patent to be unpatentable.

II. LEVEL OF ORDINARY SKILL IN THE ART

Intirion asserts a POSITA would have had (a) a bachelor's degree in mechanical or electrical engineering or the equivalent; and (b) one-to-two years working experience designing appliances, including microwaves or comparable appliances. Equivalent experience and technical training might substitute for education, and advanced degrees might substitute for experience. Petitioner's assertion of a POSITA is: "a POSITA would have had at least a bachelor's degree in electrical engineering or computer engineering. Alternatively, a POSITA could have had a bachelor's degree in mechanical engineering, industrial engineering,

physics, or a related engineering or discipline, plus at least two years of experience working with control circuits, sensors, kitchen appliances, or similar fields." Petition at 14 (citations omitted). The differences do not matter for purposes of this Petition.

III. CLAIM CONSTRUCTION

Intirion agrees with the Board's application of the plain and ordinary meaning for level of smoke. The terms are comprised of non-technical words that a lay person can easily understand. As used in the specification, "level of smoke," or amount of smoke, is generally a predetermined level of smoke indicative of a dangerous condition—the traditional function of a smoke sensor. Ex. 2001, ¶ 64; Ex. 1001, 16:19-21 (describing a sensor which "includes a programmed trip point or threshold that corresponds to the reduced amount of light sensed caused by the amount of smoke"). The specifications note parameters that may serve as the threshold "amounts" or "levels" of smoke sensed by the smoke sensor that could trigger an alarm or cause power to the microwave to be disabled. Ex. 2001, ¶ 65; *See, e.g.*, Ex. 1001, 15:57–62 (an exemplary infrared sensor "may use the smoke point of oil … as the basis for its threshold amount"). A POSITA would understand the common food oils found in microwaveable foods. Ex. 2001, ¶ 65. The specification also notes the known difference between "normal smoke emitted during the cooking or heating of food or beverages" (Ex. 1001, 15:57-62), and "excessive smoke generated from overcooked food" (*id.* at 14:15-19). Ex. 2001, ¶ 67. This is consistent with the

Board's construction, which reinforces that the "level of smoke" is simply directed to the turning off at a predetermined trip-point. *Id.*, *see also* Institution Decision at 11. Moreover, as discussed in further detail below, Petitioner has not established that the claims of the '745 Patent are invalid.[1]

IV. GROUNDS 1 AND 5-8: PETITIONER FAILS TO ESTABLISH A *PRIMA FACIE* CASE OF OBVIOUSNESS BASED ON ISDU

Grounds 1 and 5-8 each fail because they purport to rely on ISDU, which Petitioner has not established as prior art. Specifically, Petitioner has not met its burden to show that ISDU was publicly accessible by April 25, 2014 (the priority date of the '745 Patent). Public accessibility is the "touchstone in determining

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[1] Petitioner does not, and cannot, argue indefiniteness of this term at the PGR. Office Patent Trial Practice Guide ("Practice Guide") at 13. (Petitioner may "respond to any such new claim construction issues raised by the patent owner, but cannot raise new claim construction issues that were not previously raised in its petition.") Neither can Petitioner use the district court as an end-around, as it did not argue indefiniteness of this term as a ground in its petition. Regardless, Petitioner did not timely make the claim construction determination in the district court of record here. Practice Guide at 47-48; 37 C.F.R. §§ 42.123, 42.223. Moreover, that decision should not be given any weight because it is not final and appealable. Indeed, Patent Owner has moved for reconsideration.

whether a reference constitutes a printed publication." *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016). At the final decision stage, Petitioner must establish public accessibility by a "preponderance of the evidence." 35 U.S.C. § 326(e); *see Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29, at 11 (PTAB Dec. 20, 2019) (precedential). Petitioner's purported evidence is neither admissible nor sufficient to establish public accessibility.

A. Petitioner Has Not Submitted Admissible Evidence.

Attempting to prove public accessibility, Petitioner relies on evidence that is unauthenticated, is inadmissible hearsay, and is presented in an expert declaration that is not based on any qualified expert testimony or personal knowledge. Intirion timely filed objections to Petitioner's evidence on April 24, 2024. Paper 12. In response, Petitioner served supplemental evidence (Exhibit 1024) pursuant to 37 C.F.R. § 42.64(b)(2). Intirion again timely filed objections to Petitioner's supplemental evidence, pointing out that Exhibit 1024 is improper because, among other things, it is inadmissible hearsay, the author conceded she lacked personal knowledge on the subject, and it is incomplete. Paper 16. In short, none of Petitioner's public accessibility evidence is admissible. Intirion will be filing a Motion to Exclude this evidence per the Board's Scheduling Order.

B. Petitioner Fails to Meet Its Burden of Showing Public Accessibility.

A reference is considered "publicly accessible if it was 'disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.'" *Blue Calypso*, 815 F.3d at 1348 (citation omitted)). For electronic documents, public accessibility may be demonstrated if the document was "indexed or catalogued, or if there were other tools for customary and meaningful research." *Sophos Ltd. v. Open Text Inc.*, IPR2023-00732, Paper 23, at 8 (PTAB Nov. 1, 2023) (citing *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1196 (Fed. Cir. 2008)). The Federal Circuit has emphasized "technical accessibility" is not sufficient: a reference must be "*meaningfully* indexed such that an interested artisan exercising reasonable diligence would have found it." *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 773-74 (Fed. Cir. 2018).

Petitioner's purported evidence of public accessibility falls short. Petitioner does not rely on anyone with first-hand knowledge of ISDU's public accessibility. Nor does Petitioner rely on admissible evidence of actual pre-critical date access of the ISDU reference. Petitioner does not rely on first-hand knowledge of the system on which ISDU was allegedly published ("IRis"). Instead, the evidence Petitioner submits in support of its position that ISDU is a printed publication is limited to (1) ISDU itself; (2) two unauthenticated documents that generically describe the

IRis system, namely an undated brochure entitled "IRis: Digital Scholarship, Publishing, and Preservation at Northeastern University" ("IRis Brochure"), and a presentation titled "Iris at Northeastern University: Why, What, How" ("IRis PowerPoint"); and (3) its technical expert's declaration, purportedly offering opinions regarding ISDU's public accessibility by quoting the IRis Brochure and PowerPoint.[2] None of this evidence, alone or collectively, satisfies Petitioner's burden.

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[2] Since the Institution Decision, Petitioner has tried to expand the record to no avail. First, as noted above, Petitioner served Exhibit 1024 as supplemental evidence under 37 C.F.R. § 42.64(b)(2) in response to Intirion's evidentiary objections. The Practice Guide makes clear, supplemental evidence "is filed only in support of an opposition to a motion to exclude." Practice Guide at 79; 37 C.F.R. § 42.64. Moreover, as Intirion stated in its objections, Exhibit 1024 is inadmissible itself as an unauthenticated hearsay document where the declarant admitted a lack of personal knowledge. Paper 16.

Second, Petitioner moved to apply for a subpoena to compel testimony related to Exhibit 1024, which Intirion opposed. Papers 17-18. The Board has not yet ruled on that motion. Intirion reserves the right to respond to any evidence Petitioner is authorized to introduce into the record.

First, ISDU itself does not establish when the reference became publicly accessible. Petitioner points to the date "April 17, 2007," listed on ISDU along with an "IRis" stamp to argue that "ISDU was published and publicly available in Northeastern University's digital archive in 2007." Petition at 20. However, the relevant date is not the date listed on a document, but "[t]he date on which the public actually gained access to the invention by means of the publication." *In re Bayer*, 568 F.2d 1357, 1361 (C.C.P.A. 1978). Petitioner has put forward no evidence to show when ISDU was actually made publicly accessible.

In fact, ISDU itself suggests that April 17, 2007, was the date the paper was submitted for a class. ISDU is a student paper submitted as a capstone final, and the testing for the paper was set to conclude in early April 2007. Ex. 1012 at 33. This is reinforced by ISDU's conclusion: "We had set an ambitious goal of completing our integration by spring break of classes to ensure ample time for testing and completing our final report, as well as compiling our final presentation and as we reported to our advisor, we were able to meet that deadline." *Id.* at 27. Thus, April

17, 2007, appears to be a paper submission date—it does not purport to be a date when the document became publicly accessible.[3]

As the Board recognized in its Institution Decision, "it is unclear what the April 17, 2007, date, either on the cover page or the title page, is intended to reflect, i.e., a publication date, a project or paper submission date, or otherwise." Paper 10 at 43. Even the fact that ISDU's cover page states that "[t]his work is available open access, hosted by Northeastern University" is unhelpful, as Petitioner has put forward no admissible evidence from anyone with first-hand knowledge regarding what that means. *See Medivis, Inc. v. Novarad Corp.*, IPR2023-00042, Paper 35 at 27 (PTAB Mar. 6, 2024) (concluding petitioner failed to show publicly accessibility despite the reference stating it was "[a]vailable online," because "any reference can state it was published without actually being published" and there was no indication the reference was "made available to the extent that persons interested and ordinarily skilled in the subject matter or art[,] exercising reasonable diligence, can locate it"); *Adama A.gan Ltd.*, PGR2022-00057, Paper 9, at 31-32 (PTAB Feb. 13, 2023) (dissertation labeled with "date.available" stamp was insufficient evidence of public

[3] The 2007 "Recommended Citation" date on the cover is likewise irrelevant, as that merely reflects the date the paper was written. It does not speak to if and when the paper became publicly accessible.

accessibility "[w]ithout any additional evidence … about what this electronic record means in terms of the public accessibility of the reference for persons interested and ordinarily skilled in the subject matter or art").

Just as the Board concluded in *In-Depth Geophysical*, Petitioner's petition should be denied as to ISDU because it made no attempt to explain "what this date represents" such as whether it was "the date of submission, acceptance for publication, or publication," and ISDU itself has no indicia such as express publication dates, journal numbers, or other markers that would indicate public availability. *In-Depth Geophysical, Inc.*, IPR2019-00849, Paper 14, at 9-10 (PTAB Sept. 6, 2019) (informative). The Board has repeatedly rejected similar evidence. *See, e.g.*, *EMC Corp. v. Acqis*, IPR2014-01469, Paper 56, at 16-20 (PTAB Mar. 8, 2016) (finding paper was not a printed publication where the date "submitted" only showed when it was "submitted to the CERN/LHCC committee, not necessarily when it was available in the CERN Library"); *Apple Inc. v. DSS Tech, Mgmt., Inc.*, IPR2015-00373, Paper 12, at 6 (PTAB Aug. 12, 2015) (rejecting thesis as a printed publication where the library stamp date was "evidence only of when [it] was archived," which "cannot establish when, if ever, [the thesis] became publicly available").

Petitioner's contention that April 17, 2007, is ISDU's public accessibility date is undermined by its recent arguments. In its untimely motion for a subpoena to seek

discovery from Northeastern University, Petitioner argued that "ISDU was publicly available no later than November 2013," over five years later. Paper 17 at 2. Petitioner's shifting dates confirm its arguments about public accessibility are merely speculation. *See Unified Patents, LLC v. 2BCom, LLC*, IPR2020-0096, Paper 58 at 19-23 (PTAB Nov. 30, 2021) (finding public availability evidence insufficient given "numerous flaws or gaps," including the petitioner's "inconsistent statements and evidence" about the alleged availability date, even where each date was before the critical date); *Dropbox, Inc. v. Synchronoss Techs., Inc.*, IPR2016-00851, Paper 40 at 21 & n.8 (PTAB Oct. 5, 2017) (excluding untimely supplemental evidence and stating that, even if considered, "such evidence only adds support" to the Board's finding that the reference was not published in the way "represented in the Petition").

Petitioner's reliance on generic information about Northeastern University's old system, IRis, does not fill in the gaps. Petitioner points to an undated IRis Brochure and an IRis PowerPoint (Ex. 1002, App'xs B & D), both of which are unauthenticated under Federal Rules of Evidence 901-902 and are inadmissible hearsay under Rule 802. *See TRW Automotive U.S. LLC v. Magna Electronics Inc.*, IPR201401348 Paper 25 at 12 (PTAB Jan. 15, 2016) (excluding alleged prior art publication because petitioner did not sufficient authenticate it); *cf. ServiceNow, Inc. v. Hewlett-Packard Co.*, IPR2015-00707, Paper 14, at 9-10 (PTAB Nov. 2, 2015)

(giving little weight to hearsay in determining public accessibility). Petitioner's expert attaches these documents to his declaration, but he has no personal knowledge to authenticate them—nor does he try to.

Even if the Board considers these exhibits, they provide no information as to when, if ever, ISDU became publicly accessible. Neither the IRis Brochure nor the IRis PowerPoint mention ISDU. Instead, Petitioner argues that because these documents suggest that portions of the IRis system had the *option* of being indexed, ISDU was publicly available. Yet Petitioner has provided no evidence that ISDU was indexed. Further, "[t]he test for public accessibility is not 'has the reference been indexed?'…the 'ultimate question is whether the reference was 'available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.'" *Acceleration Bay*, 908 F.3d 765 at 774.

Here, Petitioner has failed to submit any evidence of what, if any, information about ISDU was indexed, or how that would make ISDU discoverable by those of skill in the art. Indeed, the IRis PowerPoint shows that indexing information (metadata) may be input by the individual that uploads the paper to IRis—including title. Ex. 1002, App'x B, at 277. That metadata may later be edited. *Id.* at 288. The presentation also stated others would have been responsible for any migration, which would include the later transition to the current "Digital Repository Service."

Petitioner provided no information on whether, how, or when that metadata was input. For example, if ISDU was input with the title "ISDU," the publication date would be irrelevant—ISDU could not be reasonably found and would be inaccessible to one of ordinary skill in the art. *See Acceleration Bay*, 908 F.3d 765 at 774 (affirming that although a reference was indexed by author and year, it was not meaningfully indexed such that an interested artisan could find it); *In re Cronyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989) (same).

As the IRis PowerPoint demonstrates, IRis papers could be submitted in a way where the submission was kept confidential. Ex. 1002 at 237 (noting "not published" information), 238 (noting "fairly restrictive access to preprints"), 240 (noting access restrictions), 260 (same). IRis papers could also be limited to certain communities. Ex. 2001, ¶ 93. In other words, uploading a paper to IRis did not necessarily make it accessible by the public. It is certainly possible that ISDU was a student paper that was uploaded to IRis but limited to the engineering department, such that the capstone professor made it available to other students as an example in later years. *Id.*, ¶ 95. *See Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1372 (Fed. Cir. 2019) ("[A] work is not publicly accessible if the only people who know how to find it are the ones who created it.").

Petitioner's expert declaration fares no better. Dr. Horenstein merely parrots information from a Google search, including the IRis Brochure and IRis PowerPoint.

Ex. 1002, ¶ 98. His declaration is not made with first-hand knowledge. Dr. Horenstein is not a custodian of the ISDU reference and is instead utilizing documents he apparently found in 2023 to try to reconstruct the availability of ISDU. The Board in *Sophos*, IPR2023-00732, Paper 23, at 5, similarly dismissed an expert's declaration where the expert had no personal knowledge of a reference's first publication and instead relied "on nothing more than speculation." Dr. Horenstein's attempt to opine on IRis practices is unavailing because neither he nor Petitioner point to any evidence that he has "the sort of specialized knowledge of [Northeastern University's IRis system] procedures that would enable him to provide expert testimony regarding the public accessibility of [ISDU]." *DSS Tech. Mgmt*., IPR2015-00373, Paper 12, at 6. Likewise, Dr. Horenstein's belief (stated for the first time in his deposition) that all capstone papers must be published is untimely and, moreover, incorrect. Ex. 2002, 111:22-112:12; Ex. 2001, ¶¶96-97. The ABET accreditation guidelines Dr. Horenstein referenced do not contain this requirement. Ex. 2001, ¶98.

Collectively, Petitioner's purported evidence "amounts to little more than a bare allegation" that ISDU was published on April 17, 2007. *In-Depth Geophysical*, IPR2019-00849, Paper 14 at 9-10, 13 *Adama Agan Ltd.*, PGR2022-00057, Paper 9, at 31-32. The Board recognized in its Institution Decision that Petitioner failed to put forward "corroborating testimony from a person with first-hand knowledge as to

how, or when, papers were catalogued, indexed, or by what search methods, and by whom, they could be found and accessed within IRis." Paper 10 at 43. This failing remains. Because Petitioner falls short of its burden to show that ISDU qualifies as a prior art printed publication, Petitioner has not shown that it is more likely than not that it would prevail in its prior art challenges outlined in Grounds 1 and 5-8.

V. GROUNDS 1-8: PETITIONER FAILS TO DEMONSTRATE OBVIOUSNESS OF THE CLAIMED COMBINATION APPLIANCES.

Petitioner argues in Grounds 1-8 that the '745 Patent is obvious over a series of convoluted, and sparsely described, combinations. A patent is unpatentable as obvious under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter would have been obvious to a POSITA at the time of the effective filing date. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). A showing of obviousness requires: (1) that the prior art teach or suggest each claim limitation; (2) that there is a motivation to combine or modify the prior art in the way Petitioners propose; and (3) that a POSITA would have a reasonable expectation of success in the proposed combination or modification. *Id.*; *Graham v. John Deere Co*., 383 U.S. 1, 17–18 (1966); *Pfizer, Inc. v. Apotex, Inc*., 480 F.3d 1348, 1361 (Fed. Cir. 2007); *Regents of Univ. of California v. Broad Institute, Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018). Petitioner has failed to demonstrate that the alleged prior art (even if accepted as prior art) teaches or suggests each claim limitation.

Petitioner's proposed modifications would conflict with the references' design goals in other ways as well. In a hindsight-driven attempt to create a structure that a POSITA would not have created, the Petition proposes modifications that would violate explicit design requirements of the references and contravene both the references' and the '745 Patent's teachings. For these reasons, Petitioner has not shown any challenged claim was prima facie obvious. Moreover, strong evidence of objective indicia further undercuts the Petition's assertions. The Board should find that Petitioner has not shown any challenged claim of the '745 Patent to be unpatentable.

VI. GROUND 1: THE PETITION DOES NOT SHOW THAT EMMA AND ISDU RENDER OBVIOUS ANY CLAIMS.

As described above, Petitioner has not met—and cannot meet—its burden to show that ISDU qualifies as prior art, as there is no evidence of public accessibility before the critical date. Petitioner has also failed to demonstrate that combining Emma and ISDU would teach each limitation of the '745 Patent's challenged claims, that there was a motivation to combine the references, or that the combination was enabled.

A. Emma and ISDU Fail to Disclose all Elements of Independent Claims 1, 15, and 24.

Petitioner has not met its burden to show that the combination of Emma and ISDU teaches each and every claim element, including the four elements detailed below.

i. "Withhold and deliver electrical power."

Claims 1, 15, and 24 require the control circuit be operative to cause power to be available to the refrigerator when the microwave does not draw power. *E.g.*, Ex. 1001, Claim 1 ("the at least one power control circuit is operative to cause...*electrical power to be delivered to the refrigerator when the magnetron does not draw cooking power*"). Petitioner's full allegation that this element is met by Emma (ISDU is not asserted against this limitation) is provided below:

> Conversely, Emma discloses the microprocessor may enable power to the compressor and refrigerator when the microwave is not in use. Ex. 1002 ¶¶[203-06, 289]; Ex. 1023 ¶[65].

Petition at 46.

Petitioner's citations to Exhibits 1002 and 1023[4] do not support this allegation. Ex. 1002 is the Expert Declaration of Mark Horenstein from petitions for *inter partes* review on related patents, *not* the '745 Patent. This declaration

[4] Notably, the citation to ¶[65] of Exhibit 1023 is simply a cross-reference to ¶[283] of Exhibit 1002.

should not be considered as to any of Petitioner's grounds because Dr. Horenstein is not analyzing the claims at issue in this proceeding. Exhibit 1023, in turn, is Dr. Horenstein's "supplemental" declaration for this proceeding. However, paragraph 65 of Exhibit 1023 is not discussing Emma, but only discusses Dr. Horenstein's prior declaration. Petitioner's citations to Ex. 1002 contain pages of argument regarding how Emma might meet the second half of this claim limitation—enabling power to the electrical connector when the magnetron does not draw cooking power—that *do not appear in the Petition*. The Board should disregard these improperly incorporated arguments as an improper attempt to exceed the word count limit. *Freedom to Operate, Inc.*, PGR2022-0012, Paper No. 18 at 20-21 (PTAB May 3, 2022) (refusing to consider arguments and "other reasons" that were improperly incorporated by reference in an expert witness declaration).

ii. "Smoke sensor."

The combination of Emma and ISDU does not disclose a smoke sensor in operative connection with the cooking area and control circuit as described in independent claims 1, 15, and 24. Claims 1 and 24 require:

> *wherein the microwave oven includes a smoke sensor,*
>
> *wherein the smoke sensor is positioned in operative connection with a cooking area inside the microwave oven,*
>
> *is in operative connection with the at least one power control circuit,*

Ex. 1001, Claims 1, 24. Claim 15 has similar limitations. *Id.*, Claim 15.

The smoke detector in ISDU is not located in operative connection with a cooking area inside the microwave oven. Ex. 2001, ¶¶102-103. Instead, ISDU teaches a smoke detector wherein a portion of the smoke detector (including the sensitivity adjustment) is located *outside of* the microwave. Ex. 1012 at 23; Ex. 2001, ¶103. ISDU's Figure 4 plainly shows the "smoke detector" outside of the "interior microwave compartment." Ex. 1012 at 23; Ex. 2001, ¶103. Even the pictured "vent fan" is not within the microwave compartment, but in a "secondary housing." Ex. 1012 at 11, 23; Ex. 2001, ¶103. In other words, the microwave of ISDU does not include a smoke sensor "in operative connection with a cooking area *inside* the microwave oven." Ex. 1001, Claims 1, 24 (Emphasis added.) At best, the smoke detector is in operative connection with the secondary housing containing the vent fan.

Contrary to Petitioner's arguments, it also would not have been obvious or obvious to try placing ISDU's smoke detector inside the microwave oven. Ex. 2001, ¶¶ 104-105. Nor are there a "finite" number of identified, predictable solutions as Petitioner professes leading to a reasonable expectation of success. Ex. 2001, ¶ 109. ISDU specifically teaches against doing so because of its warnings of the dangers of false alarms: "[i]t is known that cooking foods that include oils and sugars generate more non-threatening smoke than other foods and would trigger a standard detection device…." Ex. 1012 at 3, 7-8 ("Another concern inherent in the design of this

system is the propensity of the smoke detector towards false alarms."). The likelihood of such false alarms would be even greater if the smoke detector were placed inside the microwave oven. Ex. 2001, ¶106. Likewise, ISDU teaches a "photoelectric smoke detector," which ISDU teaches are "more prone to isolated particulate triggering." Ex. 1012 at 11, 15. A POSITA would not be motivated to use the ISDU smoke detector in operative connection with the inside of a microwave oven because the ever-present particles in a microwave would constantly trigger false alarms based on ISDU's description. Ex. 2001, ¶¶107-108.

iii. "Shut-down function."

Petitioner also fails to show the "shut-down function" element of claims 1, 15, and 24:

Claim 1:

wherein responsive at least in part to a level of smoke sensed by the smoke sensor, the at least one power control circuit is operative to cause cooking power to the magnetron to be withdrawn <u>to end a current cooking session prior to a set end time of the current cooking session</u>,

Claim 15:

wherein the smoke sensor is in operative connection with the at least one electrical power control circuit, and wherein the at least one electrical power control circuit is configured to cause cooking power <u>to be withdrawn from a magnetron of the microwave</u> <u>oven prior to a set end time of a current cooking session</u> responsive at least in part to the smoke sensor sensing an amount of smoke,

Claim 24:

> *wherein responsive at least in part to a level of smoke sensed by the smoke sensor, the at least one power control circuit is operative to cause cooking power to the magnetron to be withdrawn <u>to end a current cooking session prior to a set end time of the current cooking session</u>.*

Ex. 1001 at claims 1, 15, 24 (emphasis added).

Petitioner argues in Ground 1 that ISDU alone meets this claim element. However, ISDU does not disclose a power control circuit operative to cause cooking power to the magnetron to be withdrawn. Ex. 2001, ¶¶ 111-112. Rather, ISDU teaches microwave operations are "temporarily disabled" and the "cessation" of magnetron operation. Ex. 1012 at 1, 8, 24. *Id.* at 24. But ISDU teach that the cooking power is withdrawn "prior to a set end time," as the claims require. Ex. 2001, ¶¶112-113. Under ISDU's teaching, the system may just pause the current cooking system instead of withdrawing power before the set end time. *Id.*

iv. "Reset enable function."

Petitioner further has not shown that the combination of Emma and ISDU discloses the "reset enable function" found in each independent claim.

> *Claim 1:*
>
> *wherein after the current cooking session has been caused to end prior to the set end time based on the sensed level of smoke, the at least one power control circuit is operative thereafter to enable the magnetron to receive cooking power in a next subsequent cooking session,*
>
> *Claim 15:*
>
> *wherein the at least one electrical power control circuit is configured such that after ending the current cooking session prior to the set end*

> *time due to sensing the amount of smoke, to enable cooking power to again be available to the magnetron in a next subsequent cooking session,*
>
> *Claim 24:*
>
> *wherein after the current cooking session has been caused to end prior to the set end time based on the sensed level of smoke, the at least one control circuit is operative thereafter to enable the magnetron to receive cooking power in a next subsequent cooking session.*

Ex. 1001 at claims 1, 15, 24.

Petitioner again relies in Ground 1 on ISDU for the "reset enable function." However, ISDU is inapt. First, the cited portions demonstrate that ISDU teaches "reset[ting] the *smoke detector circuit* for further use." Ex. 1012 at 8-9 (emphasis added). ISDU does not teach the *claimed control circuit* being operative to enable the magnetron to receive cooking power in a next subsequent cooking session.[5] Ex. 2001, ¶116.

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[5] As with the "smoke sensor" claim element, Petitioner does not allege that ISDU teaches the claimed control circuit. Instead, the Petition points only to Emma for claimed control circuit. However, Petitioner has again failed to allege that the control circuit of Emma is used to meet this claim element. *See* Petition at 56-59 ("reset-enable" limitations); 68-72 (describing alleged combination). Thus, Ground 1 fails.

Petitioner's citation to *pages* of Exhibits 1002 and 1023—including Mark Horenstein's declaration for a separate petition for *inter partes* review on patents not at issue here—*cannot* be the basis for Petitioner's argument that ISDU meets this limitation. *Freedom to Operate, Inc.*, No. PGR2022-0012, Paper No. 18 at 20-21. Finally, as described below, ISDU's purported "reset function" did not work and cannot enable this claim limitation. *See* Section VI(C).

Because Petitioner has not demonstrated combining Emma and ISDU rendered any independent claims of the '745 Patent obvious, Petitioner has not proven the dependent claims 13, 20, 22, and 25 are obvious.

B. Petitioner Fails to Establish Any Motivation to Combine Emma and ISDU or a Reasonable Expectation of Success.

Petitioner has failed to show a motivation to combine. Although ISDU was an undergraduate paper that never functioned (*see* Section VI(C)), Petitioner asserts a POSITA would have been motivated to combine ISDU with Emma. Ex. 2001, ¶¶ 118-129. But a POSITA would not be motivated to combine a non-functional student paper focused on smoke sensors and microwaves with Emma. *Id.*, ¶ 123. Emma does not mention smoke sensors *at all*. *See generally* Ex. 1011. Nor does Emma contain a single reference to smoke or fire. *Id.* To the extent Emma mentions sensors, it focuses on entirely different sensors monitoring current to the claimed combination appliances. *E.g.*, Ex. 1011, ¶[0029].

Petitioner's only link in its alleged motivation to combine ISDU and Emma is that both are concerned with microwave safety. Petition at 68-69. Petitioner ignores, however, that Emma is directed to preventing current overload conditions, not related to the problem of smoke and fires in microwaves. *See generally* Ex. 1011, ¶¶ [0003]-[0007]. Petitioner's "motivation to combine" is no more than an improper attempt to reconstruct the claimed invention of the '745 Patent through hindsight Patent itself as a template. *See Sensonics Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1996) ("The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made."). A POSITA would not have been motivated to combine Emma with ISDU.

Petitioner argues there is motivation to combine by alleging that all the references, including ISDU, are analogous as they "pertain[] to the field of electrical cooking appliances and/or relate[] to powering electrical appliances." Ex. 1023, [38]. A POSITA would not simply look generally to cooking appliances to arrive at the inventions claimed in the '745 Patent. Ex. 2001, ¶ 121. A POSITA would have no reason to modify Emma to add a smoke sensor to its microwave by looking to ISDU. To the contrary, ISDU teaches a smoke sensor outside of the microwave and teaches against adding a smoke sensor inside a microwave. Ex. 2001, ¶ 124; Ex. 1012 at 3, 7-8 ("Another concern inherent in the design of this system is the

propensity of the smoke detector towards false alarms."). ISDU also teaches a "photoelectric smoke detector," which ISDU recognizes are "more prone to isolated particulate triggering." Ex. 1012 at 11, 15. Based on ISDU's own teaching, a POSITA would be discouraged from using ISDU's smoke detector in operative connection with the inside of a microwave oven because the ever-present particles in a microwave would trigger false alarms. Ex. 2001, ¶¶124-125. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc*., 567 F.3d 1314, 1326 (Fed. Cir. 2009) ("An inference of nonobviousness is especially strong where the prior art's teachings undermine the very reason being proffered as to why a [POSITA] would have combined the known elements.").

Additionally, the ISDU smoke detector is "powered by the integrated low-voltage power supply." Ex. 1012 at 9, 12. The detector requires a continuous power draw, which would cause it to exceed the stand-by draw maximum set by the standards. Ex. 2001, ¶ 126. A POSITA would have understood ISDU's smoke sensor was non-functional and not properly added to a microwave. *Id.*

Petitioner has the burden of showing a reasonable expectation of success. *See Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd*., 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) ("It was [Petitioner]'s burden to demonstrate both 'that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have

had a reasonable expectation of success in doing so.'"); *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1379 (Fed. Cir. 2015). Petitioner fails to meaningfully establish an expectation of success in combining Emma and ISDU. Petition at 76-81. The closest Petitioner comes to attempting to meet its burden is stating:

> Based on ISDU's teaching and/or the motivation to have the smoke sensor be optimally positioned in a location where it could detect generated smoke close to its source, a POSITA would have placed, or at least tried to place, the smoke detection sensor in operative connection with the cooking area of the microwave oven; otherwise, the sensor would not function as intended. Ex. 1023 ¶[109]. The POSITA would have had a reasonable expectation of success in detecting smoke more quickly compared to attempting to detect smoke using a smoke detector positioned further away from the cooking area. *Id*.

Petition at 70. This paragraph is directed just to the placement of the smoke sensor in operative connection with the microwave oven and does not demonstrate how or why Emma and ISDU could successfully be combined. *See Unified Patents LLC v. Divx LLC*, IPR2019-01379, Paper 52, at *36–37 (PTAB Feb. 8, 2021) ("Although proof of physical or bodily incorporation is not required, a satisfactory explanation of 'how the combination of the...references [is] supposed to work' is necessary to support [a conclusion of obviousness]."). Petitioner has no explanation as to how the combination is "supposed to work."

ISDU's teachings undercut any reasonable expectation of success. ISDU did not function. *See* Section VI(C). A POSITA reading its disclosure would not expect

combining ISDU with Emma would somehow be successful, when ISDU itself was not. Ex. 2001, ¶127. Additionally, ISDU cautions against false alarms, undercutting the argument that a POSITA would reasonably expect to be success by modifying ISDU to place the smoke sensor in operative connection with the inside of the microwave oven, let alone combining it with the other elements of Emma. *Id.*, ¶ 128. *See, e.g.*, *Teva Pharmas. USA, Inc. v. Corcept Therapeutics, Inc.*, PGR2019-00048, Paper 51 at 43-44 (PTAB Nov. 18, 2020) (holding that "where the chance of failure is equal to the chance of success or where the prior art supports at best a cautious optimism that a particular course of action will work," the party bearing the burden of proof may not have met its burden).[6]

Petitioner has not demonstrated that a POSITA would be motivated to combine Emma and ISDU, nor that a POSITA would have a reasonable expectation of success in doing so.

C. ISDU Does Not Enable the Claim Elements for which Petitioner Utilizes ISDU.

In addition to not being prior art and failing to teach all required elements of the independent claims, SDU did not function. Ex. 2001, ¶ 129. On its face, ISDU purports to be a student paper, with the goal of completion by "spring break." Ex.

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[6] For these same reasons, modifying ISDU to add the microwave-refrigerator combination in Emma does not render the Claims obvious.

1012 at 27. Despite the students' efforts, ISDU encountered "implementation issues," and the students did not produce a working model. *Id.* at 25-26. Indeed, the students experienced forced resets of the magnetron, and their attempts to fix the issues resulted in "disable[ment of] our reset function." *Id.* at 26.

While prior art need not be self-enabling, when it is not, that prior art has more narrow utility in an obviousness analysis. "For example, a reference that does not provide an enabling disclosure for a particular claim limitation may nonetheless furnish the motivation to combine, and be combined with, another reference *in which that limitation is enabled*." *Raytheon Techs. Corp. v. General Elec. Co.*, 993 F.3d 1374 (Fed. Cir. 2021) (emphasis added). "In this context the reference must necessarily enable the relied-upon portion of its own disclosure—the same standard applied to anticipatory references." *Id.* (citing *In re Antor Media Corp.*, 689 F.3d 1282, 1290 (Fed. Cir. 2012).

Ground 1 relies solely on ISDU to disclose the "smoke sensor", "shut-down function", and "reset enable function". (Petition at 46-47, 52-53, 56). Yet the "shut-down function" and "reset enable function" are *precisely* what ISDU's student writers indicated did not work. Ex. 1012 at 26. Because ISDU does not enable these

limitations—found in each independent claim here—and Petitioner provides no other basis for those limitations, Ground 1 fails.[7]

VII. GROUND 2: EMMA AND SMITH.

Emma and Smith do not render the challenged Claims obvious under §103. Petitioner has failed to demonstrate the Emma and Smith combination would teach each claim limitation of the challenged claims of the '745 Patent, and failed to meet its burden to demonstrate a motivation to combine Emma and Smith. *See* Ex. 2001, ¶¶ 130-168.

A. Petitioner Fails to Demonstrate the Claimed Apparatuses Are Obvious and Any Motivation to Combine

i. "Smoke sensor."

The combination of Emma and Smith does not disclose a smoke sensor, let alone a smoke sensor in operative connection with the cooking area and the control circuit as described in independent claims 1, 15, and 24. *Id.*, ¶ 131.

Petitioner does not meet its burden to show Smith teaches the claimed smoke sensor. Both parties agree Smith does not explicitly disclose a "smoke sensor." As Petitioner concedes, Smith discloses only gas sensor 52, which is specifically described as being responsive to "water vapor and other gases"—i.e., it is a humidity

[7] Petitioner did not show obviousness for independent claims 1, 15, and 24, and thus also did not demonstrate invalidity for dependent claims 13, 20, 22, and 25.

sensor. *See* Petition at 47-48; Ex. 1014, 1:32-50, 3:15-16; Ex. 2001, ¶ 134. This is consistent with Smith's description that the disclosed sensor is normally used for "automatic cooking." Ex. 2001, ¶ 135. Indeed, cooking sensors used at that time for automatic cooking were humidity sensors. *See, e.g.*, Ex. 1002 at 93-94, 100 (describing use of vapor/humidity sensors in automatic cooking), at 139 (arguing Ueda and Smith "use the same" sensor); Ex. 2001, ¶ 135. Smith itself lists "U.S. Pat. No. 4,133,995 to Buck" as an example of these sensors normally used for automatic cooking, and states "[i]n the Buck arrangement a humidity sensor and temperature sensor are employed to monitor the relative humidity and temperature in the cavity." Ex. 1014, 1:31-52. Smith then describes how it uses this typical sensor used for automatic cooking—the humidity sensor—without the need for the temperature sensor of Buck. *Id.* Smith repeatedly describes how it is detecting the cooking food "drying out," and attempting to detect the transition from the "drying out phase" into the "pre-combustion phase." *Id.*; Ex. 2001, ¶ 136. In addition, the simplified temperature curve shown in Smith's Figure 3 is consistent with a humidity sensor's resistance during a cooking cycle at that time. Ex. 2001, ¶ 137. Smith is therefore disclosing a humidity sensor, not a smoke sensor.

Smith's reference to "gas" is not anymore helpful and does not change the humidity sensor into a smoke sensor. Ex. 2001, ¶ 137. While some gas sensors may be designed to detect specific volatile organic compounds ("VOCs") associated with

smoke, the vast majority are not smoke sensors. And Smith's sensor is not a VOC sensor at all. *Id.* ¶¶ 138-140; Ex. 1014, 3:3-21. Regardless, not all VOC sensors are smoke sensors. Ex. 2001, ¶ 140. Accordingly, neither a gas sensor nor a VOC sensor is inherently a smoke sensor. In other words, even if Smith's sensor were a VOC sensor, it is not a smoke sensor. Ex. 2001, ¶ 141; Ex. 1001, 14:8-10.[8]

Understanding this failure, Petitioner does not address Smith's disclosure or identified Figaro Model No. 186 sensor, instead improperly relying on a different Figaro Model No. 816 sensor ("TGS-816"). Ex. 2001, ¶ 142. Petitioner grasps at straws claiming Smith's reference to a Figaro Model No. 186 sensor is a "typographical error," relying on Dr. Horenstein, whose opinion that the Model 186 did not exist relies merely on a "Google" search. Petition at 48, n.7; Ex. 2002, 118:10-119:11. He did not attempt to contact anyone at Figaro or do any other investigation. *Id.* Instead, Dr. Horenstein testified he found an (unproduced) list showing some unknown sensors from some unknown date, and selected the 816. *Id.* However, the Figaro Model No. 816 sensor is not disclosed anywhere in the prosecution or related patents. Ex. 1014; Ex. 2001, ¶ 144. And there is no indication

[8] The Board and Petitioner may not rely on the '745 Patent's specification as a basis to interpret Smith's teaching nor as a basis to read in non-existent teachings. *Sensonics Inc.*, 81 F.3d at 1570.

of Model "186" being a typo, especially because "186" was used consistently throughout prosecution and in other patents to "Smith." *Id.*; Ex. 1014 at 3:15-16, 4:16, 5:58.

In addition to citing nothing in Smith, the prosecution history, or any related patents supporting that "Model TGS No. 186" was a typographical error, Petitioner does not show the separate "816" was even available by July 7, 1983, and has not shown this ***could*** have been a typographical error.[9] Instead, Petitioner relies on a conclusory declaration referring to a "TGS-816" document dated nearly 20 years later—September 1999. Petition at 47-48; Ex 1002 at 219; Ex. 2002, 121:5-122:5; Ex. 2001, ¶ 144.

Petitioner cannot read in TGS-816—a separate sensor—into Smith.[10]

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[9] After noting this failure in the preliminary response, Patent Owner served objections on these grounds. Petitioner did not offer any supplemental discovery.

[10] Petitioner's only "support" is its citation to Exhibits 1002 and 1023, which are Dr. Horenstein Declaration submitted with an *inter partes* review petition and the supplemental report submitted here. The Board should disregard Ex. 1002. *Freedom to Operate, Inc*, No. PGR2022-0012, Paper No. 18 at 20-21 (refusing to consider arguments and "other reasons" improperly incorporated by reference in an expert witness declaration).

The TGS-816 is also inconsistent with Smith's teachings. Dr. Horenstein argues the TGS-816 measures VOCs and Carbon Monoxide.[11] Ex. 1002, ¶ 159. Smith only notes its humidity sensor is capable of sensing water vapor and "various organic gases." Ex. 1014, 3:16-17. There is no reference in Smith to "VOCs." *See generally* Ex. 1014. Further, Carbon Monoxide is an inorganic chemical compound—not an organic gas. Ex. 2001, ¶ 146. This undercuts any idea that Smith was referring to the TGS-816. *Id.*, ¶ 147.

Smith is clearly not referencing the TGS-816 also because it is not a "humidity sensor." Dr. Horenstein acknowledges the TGS-816 sensor is targeted toward "Methane," "Butane," and "Propane" and "other combustible gases." Ex. 1002, ¶160; *id.* at fn11 (citing websites). Not included is water vapor—what the sensor in Smith must measure—which is not a "combustible gas." Ex. 2002, 127:12-14; Ex. 2001, ¶ 147. The TGS-816's reference dependency graph confirms it is ***not*** intended to be a humidity sensor. *Id.*, ¶ 148. Instead, the TGS-816's accurate detection of methane depends on constant temperature and humidity. *Id*. Put simply, Smith

[11] The TGS-816 documents do not state they can measure "Carbon Monoxide" nor do they state it can measure "VOCs" generally. See Ex. 1002, App'x B. This conclusory assertion by Dr. Horenstein is not supported by any documentation, and a POSITA would not have understood such at the relevant time. Ex. 2001, ¶ 144.

discloses using a humidity sensor ***not*** the TGS-816 or any other "combustible gas sensor." *Id.*, ¶ 149. Thus, Petitioner does not show Smith discloses a smoke sensor. *Id.*, ¶ 150.

ii. "Shut-down function."

Ground 2 further fails because Petitioner does not demonstrate that either Emma or Smith teach withdrawing power from a magnetron prior to a set end time, required by all independent claims. Ex. 2001, ¶ 154. Petitioner describes this function as the "Shut-down function." *See* Petition, Appendix A. However, in the "Shut-Down Element" Petitioner does not mention Emma at all, and does not mention "a set end time" or "removing power prior to the set end time," let alone doing so "responsive at least in part to a level of smoke sensed by the smoke sensor," as the claims require. Petition at 53-54. Thus, Petitioner must be relying solely on Smith. However, as the Board recognized, Smith does not explicitly disclose these elements. Institution Decision at 31. It would not have been reasonably clear to a POSITA that there was any set end time, nor that power is removed to end a current cooking session prior to the cooking session's set end time. Ex. 2001, ¶ 154. For example, Smith discusses automatic cooking, meaning the system may not have any "time," or may change the current time to the time of completion, as taught by Ueda. *Id.*, ¶ 155. Regardless, even if there was a teaching of setting an end time, there is no teaching or suggestion that the current cooking session is ended prior to the set

end time—and is wholly silent as to what happens next. *Id.*, ¶ 156; *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1297 (Fed. Cir. 2002) ("Inherency does not embrace probabilities or possibilities."). Petitioner has failed to meet its burden on this critical element.[12]

iii. "Reset enable function."

Petitioner's Ground 2 also fails because neither Emma nor Smith teach the element of enablement to receive cooking power, a next subsequent cooking session, let alone enabling a "magnetron to receive cooking power in a next subsequent cooking session," as the claims require. Ex. 2001, ¶ 157. Petitioner argues this limitation falls under the "reset enable function." Petition at App'x A. Petitioner does not allege Emma teaches this element. Petition at 56-59. Likewise, Petitioner does not meaningfully argue Smith discloses this element. *Id.* at 59-60. Smith does not mention a reset or enabling power in a subsequent session after a current cooking

[12] Petitioner also failed to allege or support that Emma's control circuit (the alleged claimed control circuit) is what "is operative to cause cooking power to the magnetron to be withdrawn."

session has been caused to end based on sensing smoke, nor how such would be completed. Ex. 2001, ¶ 157.

Petitioner's limited allegation is a citation to Smith about a signal being provided to cause a relay to open and withdraw power, and an unsupported conclusion that "disclosed power control relays are electronically controlled to open or shut by microcontroller 64." Petition at 59. Petitioner acknowledges Smith does not teach shutting the relay to re-energize the magnetron. *Id.* There is also no teaching that this is done to enable cooking power in a subsequent cooking session after removing cooking power upon sensing a dangerous condition. Ex. 2001, ¶ 157. Thus, just as Dr. Horenstein's testimony shows, Smith does not teach or disclose the "reset enable feature." Ex. 2002, 128:3-12 ("Q But there is no disclosure of a reset relay in Smith, correct? A That's correct."); Ex. 2001, ¶ 159.

Similarly, Petitioner has failed to allege or support that the control circuit of Emma would be operative to re-enable the magnetron to receive cooking power after removing cooking power upon sensing a dangerous condition. Ex. 2001, ¶ 164 A POSITA would not understand Emma and Smith discloses such. *Id*.

Petitioner cannot create missing elements out of thin air. Nonetheless, despite Ground 2 being based on Emma and Smith, Petitioner attempts to improperly fill in missing claim limitations in the combination with the knowledge of a POSITA. *E.g.*, Petition at 72-73 (arguing a POSITA would have added the "Reset Enable

Function.") This is improper and should not be considered. *See Tct Commc'n Tech. Holdings Ltd. v. Dataquill Ltd.*, IPR2020-00746, 2020 WL 5592711, at *10 (PTAB Sept. 18, 2020); *Fellowes, Inc. v. Treefrog Devs., Inc.*, IPR2020-01623, 2021 WL 1287222, at *5 (PTAB Apr. 6, 2021); *In re Leonard R. Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning"); *see also Eizo Corp. v. Barco N.V.*, IPR2014-00358, Paper 11, at 29-30 (PTAB July 23, 2014). The Board has recognized that, "in an obviousness analysis, conclusory assertions from a third party about general knowledge in the art cannot, without supporting evidence of record, supply a limitation that is not evidently and indisputably within the common knowledge of those skilled in the art." *See* Practice Guide at 36 ("Furthermore,...expert testimony cannot take the place of disclosure from patents or printed publications…."); *see also K/S Himpp v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014); *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1366-67 (Fed. Cir. 2016) (reversing obviousness decision because the Board presumed missing claim limitation was present in prior art based on Petitioner's expert's conclusory statements).

Regardless, a POSITA would not be motivated to further modify Smith and/or the Emma-Smith combination to contain the "Reset Enable Function." Ex. 2001, ¶ 162. Petitioner argues "there would only be a finite number of potential solutions and conditions for restarting the microwave after shutdown." Petition at 76. This is

unsupported and not true. Ex. 2001, ¶¶ 162-163. There is no disclosure or teaching within the references that after "fire detection" circuitry is triggered, the system should be turned back on. The opposite is true. *Id.*, ¶ 163. Smith's invention is to prevent or cease feeding a fire, and contrary to Petitioner's suggestion, Smith states the humidity sensor triggers an alarm for "an imminent fire condition in the cooking cavity." Ex. 1014 at 5:14-15; *Id*. It would be illogical and counter to Smith's stated purpose to allow the system to be re-enabled.

There is no teaching that it would be appropriate to re-enable power to the microwave (let alone do so to deliver power in a subsequent cooking session). Ex. 2001, ¶¶ 164. Petitioner has offered no evidence of a "reset" element taught in Smith and/or Emma and cannot even begin to meet its burden. *Id*.

B. Petitioner's Obviousness Theories Rely on Hindsight and a Generic Motivation to Combine.

Petitioner's obviousness theories and the Institution Decision improperly rely on the '745 Patent and hindsight, including related to the smoke sensor and reset limitations. The '745 Patent says the system may detect smoke by determining VOCs. Ex. 1001, 16:58-65. However, the Patent does not say all VOC sensors will determine smoke or that a VOC sensor is the same as a smoke sensor. *See id.* The Board may not rely on the teachings in the '745 Patent and read them into prior art that does not include the same teaching. This is improper hindsight.

Regardless, while some smoke sensors may function by determining VOCs, it is not true (nor does the '745 Patent say) that all VOC sensors are smoke sensors nor that simply by being a VOC sensor it is a smoke sensor. Ex. 2001, ¶¶ 140-141. Petitioner does not offer any allegation or support to the contrary, nor could it. A VOC sensor is not inherently a smoke sensor. *Trintec Indus., Inc.,* 295 F.3d at 1297. Thus, even to the extent Smith discloses a VOC sensor, Smith does not disclose a smoke sensor. Ex. 2001, ¶ 139.

Moreover, Petitioner offers an improper motivation to combine. As Dr. Horenstein's cross examination made clear, the alleged motivation to combine is essentially that any functionality could be added to Emma. Ex. 2002, 65:18-70:7, 71:12-74:16. That motivation, is admittedly, not found in Emma. Nor is that consistent with the state of the law. *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1334 (Fed. Cir. 2002) ("The showing of a motivation to combine must be clear and particular, and it must be supported by actual evidence").

C. Ground 2 Is Only Based on Emma in View of Smith.

It is wholly improper to look at other references and read those teachings into Smith. As noted above, Smith does not include TGS-816, and any argument to the contrary is not only unsupported by, but also contradicted by Smith itself. Ex. 2001, ¶¶ 144-46. Smith does not reference "816," does not reference sensing "Carbon Monoxide," and the TGS-816 "Combustible Gas Sensor" is clearly not a humidity

sensor, including because there is no showing it detects water vapor—a noncombustible gas. *Id.*, ¶¶146-47. After-the-fact reliance on documents not asserted as prior art are wholly improper and cannot form the basis of an invalidity finding under § 103. Regardless, there is no shown motivation to combine a separate sensor that performs a wholly different function and purpose. Ex. 2001, ¶ 165. In addition to the reasons above, a POSITA would not have combined the TGS-816 and used it inside a microwave, because the standby power consumption would have exceeded the maximum for a microwave. *See* Ex. 2001, ¶ 166, Ex. 2002, 124:8-20; *see also* Section XII.D.

D. Petitioner Fails to Demonstrate Dependent Claims Are Obvious.

Petitioner failed to show obviousness of the independent claims 1, 15, and 24, and thus also fails to demonstrate invalidity of the dependent claims 13, 20, 22, and 25. Additionally, Emma and Smith do not disclose the smoke sensor "includes at least one of a radiation emitter and radiation receiver, a photosensor, a motion sensor, an ionization sensor, and a VOC sensor," as required by Claim 22. Ex. 2001, ¶ 168.

VIII. GROUND 3: EMMA AND BUTT.

Petitioner does not meaningfully contend Ground 3 invalidates the asserted patents, instead glazing over the actual combination in favor of Ground 4. Butt does not rectify the failings of Emma.

A. Proposed Combination of Emma and Butt Does Not Include a Microwave with a Smoke Sensor.

The claims require a smoke sensor inside the microwave and specify it must be positioned in operative connection with the microwave's cooking area. Ex. 1001, Claims 1, 12, 14-15, 19, 22-26. Emma does not disclose a smoke sensor. Petitioner relies solely on Butt for these requirements. Ex. 2001, ¶ 170. Butt, alone or with Emma, does not disclose a microwave, a microwave having a smoke sensor, nor a smoke sensor in operative connection with a microwave (let alone a microwave's cooking area). *Id.*, ¶ 171.

Butt's smoke detector is not included in any appliance, nor would a POSITA understand combining Emma and Butt to have disclosed such. Ex. 2001, ¶¶ 172-77. Butt teaches a "a controller for a safety shut-off system" installed in/as part of an electrical outlet or socket "within a wall," using separate generic wireless smoke detectors. Ex. 1015, 4:27-52. There is no teaching or suggestion that this functionality should be moved inside any appliance, let alone inside a microwave. Ex. 2001, ¶¶ 174-75. That would also be against Butt's teachings—using a standard circuit box. *Id.*, ¶ 176. To the extent Butt and Emma would be combined, the microwave of Emma would simply be plugged into Butt's controller/outlet, and the wireless smoke sensor (or smoke sensor wired into the house) would be located somewhere else (preferably outside the kitchen). *Id.*, ¶ 176. The smoke sensor would not be inside a microwave, which the Claims require.

Additionally, any combining of Emma and Butt does not disclose or suggest a smoke sensor in operative connection with a microwave, or the cooking area inside the microwave. *See id.*, ¶¶ 178-183; Petition at 79-80. Petitioner's apparent interpretation is a smoke sensor within the vicinity of the microwave itself meets this limitation. *Id.* That is not the limitation, and Petitioner's position should be rejected.

Beyond mentioning the smoke detector in Butt can be wireless, or wired into the home, teaching regarding the location of Butt's smoke detector comes from the referenced generic wireless detectors, including the ADEMCO 5806. Ex. 1015, 4:49-52, 5:1-6. Dr. Horenstein attached installation instructions for an ADEMCO5806, which teach that "[d]etectors should be located as close to the center of the ceiling as possible," and "not install[ed] near forced-air...ducts." Ex. 1002, Appx E. The ADEMCO instructions state it should not be located in "KITCHENS" or even "IN AIRSTREAMS PASSING BY KITCHENS," and rather "AT LEAST 20 FEET (6m) FROM KITCHENS."

Where Not to Locate Detectors

To avoid false alarms and/or improper operation, avoid installation of smoke detectors in the following areas:

- KITCHENS - Smoke from cooking may cause a nuisance alarm. LOCATE DETECTORS AT LEAST 20 FEET (6m) FROM KITCHENS, IF POSSIBLE.
- IN AIRSTREAMS PASSING BY KITCHENS - Smoke from cooking may enter normal air movement paths between outlets and returns if these paths run by kitchens, causing a nuisance alarm. LOCATE DETECTORS AWAY FROM SUCH AIRSTREAMS, IF POSSIBLE.
- BATHROOMS - Excessive steam from a shower may cause a nuisance alarm. LOCATE DETECTORS AT LEAST 10 FEET (3m) FROM BATHROOMS, IF POSSIBLE.
- NEAR FORCED-AIR DUCTS used for heating or air conditioning - Air movement may prevent smoke from reaching the detector.
- NEAR FLUORESCENT LIGHT FIXTURES - "Noise" generated by these fixtures may cause a nuisance alarm.
- NEAR FURNACES OF ANY TYPE - Air and dust movement and normal combustion products may cause a nuisance alarm.
- THE PEAK OF AN "A" FRAME TYPE OF CEILING - "Dead air" at the top may prevent smoke from reaching the detector.
- GARAGES - Products of combustion are present from running automobile engines and may cause a nuisance alarm.

False alarms occur when smoke detectors are installed where they will not work properly. To avoid false alarms, do not install smoke detectors in the following situations:

- Combustion particles are by-products of something burning. Do not install smoke detectors in or near areas where combustion particles are present, such as kitchens with few windows or poor ventilation, garages where there may be vehicle exhaust, near furnaces, hot water heaters and space heaters.
- Do not install smoke detectors less than 6 meters (20 feet) away from places where combustion particles are normally present, like kitchens. If a 20-foot distance is not possible, e.g. in a mobile home, try to install the detector as far away from the combustion particles as possible, preferably on the wall. To prevent false alarms, provide good ventilation in such places.

  IMPORTANT:
  Never try to avoid false alarms by disabling the detector.
- Do not mount smoke detectors in the path of fresh air intake. The flow of fresh air in and out can drive smoke away from the smoke detector; thus reducing its efficiency. Figure 6 indicates the correct and incorrect locations concerning this problem.
- Near paint thinner fumes.
- In close proximity to an automobile exhaust pipe; this will damage the detector.
- In damp or very humid areas or near bathrooms with showers. Moisture in humid air can enter the sensing chamber, then turns into droplets upon cooling, which can cause false alarms. Install smoke detectors at least 3 meters (10 feet) away from bathrooms.

Id. Dr. Horenstein admitted during his deposition to not reviewing these warnings. Ex. 2002, 131:12-133:18. A POSITA would understand a smoke detector outside a kitchen is not in operative connection with an appliance, nor the internal cooking

area of an appliance. Ex. 2001, ¶ 180. It would not be obvious to a POSITA to modify the Emma/Butt combination to place a smoke sensor in a location that the instructions for Butt's referenced smoke detector forbid. Butt teaches detectors should be distanced apart from the kitchen and sources of smoke and cannot be placed near or inside the microwave. Ex. 2001, ¶¶ 179-183. Petitioner's Ground 3 fails.

B. Proposed Emma-Butt Combination Does Not Include the "Smoke Sensor," "Shut-down Function," and "Reset Enable Function".

The Claims require the control circuit to cause cooking power to the magnetron to be withdrawn to end a current cooking session prior to a set end time in response to the smoke sensor sensing smoke in the cooking area. *See e.g.*, limitation [1(h)]. Petitioner relies on Butt for these requirements. The Claims also require the control circuit is supplied with electrical power only through a single power cord. *E.g.*, limitation [1(e)]). These requirements are not met by combining Emma with Butt.

Butt does not teach withdrawing cooking power from the magnetron to end a current cooking session prior to a set end time after sensing a dangerous condition inside the cooking area. Ex. 2001, ¶ 184. Rather, Butt may stop *all* power to a range in the event of a fire, low battery notification, panic, or other general hazard such as an earthquake, to make it so that "the energy that would otherwise act as an accelerant for the fire is eliminated." Ex. 1015, 4:35-38, 55-60. This is not

withdrawing cooking power to a magnetron, a set end time of a current cooking session, or withdrawing power prior to a set end time. Ex. 2001, ¶ 185. The appliance plugged into Butt need not even be operating or delivering cooking power, and as discussed above, the smoke sensor is taught to not be in the kitchen. *See id.*, ¶¶179-180, 185. Thus, Emma with Butt fails to teach the "shut-down function," and cannot teach the "reset enable function."

Combining Butt with Emma would also not teach Butt's smoke detector in operative connection with a microwave's control circuit, which must be "supplied with electrical power only through the single power cord" and is releasably connected to a source of power. Ex. 1001, Claim 1. Butt *is* the power source/outlet, and therefore would be permanently wired, receive power cords, and not be supplied with power only through a single cord. Ex. 2001, ¶ 186. Petitioner offers no explanation for how this limitation is met (it is not) by Emma with Butt. *Id.*

C. A POSITA Would Not Have Been Motivated to Combine Emma and Butt, Especially as Proposed.

A POSITA would not have been motivated to combine Emma and Butt. *Id.,* ¶¶ 188-96. Petitioner pulls from thin air its conclusion that a POSITA would "combine the additional kitchen appliance safety features of Butt into the Emma microwave/refrigerator combination namely to enable the Emma microwave to shut down upon the detection of smoke." Petition at 77.

Emma is a combination appliance, attractive for use "in dorm rooms, hotel rooms, recreational vehicles, tractor trailer cabs, and other similar locations,"—e.g., places without kitchens—powering a microwave and fridge via a single power cord, cycling and controlling current draw between the appliances and auxiliary outlets to avoid tripping a circuit breaker, while "minimizing disruptions in the use of an individual appliance." Ex. 1011, ¶¶ [0004], [0030].

Butt is a controller, located in a standard outlet, meant to cut disrupt power from the outlet upon detection of a hazard, such as smoke, by a standard wireless smoke sensor located in the home. Butt is described installed into a standard circuit box/outlet by a "user alone, by a professional in a completed home, or by a professional during the construction of the home." Ex. 1015, 5:3-5; Ex. 2001, ¶ 191. Butt *is* the outlet, for example, in a kitchen, with an oven plugged into it, using a separate standard smoke detector located in a different room in the home. *See* Ex. 1015, 6:19-21; Ex. 2001, ¶191. A POSITA would understand Butt is intended for interoperability and relates to adding this to a home—not to an appliance—using standard electrical outlets and smoke detectors. *See id.*

A POSITA would understand these as fundamentally different and would not have been motivated to modify Emma based on (or even looked to) Butt's controller/outlet. Ex. 2001, ¶¶ 192-194. As Dr. Tanbour explains, a POSITA would not have looked to Butt's outlet meant to address home and kitchen fires, or its

smoke detector disclosure, and would not have looked to Butt to integrate into Emma. *Id.*, ¶ 192. Emma does not discuss smoke. Emma is directed outside the home to places traditionally without kitchens—the opposite of Butt. Conversely, Butt's teachings are inapplicable to microwaves. For example, Butt discloses one of its purposes being turning off power to an outlet if a user has accidentally left home with the oven on. That issue is non-existent in microwaves, which cook for short time periods.

The references further teach away from combining Butt into Emma. Ex. 2001, ¶ 193. For example, Butt teaches that having this function in the outlet itself is beneficial in the event of a power outage. Ex. 1015, 6:44-52. As discussed, Butt teaches away from placing the smoke detectors within any appliance—or even a kitchen. Butt teaches detectors should be distanced apart from the kitchen and sources of smoke and combustion, and cannot be placed near or inside the microwave. Ex. 2001, ¶ 189. Moving Butt's smoke detector away from the ceiling is directly contrary to Butt's teachings. *Id.* For example, Butt's residential smoke detectors are installed either on or within 4-10 inches of the ceiling and could not function at the high temperatures within an oven. *See* Ex. 1002, App'x E. If placed inside the microwave, the smoke detector would be non-functional and unable to detect smoke in the house. Nor would the combination utilize a standard electrical outlet box, a primary foundation for Butt. The proposed combination would result

in something contrary and antithetical to the teaching of Butt. Ex. 2001, ¶ 191; *Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, 600 F. App'x 755, 759 (Fed. Cir. 2015) (a change to a "principle of operation" is unlikely to be a motivation to combine); *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012).

Petitioner's proposed combination would also decrease, not increase, the "functionalities" of Emma and Butt. This is the opposite of Petitioner's purported rationale—adding "functionalities" for an "all-in-one appliance." *See* Petition at 77. "An inference of nonobviousness is especially strong where the prior art's teachings undermine the very reason being proffered as to why a [POSITA] would have combined the known elements." *DePuy*, 567 F.3d at 1326. Butt's smoke detectors would not function inside any microwave, including in Emma, and would lose its other functionalities discussed above. Ex. 1002, Appx E; Ex. 2001, ¶¶ 193-94; *see Unified Patents LLC*, IPR2019-01379, Paper 52, *36–37. For example, Butt is also designed to remove power to an appliance for any reason whatsoever, including those unrelated to a kitchen fire (e.g., an earthquake) or "leaving young children alone." Ex. 1015, 4:35-37, 7:62-65. A POSITA would not have been motivated to make a combination that removes functionality and renders the smoke detector nonoperational. *Samsung Elecs. Co. v. Dynamics Inc.*, No. 2021-2352, 2022 WL 3041158, at *3 (Fed. Cir. Aug. 2, 2022).

Petitioner's conclusory "motivation to combine" cannot overcome these failures. As Dr. Horenstein's deposition made clear, Petitioner's argument is essentially that anything could be added to Emma. *See* Ex. 2002, 65:18-73:19. That motivation is not found in Emma, and Dr. Horenstein points to no other support for his opinion. *See id.* Nor is that consistent with the state of the law. *Teleflex, Inc.*, 299 F.3d at 1334.

To the extent a POSITA would have attempted to combine Emma and Butt, at all, they would have simply plugged the Emma appliance into the Butt outlet, consistent with Butt's teaching. Ex. 2001, ¶ 195. Petitioner does not, and could not, argue this would invalidate the claims. 35 U.S.C. § 103. Petitioner's Ground 3 fails.

D. Petitioner Fails to Demonstrate Dependent Claims are Obvious.

Petitioner failed to show obviousness for independent claims 1, 15, and 24, and thus also fails to demonstrate invalidity for dependent claims 13, 20, 22, and 25.

IX. GROUND 4: EMMA, BUTT, AND FURTHER SMITH.

A. A POSITA Would Not Have Been Motivated to Combine Emma, Butt, and Smith

A POSITA would not have combined Emma, Butt, and Smith as Petitioner proposes, nor had a reasonable expectation of success. Ex. 2001, ¶¶ 198-210. The references are incompatible as Petitioner seeks to combine them, and Petitioner's proposal alters both Emma and Butt in view of Smith, including by moving Butt's

smoke detector internal to Emma's microwave, contradicting Butt's express teachings.

Petitioner appears intentionally ambiguous about its combination for Ground 4. According to the Board, Petitioner argues it would have been obvious "to combine the additional kitchen appliance safety features of Butt into the Emma microwave/refrigerator combination namely to enable the Emma microwave to shut down upon the detection of smoke," but Petitioner argues also to "combine[] the elements as disclosed by known methods for the purposes of modifying Emma's microwave refrigerator combination to include Smith's smoke sensor to be operatively connected with its cooking area and to include Butt's smoke sensor and reset functionality." Institution Decision at 21-22 (citing Petition at 78). In other words, Petitioner argues a POSITA would include Smith's ***and*** Butt's sensors. Petitioner offers no motivation for combining both sensors of Butt and Smith. Ex. 2001, ¶ 201.[13]

Regardless, as noted above, there is no motivation to combine Emma and Butt, including because Butt teaches its outlet controller and smoke detector are not to be used inside an appliance. Ex. 2001, ¶¶ 202-03; *see* Section VIII.A. A POSITA

[13] Regardless, this would not teach all limitations. Ex. 2001, ¶ 200 n.14.

would understand that Butt would not function inside Emma. *See* Section VIII.A; *Plas-Pak Indus., Inc.*, 600 F. App'x at 759.

Similarly, a POSITA would not be motivated to combine Emma with Butt and Smith. Ex. 2001, ¶¶ 204. The addition of Smith to Butt and Emma contradicts their explicit teachings. *Id.* For example, Butt contradicts using any teaching of Smith to move Butt's smoke detector into the microwave and into operative connection with the microwave's cooking area. *See id.* (citing Ex. 1015, 1:25-27.) While Petitioner argues there is some motivation to move Butt closer to the internal cooking area, this motivation is not found *in* Emma, Butt, or Smith. The smoke detector of Butt is not to be used near combustible sources and simply would not work inside the microwave. *Id*. Moreover, adding Butt's smoke sensor inside of Emma, alone or with Smith, would also be contrary to a foundational purpose of Butt—addressing that "two-thirds [of cooking fires] started with kitchen range or stove." *See* Ex. 1015, 1:26-27. Moving Butt's smoke detector inside a microwave would miss more than "two-thirds [of cooking] fires." Ex. 2001, ¶¶ 204. Petitioner cannot ignore that Butt and its smoke detector explicitly teach against being in operative connection with a cooking area *inside* a microwave oven—or even ***anywhere in the kitchen***. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (no suggestion or motivation where modification renders prior art unsatisfactory or inoperable for its intended purpose); *see* Section VIII.A-C.

Moreover, Smith teaches away from using Butt's complicated and expensive smoke detector. Ex. 2001, ¶ 205. Smith teaches using a ***humidity sensor*** because of the low cost and simplicity. *Id.* Butt's smoke detector would be far more expensive and contrary to the teachings of Smith. *Id.* Butt's smoke detector, in addition to not functioning inside of Emma in the arrangement of Smith, also would ***not detect humidity*** as required by Smith (to detect the "drying out phase"). Ex. 1014, 3:43-50. Instead, Butt is disclosed as detecting fire. *See* Ex. 1015, 4:53-67.

A POSITA would also not be motivated to combine a reset feature of Butt with Emma and in view of Smith, as this would not be appliable to the combination proposed in Ground 4 or Smith. Ex. 2001, ¶ 206. Butt describes the controller in the outlet may receive an RF signal and re-enable power to the outlet after a user panics or following an alarm unrelated to the appliance plugged into the outlet containing Butt. Ex. 1015, 4:53-67. Butt does not teach resetting an appliance after there has been a fire detected within the specific appliance, which would be improper. Ex. 2001, ¶ 206. Unlike in Butt, where the shut off is intended to avoid adding fuel to a potentially unrelated fire (or due a panic, earthquake, or unattended children), Petitioner's proposed combination of Emma, Butt, and Smith would be allegedly shutting off after detecting a fire *inside a small, closed compartment* surrounded by electrical components. A POSITA would understand the purported

microwave should not be re-enabled. Ex. 2001, ¶ 207. As the Examiner previously recognized, a fire inside a microwave would result in damage to the electricals. *Id*.

The teachings of Butt are also not applicable to Smith and/or Emma. The controller is located in the wall of the house—this is foundational to Butt. This is not applicable to Smith, which seeks to use a humidity sensor for a different purpose, inside a microwave. Their underlying purposes are at odds—creating a smart home able to function with standard smoke detectors, versus creating a microwave using low-cost humidity sensors to detect the drying out phase. Ex. 2001, ¶208. Butt, unlike Smith, has a panic reset button. Ex. 1015, 4:63-67. Butt makes clear a primary purpose of the button is to be used in situations unrelated to smoke detection (such as if no one is home, there is an earthquake, etc.)—wholly inapplicable to the microwave of Smith. As a POSITA would understand, smoke detection in a house is far different than detecting smoke in an appliance, having different risks, and considerations. Ex. 2001, ¶209.

A POSITA would also not be motivated to combine a reset feature of Butt with Emma and in view of Smith (as understood by Petitioner), because the TGS-816 sensor Petitioner argues Smith discloses would not be functional for an extended period after shutdown—and thus would not be functional upon being reset. Ex.

2001, ¶ 210.[14] As a POSITA would understand, the TGS-816 contains an internal heater and must be pre-heated to function. *Id.*. The TGS-816 specification sheet states it should be preheated for "More than 7 days" prior to testing. Ex. 1002, App'x C at 219. After removing power to any appliance including the TGS-816, a POSITA would understand the sensor would not function for an extended period. *Id.* Thus, a POSITA would not include a reset of Butt as Petitioner has described it, because a POSITA would understand the TGS 816 sensor would not be functional in any subsequent cooking session, undercutting the purported purpose of the combination and resulting in hazardous conditions. *Id.*

B. Emma, Butt, and Smith Does Not Disclose the Challenged Claims.

i. "Smoke Sensor."

The combination of Emma, Butt, and Smith does not disclose a smoke sensor in operative connection with the cooking area and the control circuit as described in independent claims 1, 15, and 24. *Id.*, ¶ 211.

As described above for Ground 3, any combination of Emma in view of Butt does not disclose or suggest a smoke sensor in operative connection with the oven, a microwave, or the cooking area inside the microwave. *See* Section VIII.A. The

[14] As noted, the TGS-816 sensor is not actually disclosed by Smith. *See* Section VII.A.

smoke detector of Butt is not included in any appliance, nor would a POSITA understand a combination of Emma and Butt to have disclosed such. Ex. 2001, ¶ 212. The addition of Smith does not change this failure. As discussed regarding Ground 2, Smith does not teach a smoke sensor at all, let alone in operative connection with a cooking area inside the microwave oven. *Id.*, ¶ 21; *see* Section VII.A.i.

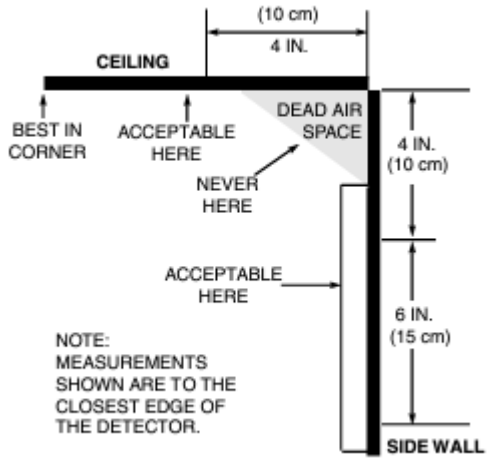
Unsurprisingly based on their individual failures, adding Smith to Emma and Butt does not disclose or suggest a smoke sensor in operative connection with the oven, a microwave, or the cooking area inside the microwave. Butt's smoke detector cannot function inside the microwave. Moving it away from the ceiling is directly contrary to Butt and the smoke detectors disclosed therein. Ex. 2001, ¶ 214.

Mounting Locations

Detectors should be located as close to the center of the ceiling as possible. If this is not practical, detectors may be located on the ceiling up to 4 inches (10cm) from the ceiling-wall junction. Do not install near forced-air heating or air conditioning ducts (outlets or returns). For sloped, gabled, or high-peaked ceilings, detectors must be mounted between 4 and 6 inches (10 and 15cm) from the highest point in the ceiling.

Detectors may also be wall-mounted. Check with your local Fire Department about code requirements. Wall-mounted detectors should be located 4–6 inches (10–15 cm) from the ceiling.

In mobile homes, battery-operated detectors are not generally installed by the manufacturer. Mount detectors ONLY on an interior wall.



Where Not to Locate Detectors

To avoid false alarms and/or improper operation, avoid installation of smoke detectors in the following areas:

- KITCHENS - Smoke from cooking may cause a nuisance alarm. LOCATE DETECTORS AT LEAST 20 FEET (6m) FROM KITCHENS, IF POSSIBLE.
- IN AIRSTREAMS PASSING BY KITCHENS - Smoke from cooking may enter normal air movement paths between outlets and returns if these paths run by kitchens, causing a nuisance alarm. LOCATE DETECTORS AWAY FROM SUCH AIRSTREAMS, IF POSSIBLE.
- BATHROOMS - Excessive steam from a shower may cause a nuisance alarm. LOCATE DETECTORS AT LEAST 10 FEET (3m) FROM BATHROOMS, IF POSSIBLE.
- NEAR FORCED-AIR DUCTS used for heating or air conditioning - Air movement may prevent smoke from reaching the detector.
- NEAR FLUORESCENT LIGHT FIXTURES - "Noise" generated by these fixtures may cause a nuisance alarm.
- NEAR FURNACES OF ANY TYPE - Air and dust movement and normal combustion products may cause a nuisance alarm.
- THE PEAK OF AN "A" FRAME TYPE OF CEILING - "Dead air" at the top may prevent smoke from reaching the detector.
- GARAGES - Products of combustion are present from running automobile engines and may cause a nuisance alarm.

False alarms occur when smoke detectors are installed where they will not work properly. To avoid false alarms, do not install smoke detectors in the following situations:

- Combustion particles are by-products of something burning. Do not install smoke detectors in or near areas where combustion particles are present, such as kitchens with few windows or poor ventilation, garages where there may be vehicle exhaust, near furnaces, hot water heaters and space heaters.
- Do not install smoke detectors less than 6 meters (20 feet) away from places where combustion particles are normally present, like kitchens. If a 20-foot distance is not possible, e.g. in a mobile home, try to install the detector as far away from the combustion particles as possible, preferably on the wall. To prevent false alarms, provide good ventilation in such places.

  IMPORTANT:
  Never try to avoid false alarms by disabling the detector.
- Do not mount smoke detectors in the path of fresh air intake. The flow of fresh air in and out can drive smoke away from the smoke detector; thus reducing its efficiency. Figure 6 indicates the correct and incorrect locations concerning this problem.
- Near paint thinner fumes.
- In close proximity to an automobile exhaust pipe; this will damage the detector.
- In damp or very humid areas or near bathrooms with showers. Moisture in humid air can enter the sensing chamber, then turns into droplets upon cooling, which can cause false alarms. Install smoke detectors at least 3 meters (10 feet) away from bathrooms.

Ex. 1002, App'x E.

ii. "Shut-Down Function."

Ground 4 further fails because Petitioner does not demonstrate that Emma, Butt, or Smith teach, responsive in part to a level of smoke sensed by the smoke sensor, the control circuit operative to withdraw power from a magnetron to end a current cooking session prior to a set end time, required by all independent claims. Ex. 2001, ¶ 215.

As described above with respect to Ground 3, any combination of Emma and Butt does not disclose or suggest causing cooking power to the magnetron to be withdrawn to end a current cooking session prior to a set end time after sensing dangerous condition. *See* Section VIII.B. Rather, Butt may stop *all* power to a stove in the event of a fire, low battery notification, panic, or other general hazard such as an earthquake, to make it so that "the energy that would otherwise act as an accelerant for the fire is eliminated." Ex. 1015, 4:35-37, 55-60. This does not disclose withdrawing cooking power to a magnetron, a set end time of a cooking session, or withdrawing power prior to a set end time. Ex. 2001, ¶ 216. Clearly Butt does not disclose such, as Butt is intended to function wholly separately from the appliance, and shutting off power to a stove says nothing about whether there is a "set end time." Ex. 2001, ¶¶ 184-185, 216. The stove need not even be operating as Butt is intended to be usable as a prophylactic measure. *Id.*, ¶ 185. Butt is at best silent as to the "shut-down function." *See* Section VIII.B.

Smith lacks a smoke sensor and is silent as to the other portions of the "shut down function," and therefore cannot fill this gap in the other references. As the Board recognized, Smith does not explicitly disclose the "shut down function." Institution Decision at 31. Moreover, it would not be reasonably clear to a POSITA that there is any set time, let alone that power is removed to end a current cooking session prior to the set end time of the cooking session. Ex. 2001, ¶ 218. For example, Smith discusses "automatic cooking," meaning the system may not have any "time," or may change the current time to the time of completion. Ex. 1014, 3:18-21. Even if there was a teaching of setting a time, there is no suggestion that the current cooking session is *ended* prior to the set end time—and is wholly silent as to what happens next. Ex. 2001, ¶ 156; *see Trintec Indus.,* 295 F.3d at 1297.

Just as they do individually, combining Emma, Butt, and Smith does not disclose or suggest that, responsive in part to a level of smoke sensed by the smoke sensor, the control circuit is operative to withdraw power from a magnetron to end a current cooking session prior to a set end time. Ex. 2001, ¶ 218.

iii. "Reset Enable Function."

Petitioner's Ground 4 also fails because none of Emma, Butt, and Smith teach the element of enablement to receive cooking power in a next subsequent cooking session. Petitioner argues this limitation falls under the "reset enable function." As addressed in Sections VIII and IX, none of Emma, Smith, or Butt teach or render

obvious this limitation. Regardless, "Petitioner relies upon" Butt for this element. Institution Decision at 34. The teaching of Butt is wholly unrelated to microwaves, magnetrons, and cooking sessions. Ex. 1015, 3:63-67, 6:36-37, 7:15-21. The "control unit" of Butt is located in a wall of a house, specifically in a standard outlet. This does not disclose enabling a magnetron to receive cooking power. It likewise says nothing about subsequent cooking sessions. For the reasons described above, a POSITA would not be motivated to combine, have reasonable expectation of success in combining Emma, Butt, and Smith, and regardless, the combination does not disclose the "Reset Enable" limitation. Ex. 2001, ¶ 219.

C. Petitioner Fails to Demonstrate Dependent Claims are Obvious

Petitioner failed to show obviousness for independent claims 1, 15, and 24, and thus also fails to demonstrate invalidity for dependent claims 13, 20, 22, and 25.

X. GROUNDS 5-8: EMMA WITH ISDU AND SMITH, AND THE KNOWLEDGE OF A POSITA OR QUEZADA.

As the Board recognized, "Grounds...5–8 all rely upon the ISDU non-patent literature reference." Institution Decision at 42. Thus, Grounds 5-8 fail because ISDU does not qualify as prior art. *See* Section IV.

Regardless, Grounds 5 and 6 are directed to dependent claims 12, 14, 19, 23, and 26, and solely rely on the knowledge of a POSITA to "substitute one or more of Emma's auxiliary low power receptacles / outlets for a USB port for power delivery to small electronic devices." Petition at 81. Grounds 5 and 6 fail for the same

reasons explained with respect to Grounds 1 and 2, because Emma and ISDU or Smith do not disclose or render obvious any independent claim.

For Grounds 5-6, Petitioner's proposed further modification of Emma, ISDU, and Smith relies solely on the knowledge of a POSITA. It would not have been obvious, as replacing an outlet of Emma would have reduced Emma's functionality, limiting connections to only USBs. Petitioner's bare assertion that there were a "finite number of potential solutions" for charging lacks any support, and does not even attempt to identify the "finite" number of options available at the time. Ex. 2001, ¶ 223. That is not the law. *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 888 (Fed. Cir. 2024) ("no evidence that there are a finite number of identified, predictable solutions"). Petitioner also does not address power control for the USB ports when the magnetron draws cooking power, a claimed limitation. There is no admissible contrary expert testimony on either point. *See* Ex. 1023 at 74-75 (relying on unsubmitted documentation) and 135-136 (only addressing "claims 4, 7, 8, 12, 18, and 19").

For Grounds 7-8, adding Quezada is improper. Ex. 2001, ¶¶ 225-26. As Petitioner and Dr. Horenstein appear to acknowledge, the alleged motivation to combine Quezada is not found in the references themselves. Instead, Dr. Horenstein again attempts to rely "on the knowledge of a POSITA." Ex. 1023, ¶ [131]. However, Quezada is not related to appliances, let alone a microwave. Ex. 2001,

¶ 226. Petitioner also does not address power control directed to the USB ports when the magnetron on draws cooking power. *See* Ex. 1023 at 77-78. This would also reduce the functionality/compatibility, and Quezada explains a USB port may not provide sufficient power for many devices.

XI. GROUND 9: INDEFINITENESS (CLAIMS 1-28).

"In operative connection"—the only term Petitioner argues is indefinite—is sufficiently definite. This term is not technical; it is a general descriptive term. This and similar terms are "frequently used in claim drafting to reflect a functional relationship between claimed components." *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1118 (Fed. Cir. 2004) (referring to "operatively connected."). When read in light of the specification, this term plainly describes that the cooking area is connected to the smoke sensor such that the smoke sensor is able to operate, *i.e.* sense smoke in the cooking area. Indeed, as the Board recognized, "[j]ust from a plain reading of the claim language we understand that the smoke sensor is either within, i.e., 'inside' the interior cooking area of the microwave or, in a connecting air passage or region connected to the interior cooking area." Institution Decision at 44.

Petitioner's argument that it does not understand "whether the connection is such that the smoke sensor somehow operates in the area or the smoke sensor operates based on being connected to the area" is unsound. The former gives no

effect to the "connection" portion of the term, and therefore cannot be correct. *See, e.g.*, *Bicon, Inc. v. Straumann Co*., 441 F.3d 945, 950 (Fed. Cir. 2006) ("[C]laims are interpreted with an eye toward giving effect to all terms in the claim.) By contrast, Petitioner's latter proposed meaning gives effect to both "operative" and "connection." A POSITA would therefore understand the plain meaning to be in accordance with the latter. Ex. 2001, ¶ 230;Ex. 1001, at 14:27–33, 16:62–17:5.

The remaining argument, that the POSITA would not know whether the claim is directed to logical or electrical connection, is merely a complaint about the breadth of the claim. It is black letter law, however, that a broad term is not indefinite merely because it is broad. *See e.g.*, *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1352 (Fed. Cir. 2009) ("Merely claiming broadly" does not "prevent the public from understanding the scope of the patent."); *Corning Optical Commc'ns Wireless, Ltd. v. SOLiD Inc.*, No. 5:14-CV-03750-PSG, 2015 WL 5096472, at *12 (N.D. Cal. Aug. 19, 2015). Here, the claim term contemplates either logical or electrical connections, or both. Thus, Petitioner has not met its burden of proving that "in operative connection" is indefinite.

XII. OBJECTIVE INDICIA CONFIRM NON-OBVIOUSNESS OF THE CLAIMED COMBINATION APPLIANCES

Even if Petitioner has somehow shown that any of its grounds (1) rest on true prior art; (2) disclose *each* requirement of the claims; (3) disclose a feasible combination; and (4) establish a motivation to combine, the Petition fails because

secondary indicia of non-obviousness weigh against a finding of obviousness. Objective evidence of non-obviousness "may often be the most probative and cogent evidence in the record." *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012). That is particularly true here where Intirion's MicroFridge Products—namely, the MicroFridge models that embody the '745 Patent—completely changed the market for combination microwave-refrigerator appliances. Ex. 2004, ¶¶ 2, 9.

Intirion's MicroFridge Products provided, for the first time, a solution to the longstanding problems of safety and energy overload in combination microwave-refrigerator appliances, which are often used in dormitories, hotels, and offices. Ex. 2001, ¶ 239; Ex. 1001 at 1:13-20. By placing a smoke sensor inside the microwave oven, the MicroFridge Products can more accurately and quickly sense a potentially dangerous condition, and then disable power to the combination appliance to prevent fire and damage to the appliance. Ex. 2001, ¶ 240; *see, e.g.*, Ex. 1001 at 14:12-20, 14:49-57; Ex. 2005. These products trigger an alert to the user early, "before any damage is done" and so "help[] prevent unnecessarily fire alarms" in buildings and avoiding needless evacuations. Ex. 2005. The MicroFridge Products also include a reset function, where the system resets after no longer detecting a potentially dangerous condition and enables a subsequent cooking session. Ex. 2001, ¶ 241; Ex. 2006 at 15; *see, e.g.*, Ex. 1001 at 15:23-28, 17:27-35, 19:29-35. The

MicroFridge Products ingeniously combine these safety features with a control circuit configured to limit overall power draw to the combination unit, and auxiliary outlets like USB ports that provide low power for charging. Ex. 1001 at 1:26-32, 1:40-46, 2:40-45, 2:47-51; Ex. 2001, ¶ 242; Ex. 2006 at 15.

The MicroFridge Products were an instant commercial success—to the point that customers began modeling Requests for Proposals ("RFPs") off the patented features of the '745 Patent. *See, e.g.*, Ex. 2009 at 6, 8; Ex. 2010 at 4-5; Ex. 2011 at 1; Ex. 2012 at 2-3; Ex. 2013 at 4. When Petitioner began to receive these RFPs from potential customers, Petitioner immediately began attempts to buy Intirion's MicroFridge Products and reverse engineer them for the purposes of copying. *See, e.g.*, Ex. 2014 at 1-3; Ex. 2015 at 1; Ex. 2016 at 1-2; *see also* Section XII(E).

Strong secondary indicia of non-obviousness related to Intirion's MicroFridge Products—including commercial success, failure of others, long-felt need, teaching away, unexpected results, and copying—more than outweigh any prima facie evidence of obviousness.

A. A Nexus Exists Between'745 Patent's Invention and the Objective Indicia of Non-Obviousness.

Intirion is entitled to a presumption of nexus if it shows that the evidence supporting secondary considerations "is tied to a specific product and that the product 'embodies the claimed features, and is coextensive with them.'" *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019). Coextensiveness

requires that the product "is the invention disclosed and claimed." *Id.* at 1374. Absent the presumption, "[a] patentee may establish nexus...by showing that the objective indicia are the 'direct result of the unique characteristics of the claimed invention,' rather than a feature that was 'known in the prior art.'" *Campbell Soup Co. v. Gamon Plus, Inc.*, 10 F.4th 1268, 1277 (Fed. Cir. 2021) (citation omitted). This may be accomplished by demonstrating "the evidence of secondary considerations is attributable to the claimed combination of [features], as opposed to, for example, prior art features in isolation or unclaimed features." *Fox Factory, Inc.*, 944 F.3d at 1378. The analysis must be done by looking at the device as a whole, not elements or features in isolation. *See Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential).

The objective indicia of non-obviousness discussed below are the direct result of the combination of features claimed in claims 1, 12, 14-15, 19-20, 23-26 of the '745 Patent. Beginning in 2015, Intirion has sold several iterations of combination appliances embodying the '745 Patent (the "MicroFridge Products"). *See* Ex. 2004, ¶ 2.

The MicroFridge Products are commercial embodiments of at least claims 1, 12, 14-15, 19-20, 23-26 of the '745 Patent. *See* Ex. 2001, ¶ 244, Appendix B (analysis by Dr. Tanbour). The claimed combination of features recited in claims 1, 12, 14-15, 19-20, 23-26 of the '745 Patent is the entire MicroFridge Product that

Intirion makes and sells, rather than simply one component or subset of components of the product. Ex. 2001, ¶ 245. Intirion also marks its MicroFridge Products with the '745 Patent. Ex. 2017.

In addition, the claimed combination of features recited in claims 1, 12, 14-15, 19-20, 23-26 are what directly provide the benefits that make the MicroFridge Products so successful Ex. 2001, ¶ 246. The MicroFridge Products for the first time combined a microwave-refrigerator appliance with a smoke sensor within the microwave, a reset function that enabled subsequent cooking sessions, a control circuit that prevented power overdraw, and auxiliary outlets for charging such as USB ports. *Id.*, ¶ 247. These are the same features recited in independent claims 1, 15, and 24 and their dependent claims. *Id.*, ¶ 248.

The MicroFridge Products' success cannot be attributed to something in the prior art. No other product had this combination of features, which significantly improved the safety and energy efficiency of these combination microwave-refrigerator appliances. *Id.*, ¶ 249.

Moreover, marketing materials that prominently feature the invention may also establish nexus. *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579 (Fed. Cir. 1997). Intirion's marketing materials confirm the *combination* of claimed features resulted in the MicroFridge Products' success. For example, Intirion has consistently emphasized its combination microwave-refrigerator

included Intirion's 1st Defense Smoke Sensor™ that is "internal" and "automatically shuts microwave operation and alerts user of smoke before any damage is done", a "USB Charging Station," "Safe Plug™ Technology" for "one-plug to the wall operation," and "current limiting technology":

Ex. 2005; *see also* Ex. 2018(2015 version); Ex. 2019 (2023 version); Ex. 2001, ¶ 250. These materials demonstrate that the entire MicroFridge Product drove commercial success, as Intirion highlighted the unique combination of elements.

Thus, the MicroFridge Products are coextensive with the claimed invention and the evidence of secondary considerations is attributable to the claimed combination of features. *Fox Factory*, 944 F.3d at 1374. The nexus prong is met.

B. The MicroFridge Products Are a Commercial Success.

Commercial success is strong evidence of non-obviousness. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1337 (Fed. Cir. 2016) ("When 'a product attains a high degree of commercial success, there is a basis for inferring that [attempts to a solution] have been made and have failed.'" (citation omitted)). The MicroFridge Products are undisputably commercially successful. Ex. 2004, ¶ 3. Since 2015, in the Academic Market alone, Intirion has sold nearly [redacted] MicroFridge Products for a total revenue of approximately [redacted] *Id.* ¶ 5. Below are charts

showing the MicroFridge Products' revenue and unit sales in the Academic Market from 2015- 2023:

[redacted]

[redacted]

Ex. 2004 ¶¶ 6–7.

The MicroFridge Products' commercial success is also evidenced by the fact that customers began modeling their RFPs off the '745 Patent's patented features. Ex. 2004, ¶ 9. For example, after Intirion released their MicroFridge Products, [redacted] informed potential vendors in late 2015 that bid for 2016 purchases would require a unit with an internal smoke sensor. Ex. 2008. Likewise, in July 2015, [redacted] sent out a bid with specifications including an [redacted] Ex. 2014 at 1-3. [redacted] *Id.* Petitioner also lost a bid for [redacted], as the school explained: [redacted] Ex. 2020 at 1.

Indeed, colleges specifically called out Intirion's MicroFridge Products as the exemplary or preferred model in their RFPs. *See* Ex. 2009 at 6, 8 ([redacted]); Ex. 2010 at 4-5 ([redacted]); Ex. 2011 at 1 ([redacted]); Ex. 2012 at 2-3 ([redacted] Ex. 2013 at 4 ([redacted]).

In short, the MicroFridge Products set the standard for the industry—strong evidence that Intirion's claimed invention is not obvious. *See Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1391 (Fed. Cir. 1988) ("The commercial response to an invention is significant to determinations of obviousness, and is entitled to fair weight.").

C. Failure of Others and Long-Felt Need.

Evidence of long-felt need and failure of others further illustrates the non-obviousness of Intirion's invention. *See In re Piasecki*, 745 F.2d 1468, 1475 (Fed. Cir. 1984) (finding non-obviousness where the evidence demonstrated a failure of others to provide a feasible solution to a longstanding problem); *WBIP*, 829 F.3d at 1332 ("Evidence of a long felt but unresolved need tends to show non-obviousness because it is reasonable to infer that the need would have not persisted had the solution been obvious."). In this case, the market had been trying for decades to solve the problem of increasing the safety and reliability of combination appliances in dormitories, offices, and apartments. Ex. 2001, ¶ 252. Placing a smoke sensor inside the microwave was not seen as a viable option, given the high likelihood of false alarms that would require unnecessary evacuations. Ex. 2001, ¶ 253; *see* Ex. 1002 at 306 (App'x E) (commercial smoke detector warning users not to locate the detector even in "kitchens" because of the likelihood of false alarms). In addition, the "length of the intervening time between the publication dates of the prior art and

the claimed invention" demonstrates non-obviousness. *Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1359 (Fed. Cir. 2013). Here, Petitioner's obviousness arguments are largely based on Smith (a reference from 1985) and disclosures from Emma that are also discussed in a reference from Bone (U.S. Pat. No. 5,521,359 from 1995) cited against the parent applications to the '745 Patent during prosecution.

[redacted]

[redacted]

This evidence is "particularly probative of obviousness" because it "demonstrates both that a demand existed for the patented invention, and that others tried but failed to satisfy that demand." *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litigation*, 676 F.3d 1063, 1082 (Fed. Cir. 2012). That these failures occurred even after Intirion's invention became public is further evidence supporting non-obviousness. *See In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Pat. Litig.*, No. 09–MD–2118, 2010 WL 3766530, at *1–2 (D. Del. Sept. 21, 2010) ("If others continue to fail despite having the patent as prior art, such failures may illustrate just how radically different the patent was from past discoveries."). Intirion's invention became public in September 2014, when the application filed on April 25, 2014 to which the '745 Patent claims priority was published.

D. Teaching Away and Unexpected Results.

Next, evidence of teaching away and unexpected results also supports the non-obviousness of the '745 Patent. *See In re Kumar*, 418 F.3d 1361, 1368 (Fed. Cir. 2005). A reference may be said to "teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *Ricoh Co. v. Quanta Computer Inc.*, 550 F.3d 1325, 1332 (Fed. Cir. 2008). Unexpected results, such as unexpected increases in a device's efficiency, also support non-obviousness. *See Transocean Offshore Deepwater Drilling*, 699 F.3d at 1351.

Here, multiple sources taught away from the claimed invention. *See* Ex. 2001, ¶¶ 258-65. For example, the ISDU reference taught away from incorporating a smoke detector in operative connection with a microwave oven. *Id.*, ¶ 259. ISDU describes placing a smoke sensor *outside* of the microwave and teaches against adding a smoke sensor inside a microwave, acknowledging, "[i]t is known that cooking foods that include oils and sugars generate more non-threatening smoke than other foods and would trigger a standard detection device…." *See id.*, Ex. 1012 at 3, 7-8 ("Another concern inherent in the design of this system is the propensity of the smoke detector towards false alarms."). ISDU also teaches a "photoelectric smoke detector," which ISDU recognizes are "more prone to isolated particulate

triggering," and thus teaches it would not be It would appropriate in operative connection with the inside of a microwave oven because the ever-present particles would constantly trigger false alarms. Ex. 1012 at 11, 15; Ex. 2001, ¶ 259.

In addition, industry regulations taught away from locating a smoke sensor in a microwave oven. *Id.*, ¶ 260. The Department of Energy in October 2008, set out the proposed Energy Conservation Standard for Cooking Products, including a maximum standby power for microwave ovens of 1.0 watt. 73 Fed. Reg. 62034 at 62036 (Oct. 17, 2008). Placing a smoke sensor within a microwave was seen as not possible under these standards, as that system would exceed the allowable maximum standby power. *Id.*, ¶ 260; Ex. 2035, ¶ 9. As a result, the regulation discouraged the industry from taking Intirion's path of designing a product with a smoke sensor in operative connection with a microwave. Ex. 2001, ¶ 262; Ex. 2035, ¶ 9. By the time the standard became enforceable in 2016, it applied to stand-alone microwaves. 78 Fed. Reg. 36316 at 36316-17 (June 17, 2013) (stating the date of compliance is "June 17, 2016"). Ex. 2001, ¶ 263; Ex. 2035, ¶ 10.

It was also unexpected that placing a smoke sensor in the microwave of a combination appliance would work. As discussed above, smoke sensors located within microwaves are apt to give false alarms. In fact, standard smoke detectors like the ADEMCO 5608 referenced in Butt (Ex. 1015, 4:49-50), specifically warned users to *not* locate smoke detectors in "kitchens" because "[s]moke from cooking

may cause a nuisance alarm. LOCATE DETECTORS AT LEAST 20 FEET (6m) FROM KITCHES, IF POSSIBLE." Ex. 1002, App'x E at 306. The MicroFridge Products solve for that problem by shutting off power to the microwave *before* a fire has occurred, thus preventing unnecessary fire alarms and unnecessary evacuations in dormitories and apartments. Ex. 2001, ¶ 265.

E. Petitioner's Copying.

The Federal Circuit recently emphasized the importance of copying evidence, noting that "a determination of copying [is] strong evidence of nonobviousness." *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202, 1213 (Fed. Cir. 2023) (internal quotations omitted). Evidence of copying may include internal documents and "access to, and substantial similarity to, the patented product." *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d. 1317, 1325 (Fed. Cir. 2004). Copying exists when "the evidence fails to persuade [the tribunal] that th[e] similarity between the parties' respective products is either a coincidence or the result of independent creation." *Intri-Plex Techs. Inc. v. Saint-Gobain Performance Plastics Rencol Ltd.*, IPR2014-00309, Paper 83 at 41 (PTAB Mar. 23, 2015).

Petitioner's products—sold under the brand "MicroChill"—are close copies of Intirion's MicroFridge Products. [redacted]

[redacted]

[redacted]

To no surprise, Petitioner's product is not only substantially similar, but virtually identical to Intirion's MicroFridge Products. Ex. 2001, ¶¶ 266-268.

To the extent there are any differences between the two sets of products (such as the exact functioning of Petitioner's USB ports), they are insubstantial. *Id.*, ¶ 267. That Petitioner may not have copied Intirion's commercial product exactly does not disprove copying, especially where, as here, the differences are irrelevant to the patent claims. *E.g.*, *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325

(Fed. Cir. 2004); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1054 (Fed. Cir. 2016).

Petitioner's copying is directly related to the claimed inventions' unique characteristics. [redacted] *Id.*, ¶ 268.

Ultimately, Petitioner's outright copying is strong evidence the claimed invention was not obvious.

F. Any Testimony from Petitioner's Expert on Objective Indicia Related to the Industry Should Be Given No Weight.

To the extent Petitioner's expert, Dr. Mark Horenstein, offers opinions on secondary considerations related to the industry or market for Intirion's MicroFridge Products and Petitioner's MicroChill products, his testimony should be given no weight because he has little to no experience in the consumer appliances industry. Dr. Horenstein is an electrical engineer by education and training. Ex. 1002, ¶¶[6-14]. During his deposition, Dr. Horenstein admitted that the only experience he has performing work for a consumer appliance company was for retrofit radio consoles for automobiles "20 years ago." Ex. 2002, 22:13-25:18. He could not identify any other experience working for a company in the residential consumer appliance industry. *Id.* He has not done any work for a company related to smoke sensors, fire alarms, or related components. *Id.*, 26:5-27:20. Dr. Horenstein's experience as

a consumer repairing his own microwave or refrigerator does not qualify him as an expert to offer expert opinions as to the consumer appliances industry.

Because of Dr. Horenstein's lack of experience in the consumer appliances industry, any testimony he provides related to that industry or market has no grounding in any expertise he has and should be given no weight. *See* Fed. R. Evid. 702; *Innovations4Flooring N.V. v. Valinge Innovation AB*, IPR2017-02130, Paper 35 at 58 (PTAB Mar. 25, 2019) (giving "limited weight to certain testimony of Dr. MacLean, because he does not possess experience in the flooring industry").

XIII. CONCLUSION

For all the above reasons, Petitioner has failed to meet its burden to show that the '745 Patent is obvious. Intirion respectfully requests that the Board confirm the patentability of the claims 1-28 of the '745 Patent.

Dated: July 16, 2024

/R. Scott Johnson/
R. Scott Johnson
Reg. No. 45,792

Counsel for Patent Owner Intirion Corporation

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(a)(1)(i), the undersigned hereby certifies that the foregoing Patent Owner's Response contains 18,462 words, excluding parts of this Response exempted under § 42.24(a), as measured by the word-processing system used to prepare this paper.

Dated: July 16, 2024

/R. Scott Johnson/
R. Scott Johnson
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Counsel for Patent Owner Intirion Corporation

CERTIFICATE OF SERVICE

Per agreement of the parties and pursuant to 37 C.F.R. ¶ 42.105(b), the undersigned certifies that a copy of this Patent Owner's Response was served on July 16, 2024, by email on the following:

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