

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COLLEGE PRODUCTS, INC.
Petitioner,

v.

INTIRION CORPORATION
Patent Owner

Case PGR2024-00004
Patent No. 11,674,746

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 11,674,746 (“Patent”)
1002	Expert Declaration
1003	Prosecution File History, U.S. Patent No. 11,674,746
1004	Original Intirion Complaint Filed on June 8, 2022.
1005-1007	RESERVED
1008	U.S. Application No. 14/262,290 (“the ’290 Application”), published as U.S. Publication 2014/0251982.
1009	Exemplary embodiment Claim chart 1 sent by Intirion related to U.S. Patent No. 11,274,876
1010	RESERVED
1011	U.S. Application No. 12/317,632 (“the ’632 Application”) published as U.S. Publication U.S. Pub. 2009/0188911 (“Emma”)
1012	“ISDU: Integrated Smoke detector Unit for Commercial Microwave Ovens”, Cory Lloyd <i>et. al</i> , Northeastern University (2007). (“ISDU”)
1013	RESERVED
1014	U.S. Patent No. 4,496,817 to Smith (“Smith”)
1015	U.S. Patent No. 8,446,048 to Butt (“Butt”)
1016	Redline Comparison between 290 and Emma
1017-1019	RESERVED
1020	U.S. Application No. 13/094,747 (“the ’747 Application”) published as U.S. Publication U.S. Pub. 2012/0276763A1 (“Quezada”)
1021	Scheduling Order for <i>Intirion Corporation v. College Products, Inc.</i> , 5:23-cv-04023-KEM, Dkt. 75.
1022	Amended Complaint filed by Initiron Corporation, 5:23-cv-04023-KEM, Dkt. 62.

Exhibit No.	Description
1023	Supplemental Expert Declaration related to the 11,674,746 Petition
1024	Email correspondence between counsel for Petitioner and Northeastern University
1025	Claim construction order from <i>Intirion Corporation v. College Products, Inc.</i> , No. 5:23-cv-04023-CJW-KEM (N.D. Iowa May 31, 2024)
1026	Email from the Board, dated August 12, 2024, authorizing Petitioner to file the district court's <i>Markman</i> Order as an exhibit
1027	Deposition Transcript of Emad Y. Tanbour, Ph.D, dated September 13, 2024, and Errata Sheet

Patent Owner's Response (Paper 23, "Response") obfuscates simple issues. Patent Owner's own prior art, Emma, discloses a microwave/refrigerator with power control features preventing circuit overdraw, which minimizes interruptions and improves safety. Patent Owner asserts adding a smoke detector shutdown/reset and USB charging were new. They were not.

Patent Owner's expert testified the smoke sensors described in the Patent were not new. The only issue is whether adding one to Emma's microwave was obvious. Based on the art's combined teachings, it was.¹ Smith teaches a gas sensor to detect food beginning to "char, smoke or smolder" to anticipate fires. Butt teaches a controller and smoke sensor to shut down/reset a cooking appliance. Quezada teaches substituting USB ports for standard outlets. Those references relate to microwaves (Emma, Smith), electrical cooking appliances (Butt), or to the Emma outlets (Quezada). Further, Patent Owner's expert testified a POSITA would have considered and known how to reset an undamaged microwave.

Patent Owner's secondary considerations arguments to support non-obviousness are meritless. It has not shown a nexus to any claimed feature.

¹ The Board denied Petitioner's request for additional discovery to further confirm ISDU's public availability. Paper 28. Accordingly, Petitioner's reply highlights non-ISDU grounds. Petitioner rests on its petition for the ISDU grounds.

I. THE BOARD’S CONSTRUCTION OF “LEVEL OF SMOKE” IS INDEFINITE

In its Institution Decision (Paper 10, “Institution”), the Board *sua sponte* proposed the following preliminary construction for the term “level of smoke”: “a predetermined level of smoke ‘*indicative of a dangerous condition*’.” *Id.*, 11. The Board invited the parties to address its construction in subsequent briefing. *Id.* Thereafter, Chief Judge (“CJ”) Williams of the Northern District of Iowa issued a *Markman* Order finding the terms “level of smoke,” “amount of smoke,” and “dangerous condition” indefinite. Ex. 1025, 14-22. By leave of the Board, Petitioner filed the *Markman* Order for the Board’s mandatory consideration. EX1026; Board’s Consolidated Trial Practice Guide (“TPG”), 47.

A. “dangerous condition”

CJ Williams properly recognized the term “dangerous condition” indicates a threshold where the level of smoke in the microwave changes from normal smoke emitted during cooking/heating to a dangerous condition. *See* EX1001, 15:54-58; EX1025, 17. Based on the intrinsic and extrinsic evidence, he found that threshold is undefined, leaving a POSITA to guess where the threshold is.

Neither the claims nor the specification provides boundaries, like a specific value, for “dangerous condition.” *Id.*, 17-18. The specification states the smoke point of oil or similar food may be the basis for the threshold. EX1001, 15:52-54.

But, as CJ Williams correctly recognized, that doesn't clarify "dangerous condition" because different oils have different smoke points. EX1025, 17-18. The Patent doesn't identify which oil or food to use. Further, even if the Patent did, that still doesn't inform a POSITA of a "dangerous condition" because, as CJ Williams properly recognized, the microwave tolerates some level of smoke before a "dangerous condition." *Id.*, 18. Dr. Tanbour confirmed the smoke point of oil is when it begins to smoke and some level of smoke is not "dangerous." EX1027, 64:6-20, 68:5-69:14. Thus, the smoke point of oil cannot form the basis for determining the higher threshold of "dangerous condition."

CJ Williams also found "the evidence does not indicate the appropriate measurement [e.g., manufacturer's R&D or apparent industry standard] by which the smoke crosses a threshold into a 'dangerous condition.'" EX1025, 21. The Patent "fail[s] to specify which measurement is applicable to differentiate a 'dangerous condition' from one that is not." *Id.*

Thus, the evidence fails to inform a POSITA of when the level of smoke crosses a threshold into a "dangerous condition."

B. "level of smoke"

The Board's construction shows that the term "level of smoke" is indefinite because that term is tied to the term "dangerous condition." The Board's preliminary

construction itself is indefinite for the reasons CJ Williams found the term “dangerous condition” indefinite. Alternatively, the Board should find “level of smoke” indefinite for the same reasons CJ Williams did. EX1025, 14-16.² The Board should cancel claims 1-24 as invalid for indefiniteness. 35 U.S.C. §328.

Petitioner anticipates Patent Owner will argue the Board cannot find that term indefinite because Petitioner did not challenge it in the Petition. That argument misses the mark. Indefiniteness is a matter of claim construction. The Board *sua sponte* proposed a construction that includes the indefinite term “dangerous condition.” The parties have the right to address that construction. *See Ericsson Inc. v. Intellectual Ventures I LLC*, 901 F.3d 1374, 1380 (Fed. Cir. 2018); *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1383 (Fed. Cir. 2023); TPG, 45. The Board’s

² Claims 1-24 are also invalid because the term “a smoke sensor...in operative connection with the cooking area” is indefinite. Petition, 87-88. Petitioner rests on its Petition for that invalidity ground. While the Board provided a range of possibilities for when a smoke detector is “in operative connection with the cooking area,” including an “interior region” connected to the interior cooking area, (Institution, 42-44), that interpretation doesn’t resolve indefiniteness. Although referencing the ’745 patent to have consistent constructions, the ’745 construction did not require an “interior region” – only a “region connected to the *interior cooking area*.” The “interior” cooking area of the present Patent is in another limitation: the “cooking area *within* the microwave oven.” Thus, “within” or “interior” doesn’t modify “smoke sensor.” The Patent also doesn’t specify how far smoke travels through a connected region to no longer be in “operative connection.”

construction shows the underlying term “level of smoke” is not amenable to a definite construction, as CJ Williams found. The Board has authority to cancel indefinite claims.

II. GROUND 2: EMMA/SMITH

A. Smith Mischaracterization

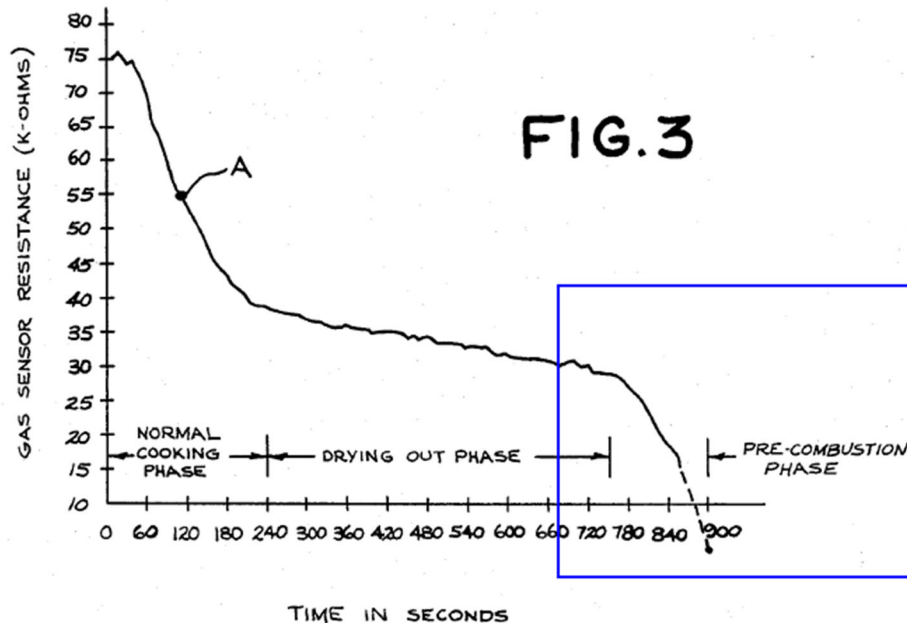
1. “Smoke Sensor”

Patent Owner incorrectly asserts “[b]oth parties agree Smith does not explicitly disclose a ‘smoke sensor.’” Response, 32. The Petition describes Smith teaching gas detection for char/smoke/smolder, i.e., a smoke sensor. Petition, 48-50. While Patent Owner characterizes Smith as merely a “humidity sensor,” Smith is not so limited.³ First, Smith discloses a “Fire Detection” routine using a sensor. EX1014, 7:58.

Second, Smith describes the detection of water and other gases. *Id.*, 3:3-10. It discloses a gas sensor “responsive to the cumulative concentration of water vapor and various organic gases” emitted by heated food. *Id.*, 3:13-18, 3:35-37. Before “reaching the ignition point, the food begins to **char, smoke or smolder**, resulting in a second period of relatively rapidly **increasing gas concentration**” in what

³ While Dr. Horenstein referenced external evidence regarding the TGS-186 Smith disclosure, such evidence is not required. Smith discloses a smoke sensor on its own.

Smith calls the “pre-combustion” phase that the Smith gas sensor senses. *Id.*, 3:51-63 (emphasis added), FIG. 3 (annotated):



Dr. Tanbour admitted that the example sensor also senses organic gases. EX1027, 157:21-24, 169:10-15. He testified when organic compounds become gas they are VOCs: “When it becomes gas, it’s a volatile []-- **it evaporated, so it is a – it’s a VOC.** *id.*, 103:18-21 (emphasis added) (discussing alcohol is a VOC in the Patent). The Board recognized the Patent discloses the sensor may be a VOC sensor “operative to detect smoke by determining the level of volatile organic compounds (VOCs).” Institution, 25-26 (citations omitted).

Despite his above admission, Dr. Tanbour maintained Smith’s sensor is a “humidity sensor” on re-direct. EX1027, 220:15-20. That testimony should be

given no weight as it directly conflicts with his earlier testimony and Smith.

Dr. Tanbour ignores Smith's teaching of detecting gas from char/smoke/smolder because Smith's lexicography called the pre-ignition period "pre-combustion," which conflicts with Dr. Tanbour's opinion that smoke cannot occur prior to "combustion": "you cannot have pre-combustion and allow yourself to have smoke." *Id.*, 172:14-18, 174:21-25 ("That's what I am struggling with"). Therefore, Dr. Tanbour concludes Smith doesn't disclose a "smoke sensor." *Id.*, 177:13-18. His opinion, however, conflicts with Smith sensing gases (smoke/char) during the "pre-combustion" period to anticipate fire. EX1014, 3:51-63. Whether Smith detects water and/or a combination of gases, Smith discloses detecting conditions indicative of smoke, i.e., it is a smoke sensor, or at least suggests to a POSITA detecting smoke in a microwave to prevent fires.

2. "Shutdown Function"

Patent Owner asserts Smith doesn't disclose "a set end time" because Smith "discusses automatic cooking." Response, 37. Smith's entire discussion of automatic cooking relates to a prior use of a gas sensor. EX1014, 3:19. However, Smith teaches turning off the magnetron as a safety shutdown to prevent fires. *Id.*, 3:53; Petition, 54-55. And Dr. Tanbour testified that all microwaves, including Smith, enable users to input a set cooking time. EX1027, 41:2-11, 156:4-7.

Accordingly, Patent Owner's assertion that Smith doesn't teach shutting down a microwave with a set end time is illogical.

Dr. Tanbour also testified he wasn't sure whether automatic cooking involves setting a time period. *Id.*, 148:16-20 ("I don't know. I never really designed a cooking appliance to answer that question accurately."). His opinion that Smith is missing "a set end time" should therefore be given no weight.

Further, the Board recognized, regardless of why Smith cuts power, it would have been clear "that during a cooking event the magnetron and blower of the microwave are turned off before a desired, or 'set,' cooking time has elapsed." Institution, 31.

3. "Reset Enable Function"

Patent Owner relies on testimony that Smith doesn't disclose a named "reset relay" to conclude the Reset Enable feature is missing. Response, 39. However, Dr. Horenstein confirmed that function was "what a [POSITA] would have understood" upon reading Smith. EX2002, 128:15-18. The Petition doesn't "create missing elements out of thin air" (Response, 39), but explains Smith's circuit elements and why, after preventing a fire, a POSITA would re-use a microwave. Petition, 59-60, 72-74. Smith recites "a power control relay 68 for controlling energization of magnetron power circuit 66...in response to a control signal from microprocessor

64.” EX1014, 5:6-12. Energization means applying power.

Dr. Tanbour admitted a disclosure is not required to describe every aspect of a circuit if it was known, including known relays. EX1027, 34:5-12; *see also Intel Corp. v. Qualcomm Inc.*, 2022 WL 880681, *3 (Fed. Cir. Mar. 24, 2022) (A POSITA has “ordinary creativity with common sense, common wisdom, and common knowledge.”).

The Smith circuit is designed to re-energize the magnetron. At best, Patent Owner’s argument is merely that Smith doesn’t describe logic to reset after a smoke shutdown. Yet, Dr. Tanbour testified that because the Smith microwave was shut down without damage (pre-ignition), it would have been obvious to reuse it:

Q. That’s right, in the context of Smith. That’s right. The microwave would be usable again; correct?

A. Yes.

EX1027, 139:25-140:8; *id.*, 102:14-17, 145:22-24. He further testified a POSITA would understand how to re-enable a microwave after safety shutdown and provided several methods (e.g., opening/closing the door, reset button, elapsed time, or other hybrid means). *Id.*, 141:2-142:9, 145:22-146:15.

Even if Smith doesn’t explicitly recite the logic to reset the microwave after a shutdown, the testimony of *both* experts shows it would have been obvious to a POSITA to reset the microwave and how to do so.

4. “Sensor”

Patent Owner argues Smith doesn’t disclose “a VOC sensor.” Response, 43. As discussed above, the testimony of both experts shows a POSITA would understand Smith teaches a VOC sensor. *Supra*, §II.A.1.

B. Obviousness

Patent Owner wrongly asserts Dr. Horenstein’s testimony concludes “any functionality could be added to Emma.” Response, 42. Dr. Horenstein stated that Emma “disclose[s] adding functionality by cycling power to a refrigerator and auxiliary electrical outlets for the purpose of improving the safety of the Emma appliances” and a POSITA “would have been motivated to look for other safety functionalities.” EX2002, 70:12-22. Dr. Tanbour confirmed preventing overloads improves safety. EX1027, 55:2-4. Smith provides motivation to add fire prevention features to a microwave. EX1014, 1:55. Both Emma and Smith are directed to issues that arise using microwaves. Further, the motivation need not be found in Emma or Smith alone. *See Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1366 (Fed. Cir. 2006) (holding motivation to combine “may be found in the knowledge of [a POSITA]” or “from the nature of the problem to be solved”).

Lastly, the Petition asserted other motivations not addressed by Patent Owner. Petition, 70-72.

III. GROUND 3: EMMA/BUTT

A. Butt Mischaracterization

1. “Smoke Sensor”

Patent Owner argues the Butt/Emma combination doesn’t teach the Smoke Sensor because the Butt sensors “cannot be placed near or inside the microwave.” Response, 50. This argument fails for several reasons.

First, there is no requirement that a smoke sensor be inside a microwave. The Challenged Claims merely require “the smoke sensor be “positioned in operative connection with the cooking area.”

Second, Patent Owner admitted this limitation is met if “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.” *Id.*, 64.

Third, Patent Owner relies on placement guidance (external to Butt) for locating general-purpose smoke detectors to conclude that Butt cannot teach a smoke sensor with an appliance. However, Butt is not so limited and such guidance is of little relevance based on Butt using a smoke detector to shut down a specific electrical appliance: “the trigger signal being generated in a response to **a safety hazard associated with the electrical appliance.**” EX1015, 2:32 (emphasis added). Butt teaches smoke from its cooking area is a safety hazard. By cutting

power “the energy that would otherwise act as an accelerant for the fire is eliminated.” *Id.*, 4:58-59. Dr. Tanbour agreed this is what Butt teaches. EX1027, 184:24-185:15.

Thus, Butt meets Patent Owner’s definition: it teaches a smoke detector to detect smoke from a cooking area, i.e., such that the smoke sensor is able to operate and sense smoke from the cooking area.

2. “Shutdown Function”

Patent Owner contends that Butt (or Butt/Emma) doesn’t teach withdrawing cooking power “prior to a set end time.” Response, 47. Patent Owner admits that Butt may “stop all power to a range in the event of a fire.” *Id.* (citing EX1015, 4:35-38, 55-60). If all power to a microwave (Emma) is stopped during cooking “in the event of a fire,” the microwave is turned off before a desired, or “set,” cooking time has elapsed. *Cf.* Institution, 31.

3. “Reset Enable Function” (“Control Circuit”⁴)

Patent Owner asserts Butt/Emma would not teach a control circuit “supplied with electrical power only through the single power cord and is releasably connected

⁴ Although titled “Reset Enable Function,” Patent Owner’s arguments focus on the “Control Circuit.”

to a source of power.”⁵ Response, 48. Patent Owner ignores Butt’s teaching of integrating the controller with a power cord, which would still supply power “through the single power cord.” EX1015, FIG. 6. Further, a POSITA would have integrated the features of Butt into Emma (Petition, 74-80). Obviousness doesn’t require the mere simple assembly of rigid components. *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214 (Fed. Cir. 2016) (“The rationale of *KSR* does not support [Patent Owner’s] theory that a [POSITA] can only perform combinations of a puzzle element A with a perfectly fitting puzzle element B.”).

B. Combination of Emma/Butt

Patent Owner asserts Butt’s safety system wouldn’t be integrated with Emma, because Butt is installed “within a wall” using separate smoke detectors. Response, 44. However, Butt discloses the safety system may be integrated into alternative locations, for example, Butt FIG. 6 (a power cord “that is not designed to be flush mounted” (EX1015, 6:16-21)) and, Butt further discloses other known custom housings. *Id.*, 1:29-66.

Patent Owner asserts Butt merely relates to a home and not an appliance. Response, 49. A POSITA could integrate an inline power controller into the Emma

⁵ Only dependent claims 7-8 and 11-12 require a “single power cord.”

microwave. *See, e.g., KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (holding a POSITA “is also a person of ordinary creativity, not an automaton”); *ClassCo*, 838 F.3d at 1219 (reiterating a flexible approach beyond fitting together static elements).

Patent Owner wrongly argues Butt’s teachings are inapplicable to microwaves. Butt teaches a shut-off system that **“may be applied to other applications involving electric appliances generally”** and addresses **“a safety hazard associated with the electrical appliance.”** EX1015, 3:64-67, 2:33 (emphasis added).

Emma discloses an electrical appliance having features that prevent electrical overloads of circuit breakers and outlets. EX1011, ¶[0029]. Circuit limits prevent overloading of wiring. EX1027, 55:2-4 (confirming that preventing overloads has a safety aspect). Thus, Emma and Butt both teach electrical cooking appliances and relate to safety features. As detailed in the Petition, a POSITA viewing the smoke detection and cut-off features of Butt would have been motivated to add additional safety features to Emma, another electrical cooking appliance.

Patent Owner’s assertion that “Butt’s teachings are inapplicable to microwaves” because the risk of leaving power on is “non-existent in microwaves, which cook for short time periods” (Response, 50) is also meritless. If that is true,

what is the point of the alleged invention? Microwaves overcook items, which anyone who has burnt microwave popcorn can confirm. *See* EX1014, Fig. 3 (pre-combustion within 15 minutes).

Patent Owner argues the benefits of Butt's reset function will not be achieved in a power outage unless the reset is in an outlet. Response, 50. That is incorrect. The reset's location is irrelevant to that benefit. Butt discloses a reset feature that restores power "only at the user's explicit request," i.e., pressing a button, which is beneficial for power outages. EX1015, 6:41-52. Even if the assertion was accurate, that is merely a preferred embodiment. Obviousness "does not require that a particular combination must be the preferred, or the most desirable, combination described in the prior art...to provide motivation...." *Novartis Pharms. Corp. v. West-Ward Pharms. Int'l Ltd.*, 923 F.3d 1051, 1059 (Fed. Cir. 2019). Nothing in Butt, teaches away from integrating a reset into another appliance. It teaches the opposite.

Patent Owner further asserts the external placement guidelines of an example sensor teach away from integrating a smoke sensor with a microwave because it's a location the guidelines "forbid." Response, 47. Those guidelines are not Butt's teachings; they are for a specific sensor. Moreover, they do not "forbid" but merely indicate, "to avoid false alarms" for that particular smoke detector, it should be away

from kitchens “if possible.”⁶ EX1002, ¶306.

A POSITA can infer that, for sensitivity, a smoke sensor should be placed close to the source. Dr. Tanbour agreed: “...the closer you are, the smoke detector to the cooking area within the microwave, the better” to get an early “alarm to provide the early control of sensing dangerous conditions.” EX1027, 122:8-17. Butt also provides a means to address false alarms: in case of “a false alarm...a user can press the panic/reset button” to “restore the AC power supply.” EX1015, 4:63-67. Accordingly, based on the teaching to detect smoke from a specific electrical appliance (Butt), a POSITA would consider placing a known smoke sensor in operative connection with a microwave cooking area (Emma) to ensure sufficient detection sensitivity.

Patent Owner asserts the Butt smoke detectors would not function inside a microwave. Response, 51. Butt makes no such claim. Further, the Challenged Claims do not require a specific smoke detector. Indeed, dependent claim 5 requires that the smoke sensor be at least one of “a radiation emitter and radiation receiver, a photosensor, a motion sensor, an ionization sensor, and a VOC sensor.” EX1001,

⁶ Patent Owner asserts Dr. Horenstein admitted “not reviewing these warnings.” Response, 46. Yet, he testified the external guidelines did not change his opinions. EX2001, 136:19-137:12.

cl.5. The exemplary Butt smoke detectors meet this limitation. EX1002, ¶[297]; EX1023, ¶[105].

Further, while Patent Owner asserts that the Butt smoke detector “could not function at the high temperatures within an oven,” that is inaccurate and irrelevant. A POSITA would have been motivated by Butt’s teaching of smoke detection to include a known smoke sensor that “can be calibrated within the principle of operation into some kind of a trigger” appropriate for Emma’s microwave. *See* EX1027, 58:18-59:7.

Patent Owner asserts that integrating the Butt smoke detector/controller into the Emma microwave would cause it to be “unable to detect smoke in the house” and “lose its other functionalities.” Response, 50-51. First, Patent Owner mischaracterizes Butt’s function. Butt discloses shutting off power based on smoke associated with a specific appliance. EX1015, 1:32-33. Second, the Butt smoke detector in the Butt/Emma combination is being used for its intended purpose of detecting smoke. Third, based on Butt’s teachings, a POSITA could choose an appropriate smoke detector feature for use with Emma without needing to disable any installed Butt systems.

Patent Owner’s assertion that any combination “would have simply plugged the Emma appliance into the Butt outlet” (Response, 52) fails to provide a POSITA

any reasonable skill to integrate disclosed features. *See ClassCo*, 838 F.3d at 1219.

IV. GROUND 4: EMMA/SMITH/ BUTT

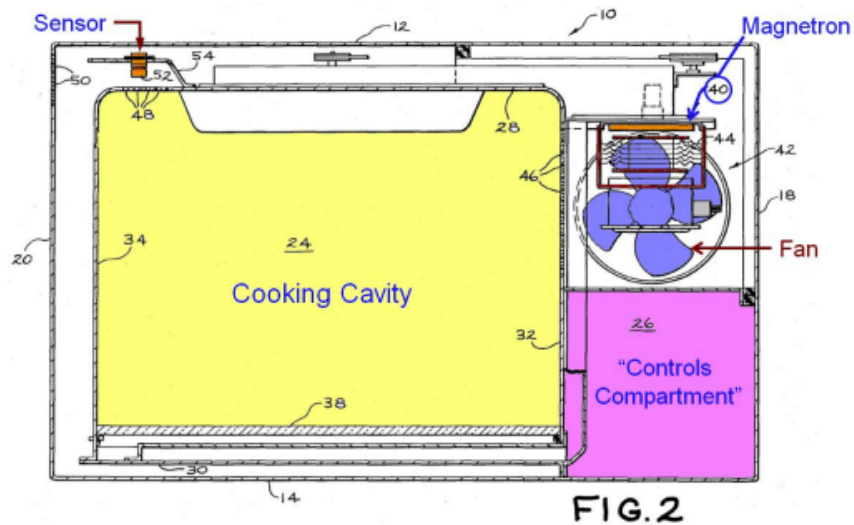
A. Combined Elements

It would have been obvious to combine the teachings of Emma and Smith (*supra*, §II) and/or Emma and Butt (*supra*, §III). Combining all three references resolves any perceived lack of teaching.

1. “Smoke Sensor”

Assuming *arguendo* that Smith’s sensor is not a “smoke” sensor, Butt fills this purported gap. Butt discloses a fire safety system for shutdown of an electrical cooking appliance based on a smoke sensor. *Supra*, §III.A.1.

While Patent Owner asserts Butt’s smoke detector is not in “operative connection with the cooking area,” Smith teaches a sensor so configured: “disposed in the air flow path” between cavity perforations and vent openings. EX1014, 3:6-



Id., FIG. 2 (annotated); Petition, 49.

2. “Shutdown Function”

As described above in §§II.A.2 and III.A.2, respectively, Smith and Butt, either alone or with the Emma microwave, teach ending a cooking session prior to a set end time; otherwise, no safety shut-off would be required based on smoke detection. The Board recognized this: if all power to a microwave is stopped during cooking “in the event of a fire,” the microwave is turned off before a desired, or “set,” cooking time has elapsed. *Cf.* Institution, 30-31.

3. “Reset Enable Function”

Smith’s circuit is designed to re-energize the magnetron (“a power control relay 68 **for controlling energization of magnetron power circuit**” in response to the controller (EX1014, 5:6-12(emphasis added))), and Dr. Tanbour confirmed a

POSITA would have known how to do so. *Supra*, §II.A.3. To the extent Smith lacks the explicit logic to do so, or a POSITA would not have known to do so, Butt provides this teaching.

Butt teaches a reset button and algorithm for re-enabling power for cooking. That button/algorithm restores “AC power supply to the appliance.” EX1015, 3:63-67, 7:15-21 (“the microcontroller 36 closes the relay 44”), FIG. 7; Petition, 57-59.

B. Motivations to Combine

The motivation to combine Emma, Smith and Butt is described above. *Supra*, §§II.B,III.B. In summary, a POSITA would have looked to include the fire safety features of Smith and/or Butt into the Emma microwave.

Patent Owner wrongly contends Butt’s controller/detector “are not to be used inside an appliance.” Response, 53. Yet, as discussed above, Butt is not limited to such a teaching. *Supra*, §III.B. II.A.III.BA POSITA would not have been limited to any specific smoke detector model. *See ClassCo*, 838 F.3d at 1219.

Patent Owner also wrongly asserts that adding Butt’s smoke sensor to Emma/Smith is “contrary to a foundational purpose of Butt,” because it would “miss” stove fires (two-thirds of all fires). Response, 54. This faulty reasoning implies a POSITA must cannibalize parts from a Butt system to integrate its teachings with Emma/Smith. A POSITA, however, may modify Emma/Smith based

on Butt's intended purpose: detect smoke, shutdown an electrical cooking appliance; and reset it for another cooking session. *See* EX1015, 3:64-67.

Patent Owner asserts Smith teaches away from using a Butt smoke detector, because Smith teaches a gas sensor for its “low cost and simplicity” and that it then couldn't “detect humidity as required by Smith.” Even if a smoke detector added cost⁷, it is irrelevant. First, the Challenged Claims do not require a cost limitation and obviousness doesn't rely on economic feasibility. *See Grit Energy Sols., LLC v. Oren Techs., LLC*, 957 F.3d 1309, 1323 (Fed. Cir. 2020) (holding economic reasons is not technological incompatibility: “Only the latter is telling on the issue of nonobviousness.”). Second, a POSITA is not required to replace the Butt smoke detector for the Smith sensor and may combine both the teachings of Butt and Smith into Emma. There is no requirement to remove features.

Patent Owner asserts “Butt does not teach resetting an appliance” after a detected fire, and the shutoff merely reduces fuel for an “unrelated fire” arguing it would be “improper” to reset an appliance after a fire therewithin. Response, 55.

First, the Challenged Claims do not require a fire (only a smoke sensor). Second, Butt teaches resetting a cooking appliance after a smoke sensor shut down

⁷ Patent Owner has not provided any data to support this argument.

of that specific appliance. *Supra*, §III.A.1. Third, Dr. Tanbour conceded it would have been obvious to reuse the microwave because the microwave was shut down before a fire. EX1027, 102:14-17, 139:25-140:8, 145:22-24. He also conceded a POSITA would understand how to re-enable the Smith microwave after safety shutdown. *Supra*, §II.A.3.

Patent Owner cannot assert Smith fails to teach a “smoke” sensor because it shuts down before smoke generation and simultaneously argue that one wouldn’t reuse the microwave because of a fire therewithin. As Dr. Tanbour testified, Smith’s shutdown would “definitely” be before a fire in the microwave. EX1027, 135:21-24. Accordingly, Patent Owner’s assertions are incredible.

Lastly, Patent Owner asserts a POSITA would not combine “a reset feature of Butt” with Emma/Smith because the Smith sensor should be preheated “prior to testing.” Response, 56. While Patent Owner relies on the TGS-816 specification sheet⁸ related to “testing,” (a teaching not in Smith), Smith doesn’t teach its microwave features cannot be used after plugging it in, nor do the Challenged Claims require any “testing” (or lack thereof). Also, Smith describes disabling cooking power by power control relay 68 which doesn’t remove power to the sensor 52.

⁸ While at the same time arguing its inapplicability. Response, 42-43.

EX1014, FIG.4.

V. GROUNDS 5-8: EMMA/SMITH + POSITA KNOWLEDGE OR QUEZADA

Patent owner wrongly claims grounds 5-8 “all rely upon” ISDU. Response, 62. Grounds 5 and 6 assert “Emma combined with **either** ISDU **or** Smith, and further combined with the knowledge of a POSITA.” Petition, 12 (emphasis added). Grounds 7 and 8 assert “Emma combined with **either** ISDU **or** Smith, and further combined with Quezada.” *Id.*, 13 (emphasis added). In other words, grounds 6 and 8 do not rely on ISDU.

A. Ground 6: Emma/Smith/POSITA

Patent Owner asserts replacing an Emma outlet was nonobvious because it would remove functionality of Emma’s outlets. Response, 63. Yet, Emma discloses an auxiliary outlet for low power devices, e.g., “cellular phones, PDA’s or other electronic devices.” EX1011, ¶[0027]. A POSITA knew at the priority date that using USB ports to power small devices was becoming common and thus, modifying an Emma auxiliary outlet would have provided for using the modern USB standard for charging small devices. Petition, 80-83.

Patent Owner wrongly asserts that Petitioner “does not address power control for the USB ports when the magnetron draws cooking power.” Emma teaches power control to auxiliary ports 11,12, to prevent overload, for which a USB port is

substituted. *Id.*, 42-46; EX1011, FIGS. 3,5,7,9.

B. Ground 8: Emma/Smith/Quezada

Patent Owner asserts “Quezada is not related to appliances” and there is no motivation to combine Emma/Smith/Quezada. Response, 63. Quezada is directed to standard format outlets. It teaches substituting a USB Port for a standard house outlet. EX1020, FIG. 2. Thus, in addition to a POSITA’s knowledge (*supra*, §V.A), Quezada provides motivation to replace a standard outlet (as taught by Emma) with a USB port.

Emma also provides motivation to combine Quezada’s teaching with a microwave. Emma teaches using a standard format outlet as an auxiliary outlet. Combining the two is a simple substitution. *Compare* EX1011, FIG. 11 (below left), *with* EX1020, FIG. 2 (below right):

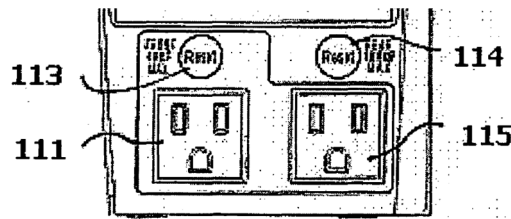


FIGURE 11

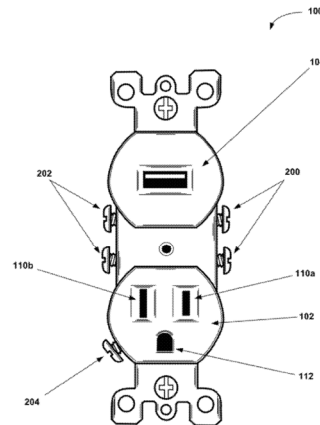


FIG. 2

Accordingly, Quezada's relevance to appliances is irrelevant; Emma, Quezada, and a POSITA's knowledge provide motivation.

VI. CLAIM 14: LACK OF WRITTEN DESCRIPTION

There is no written description for the term “a preset minimum period after the magnetron becomes inoperative” of claim 14.⁹ Petition, 90-91. Patent Owner wrongly asserts the Patent describes this limitation. Response, 67 (citing EX1001, 4:55-61, 6:43-51). The only support Patent Owner cited relates to a preset minimum period when “cooking power is demanded,” i.e., when the **compressor** is inoperative – not the magnetron. *See* EX1001, 4:55-61 (When “the compressor is disabled”), 6:43-51 (“When the compressor of the refrigerator is disabled”). Dr. Tanbour confirmed Petitioner's understanding is correct. EX1027, 210:12-213:6.

VII. SECONDARY CONSIDERATIONS

A. Commercial Success

Commercial success must have a nexus with the claimed invention, not a prior art element. *Tokai Corp. v. Easton Enters.*, 632 F.3d 1358, 1369 (Fed. Cir. 2011). No nexus exists here. [REDACTED]

⁹ Claim 10 is also invalid because the term “sensing the level of smoke continuously for a predetermined time” lacks written description. Petitioner rests on its Petition for that invalidity ground. Petition, 88-89.

[illegible]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

B. Long Felt Need

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Relying on *Leo Pharmaceutical Products, Ltd. v. Rea*, 726 F.3d 1346 (Fed.

Cir. 2013), Patent Owner argues the length of the intervening time between the prior art's publication dates and the alleged claimed invention demonstrates non-obviousness. Response, 76-78. That case is inapposite. In *Leo Pharm.*, the court held the length of time *can* qualify as an objective indicator of nonobviousness, but only if there is first evidence of long felt need. *Leo Pharm.*, 726 F.3d at 1359. Here, as discussed above, no such evidence exists.

C. Teaching Away

■ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

■ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

D. Copying

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

VIII. CONCLUSION

For the foregoing reasons, along with those in the Petition, the Board should find all Challenged Claims of the '746 Patent unpatentable.

Dated: October 8, 2024

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

I hereby certify that the foregoing Reply complies with the type-volume limitation of 37 C.F.R. §42.24(c)(1) and contains 5,582 words based on the word count indicated by the word processing system used to prepare this Reply, excluding those portions exempted by §42.24(c). I also certify that the foregoing Reply complies with the general format requirements of 37 C.F.R. §42.6(a) and has been prepared using Microsoft® Word in 14-point, Times New Roman font.

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e), the undersigned certifies that a copy of the foregoing **PETITIONER’S REPLY TO PATENT OWNER’S RESPONSE AND EXHIBITS 1026-1027** were served on counsel of record on October 8, 2024, by electronic mail at the following address, as authorized by Patent Owner in its Mandatory Notices:

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