

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

PETITION FOR POST GRANT REVIEW

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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 11,674,746
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”)

Exhibit No.	Description
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.
1023	Supplemental Expert Declaration related to the 11,674,746 Petition

College Products, Inc. (“College Products” or “Petitioner”) respectfully requests Post Grant Review of claims 1-24 (“Challenged Claims”) of U.S. Patent No. 11,674,746 (“the ’746 Patent”) pursuant to 35 U.S.C. §321 and 37 C.F.R. §42.200.

I. MANDATORY NOTICES (37 C.F.R. §42.8)

A. Real Parties-in-Interest (37 C.F.R. §42.8(b)(1))

College Products is the real party-in-interest for this proceeding.

B. Related Matters (37 C.F.R. §42.8(b)(2))

Petitioner is aware of the following judicial or administrative matters that would affect, or be affected by, a decision pending in this proceeding:

- *Intirion Corporation v. College Products, Inc.*, 5:23-cv-04023-KEM (N.D. Iowa) (“Iowa Transfer Case”).
- IPR2023-01041
- IPR2023-01042
- IPR2023-01043

The afore-mentioned proceedings involve six related U.S. patents: U.S. Patent 9,791,206; U.S. Patent 10,495,374; U.S. Patent 9,657,974; U.S. Patent 11,674,745; U.S. Patent 11,674,746; and U.S. Patent 11,274,876.

In the Iowa transfer case, the Court entered a Scheduling Order, but only up to a claim construction hearing. Ex.1021. The Court will not set a trial date until

after the claim construction hearing.

Concurrently with this Petition, Petitioner filed a petition for PGR for U.S. Patent 11,674,745 (PGR2024-00003), which is related to the '746 Patent. For efficiency, Petitioner requests these two related PGR petitions be consolidated into one proceeding.¹

C. Lead and Backup Counsel (37 C.F.R. §42.8(b)(3))

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¹ A single expert declaration is provided for these two petitions because of the substantial overlap.

<u>Backup Counsel</u>	Alexander S. Perry (Reg. No. 68,030) BLANK ROME LLP 1825 Eye Street NW Washington D.C. 20006 Tel.:(202) 420-3115 / Fax:(202) 420-2201 alex.perry@blankrome.com
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D. Service Information (37 C.F.R. §42.8(b)(4))

Please direct all correspondence to lead counsel and backup counsel at the addresses shown above. Petitioner consents to electronic service by e-mail, provided that all counsel for Petitioner are copied at the foregoing email addresses.

E. Payment of Fees (37 C.F.R. §42.203)

The undersigned authorizes the Commissioner to charge the fee specified by 37 C.F.R. §42.15(b) to Blank Rome LLP Deposit Account No. 23-2185, referencing attorney docket number 163456-00106. In addition, the undersigned representative authorizes the Commissioner to charge any additional fees which may be required, or credit any overpayment, to that deposit account.

II. COMPLIANCE WITH REQUIREMENTS FOR POST GRANT PETITION PURSUANT TO 37 C.F.R. §42.204(A)

On June 28, 2023, Patent Owner served Petitioner with a First Amended Complaint for Patent Infringement in the Iowa Transfer Case, adding infringement of the '746 Patent as a new count. *See* Exhibit 1022. As such, this Petition is being filed within nine months of the grant of the patent.

Petitioner certifies that the '746 Patent is available for *Post Grant* review;

and (2) Petitioner is not barred or estopped from requesting *Post Grant* review of any of the challenged claims on the grounds identified herein.

Concurrently, Petitioner is filing a Power of Attorney pursuant to 37 C.F.R. §42.10(b). Proof of Service of this petition pursuant to §§42.6(e) and 42.205(a) is provided in the attached certificate of service.

III. SUMMARY OF THE ARGUMENT

The '746 Patent generally teaches a combined microwave-refrigerator appliance, where power is cut to the refrigerator during microwave use, and the microwave includes a smoke sensor and/or USB ports for charging low power devices.

The most critical prior art reference to the '746 Patent is its parent application, U.S. Patent Application No. 12/317,632, which was published as U.S. Publication No. US20090188911A1 ("Emma"). The application that issued as the '746 Patent (U.S. Patent Application No. 17/691,628) (the "746 Patent Application") was a continuation in part to Emma. The Examiner did not consider Emma during prosecution, perhaps because he did not appreciate that Emma is prior art even though it is the parent. Emma discloses all the features of the microwave-refrigerator appliance recited in most of the Challenged Claims, except for a smoke sensor or a USB port.

Smoke sensors were used in microwaves decades before the '746 Patent's

priority date. Multiple prior art references discussed herein that were not considered by the Examiner disclose smoke sensors in microwaves, including re-enabling the microwave after a smoke sensor shutdown. Those references include ISDU: Integrated Smoke detector Unit for Commercial Microwave Ovens, Cory Lloyd *et. al*, Northeastern University (“ISDU”) published on April 17, 2007, and U.S. Patent No. 4,496,817 (“Smith”) which issued on January 29, 1985. Had the Examiner considered Emma as prior art and considered microwave smoke sensing references like ISDU and Smith, the Challenged Claims would not have been allowed. As discussed below, claims 1-3, 5-6, 8-11, 13-17 and 20-24 of the ’746 Patent are unpatentable in view of Emma (disclosing a microwave-refrigerator appliance), combined with ISDU, Smith, or Butt, (disclosing a resettable smoke sensor shutdown of microwaves).

Further, Emma teaches using auxiliary charging ports on a microwave to charge small devices, like cell phones. At the time of the invention, USB ports had been standardized world-wide as a means for charging electronic devices, including as taught by U.S. Application No. 13/094,747 (“the ’747 Application”) published as U.S. Publication U.S. Pub. 2012/0276763A1 (“Quezada”). As discussed below, claims 4, 7, 8, 12, 18 and 19 are unpatentable in view of Emma (disclosing a microwave-refrigerator appliance with auxiliary charging ports),

combined with the knowledge of a POSITA, or Quezada, which teaches USB ports for charging.

As a final matter, Petitioner notes that Patent Owner did not disclose to the Examiner the references discussed herein or related lawsuits and IPR proceedings, even though it had a duty to do so. During prosecution of the '746 Patent, Patent Owner sued Petitioner based on four patents related to the '746 Patent. Petitioner counterclaimed, alleging the patents were invalid over, *inter alia*, Emma and ISDU. Petitioner also filed three IPR proceedings against the related patents, alleging the claims were anticipated or obvious in view of Emma, ISDU, Smith, and/or Butt. Though the '746 Patent was pending at the time of this activity, none of the inventors, Patent Owner, or counsel disclosed the litigation, IPR proceedings, or prior art disclosed therein to the Examiner.

IV. U.S. PATENT NO. 11,674,746

The technology of the '746 patent relates, generally to a microwave oven and refrigerator combination that includes a smoke sensor and, in certain dependent claims, a USB port. Ex. 1023 ¶[11].

A. Effective Filing Date is No Earlier than April 25, 2014

The '746 Patent, entitled “Multiple Linked Appliance with Auxiliary Outlet,” was filed as application no. 17/691,628 on March 10, 2022. Ex. 1001 at (21), (22), (54). The '746 Patent claims priority as a continuation-in-part (“CIP”) to

U.S. Application No. 14/262,290 (“the ’290 Application”), which was filed on April 25, 2014, and published as U.S. Pub. 2014/0251982. *Id.* at (63); Ex. 1008. The ’290 Application claims priority as a CIP to U.S. Application No. 12/317,632 (“the ’632 Application”), which was filed on December 23, 2008, and published as U.S. Pub. 2009/0188911 (“Emma”). Ex. 1008 at (63); Ex. 1011 at (10), (21), (22). As explained below, none of the Challenged Claims are entitled to claim priority to the Emma filing date.

As shown in Section VI.C.1 below, each of the Challenged Claims contain at least the following basic elements: Microwave Oven, Control Circuit, and Smoke Sensor, configured to (i) provide a Shutdown Function to the microwave oven based on the Smoke Sensor and (ii) provide a Reset Enable Function so that the microwave oven may be turned back on.² As shown in the attached redline comparison of Emma and the ’290 Application, a smoke sensor was first mentioned in the ’290 Application. *See* Ex. 1016, Ex. 1011 ¶[0055]. As that element and others were not disclosed in Emma, the Challenged Claims cannot claim priority to Emma. The earliest possible priority date for the Challenged Claims is the filing date of the ’290 Application, or April 25, 2014.

² Capitalized terms refer to elements of the Challenged Claims as shown in the Listing of Challenged Claims, attached as Petition Appendix A.

For purposes of this petition, Petitioner assumes that April 25, 2014 is the earliest priority date of the '746 Patent. However, Petitioner is not conceding the Challenged Claims are entitled to that priority date. Petitioner reserves the right to contest in the parallel litigation proceedings that the Challenged Claims are not enabled by the '290 Application.

B. Specification

The following discussion of the '746 Patent specification includes a discussion of its CIP parent Emma because of the substantial overlap, as would be expected. The '746 Patent is directed to a microwave oven and refrigerator combination that includes a smoke sensor and/or a USB port. As discussed below in Section VI.B.2.a, Emma, prior art to the '746 Patent, discloses a microwave oven and refrigerator combination, as shown in Figures 1 and 2 below, with auxiliary ports 11 and 12 and an electrical control scheme to prevent the combination from overloading. Ex. 1011 at Figs. 1-2; Ex. 1002 ¶[64].

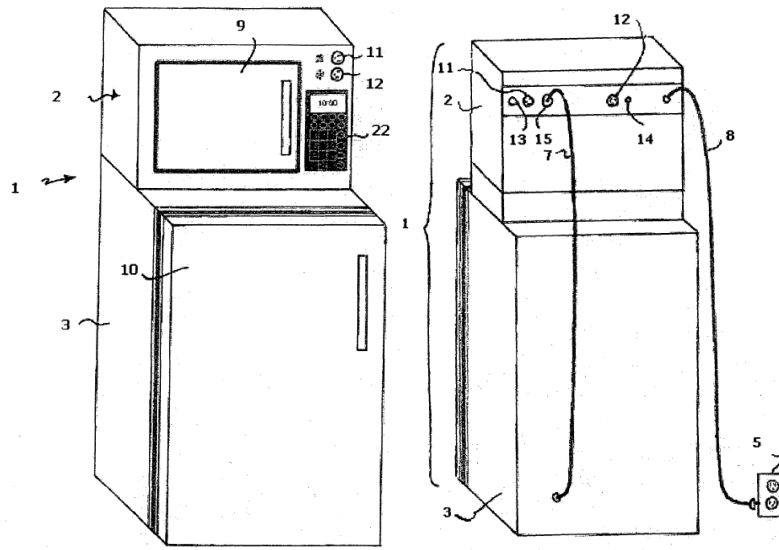


FIGURE 1

FIGURE 2

The auxiliary ports 11 and 12 “permit convenient access for plugging in low power device[sic] for example, rechargeable devices, such as cellular phones...” Ex. 1011 at 3:64-67. Emma generally describes a system where power to the refrigerator and auxiliary ports is cut off when the microwave is turned on. When the microwave is turned off, power is restored to those components. Emma states: “a combination microwave and refrigerator System is constructed having a single plug input supply. Ex. 1011 at Abstract. “The microwave oven is adapted to provide power to a refrigerator, and to auxiliary receptacles ... a microprocessor controller adapted to monitor operation of the refrigerator compressor and controls the power to the microwave magnetron and other components.” *Id.*, ¶[0008]. Moreover, as part of the device’s electrical control scheme, power to both the

refrigerator and the auxiliary power receptacles are disabled when the microwave demands cooking power. Emma states: “When power to the microwave is demanded, the compressor is disabled for a preset minimum period. When microwave demand ceases, refrigerator power is restored...The control model is adapted to disable the power to the auxiliary receptacles, if the microwave is in operation.” *Id.*, ¶[0011-12]; Ex. 1002 ¶[65].

Emma Figure 4 (below) shows a control circuit with the microwave controller 4 electrically controlling relays 19 and 20 for cycling power to refrigerator receptacle 15 and the auxiliary ports 11 and 12:

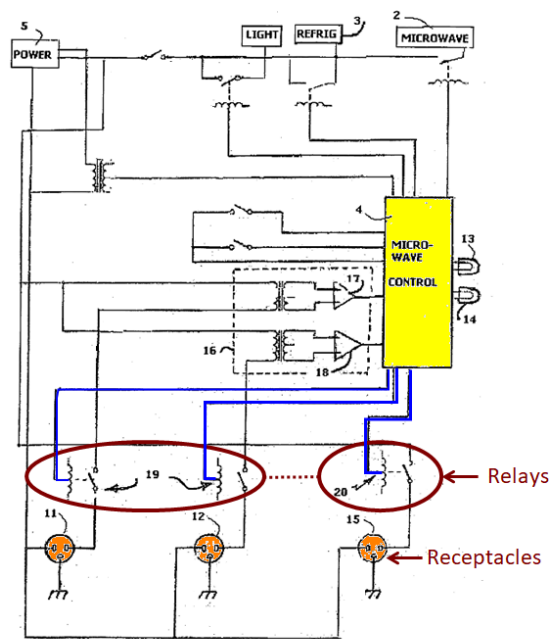


FIGURE 4

Id. at Fig. 4 (annotated); Ex. 1002 ¶[66].

The '746 Patent includes the same microwave-refrigerator combination as Emma but adds a smoke sensor that can send a signal to shut down the microwave

oven if smoke is detected and where the microwave is enabled to receive cooking power following the shutdown. Ex. 1001. “[A] safety sensor... such as a smoke or gas sensor may be provided in the microwave oven 2. The smoke sensor 226 operates . . . to turn off the microwave oven upon sensing smoke or polluted air indicative of a potentially dangerous condition...” *Id.* at 14:7-13-18. “The alcohol/[smoke] sensor 226 may be reset automatically responsive to the alcohol sensor 226 no longer detecting gas indicative of the dangerous condition. Alternatively, or in addition, the alcohol sensor 226 may be reset upon a sensor sensing opening of the door 9 of the microwave oven 2.” *Id.* at 15:18-23; Ex. 1002 ¶[67]; Ex. 1023 ¶[141].

The '746 Patent also adds USB port(s) as an alternative for the auxiliary ports 11 and 12 disclosed in Emma. “As shown in FIGS. 15, 16 and 27, the exemplary front control panel 22 of the microwave oven 2 may include Universal Serial Bus (USB) ports 232, 234 for connection, communication, and power supply between the front control panel 22 and electronic devices such as a personal computer, cell phone, Smart Phone, Ipod®, Ipad®, or other suitable device to allow communication and/or charging of the electronic device plugged into the USB ports.” Ex. 1001 at 20:3-10, Ex. 1023 ¶[232-39].

C. The Claims

The '746 Patent has 24 claims, all of which are challenged claims (the

“Challenged Claims”) with claims 1, 15, and 22 being independent (the “Independent Claims”). Ex. 1001 at claims 1-24. The Challenged Claims can be found in the listing of the claims attached as Petition Appendix A in which Petitioner provides descriptors for the claim elements, which are used throughout this petition.

V. CHALLENGE AND RELIEF REQUESTED

A. Challenged Claims, Specific Art, and Statutory Grounds

Petitioner requests institution of trial and cancellation of the Challenged Claims of the '746 Patent. The specific grounds for each Challenged Claim are summarized as follows:

Ground 1: Claims 1-3, 5-6, 8-11, 13-17 and 20-24 are obvious under 35 U.S.C. §103 in view of Emma combined with ISDU;

Ground 2: Claims 1-3, 5-6, 8-11, 13-17 and 20-24 are obvious under 35 U.S.C. §103 in view of Emma combined with Smith;

Grounds 3 and 4: Claims 1-3, 5-6, 8-11, 13-17 and 20-24 are obvious under 35 U.S.C. §103 in view of Emma combined with Butt and/or alternatively obvious under 35 U.S.C. §103 in view of Emma combined with Butt and Smith;

Grounds 5 and 6: Claims 4, 7, 8, 12, 18 and 19 are obvious under 35 U.S.C. §103 in view of Emma combined with either ISDU or Smith, and further combined with the knowledge of a POSITA.

Grounds 7 and 8: Claims 4, 7, 8, 12, 18 and 19 are obvious under 35 U.S.C. §103 in view of Emma combined with either ISDU or Smith, and further combined with Quezada.

Ground 9: Claims 1-24 are invalid under 35 U.S.C. §112(b) as being indefinite.

Ground 10: Claim 10 is invalid under 35 U.S.C. §112(a) and/or §112(b) as lacking written description, and/or lacking enablement, and/or being indefinite.

Grounds 11: Claim 14 is invalid under 35 U.S.C. §112(a) and/or §112(b) as lacking written description, and/or being indefinite.

A. Claim Construction

Petitioner does not believe any claim term requires a construction to find the Challenged Claims invalid for the reasons provided in this Petition.³ Ex. 10023 ¶[47]. However, as explained below, Petitioner applies Patent Owner's interpretations of one claim term to avoid unnecessary arguments regarding claim construction. The Challenged Claims are invalid even using Patent Owner's constructions. *Id.*, ¶[49].

³ Petitioner reserves all rights to raise claim construction and other arguments, including challenges under 35 U.S.C. §§101 or 112, in district court as relevant to those proceedings. *See, e.g., Target Corp. v. Proxicom Wireless, LLC*, IPR2020-00904, Paper 11 at 11-13 (P.T.A.B. Nov. 10, 2020).

1. “Level of smoke”

Claims 1 recites: “responsive at least in part to a level of smoke sensed by the smoke sensor” and Claim 15 and 22 recite: “responsive at least in part to a level of smoke sensed by the at least one smoke sensor.” Ex. 1001 at claims 1, 15 and 24. Based on its contentions in the Iowa Transfer Case on related patents, Patent Owner interprets “level of smoke” as merely detecting smoke. Ex. 1009 at 6. Petitioner applies what it understands Patent Owner contends is the meaning of this term in this Petition and shows below the claims are invalid under Patent Owner’s construction. However, Petitioner does not adopt Patent Owner’s construction and reserves all rights to contest Patent Owner’s construction in the related litigation proceedings, including that this term is indefinite. Ex. 10023 ¶[50].

B. Unpatentability

The Challenged Claims are unpatentable as detailed in Sections VI.

C. Supporting Evidence

Petitioner’s exhibits are filed herewith. The relevance of the evidence, including identification of specific evidence that support this challenge is found in Sections VI.A–VI.C. Petitioner submits the Original and Supplemental declaration of Mark N. Horenstein (respectively, Ex. 1002 and 1023) in support of this Petition pursuant to 37 C.F.R. §1.68.

VI. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. The Level of Ordinary Skill in the Art

In this case, a POSITA would have had at least a bachelor's degree in electrical engineering or computer engineering. Ex. 1002 ¶[10]. 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. *Id.*

B. The Scope and Content of the Prior Art

1. The Prior Art is Analogous

A POSITA would understand the field of the invention to be electrical kitchen appliances including refrigeration and cooking appliances, including their control circuits to enable functions such as smoke sensing and power delivery. *Id.*, ¶[38]. For example, the '746 Patent describes the field as “improvements to appliances that include compact refrigerator and microwave oven functionality” Ex. 1001 at 1:8-9. Similarly, the Background and Summary sections disclose: “Compact refrigerators and associated appliances may benefit from improvements,” and “In one exemplary arrangement, an appliance apparatus is provided that includes a microwave oven,” respectively. *Id.* at 1:21-22, 1:26-27.

As shown below, Emma, ISDU, Smith, and Butt are from this exact same field i.e., electrical kitchen appliances, qualifying them as analogous prior art. Ex. 1002 ¶[38]. Moreover, Emma, ISDU, Smith, and Butt are directed to the same type

of subject matter as in the '746 Patent. *Id.* These references relate to using logic circuitry in a microwave-refrigerator combination to shut power to the microwave when the refrigerator is in use (e.g., Emma) or relates to smoke or gas sensing in an electrical cooking appliance to shut down the appliance to prevent over cooking and/or prevent a fire from accelerating (e.g., ISDU, Smith, and Butt). *Id.* Finally, Quezada is analogous art because it is reasonably pertinent to the problem faced by the inventor. Ex. 1023 ¶[38]. The '746 Patent teaches adding USB ports to a microwave having auxiliary electrical outlets to charge small electronic devices. Quezada also addresses charging small electronic devices by integrating USB ports into electrical outlets. Ex. 1023 ¶[38].

2. The Prior Art References

Emma, which the '746 Patent claims priority from, is a critical prior art reference to the Challenged Claims but was not referenced or cited by the Examiner as prior art. Emma is prior art because the Challenged Claims claim new matter not disclosed in Emma. *Supra* at §IV.A.. The Examiner may not have appreciated Emma is prior art because it is the parent patent.

Prior art references ISDU, Smith, Butt, and Quezada were not of record in the prosecution of the '746 Patent.

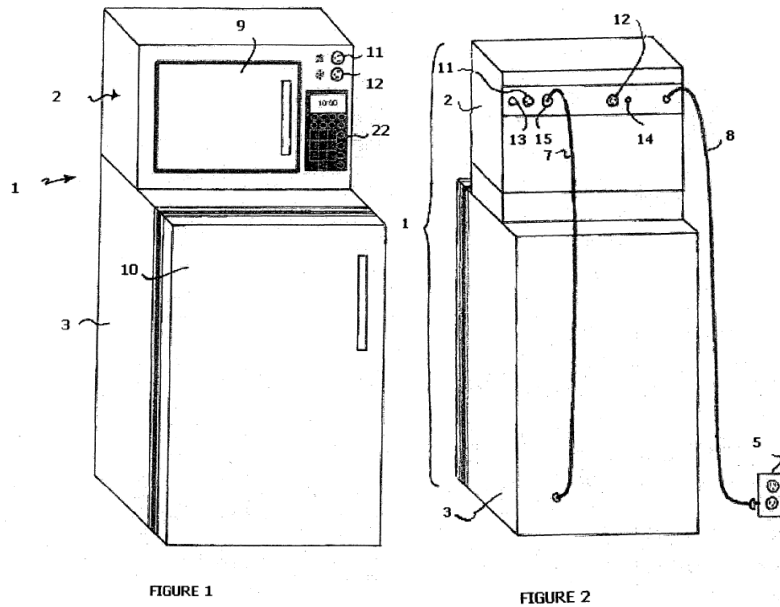
a. *Emma*

U.S. Patent Publication No. 2009/01889117 (“Emma”) (Ex. 1011), entitled

“Multiple Linked appliances with Auxiliary Outlet,” published on July 30, 2009. Ex. 1011. Emma is prior art pursuant to at least 35 U.S.C. §102(a)(1). As discussed above, Emma is a parent application to the ’746 Patent and is prior art. *Supra* at §IV.A.

Emma is directed to a combination microwave refrigerator in which the refrigerator is plugged into an auxiliary outlet that is controlled by a control circuit adapted to open and close one or more power relays. Ex. 1011 at Abstract. The control circuit controls relays to supply or withdraw power to the refrigerator and/or other loads while the microwave is actively operating for the purpose of preventing an overload condition on the supply circuit. *See id.*, ¶¶[0025-27]; Ex. 1002 ¶[64].

As shown in Figures 1 and 2 (reproduced below), Emma discloses a microwave oven refrigerator combination in which the refrigerator connects to a receptacle 15 power supply outlet on the microwave oven with both appliances being powered by a single cord 8. Ex. 1011 ¶[0008]; Ex. 1002 ¶[111].



Ex. 1011 at Figs. 1 and 2.

Furthermore, the “microwave oven includes a microprocessor controller adapted to monitor operation of the refrigerator compressor and controls the power to the microwave magnetron and other components.” *Id.*, ¶[0026]; Ex. 1002 ¶[112].

As shown in the below diagram of the control circuit (Figure 4), Emma discloses a control circuit providing for digitally operating relays 19, 20 for controlling the receptacles 11, 12, and 15; Ex. 1002 ¶[113].



Emma discloses “[t]he current demands of the microwave 2 are generally the most significant contribution to overload....” *Id.*, ¶[0033]. As shown in Figure 6 (below), to avoid overload conditions, Emma discloses several control methods to disable and/or limit power to the refrigerator during microwave operation. *Id.*, ¶[0037]; Ex. 1002 ¶¶[114-15].

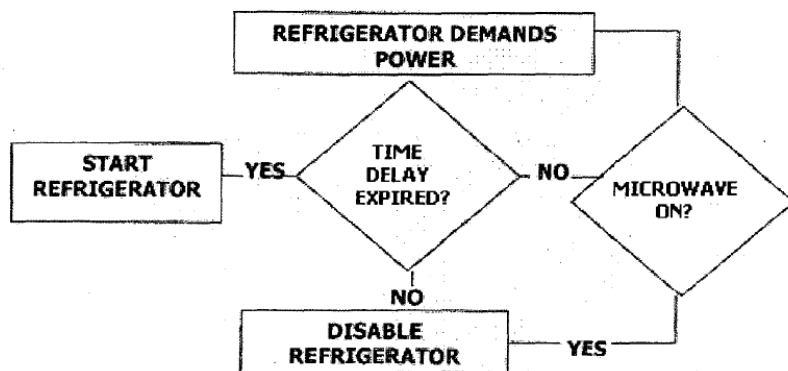


FIGURE 6

Ex. 1011 at Fig. 6.

For example, when the refrigerator demands power, it will first check to see if the microwave is on. *Id.* If it is, it will not start. *Id.* If the microwave oven is not on and the time delay has expired (a method used in Emma to “prevent undesirabl[e] rapid on/off cycles”), the refrigerator may receive power. *Id.* at ¶[0030].

As shown in Figure 1 above, Emma also discloses auxiliary ports 11 and 12 on the microwave panel to “permit convenient access for plugging in low power device[sic] for example, rechargeable devices, such as cellular phones...” Ex. 1011 ¶[0026]. Emma states: “The control model is adapted to disable the power to the auxiliary receptacles, if the microwave is in operation.” *Id.*, ¶[0011-12]; Ex. 1002 ¶[65].

b. **ISDU**

ISDU: Integrated Smoke detector Unit for Commercial Microwave Ovens,

Cory Lloyd *et. al*, Northeastern University (“ISDU”) published on April 17, 2007, on “IRis”. Ex. 1012. IRis was a “digital archive,” indexed on Google and readily accessible worldwide, that allowed Northeastern University researchers, starting in 2006, to publish their work to “promote and preserve their intellectual output” and was a precursor to Northeastern University’s more current Digital Repository Service. Ex. 1002, ¶[96-98]. Per IRis’s publishing practices, ISDU was published and publicly available in Northeastern University’s digital archive in 2007. *Id.* ISDU is prior art pursuant to at least 35 U.S.C. §102(a)(1). *See Id.*, ¶[98].

ISDU discloses, among other things: that “smoke detection devices be integrated into range ovens and microwaves ... when smoke is detected during microwave operation, the device will temporarily disable microwave operation and let the user know that the food has begun to smoke or even burn.” Ex 1012 at 1. Reproduced below is a diagram of ISDU’s smoke detector circuit interface:

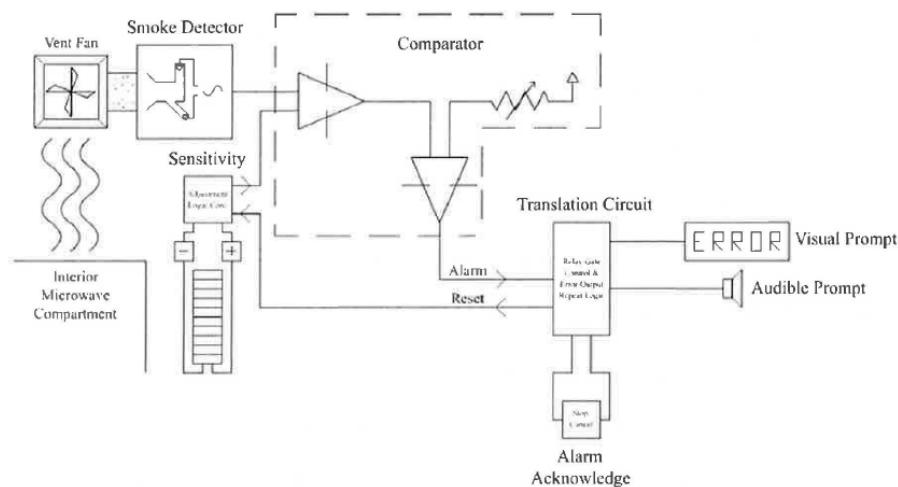


Figure 4

Id. at Fig. 4; Ex. 1002 ¶[99].

The microwave in the above diagram includes a vent fan, where air will flow through to the smoke detector. If the detector reaches its predetermined condition, then a signal is sent to the translation circuit to shut down the microwave oven and emit an audible alarm, a visual prompt and waits for the user's acknowledgement:

[O]nce smoke is detected, we will send a signal that lets a circuit interrupt the power to the microwave through the use of a 'soft' power-off function already in use by the microwave logic. This will stop the microwave while simultaneously sounding an alarm. After the alert, the user will be able to reset the microwave, change its sensitivity, or stop microwaving.

Id. at 6.

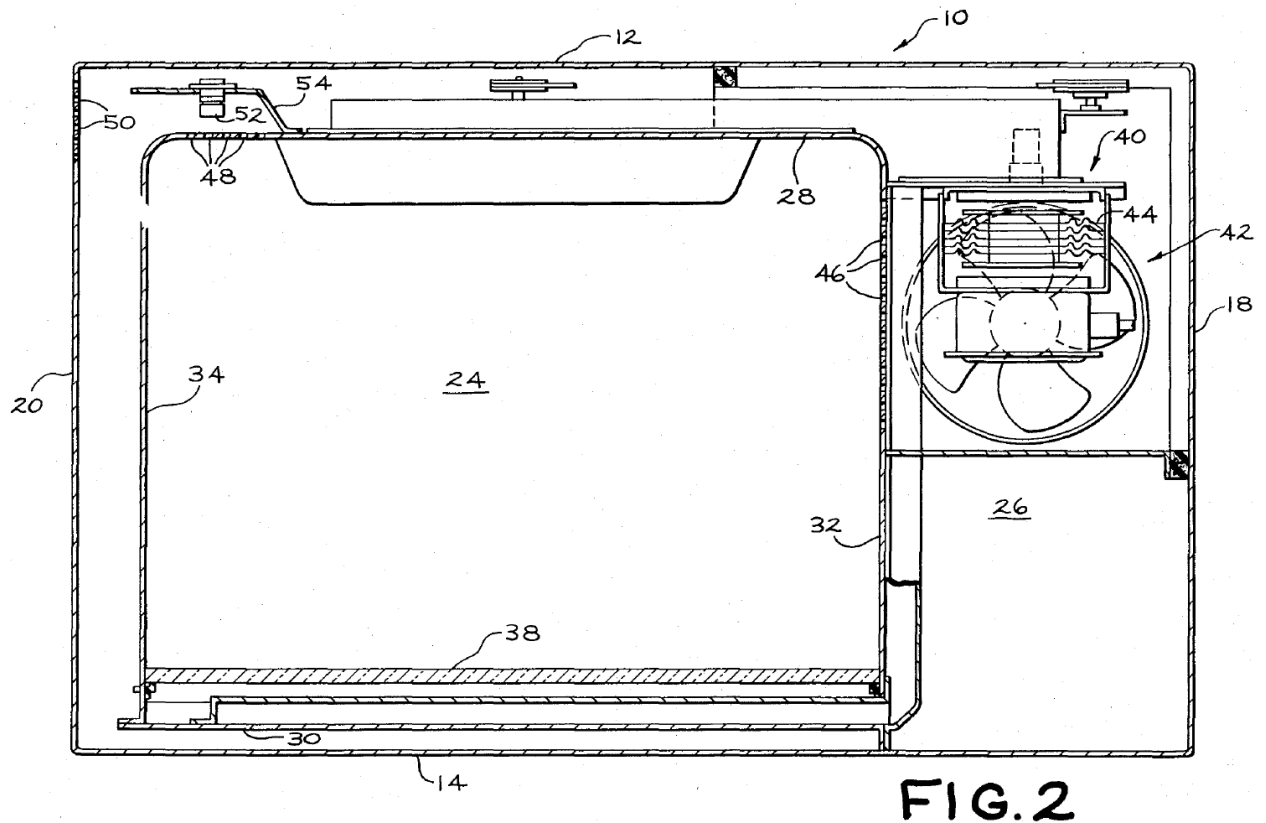
"Acknowledgement of the alarm state will reinstate all normal microwave functions and reset the smoke detector circuit for further use." *Id.* at 8; Ex. 1002 ¶[100].

c. ***Smith***

U.S. Patent No. 4,496,817 ("Smith") (Ex. 1014), entitled "Automatic Fire Detection for Microwave Oven," issued January 29, 1985. Ex. 1014. Smith is prior art pursuant to at least 35 U.S.C. §102(a)(1).

Smith discloses "a method and apparatus for anticipating the occurrence of a fire in the cooking cavity of a microwave oven." *Id.* at 1:55-57. Smith discloses

that “before actually reaching the ignition point, the food begins to char, smoke or smolder” resulting in a period of “rapidly increasing gas concentration in the circulating air....” *Id.* at 3:51-56. As shown in Figure 2 (reproduced below), the oven [10] in Smith has “a blower for continuously circulating air and a sensor [52] responsive to the concentration of gases in the circulating air.” *Id.* at Abstract.



Id. at Fig. 2.

Smith further discloses that “upon the detection of a characteristic rate of change indicative of the load being heated closely approaching its combustion point, power to the oven is turned off and indication is provided to the user that a combustion condition in the oven cavity is imminent.” *Id.* at 1:57- 2:4; Ex. 1002

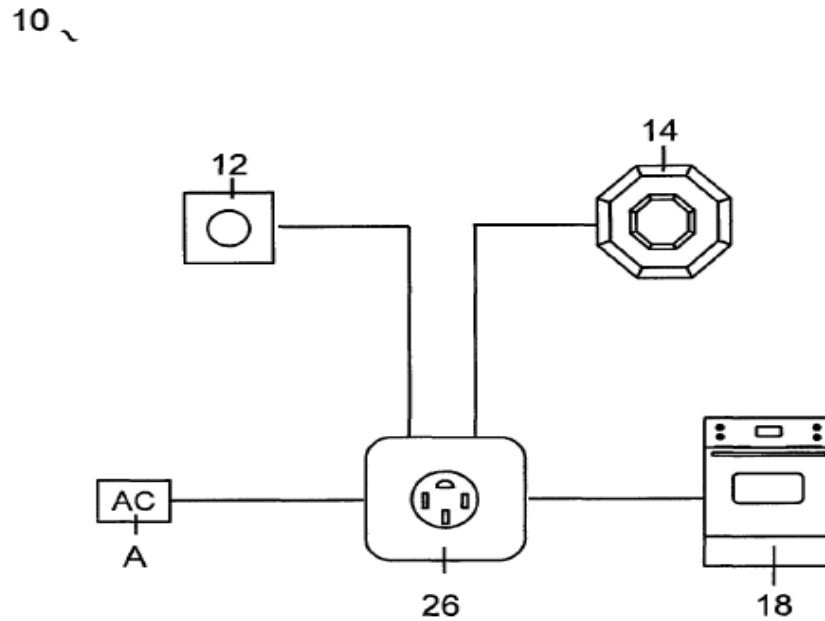
¶[104].

d. ***Butt***

U.S. Patent No. 8,446,048 (“Butt”) (Ex. 1015), entitled “Controller for a safety shut-off system,” issued May 21, 2013, based on application no. 12/733,212 filed on 04/29/2010, which was a national stage entry of PCT/CA2008/001462 filed on August 18, 2008. Ex. 1015. Butt is prior art pursuant to at least 35 U.S.C. §102(a)(1).

Butt discloses a safety shutoff for electrical kitchen appliances. *Id.* at 3:64-66. In particular, “a controller for interrupting a supply of electricity to an appliance upon detection of a trigger, such as Smoke.” *Id.* at 1:16-18. Specifically, “[t]he trigger may be, for example, a signal from a hazard detector such as a smoke detector.” *Id.* at 2:33-34. And the signal can be “transmitted... either wirelessly or using a wired connection.” *Id.* at 2:51-52; Ex. 1002 ¶[106].

Figure 1B



Ex. 1015 at Fig. 1B.

For example, as shown in Figure 1B (reproduced above), Butt discloses the system 10 may include a smoke detector 14 connected to a circuit box 26 housing a controller 20. “If the detector 14 detects the presence of smoke, then ... signal 15 is transmitted and is received by the controller 20. Upon receiving the signal, the controller interrupts the AC power supply to the appliance 18 and consequently shuts the appliance 18 off.” *Id.* at 4:53-58. As a result, “the energy that would otherwise act as an accelerant for the fire is eliminated, and the progress of the fire is slowed.” *Id.* at 4:58-60; Ex. 1002 ¶[107].

Butt discloses a reset button 12 that re-enables the system for further use by checking for a smoke alarm system signal and then closing a relay to reconnect the electrical appliance to AC power. *See* Ex. 1015 at 6:53-7:20; Ex. 1002 ¶[108].

a. *Quezada*

U.S. Patent Pub. No. 2012/0276763 (“Quezada”) (Ex. 1020), entitled “Wall Mountable Universal Serial Bus and Alternating Current Power Sourcing Receptacle,” published on November 1, 2012. Ex. 1020. Quezada is prior art pursuant to at least 35 U.S.C. §102(a)(1).

Quezada teaches combining a USB port with a standard alternating current (AC) power outlet to conveniently provide a direct current (DC) power source via a USB connector alongside the standard outlet. Ex. 1020 at Abstract; Ex. 1023 ¶[41]. The embodiment in Quezada Fig. 2 (see below) shows a power sourcing receptacle 100 that includes both a 120-V AC electrical receptacle 102 (red), and a USB receptacle 104 (blue). *Id.*, Ex. 1020 ¶[0023].

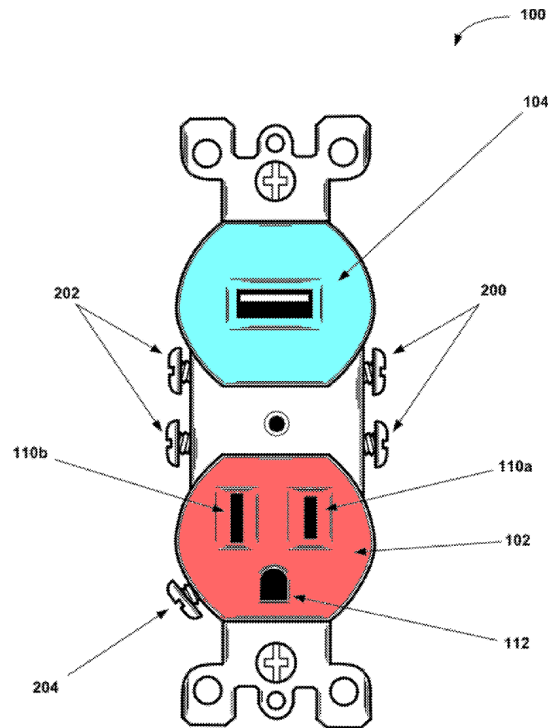


FIG. 2

Ex. 1020, Fig. 2 (annotated).

“The USB receptacle 104 provides 100-150 milliamps (mA) and 5 volts direct current (DC) to devices inserted into USB receptacle 104.” Ex. 1020 ¶[0025]; Ex. 1023 ¶[42]. Thus, the USB receptacle 104 can provide DC power to computer peripherals, digital cameras, printers, personal media players, flash drives, “and other devices capable of accepting power or charge via a USB connector.” *Id.*

Figure 6 from Quezada, replicated below, is a block diagram showing the flow of power to the USB port 104 and AC receptacle 102. Ex.1020 ¶[0039]; Ex. 1023 ¶[43]. The “main power source” supplies power directly to 120-V AC

receptacle (red) 102 and directly to USB regulated voltage sourcing unit (“RVSU”) 600 (yellow). *Id.*, Ex. 1020 ¶[0039-40]. The RVSU in turn provides 5-V DC power to the USB receptacle (i.e., “port”, blue) 104.

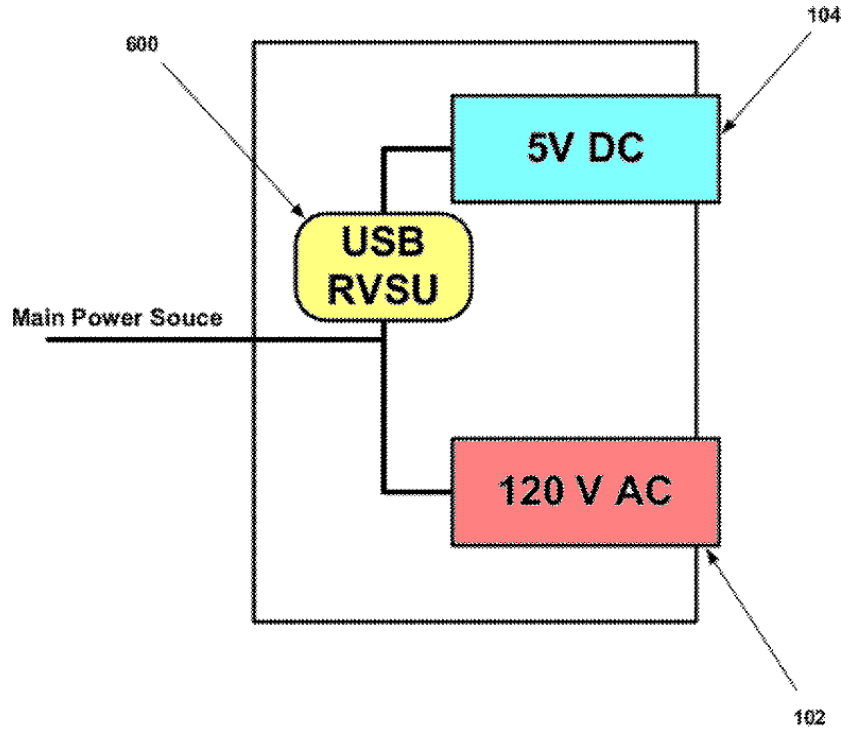


FIG. 6

Ex. 1020, Fig. 6 (annotated).

As shown below in Quezada Fig. 7, the USB RSVU 600 includes a transformer 700 that steps down the incoming source voltage from the 120-V AC main power supply to 5-V AC; rectifier 702 (green) converts the latter voltage from alternating to a “pulsating DC voltage.” Filter 704 (purple) then smooths rectified voltage into a DC voltage. Voltage regulator 706 (blue) then produces and maintains the precisely regulated 5-V DC sent to the USB port. Ex. 1020, Fig. 7,

¶[0041]; Ex. 1023 ¶[44].

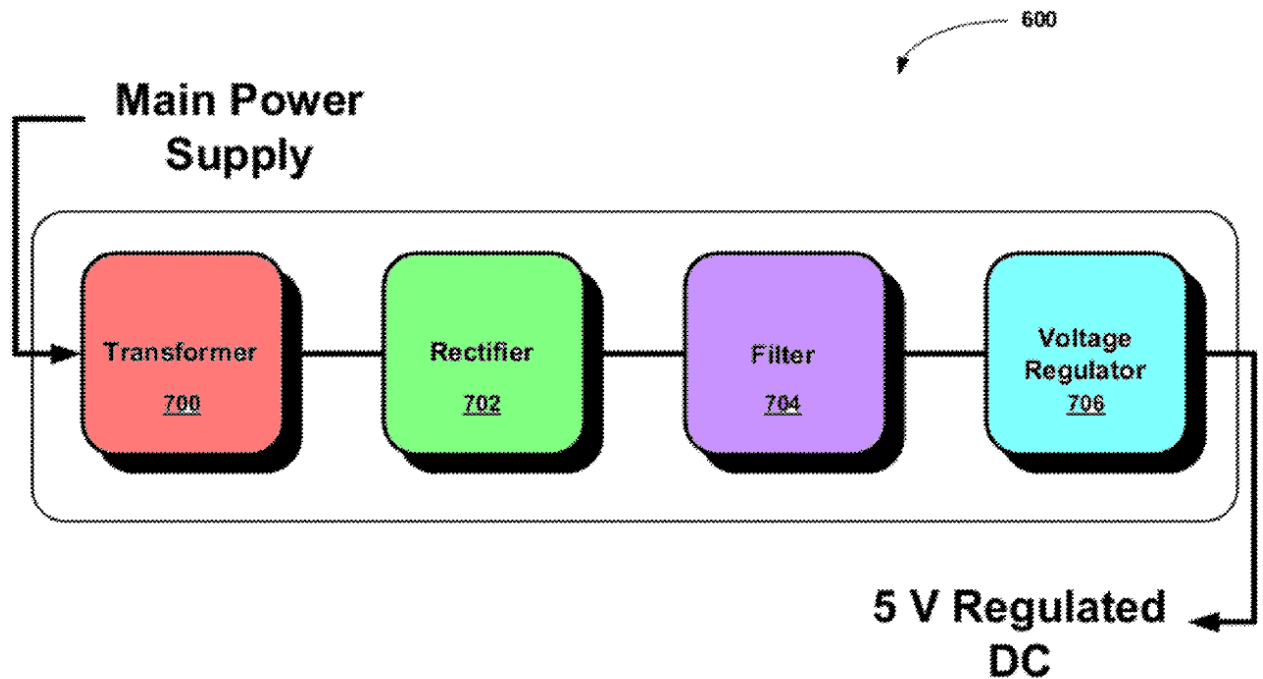


FIG. 7

Ex. 1020, Fig. 7 (annotated).

As such, the USB RVSU 600 provides a 5-volt regulated voltage to USB port 104. *Id.*

C. Differences Between the Claimed Subject Matter and the Prior Art

1. The Prior Art References Teach All Elements of the Challenged Claims.

The teachings of the prior art references are mapped to each element of the Challenged Claims below. Due to the similarity of the claims, the analysis is organized by reference to the basic claim elements common to each of the

Challenged Claims. However, where an element differs from the basic common element, that claim element is specifically analyzed.

a. ***The Microwave Element (Claims 1, 3, 6, 8, 10, 11, 12, 15, 17, 19, 21, 22 23 and 24)***

i. *Microwave Oven*⁴

(A) Emma

Emma discloses an appliance with a microwave oven that has an interior cooking area: “A system of linked appliances comprising: a microwave oven connected to a source of power.” *See, e.g.*, Ex. 1011 at Claim 1. As shown below in Emma Figure 2, the microwave oven 2 is connected to power source 5 (pink), which is depicted as a standard household outlet. *Id.*, ¶[0026]; Ex. 1002 ¶¶[138-39, 285]; Ex. 1023 ¶[157].

⁴ Capitalized terms refer to elements of the Independent Claims and Dependent Claims as shown in the Listing of Challenged Claims, attached as Petition Appendix A.

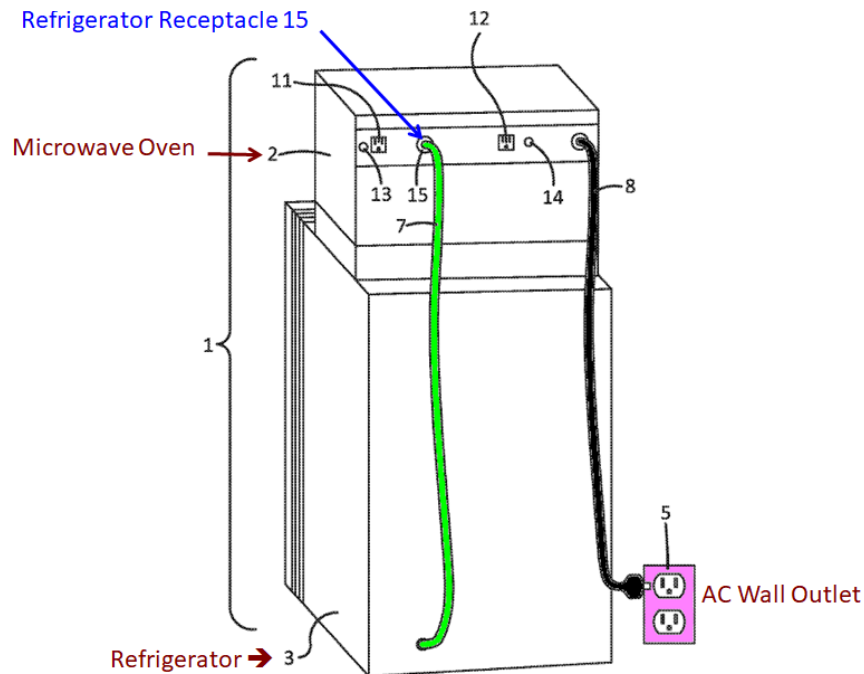


FIGURE 2

The microwave includes an external refrigerator receptacle 15 at the rear of the microwave which is connectable to a plug via wire 7 (green). Ex. 1011 ¶[0026, 0032]. The refrigerator receptacle 15 is depicted in FIG. 4 as being a standard household outlet for releasably receiving a matching plug. Ex. 1023 ¶[158].

As shown in the block diagram of Figure 4 (reproduced below), externally accessible refrigerator receptable 15 [pink] is connected through relay 20 (orange) to power source 5, the standard household outlet (pink). *Id.* at Fig. 4. Accordingly, the refrigerator receptacle 15 is configured to deliver household current from the power source 5. Ex. 1011 ¶[0032], Ex.1023 ¶[159].

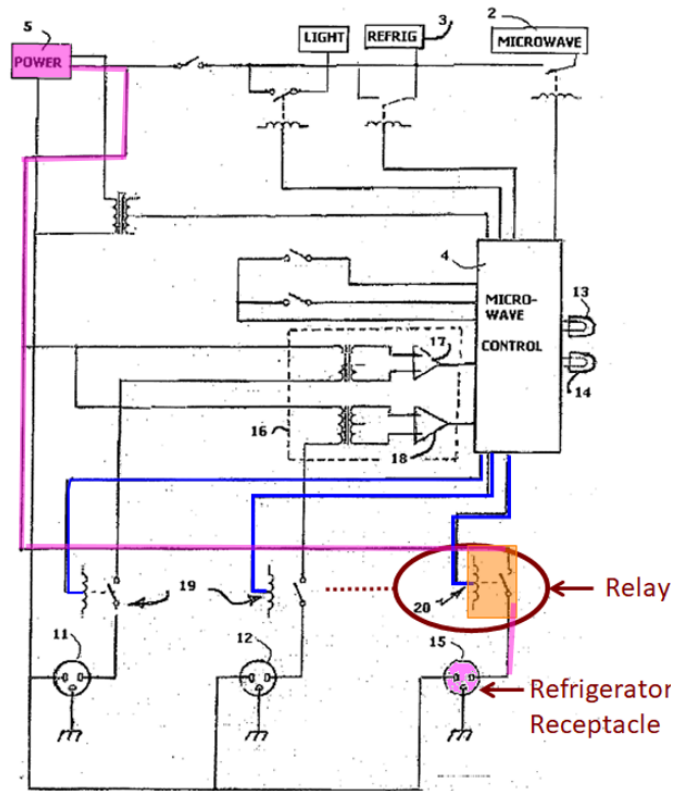
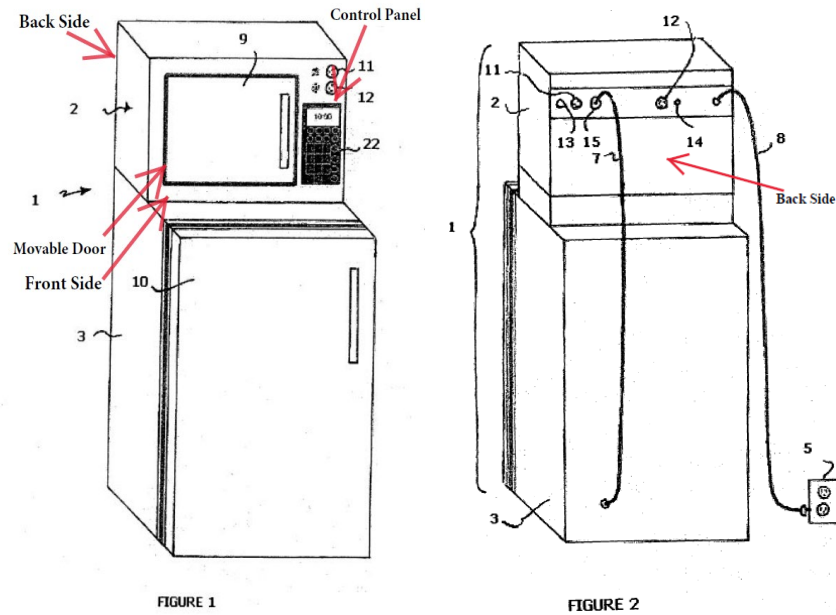


FIGURE 4

Id. at Fig. 4 (annotated).

Additionally, as shown in Fig. 1 below, Emma discloses a front side that has a control panel and a back side, where on the front side the cooking area is accessible from the outside by way of a movable door. Emma states as follows: “The appliances (microwave and refrigerator) may be of standard design with features commonly available. The internal components of the appliances are well known and do not need to be described herein.” *Id.* Furthermore, the microwave also includes a magnetron configured to cook items in the cooking area. Ex. 1011 ¶¶[0008, 0010, 0011], Fig. 10., Ex. 1023 ¶[160].



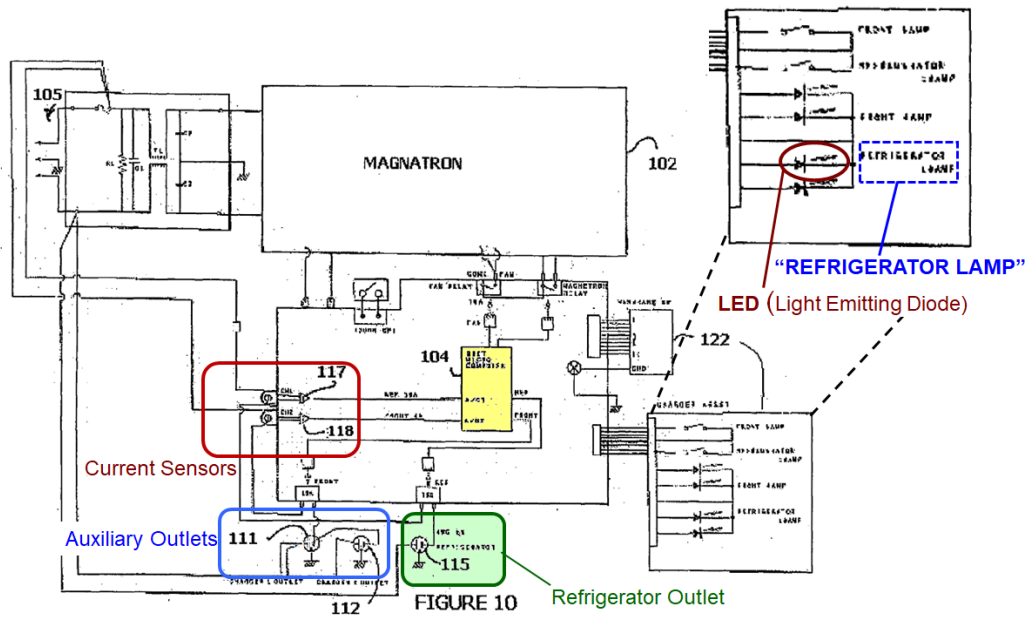
Id., Fig. 1 (annotated).

b. ***The Control Circuit Element (Claims 1, 7, 8, 11, 12, 15, 22, 23 and 24)***

i. *Control Circuit*

(A) Emma

As shown in FIG. 10 reproduced below, Emma discloses a microwave / magnetron with a controller 104 (yellow) in operative connection with the magnetron and electrical connector (refrigerator outlet 115, green).



Ex. 1011, Fig. 10 (annotated).

As shown in Figure 2 (reproduced below), Emma discloses a microwave oven (which includes the magnetron) and refrigerator combination with both appliances being powered only through a single power cord 8 (black) that is releasably connectable to a power outlet 5 (pink): a “single cord 8, provides input power to the system 1 from receptacle 5 through microwave 2.” Ex. 1011 ¶¶[0008, 0026]. Ex. 1023 ¶[169]. The microwave includes a refrigerator receptacle 15 (i.e., “electrical connector”) at the rear of the microwave oven which is connectable to a plug via cord 7. Ex. 1011 ¶¶[0026, 0032]. The “refrigerator receptacle 15 [is] accessible at the rear of the microwave oven,” *Id.*, ¶[0032].

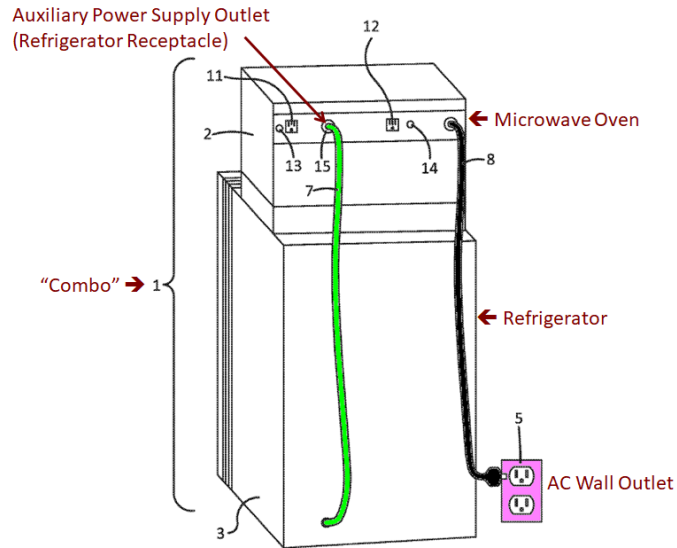


FIGURE 2

Additionally, Emma Figure 3 (reproduced and annotated below) contains a hierarchical block diagram of the system, specifically, the microprocessor (i.e., “at least one power control circuit”) and its distribution of power to the device made possible by power from the power supply, through the single power cord 8. Ex. 1002 ¶¶[149, 285]; Ex. 1023 ¶[170].

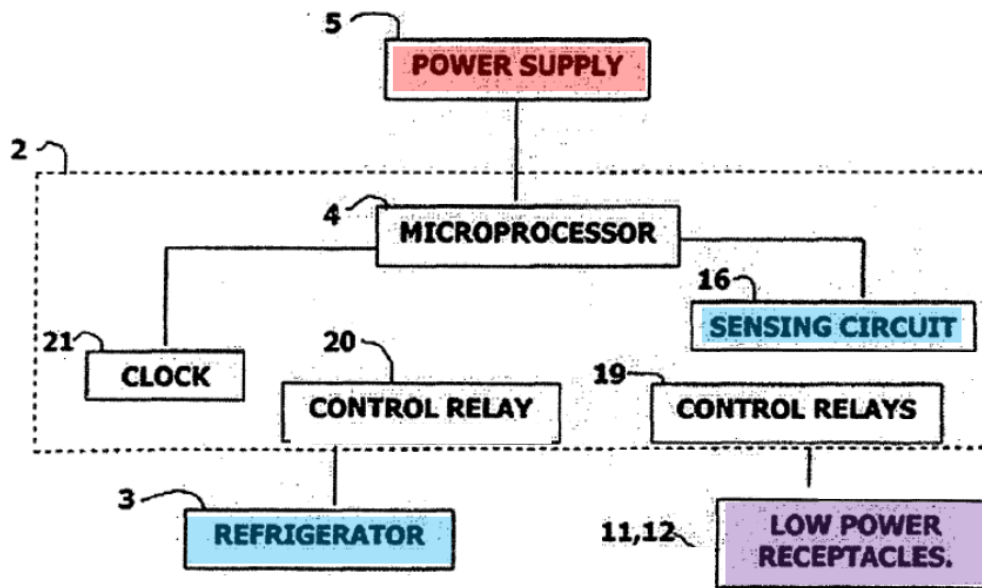


FIGURE 3

Emma further discloses a microprocessor-based control circuit (i.e., “at least one power control circuit”) installed in the microwave oven which is in operative connection with the microwave oven/magnetron and refrigerator receptacle (i.e., “wherein each electrical connector is configured to deliver electrical power from the microwave oven through the respective electrical connector...”).

As shown in the diagram below which depicts the control circuit (Figure 4), Emma discloses an input power to the system from receptacle 5, a control circuit providing for digitally operating relays 19, 20 for controlling electrically powered devices outside the microwave through the low power auxiliary outlets 11, 12, and refrigerator receptacle 15. (i.e., “the electrical connector, is in operative electrical connection with the at least one power control circuit”). Ex. 1011 ¶[0027].

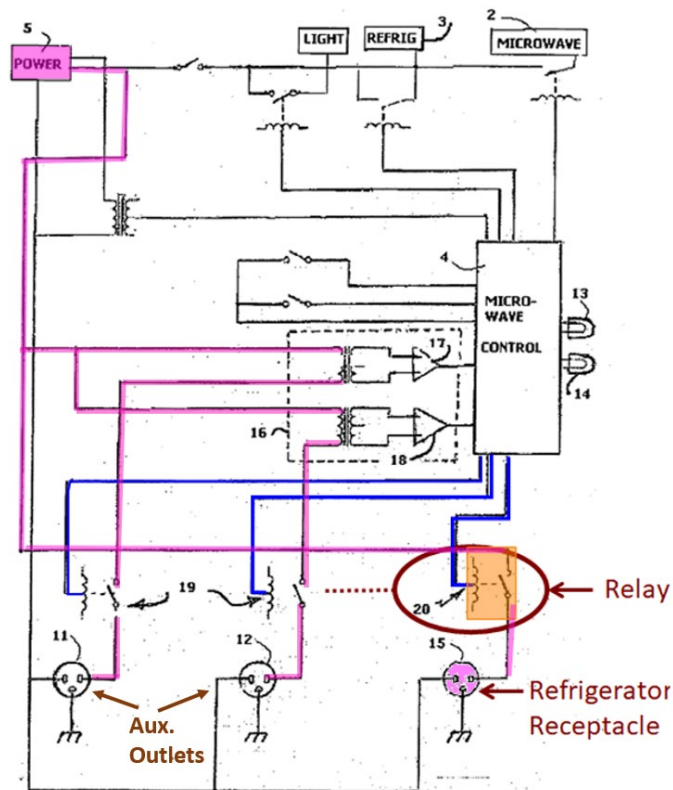


FIGURE 4

Id. at Fig 4 (annotated).

(B) ISDU

As shown in ISDU, the smoke detection unit (i.e., “Smoke Sensor”) is in operative electrical connection with the circuit (i.e., “at least one power control circuit”). As explained by ISDU, the integrated smoke detection unit interfaces with the microwave logic to control shutting down and alert the user: “Once smoke is detected, we will send a signal that lets a circuit interrupt the power to the microwave through the use of a ‘soft’ power-off function already in use by the

microwave logic. This will stop the microwave while simultaneously sounding an alarm.” Ex. 1012 at 6; Ex. 1023 ¶[173]. In addition, the alarm state includes “a suspension of normal microwave functions including the cessation of magnetron operation, a visual alert to be displayed on the integrated microwave LCD, and an audible alert. Ex.1012 at 8; Ex. 1023 ¶[173].

(C) Smith

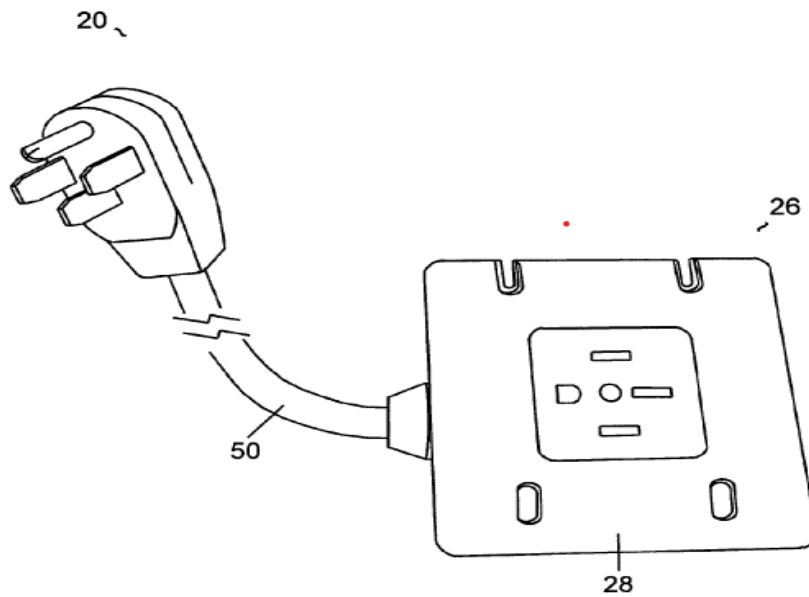
Referring to FIG. 4 (below), Smith discloses that the microwave microprocessor 64 (i.e., “at least one power control circuit”) is in operative electrical connection with a gas sensor 52 (i.e., “Smoke Sensor”, blue) and the microwave magnetron 40 (yellow):

gas sensor 52 is incorporated in a microprocessor-based control arrangement The circuit of FIG. 4 includes a gas sensing circuit 60 for sensing the concentration level of gases in the circulating air as it exits cooking cavity 24 and generating a voltage signal having a magnitude representative of the sensed gas concentration level...

Ex. 1014. at 4:61- 5:19; Ex. 1023 ¶[174].

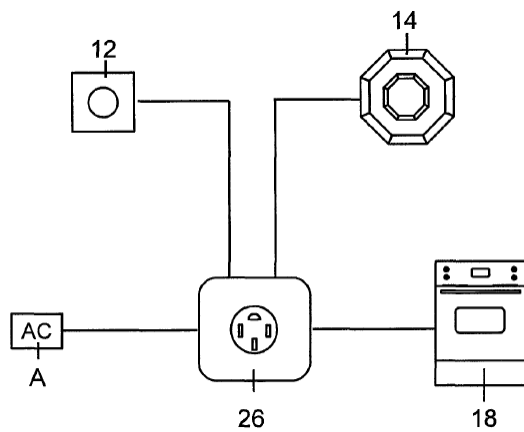
Additionally, as further notated in Figure 4 below, microcontroller 64 is in operative electrical connection to magnetron 40 through relay 68 (green) which is buffered by relay driver 136 (turquoise) and/or control TRIAC 140 via optocoupler 143. Ex. 1023 ¶[175].

Figure 6



Ex. 1015 at Fig.6.

Further, the controller 20 (housed within circuit box 26) is in operative electrical connection to detector 14 and the externally accessible electrical appliance outlet.



Id. FIG. 1B; 5:1-3; Ex. 1023 ¶[178].

c. ***The Withhold and Deliver Electrical Power Element
(Claims 2, 3, 4, 6, 8, 9, 12, 13, 14, 16, 19, 21, 23 and 24)***

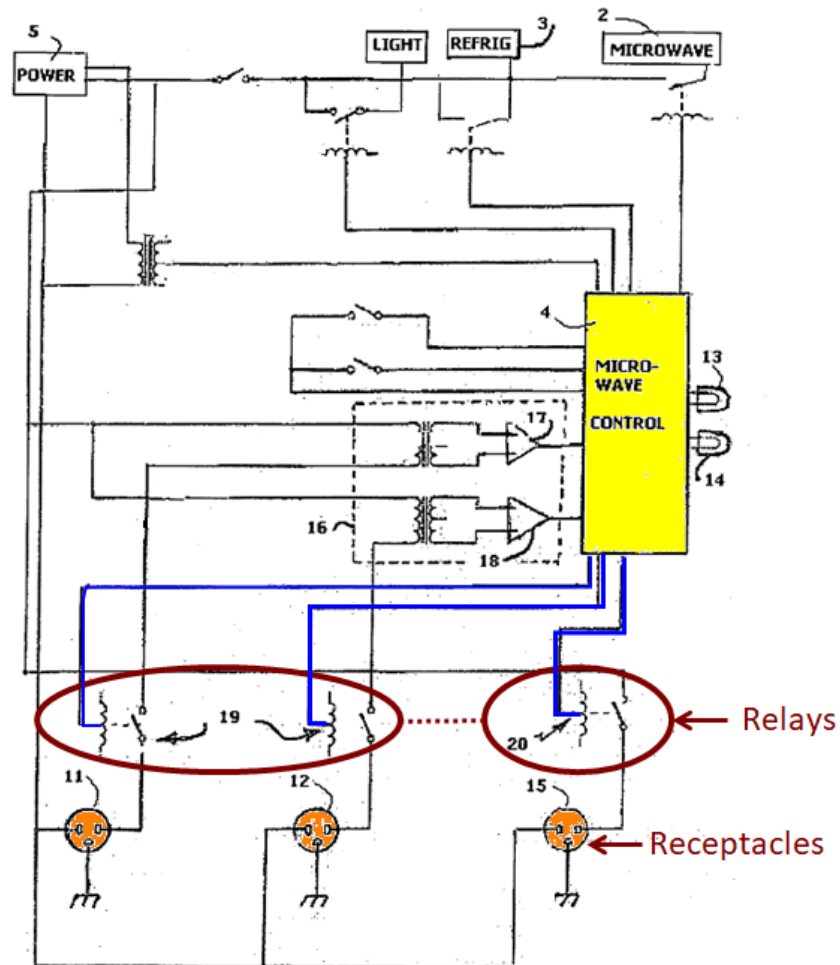
i. *Withhold and Deliver Electrical Power*

(A) Emma

Emma discloses a microprocessor (i.e., “at least one power control circuit”) that is operative to cause electrical power to be unavailable to the refrigerator through the refrigerator receptacle (i.e., “electrical connector”) and/or the auxiliary lower power receptacles when the magnetron draws cooking power, i.e., when the microwave is in use. For example, Emma recites “the power to the auxiliary outlets is disabled by the microwave controller when the microwave magnetron is energized or whenever the current to the auxiliary outlets exceeds a preset value” and the control model is “dependent on the state of operation of the microwave magnetron.” Ex. 1011 ¶¶[0010-0011]. Further Emma recites “wherein the algorithm causes the control processor to disable the refrigerator and the second power supply outlet, when the microwave demands power.” Ex. 1011 at claim 1. Emma further recites: “[r]efrigerator 3 is generally subject to control by the microwave microprocessor controller 4 of the microwave oven 2.” *Id.*, ¶[0026]. “Controller 4 may be programmed to manage the power to the components of the system to avoid overload conditions, while minimizing disruptions in the use of an individual appliance.” *Id.*, ¶[0030]; Ex. 1002 ¶¶[203, 205, 289].

As shown in the below diagram of the control circuit (Figure 4), Emma

discloses a control circuit providing for digitally operating relays 19, 20 for controlling the low power auxiliary outlets 11, 12, and refrigerator receptacle 15.



For example, as shown in the annotated Figure 7 below, when the Microwave demands cooking power it will first disable power to the Refrigerator (yellow) and the auxiliary outlets (blue) during cooking. This is because “priority is given to the power demands of the microwave oven.” Ex. 1011 ¶¶0038]. “Use of

the [auxiliary] receptacles 11, 12, and [refrigerator receptacle] 15 are, therefore, disabled during microwave operation.”⁵ *Id.*; Ex. 1002 ¶¶[203, 289]; Ex. 1023 ¶[194]. Only after the refrigerator or auxiliary outlets have been disabled is microwave power enabled (red). Ex. 1023 ¶[194].

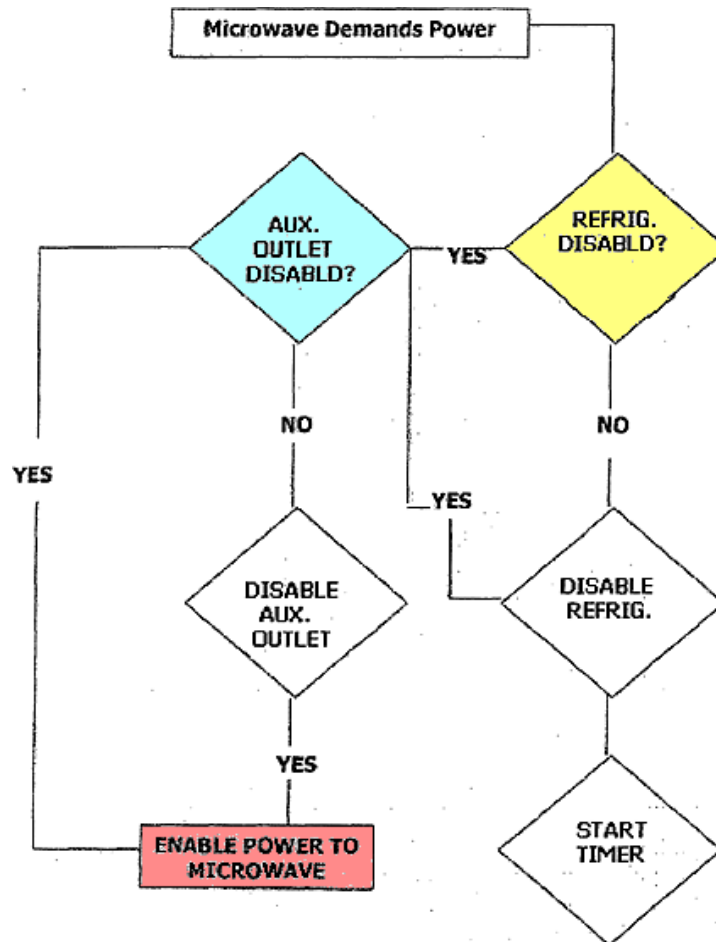


FIGURE 7

⁵ For additional reference, see Figure 2 in VI.C.1.a. ii. (A).

As another example, Figure 6 (reproduced below) is a control logic flow for enabling power to the refrigerator/receptacle 15. Ex. 1023 ¶[195]. If the refrigerator demands power (green; e.g., via its thermostat), the logic controller determines whether or not the microwave is on (red). Ex. 1023 ¶[195]. If the microwave is operative, the controller disables power to the refrigerator (blue). Ex. 1023 ¶[195].

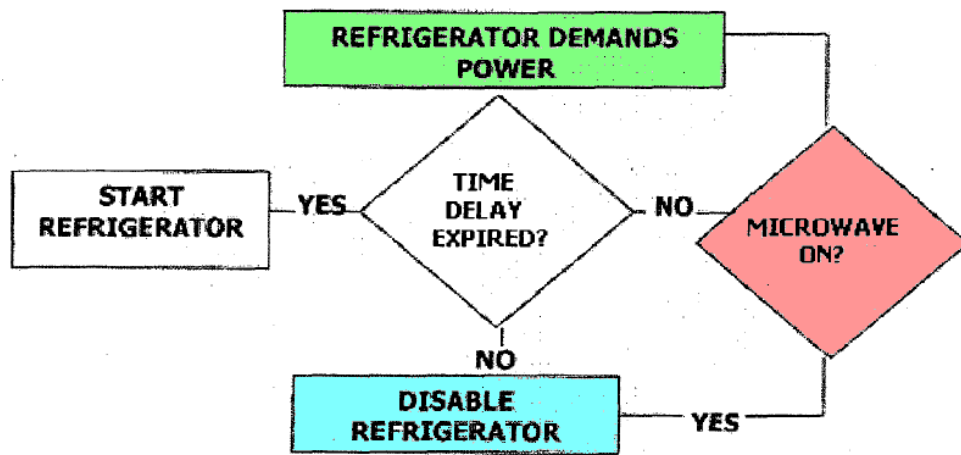


FIGURE 6

Ex. 1011 at Fig. 6; Ex. 1002 ¶[206, 289]; Ex. 1023 ¶[195].

Furthermore, to minimize rapid cycling of the Refrigerator and auxiliary outlets, Emma further discloses: “[i]f the refrigerator 3 is under power when the microwave 2 is turned on, the power, to the refrigerator is turned off and clock 21 begins to count for a **predetermined period** during which the compressor of refrigerator 3 cannot be restarted.” *Id.*, ¶[0033].

Accordingly, given that the cooking operation of a microwave requires that power to be applied to its magnetron, Emma thus further teaches that electrical

power will be unavailable to the refrigerator receptacle during magnetron operation and for a period of time after cooking power is not delivered to the magnetron:

a clock device 21 could be used to provide timed delays during which, for example, refrigerator 3 would be prevented from undesirably rapid on/off cycles. When refrigerator 3 is disabled during microwave operation, a time delay of 3 minutes is provided during which refrigerator 3 **will remain disabled, even if microwave use is only for a short period.**

Id., ¶[0030] (emphasis added); Ex.1023 ¶[197].

That is, Emma further teaches that the at least one electrical connector 15 used to power the refrigerator does not have electrical power for a preset minimum period of time and is unavailable even after the magnetron becomes inoperative.

Emma also discloses that the microprocessor is operative to enable power to the refrigerator, e.g., through the electrical connector 15, when the microwave is not in use. Ex. 1002 ¶¶[203-06, 289]; Ex. 1023 ¶[199].

d. ***The Smoke Sensor Element (Claims 1, 12, 15 and 22)***

i. *Smoke Sensor*

(A) ISDU

ISDU discloses a smoke sensor positioned in operative connection with the cooking area inside the microwave oven. As shown in FIG 4 (below), the smoke detector (grey) is in operative connection with the microwave cooking area (“interior microwave compartment”; yellow) through a vent fan (blue). Ex. 1002

¶¶[289-90] Ex. 1023 ¶[203].

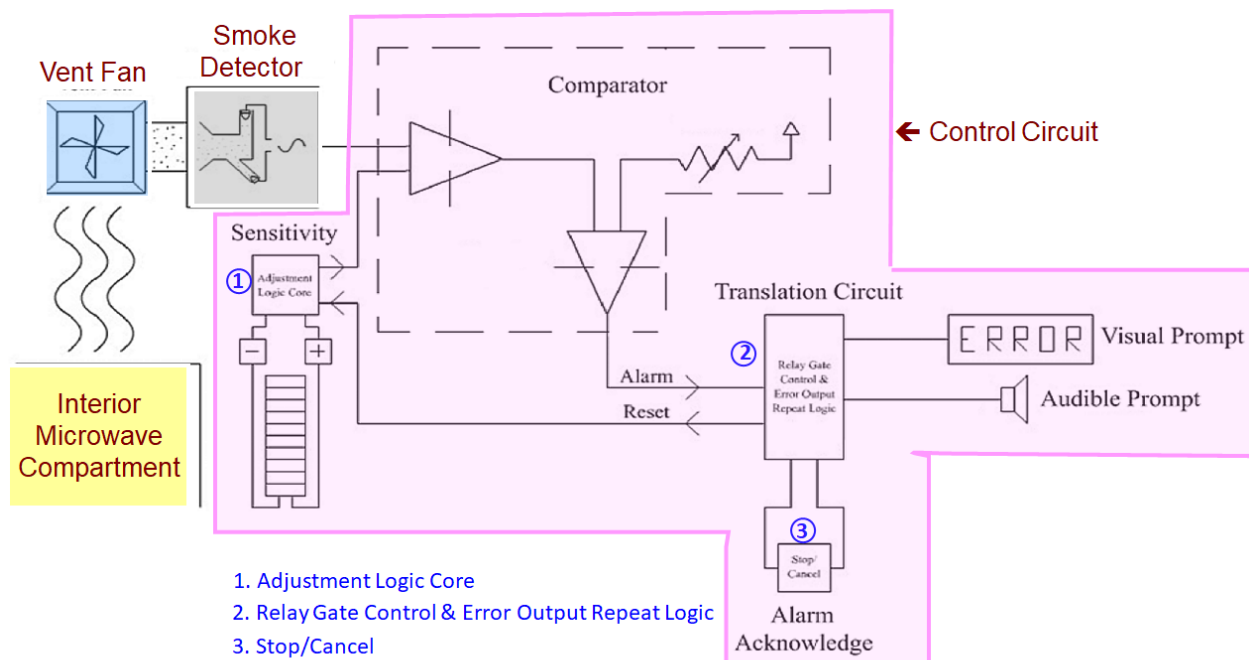


Figure 4

Ex. 1012, Fig. 4 (annotated).

The smoke detection unit is also in operative connection with the control circuit (i.e., “at least one power control circuit”). As explained by ISDU, the integrated smoke detection unit interfaces with the microwave logic to control shutting down the microwave and alert the user: “Once smoke is detected, we will send a signal that lets a circuit interrupt the power to the microwave through the use of a ‘soft’ power-off function already in use by the microwave logic. This will stop the microwave while simultaneously sounding an alarm.” Ex. 1012 at 6; Ex. 1002 ¶¶[99-100, 289]; Ex. 1023 ¶[204].

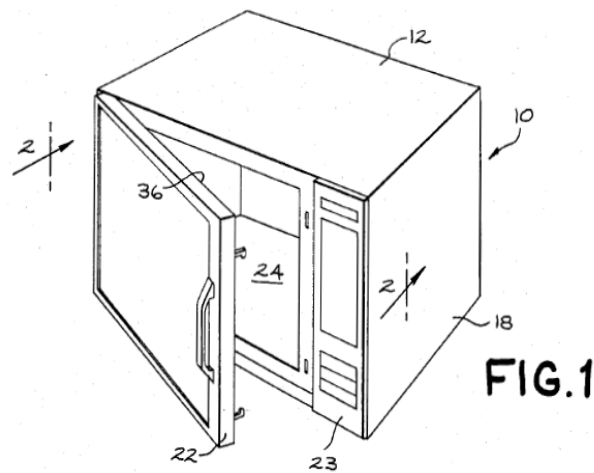
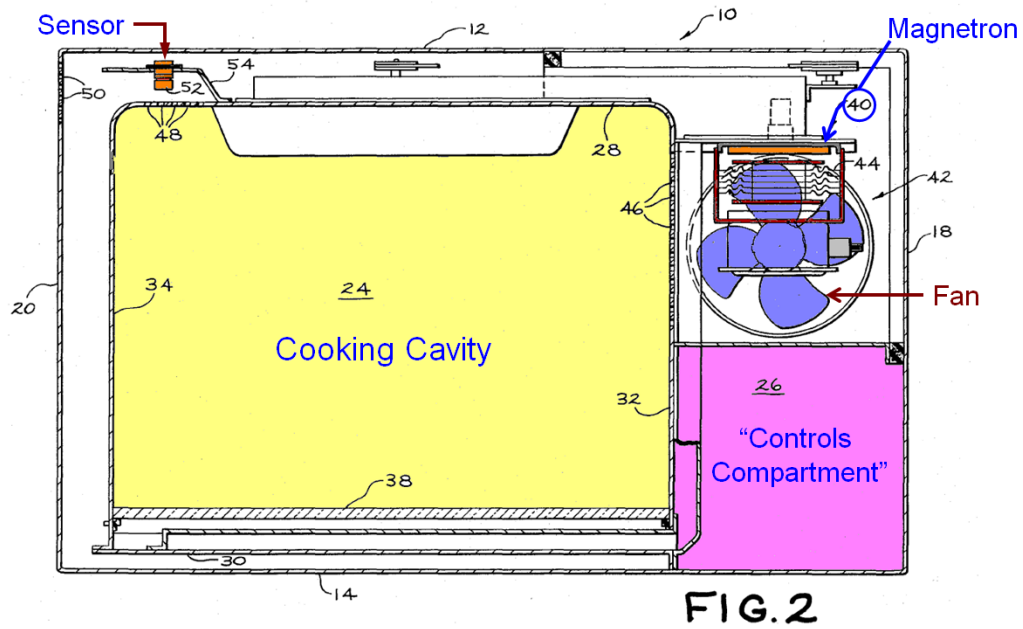
(B) Smith

Smith discloses a gas sensor (i.e., “smoke sensor”) positioned in operative connection with a cooking area inside a microwave oven. Smith describes the need to detect smoke and increasing gas concentration prior to combustion: “However, before actually reaching the ignition point, the food begins to char, smoke or smolder, resulting in a second period of relatively rapidly increasing gas concentration in the circulating air, comparable to that rate of increase which characterizes the normal cooking period.” *Id.* at 3:51-54. Referring to Figures 1 and 2 below, which are different angles of the microwave oven, Smith discloses a gas sensor 52 (i.e., “smoke sensor”) positioned in operative connection with a cooking area inside the microwave oven:

Means for sensing the concentration level of such gases in the air leaving the cavity is provided in the form of a gas sensor 52 disposed in the air flow path between perforations 48 in cavity wall 28 and vent openings 50 in cabinet wall 20. Sensor 52 is supported proximate perforations 48 by mounting bracket 54 which is suitably secured to cavity wall 28. Sensor 52 in the illustrative embodiment of FIG. 2 is a gas sensor readily commercially available from Figaro Engineering, Inc., identifiable as Model TGS No. [816]⁶.

⁶ Ex. 1002 ¶¶[167-169] (discussing typographical error).

Id. at 3:6-16; Ex. 1002 ¶¶[289-90]; Ex. 1023 ¶[205].



Ex. 1014, Figs 1 and 2.

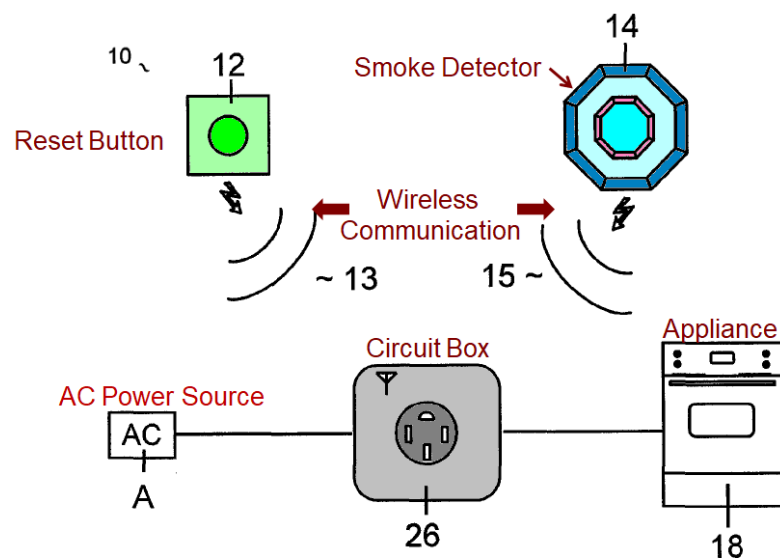
Smith discloses, the Model TGS No. 816 sensor from Figaro Engineering Inc. is a smoke sensor. Ex. 1002 ¶¶[167-69]; Ex. 1023¶[167-69]. Additionally, referring to FIG. 4 (annotated below), Smith discloses the gas sensor (blue) is in operative connection with the microwave microprocessor (i.e., “control circuit”,

gas sensor 52 is incorporated in a microprocessor-based control arrangement . . . The circuit of FIG. 4 includes a gas sensing circuit 60 for sensing the concentration level of gases in the circulating air as it exits cooking cavity 24 and generating a voltage signal having a magnitude representative of the sensed gas concentration level.

Butt addresses the problem of fires caused by kitchen appliances: “[t]he National Fire Protection Association reports that between the years 1999-2002, for example, there were 114,000 reported home fires associated with cooking alone.”

50

by Butt controls power to an electrical kitchen appliance 18 coupled to a controller 20, where the Butt system includes a smoke detector 14 (blue), panic/reset button 12 (green) and a wireless transmitter. *Id.* at 4:29-34; Ex. 1002 ¶¶[171, 289]; Ex. 1023 ¶[207]. Butt discloses that the controller is housed inside circuit box 26 (grey): “...a standard circuit box 26 and a controller 20 housed therein...” Ex 1015 at 4:33-34.



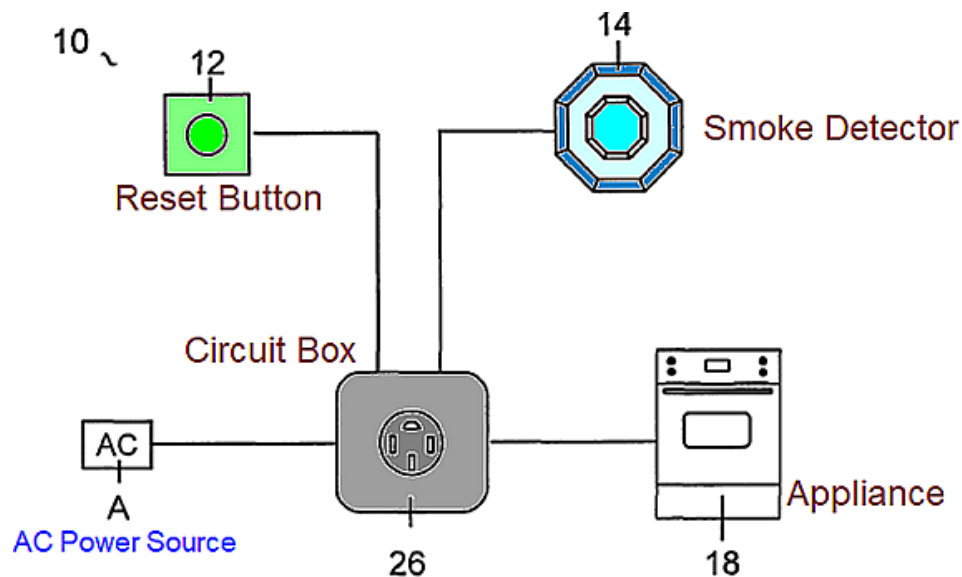
Id. at Fig. 1A.

The system taught by Butt includes a smoke sensor in operative connection with the cooking area of a cooking range. Ex. 1015 at 2:22-25. Butt further teaches a smoke detector is in operative connection to the controller (i.e., “at least one power control circuit”). If the detector detects smoke, then a signal is sent to the controller to interrupt power to the kitchen appliance:

If the detector 14 detects the presence of smoke, then in the wireless embodiment illustrated in FIG. 1 an RF signal 15 is transmitted and is received by the controller 20.

Id. at 4:53-63; Ex. 1002 ¶¶[107, 172, 289]; Ex. 1023 ¶[208].

“Further, in the embodiment shown in FIG. 1B (reproduced and annotated below), the controller 20, detector 14, and panic/reset button 12 are all wired together.” *Id.* at 5:3-4. “The wiring takes the place of the RF signals 13, 15 illustrated in FIG. 1A.” Ex. 1015 at 5:3-4; Ex. 1002 ¶¶[173, 289]; Ex. 1023 ¶[209].



Ex. 1015 at Fig. 1B (annotated).

e. ***The Shut-Down Function Element (Claims 1, 10, 15 and 22)***

i. *Shut-Down Function*

(A) ISDU

ISDU discloses that when smoke is detected, the microwave oven operation, i.e., magnetron, is disabled, and the user is alerted to the smoke:

[W]hen smoke is detected during microwave operation, the device will temporarily disable microwave operation and let the user know that the food has begun to smoke or even burn... The product, Integrated Smoke Detection Unit (ISDU) for commercial microwave ovens, will work in the following way. The presence of particulate during cooking will trigger our device thus sounding an alarm and halting microwave operations.

Ex. 1012 at 1; Ex. 1002 ¶¶[174-75, 289]; Ex. 1023 ¶[215].

The alarm state will consist of a suspension of normal microwave functions including the cessation of magnetron operation, a visual alert to be displayed on the integrated microwave LCD, and an audible alert.

Ex. 1012 at 8.

Additionally, in order to prevent false alarms for the user, ISDU discloses that power to the microwave can be withdrawn responsive to the smoke sensor outputting a signal for a predetermined set of time to indicate the presence of unwanted smoke (i.e., “responsive at least in part to sensing the level of smoke continuously for a predetermined time.”) and not a false alarm:

Because a photoelectric detector is more prone to isolated particulate triggering, measures must be taken to ensure triggering only when an alarm is merited. To prevent such singular responses, the time averaged output signal from the smoke detector can be evaluated and used to output an alarm trigger only in the event of true danger to the user.... Time referencing this output pulse against a set of standard

conditions will allow the evaluation of the signal to determine whether an alarm is necessary or not.

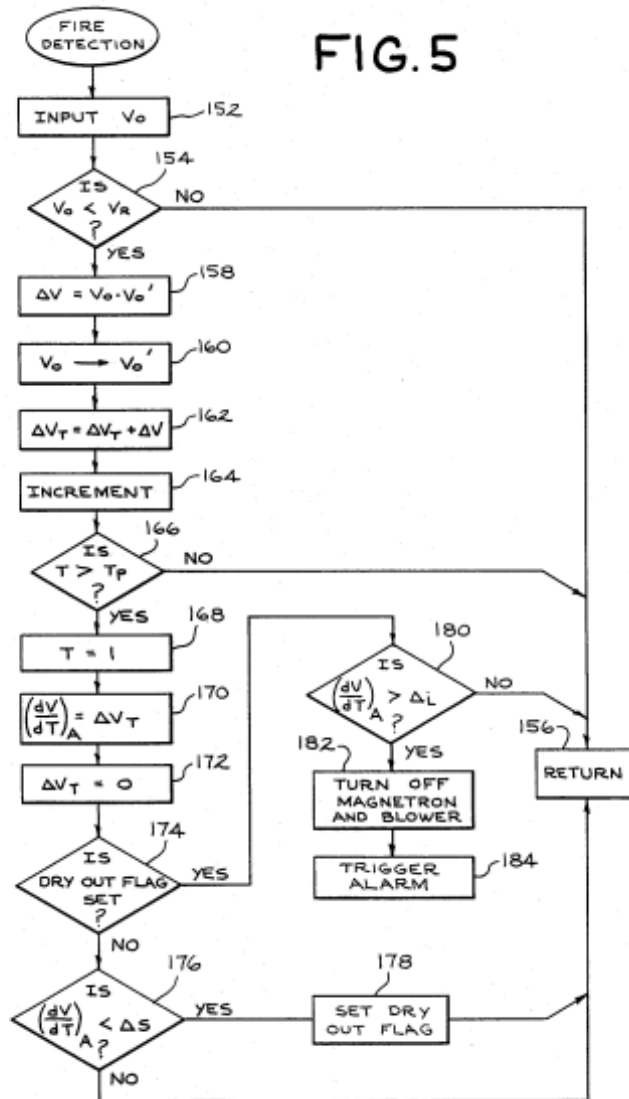
Ex. 1012 at 8 and 20, Ex. 1023 ¶[216].

(B) Smith

Smith discloses a gas sensor that can cause cooking power, i.e., power to the magnetron, to be withdrawn upon the gas sensor sensing smoke by the smoke sensor over time. Figure 5 (reproduced below) shows the control algorithm implemented by the microprocessor implements for smoke detection. Ex. 1002 ¶¶[180-81, 289]; Ex. 1023 ¶[217]. Smith states:

Upon detection of a rate of change greater than reference AL, (Yes to In-quiry 180) a signal is provided at output port R12 causing power control relay 68 to open, thereby deenergizing magnetron 40 and the blower motor 67 (Block 182). ...The deenergizing of both the magnetron and the blower motor using either technique in effect turns off power to the oven. By detecting the occurrence of a rapid increase in the rate of change of concentration level by the hereinbefore described method, magnetron 40 is deenergized 35 prior to the load being heated in the oven reaching its actual combustion temperature, thereby anticipating a potential fire condition and preventing the load from reaching its combustion point.

Ex. 1014 at 9:17-39; Ex. 1023 ¶[217].



Id. at Fig. 5.

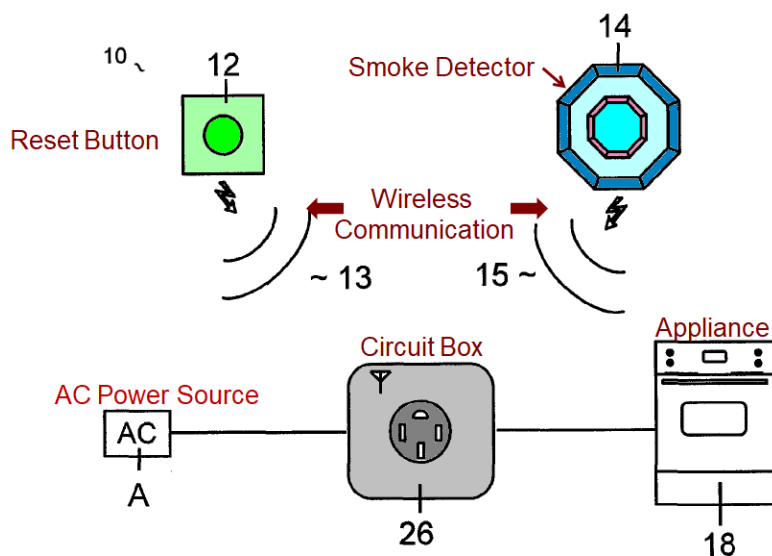
(C) Butt

As shown in FIG 1A (reproduced below), Butt teaches that if the detector (i.e., “smoke sensor”) senses smoke and consequently interrupts power to the microwave it will be stopping the microwave before the end time of the cooking session set by the user. For example, Butt teaches sending a control signal to a

relay to prevent the flow of electricity to the electrical cooking appliance:

If the detector 14 detects the presence of smoke, then in the wireless embodiment illustrated in FIG. 1[A] [shown below] an RF signal 15 is transmitted and is received by the controller 20. Upon receiving the signal, *the controller interrupts the AC power supply to the appliance 18 and consequently shuts the appliance 18 off.*

Id. at 4:53-67 (emphasis added); Ex. 1002 ¶¶[182, 184, 289]; Ex. 1023 ¶[218].



Id., Fig 1A (annotated).

Butt further described that it was previously known to have a safety shut-off system to switch off an electrical appliance upon detecting a signal indicative of a fire: “a detector for detecting a signal indicative of fire, such as smoke; a switch that connects an appliance, such as an electric range, to an AC power supply; and a controller that opens the switch upon receiving a signal from the detector.” Ex 1015 at 1:34-36; Ex. 1002 ¶¶[183, 185, 289] Ex. 1023 ¶[219].

f. ***The Reset Enable Function Element (Claims 1, 15 and 22)***

i. *Reset Enable Function*

(A) ISDU

ISDU discloses a control circuit (i.e., “at least one power control circuit”) operative to enable the microwave / magnetron after ending the cooking session due to the Shut Down Function:

Triggering the smoke detector will output a number of alarm conditions to alert the user. The alarm state will consist of a suspension of normal microwave functions including the cessation of magnetron operation, a visual alert to be displayed on the integrated microwave LCD, and an audible alert . . . ***Acknowledgement of the alarm state will reinstate all normal microwave functions and reset the smoke detector circuit for further use.***

Ex. 1012 at 8-9 (emphasis added).

As shown above, ISDU discloses the power control circuit enables the microwave oven, including its magnetron, to receive cooking power to commence a subsequent cooking session to enable further cooking. *Id.*; Ex. 1002 ¶¶[186-87, 283, 289]; Ex. 1023 ¶[225]. ISDU equates suspension of microwave operation with cessation of magnetron operation. Ex. 1012 at 8; Ex. 1023 ¶[225].

(B) Butt

Butt teaches that a user may press the panic/reset button to enable the

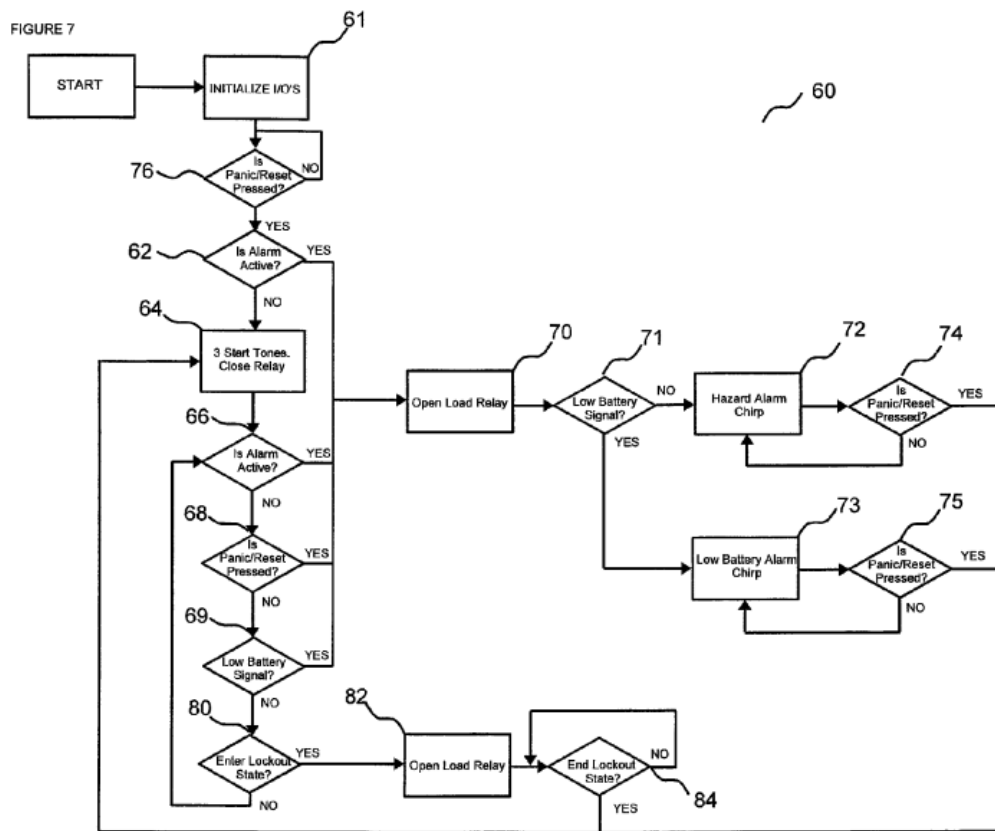
controller to restore power to the appliance: “when the danger posed by the fire has passed, a user can press the panic/reset button 12, which will transmit an RF signal 13 to the controller 20, and the controller 20 will restore the AC power supply to the appliance 18.” Ex. 1015 at 3:63-67; Ex. 1002 ¶¶[192, 289]; Ex. 1023 ¶[226].

As shown in FIG 7 (reproduced below), when the panic/reset button is pushed, the device is re-enabled:

The relay 44 remains open until the panic/reset button 12 is pressed (block 74), following which the microcontroller 36 closes the relay 44
...

Ex. 1015 at 7:15-21; Ex. 1002 ¶¶[195, 289]; Ex. 1023 ¶[227].

Relay 44 operates to remove or provide power to the appliance: “If pursuant to the algorithm implemented in the firmware, power should be restored to the appliance 18, the appropriate signal is sent to relay driver 42, which consequently closes the relay 44 and restores power.” Ex.1015 at 5:51-54; Ex. 1023 ¶[228]. “When the lockout state is over, the relay 44 is closed and power is restored to the appliance 18 (block 64).” Ex. 1015 at 7:60-62. Ex. 1023 ¶[228].



Ex. 1015, Fig. 7

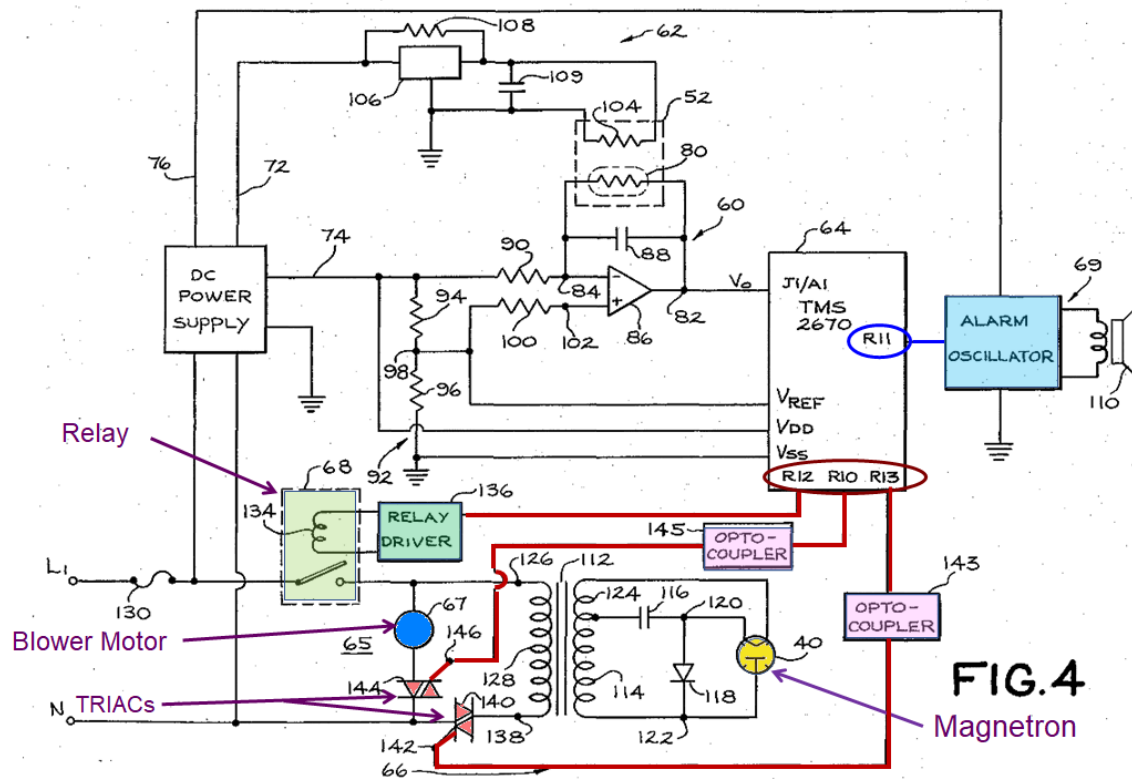
(C) Smith

Smith discloses an electrical circuit (“at least one electrical power control circuit”) as shown in FIG 4 (annotated below), which is configured to allow the microprocessor 64 to cycle power to the microwave magnetron. For example, by sending digital signals to control the position of a relay in line with the magnetron power supply:

Upon detection of a rate of change greater than reference ΔL , (Yes to

Inquiry 180) *a signal is provided at output port R12 causing power control relay 68 to open*, thereby de-energizing magnetron 40 and the blower motor 67 (Block 182) . . . The de-energizing of both the magnetron and the blower motor using either technique in effect turns off power to the oven.

Ex. 1014 at 9:17-28 (emphasis added); Ex. 1002 ¶¶[196-97, 289]; Ex. 1023 ¶[230].



The disclosed power control relays are electronically controlled to open or shut by microcontroller 64. Ex 1002 ¶¶[196-97, 283, 289]; Ex. 1023 ¶[231].

g. *The USB port Element (4, 7, 8, 12, 18 and 19)*

i. USB Port

(A) Emma

As annotated in Fig.1 below, Emma discloses a microwave oven that includes at least one auxiliary low power receptacle (i.e., “auxiliary electrical outlet”) “for plugging in low power device for example, rechargeable devices, such as cellular phones, PDA’s or other electronic devices that do not demand high power” on the front side. Ex. 1011 ¶[0027].

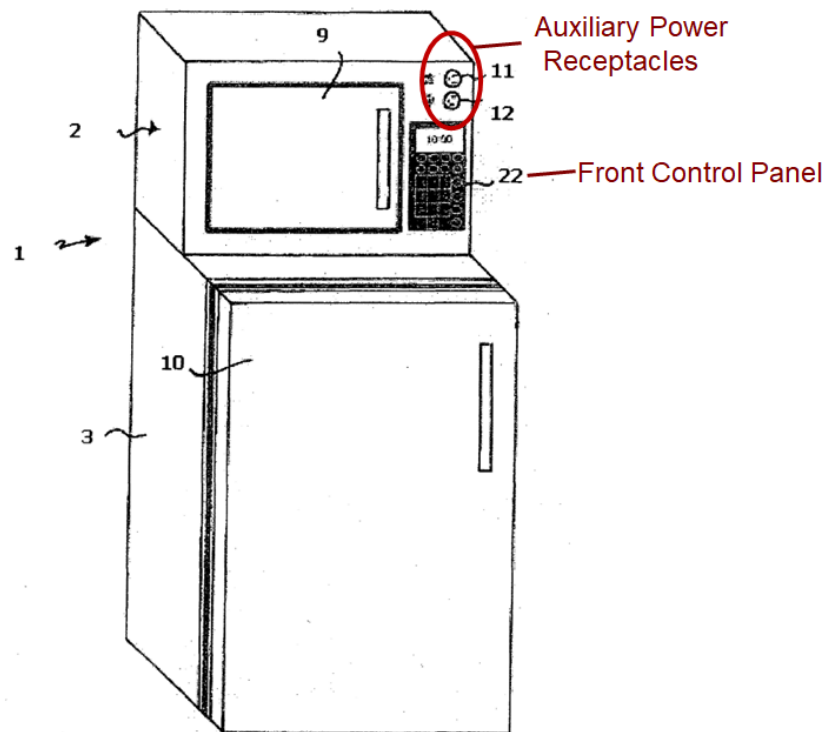


FIGURE 1

Id., Fig. 1 (annotated).

(B) Quezada

Quezada teaches a power sourcing receptacle that integrates a standard AC electrical receptacle and a USB port for a direct current (DC) power source. Ex.

1020, (57). Ex. 1023 ¶[240]. As shown in Figure 2 reproduced and annotated below, an embodiment includes a power sourcing receptacle 100 that combines a USB receptacle 104 with an AC electrical receptacle 102. *Id.*, Ex. 1020 ¶[0023].

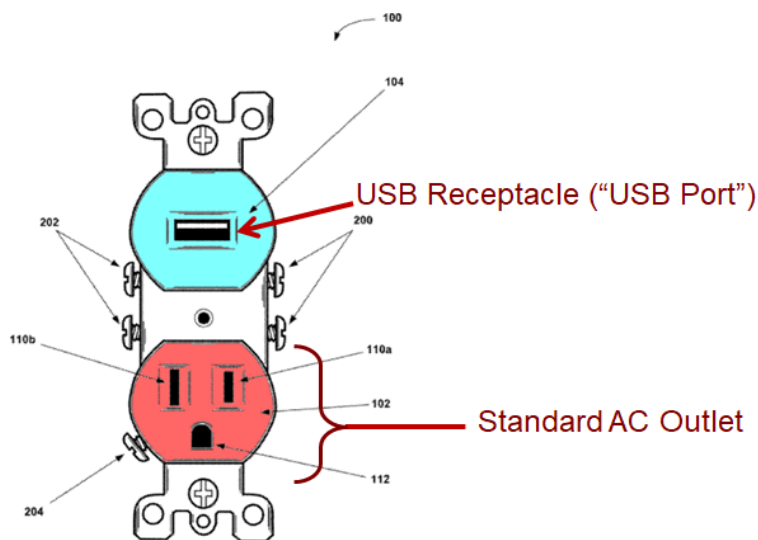


FIG. 2

Ex. 1020, Fig. 2 (annotated).

“The USB receptacle 104 provides 100-150 milliamps (mA) and 5 volts direct current (DC) to devices inserted into USB receptacle 104.” Ex. 1020, ¶[0025]; Ex. 1023 ¶[241]. Thus, the USB receptacle 104 can provide DC power to computer peripherals, digital cameras, printers, personal media players, flash drives, “and other devices capable of accepting power or charge via a USB connector.” *Id.*

Figure 6 below is a block diagram from Quezada showing the flow of power to the USB port 104 (“5V DC”; blue) and AC receptacle 102 (“120 V AC”, red). Ex. 1020 ¶[0039]; Ex. 1023 ¶[242]. A main power source supplies power directly

to AC receptacle 102 and directly to USB regulated voltage sourcing unit (“USB RVSU”; yellow) 600. Ex. 1020, ¶¶[0039-40]; Ex. 1023 ¶[242].

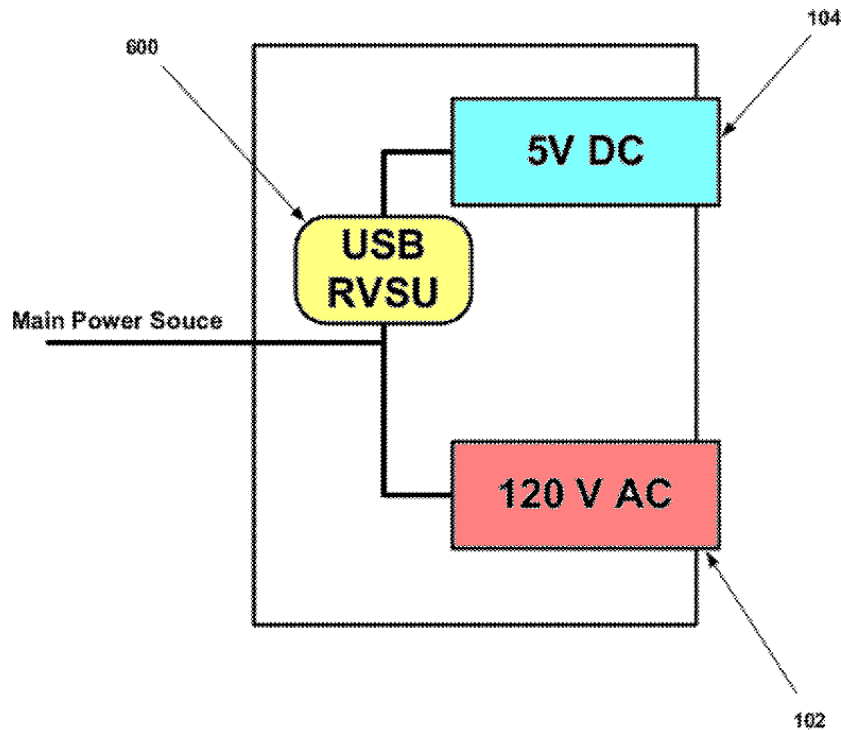


FIG. 6

Ex. 1020, Fig. 6. (annotated).

As shown below in Quezada Fig. 7, the USB RSVU 600 includes a transformer 700 (red) that steps down the incoming source voltage to 5 volts, a rectifier 702 (green) that converts the voltage from alternating to (pulsating) direct current, a filter 704 (purple) that smooths the wave form of the direct current, and a voltage regulator 706 (blue) to maintain the voltage. Ex. 1020, Fig. 7, ¶[0041]; Ex. 1023 ¶[243].

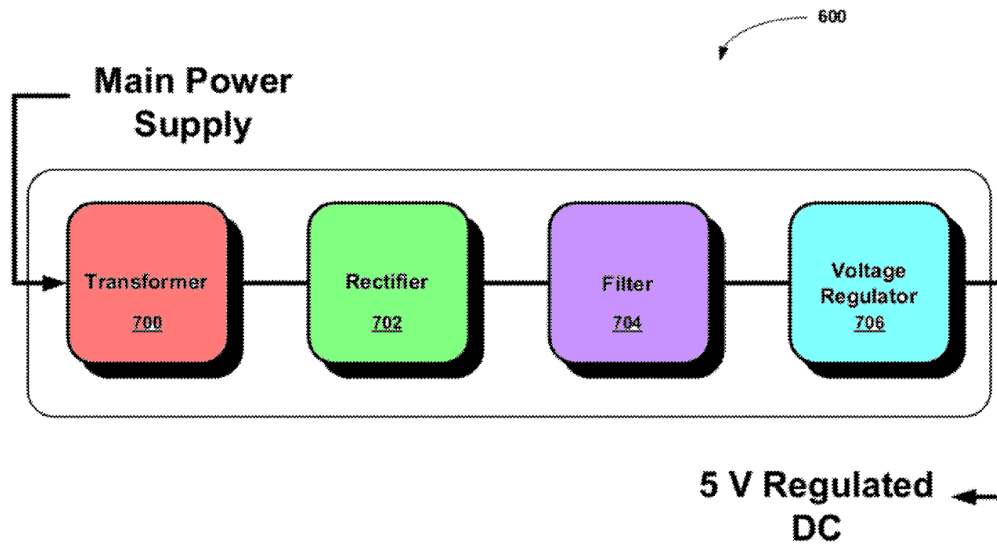


FIG. 7

Ex.1020, Fig. 7 (annotated).

As such, the USB RVSU 600 provides a 5-volt regulated voltage to the USB port 104. *Id.*

h. *The Refrigerator Element (Claims 13, 20 and 21)*

(A) Emma

Emma discloses a refrigerator electrically connected to a refrigerator receptacle (i.e., “at least one externally accessible electrical connector”), on the microwave oven. As discussed above in VI.C.1.b.i.(A) the Refrigerator receptacle is in operative electrical connection with a power control circuit. As shown below in Figure 2, the “[r]efrigerator 3 is connected to microwave oven 2 by power cord 7 to refrigerator receptacle 15, shown at the rear of the microwave 2 in FIG. 2 (annotated below).” *Id.*, ¶[0026]; Ex. 1002 ¶¶[138-39, 285, 287]; Ex. 1023 ¶[249].

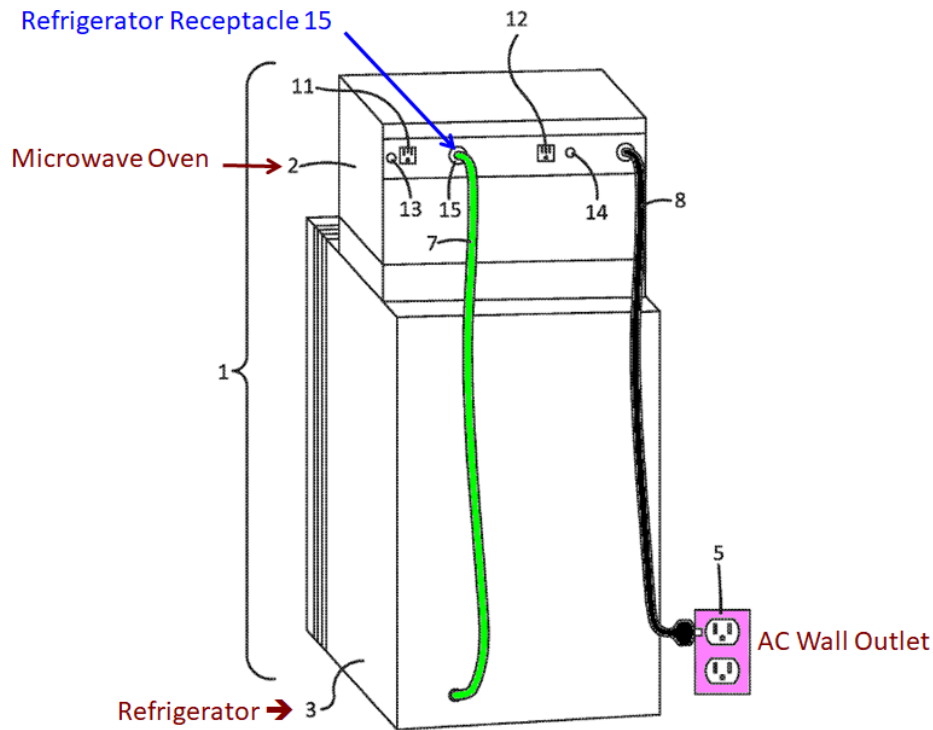


FIGURE 2

i. ***The Sensor Element (Claim 5)***

(A) ISDU

ISDU discloses both “ionization and photoelectric smoke detectors.” Ex. 1012 at 9; Ex. 1002 ¶[295]; Ex. 1023 ¶[253].

(B) Smith

As discussed above, Smith discloses a microwave oven which includes a smoke /gas sensor. *Supra* at §VI.C.1.d.i.(B). The Smith gas sensor is adapted to detect VOC and is thus, a VOC sensor Ex 1002 ¶[296]; Ex. 1023 ¶[254].

(C) Butt

Butt’s exemplary smoke detectors include: “ADEMCO 5806 detector, the SecureLinc (73942) detector, and the Wisdom 433 Mhz Wireless Smoke

Detector.” Ex. 1015 at 4:49-52. The Ademco 5806 is a photoelectric smoke detector. Ex 1002 ¶[297]; Ex. 1023 ¶[255].

2. Explanation of Asserted Grounds and Rationales Supporting a Conclusion of Obviousness

a. ***Ground 1: Obvious in view of Emma combined with ISDU***

Ground 1 is that claims 1-3, 5, 6, 8-11, 13-17 and 20-24 are invalid because it would have been obvious to combine the microwave-refrigerator appliance of Emma with the ISDU smoke sensor. *Id.*, ¶[256]. There are numerous reasons that a POSITA would make a combination of the microwave refrigerator combination of Emma with the smoke sensor of ISDU. *Id.* First, all the claimed elements were known in the prior art and a POSITA would have combined the elements as claimed by known methods, with no change in their respective functions. *Id.* The combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *Id.* While Emma fails to recite a smoke sensor, Emma does disclose adding functionality to appliances by cycling power to a refrigerator and auxiliary electrical outlets for the purpose of improving the safety of the Emma appliance (preventing overload conditions). *Id.* Emma’s teaching would motivate a POSITA to look to further microwave functionalities, including those in ISDU. *Id.*

Both Emma and ISDU disclose shutdown conditions while using electrical

cooking appliances that provide added functionality. *Id.* Additionally, ISDU, explicitly relates to added features of microwave ovens. *Id.*; *supra* at §VI.B.2.b. It would have been obvious to a POSITA to combine the additional microwave oven safety features of ISDU into the Emma microwave/refrigerator combination appliance to provide the added microwave features discussed in ISDU. Ex 1023 ¶[256]. Specifically, to enable the Emma microwave to shut down upon the detection of smoke and reenable the Emma microwave for a further cooking session when the smoke has cleared. *Id.* Further, it would have also been obvious to a POSITA to modify ISDU with the features of the microwave/refrigerator combination of Emma for the purpose and convenience of having an “all-in-one appliance” in addition to the safety feature of managing total power draw as taught by Emma. *Id.*

Finally, the claims recite that “a smoke sensor is positioned in operative connection with a cooking area,” “at least one smoke sensor, wherein the smoke sensor is positioned in operative connection with the cooking area” or “at least one smoke sensor, wherein the at least one smoke sensor is positioned in operative connection with the cooking area.” Petitioner contends ISDU meets this limitation as shown in Section VI.C.1.d.i.(A), because it operates in response to conditions in the microwave. Ex. 1023 ¶[256]. However, to the extent the Board determines there is a positioning requirement and ISDU’s smoke sensor is not in “operative

connection with the cooking area” it would have been obvious to do so. *Id.* Based on the teaching and suggestion provided in ISDU, it would have been obvious to a POSITA to place the smoke sensor with sufficient position to the cooking area for it to operate with respect to the source of smoke (initiating at the food being heated). *Id.* This is consistent with the express teaching of ISDU that it is integrated with the microwave oven. *Id.* Additionally, ISDU specifically teaches this. *Id.* When referring to prior art, it states: “[w]ith the introduction of a smoke detection circuit *inside* the microwave the consumer will be alerted, by a louder more intense alarm, that they have overcooked their food or that there is another cause of smoke *inside* the microwave.” *Id.*, Ex. 1012 at 4.

Based on ISDU’s teaching and/or the motivation to have the smoke sensor be optimally positioned in a location to 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, it would not function as intended. Ex 1023 ¶[256]. 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.*

Additionally, it would have been “obvious to try” placing the sensor in operative connection with the cooking area of the microwave as opposed to

outside/around the microwave oven, as there are only a finite number of identified, predictable solutions (i.e., just two feasible: inside or outside), with a reasonable expectation for success. *Id.* ISDU emphasized that at the time there was a market need to prevent fires but only a finite number of solutions for integrating smoke sensors into microwave ovens. *Id.* Further, it would have been obvious to integrate any smoke sensor with a microwave oven to create a commercially integrated package for sale and shipping. *Id.*

Should the Board decide that “operative connection” means close proximity, ISDU teaches this as well. *Id.* It would have been well understood from the art how a microwave oven and a smoke detection sensor work (the smoke detector should be in proximity to the cooking operation to detect the smoke), and a POSITA would have substituted the placement of the smoke sensor inside as opposed to outside/around the microwave oven and obtained predictable results. *Id.*

Lastly, the Challenged Claims add a “time delay” limitation where power to the “at least one electrical connector” is withheld while the magnetron is in use and after it ceases, for a period of time. For example, power to the “at least one electrical connector” is unavailable while the “magnetron is operative and for at least a preset minimum period after the magnetron becomes inoperative.” Ex. 1001, ’746 patent at Claim 14. The ’746 patent does not offer additional support

for these features other than what is taught within the bounds of Emma. Therefore, to the extent these features are enabled, they are taught or obvious in view of Emma.

b. ***Ground 2: Obvious in view of Emma combined with Smith***

Ground 2 is that claims 1-3, 5, 6, 8-11, 13-17 and 20-24 are invalid because it would have been obvious to combine the microwave refrigerator combination of Emma with the smoke sensor discussed in Smith. As discussed above, Emma discloses a microwave refrigerator combination. Smith teaches a microwave oven that is designed to shut down the microwave based on a smoke sensor positioned inside the microwave oven and in operative connection with the cooking area detecting the food being cooked, almost reaching its combustion point. *Supra* at §VI.B.2.c; Ex. 1023 ¶[257].

There are numerous reasons why a POSITA would have combined the microwave refrigerator combination taught in Emma, with the Smoke Sensor operatively placed inside the microwave oven as in Smith. Ex 1023 ¶[257].

First, Emma and Smith each relate to optimizing electric cooking appliances, including specifically microwaves. *Id.* Second, all the claimed elements were known in the prior art, and a POSITA would have combined the elements as disclosed by known methods for the purposes of providing Emma's microwave refrigerator combination with Smith's smoke sensor operatively connected with the

cooking area. *Id.* Such a combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *Id.* While Emma fails to recite a smoke sensor, Emma does disclose adding functionality to appliances by cycling power to a refrigerator and auxiliary electrical outlets for the purpose of improving the safety of the Emma appliance (preventing overload conditions). *Id.* Emma's teaching would motivate a POSITA to look to further microwave functionalities, including those in Smith. *Id.*

Any inclusion of Smith's smoke sensor operatively connected with the cooking area with Emma, would result in such elements merely performing the same function as they do separately, i.e., smoke sensing to withdraw electrical power from an electrical cooking appliance and then enabling resetting of the electrical cooking appliance. *Id.* A POSITA would have recognized that the results of said combination were predictable because Emma and Smith function to digitally control power control circuitry for an electrical appliance based on a sensor input. *Id.*

Third, a POSITA would have been motivated to combine Emma and Smith based on the teachings of each reference. *Id.* Emma and Smith are both directed towards shutting down a component of the device in response to a sensor output indicative of an unwanted condition. *Id.* Emma teaches withholding power based on the power demands of the microwave oven. *Id.* Smith inherently teaches a

power control relay designed to be power cycled by the controller. *Id.* It would have been obvious to a POSITA to modify Emma with Smith to include the smoke sensor in operative connection with the microwave oven following the elimination of the unwanted condition detected and re-check for smoke condition for the added benefit of re-using the microwave oven. *Id.* A POSITA would have been able to pursue any of these known potential solutions with a reasonable expectation of success grounded in the disclosures of the prior art. *Id.*

Fourth, it would have also been obvious to a POSITA to modify Smith with the features of the microwave/refrigerator combination of Emma for the purpose and convenience of having an “all-in-one appliance” in addition to the safety feature of managing total power draw as taught by Emma. Ex 1002 ¶[237].

Fifth, a POSITA would also have found the asserted combinations of Emma and Smith “obvious to try.” Ex. 1023 ¶[257]. As shown in Emma and Smith, at the time of the invention, there was a recognized need in the art to optimize microwave ovens. Ex. 1011 ¶[0007]; Ex. 1014 at 1:6-40. Therefore, it would have been obvious to a POSITA to try this combination. Ex 1023 ¶[257].

Finally, Petitioner contends Smith discloses the Reset Enable Function as shown in Section VI.C.1.f.i.(C). Should the Board disagree, it would have been obvious to modify Smith and/or the Smith/Emma combination to reset the microwave oven after a smoke-based shutdown to enable the microwave /

magnetron to receive cooking power in a next subsequent cooking session. Ex 1023 ¶[257]. First, based on a teaching suggestion or motivation in Smith, a POSITA would modify Smith and/or the Smith/Emma combination to contain the Reset Enable Function. *Id.*

The shutdown function of Smith is configured to be reversible by the control of the Smith and/or the Smith/Emma combination microcontroller through the use of an electronically controlled relay. *Id.* Further, Smith teaches that a goal of the Smith smoke sensor is to anticipate fires before they occur. Ex. 1014 at 1:6-9. Resetting the microwave – undamaged upon early detection of a fire in its early stages – would re-enable the microwave for use again in a subsequent cooking session and would prevent replacing a costly appliance or service call when such replacement or service would not be necessary. Ex 1023 ¶[257]. Moreover, a POSITA would have understood that modifying Smith and/or the Smith/Emma combination to return to a reset state following a shutdown condition would yield a reasonable expectation of success and allow for successive cooking sessions. *Id.* A POSITA would have understood, for example, that a microwave is a commercially sold cooking appliance. *Id.* It would be problematic to offer for sale a microwave oven that had to be serviced or replaced after just one trip of its smoke detection circuit. *Id.*

Additionally, it would have been “obvious to try” to add a Reset Enable

Function as discussed previously, because all of the microwave components disclosed in Smith and/or the Smith/Emma combination are non-destructive, as discussed above, and designed to be power cycled. *Id.* Thus, there would only be a finite number of potential solutions and conditions for restarting the microwave after the shutdown. *Id.* A POSITA would have included such a feature with a reasonable expectation of success. *Id.*

Finally, Petitioner contends the device taught in Smith teaches withdrawing power to the magnetron “responsive...to sensing the level of smoke continuously for a predetermined time.” Should the Board disagree, it would have been obvious to a POSITA to modify Smith and/or the Smith/Emma combination to have this function. *Id.*, ¶[258]. Based on a teaching suggestion or motivation in Smith to measure smoke level over time, or because a POSITA would have wanted to have a smoke sensor which minimizes false alarms by verifying that a high smoke level signal is not spurious, it would have been obvious to a POSITA to configure the Emma/Smith combination to withdraw power to the microwave only after smoke is detected continuously for a predetermined period of time to avoid spurious false positive alarms. *Id.*

c. ***Grounds 3 and 4: Obvious in view of Emma combined with Butt, or alternatively, with Butt and Smith***

Ground 3 is that claims 1-3, 5, 6, 8-11, 13-17 and 20-24 are invalid because it would have been obvious to combine the microwave refrigerator combination of

Emma with the smoke sensor taught in Butt. There are numerous reasons that a POSITA would make a combination of the microwave refrigerator combination of Emma with the smoke sensor of Butt. *Id.*, ¶[259]. First, all the claimed elements were known in the prior art and a POSITA would have combined the elements as claimed by known methods, with no change in their respective functions. *Id.* The combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *Id.* While Emma fails to recite a smoke sensor, Emma does disclose adding functionality to appliances by cycling power to a refrigerator and auxiliary electrical outlets for the purpose of improving the safety of the Emma appliance (preventing overload conditions). *Id.* Emma's teaching would motivate a POSITA to look to further microwave functionalities, including those in Butt. *Id.*

Both Emma and Butt disclose shutdown conditions while using electrical cooking appliances that provide added functionality. *Id.* Additionally, Butt, explicitly relates to added features of kitchen appliances. *Id.*; *supra* at §VI.B.2.d. It would have been obvious to a POSITA 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 and reenable the Emma microwave for a further cooking session. Ex 1023 ¶[259]. Further, it would have also been obvious to a POSITA to modify Butt with the features of the microwave/refrigerator combination of Emma for the purpose and

convenience of having an “all-in-one appliance” in addition to the safety feature of managing total power draw as taught by Emma. *Id.*

To the extent the Board determines that the combination of Emma and Butt do not render obvious the afore-mentioned claims, Ground 4 is it would be obvious to a POSITA to combine Emma with Butt and Smith. *Id.*

First, Emma, Butt and Smith each relate to optimizing electric cooking appliances. *Id.* Second, all the claimed elements of the afore-mentioned claims were known in the prior art, and a POSITA would have combined 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. *Id.* Such a combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *Id.* Any inclusion of Butt’s reset functionality with Smith’s smoke sensor operatively connected with the cooking area into Emma, would result in such elements merely performing the same function as they do separately, i.e., smoke sensing to withdraw electrical power from an electrical cooking appliance and then re-enabling the electrical cooking appliance. *Id.* A POSITA would have recognized that the results of said combination were predictable because Emma, Butt and Smith function to digitally control power control circuitry for an electrical appliance based on a sensor input.

Id.

Third, a POSITA would have been motivated to combine Emma, Butt and Smith based on the teachings of each reference. *Id.* Specifically, Emma, Butt and Smith are each directed towards shutting down a component of the device in response to a sensor output indicative of an unwanted condition. *Id.* Emma teaches withholding of power based on the power demands of the microwave oven. *Id.* Butt discloses shutting down electrical cooking appliances in response to a smoke sensor, and also discloses resetting the electrical power supply to the cooking appliance after a smoke-triggered shutdown condition. *Id.*; *supra* at §-VI.C.1.e.i.(C), §VI.C.1.f.i.(B). Similarly, Smith inherently teaches a power control relay for the microwave magnetron designed to be power cycled by the controller. *Supra* at §VI.C.1.b.i.(C); Ex. 1023 ¶[259]. It would have been obvious to a POSITA to modify Emma with Butt and Smith to include the smoke sensor in operative connection with the microwave oven with the reset functionality disclosed by Butt for the added benefit of re-using the microwave oven. Ex 1023 ¶[259]. A POSITA would have been able to pursue any of these known potential solutions with a reasonable expectation of success grounded in the disclosures of the prior art. *Id.*

Fourth, a POSITA would also have found the asserted combinations of Emma and Butt with Smith “obvious to try.” *Id.* As shown in Emma, Butt and

Smith, at the time of the invention, there was a recognized need in the art to optimize microwave ovens. *Id.*; Ex. 1011 ¶[0007]; Ex. 1015 at 1:22-44; Ex. 1014 at 1:6-40. Therefore, it would have been obvious to a POSITA to try this combination.

Finally, Petitioner contends Butt discloses “wherein the smoke sensor is positioned in operative connection with a cooking area” because there is no positioning requirement. However, should the Board disagree, it would have been obvious to a person of ordinary skill in the art to modify the Emma/Butt combination to teach a smoke sensor in operative connection with a cooking area. *Id.* Butt teaches a user enabled reset device which can be initiated following the smoke detector unit detecting smoke and ceasing the supply of power to the appliance. *Id.*; *supra* at §VI.C.1.e.i.(C), §VI.C.1.f.vi.(B). Butt’s reset function reinitializes the system for further use by closing a relay to reconnect the electrical appliance to AC power if no such signal is detected. Ex 1023 ¶[259]. There are numerous reasons that a POSITA would make a modification in the Emma/Butt combination to position the smoke detection sensor in operative connection with the microwave oven. *Id.* First, based on the teaching and suggestion provided in Emma/Butt combination, it would have been obvious to a POSITA to place the smoke sensor to be in operative connection with the cooking area because that would place it in closer proximity to the source of smoke (initiating at the food

being heated) and the smoke detector must be in operative connection for it to function as a smoke detector. *Id.* This is consistent with the express teaching of Butt that it is integrated with the kitchen appliance. *Id.*

Based on Butt's teaching and/or the motivation to have the smoke sensor be positioned in a location to 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 any kitchen appliance in this case, a microwave oven. *Id.* 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.*

Petitioner contends the device taught in Smith teaches withdrawing power to the magnetron "responsive...to sensing the level of smoke continuously for a predetermined time." *Id.*, ¶[260]. Should the Board disagree, it would have been obvious to a POSITA to modify Smith, Butt, and/or the Emma/Butt or Emma/Butt/Smith combination to have this function. *Id.* Based on a teaching suggestion or motivation in Smith to measure smoke level over time, or because a POSITA would want to have a smoke sensor which minimizes false alarms by verifying that a high smoke level signal is not spurious, it would have been obvious to a POSITA to configure the Emma/Butt or Emma/Butt/Smith combination to withdraw power to the microwave only after smoke is detected continuously for a

predetermined period of time to avoid spurious false positive alarms. *Id.*

Lastly, if it is determined that Butt fails to teach the VOC Sensor claim element, it would have been obvious to a POSITA to use either a photoelectric or ionization smoke sensor as the Butt smoke sensor, because photoelectric and ionization smoke sensors are common smoke detector designs that would have been known to a POSITA. *Id.*, ¶[259].

d. ***Grounds 5 and 6: Obvious in View of Emma combined with either ISDU or Smith and further combined with the Knowledge of a POSITA***

Grounds 5 and 6 are that dependent claims 4, 7, 8, 12, 18 and 19, which claim USB ports with certain functionalities, are invalid because it would have been obvious to combine the microwave refrigerator combination of Emma with the smoke sensors taught in ISDU or Smith, and also substitute one or more of Emma's auxiliary low power receptacles / outlets for a USB port for power delivery to small electronic devices.

The bases for combining Emma's microwave refrigerator with the smoke sensors taught in ISDU or Smith are provided in Sections VI.C.2.a and VI.C.2.b, incorporated herein by reference. It would have been obvious to substitute one or more of the auxiliary low power receptacles / outlets on Emma's microwave with USB ports in light of the knowledge of a POSITA. Ex. 1023 ¶[261]. First, Emma specifically teaches providing low power auxiliary outlets for the purposes of

recharging cellular phones and other low power devices; based on this teaching suggestion or motivation in Emma, a POSITA would modify Emma's front panel to add USB ports or substitute Emma's auxiliary low power receptacles / outlets 11 and 12 on the front panel of the microwave with USB ports, a known low power charging means, for providing power to small electronic devices. *Id.* Emma teaches using "low power" auxiliary ports to charge small electronic devices, like cell phones. Ex. 1011 ¶[0027]; Ex. 1023 ¶[261]. "A maximum current may be set by controller 4 to prevent overload of the outlets 11 and 12." Ex. 1011 ¶[0029]. A POSITA would have known at the time that the use of USB ports to deliver power to small devices like cell phones was becoming prolific worldwide. Ex. 1023 ¶[261]. Moreover, a POSITA would know that the use of devices to convert AC to DC for charging small electronic devices like cell phones and laptops through USB ports was also prolific. *Id.* In fact, in 2009, around the time of Emma and well before the invention date, the USB Implementers Forum had released the USB Battery Charging Specification 1.1 as an extension of the USB specifications to battery charging over USB to provide additional current in excess of the prior released USB 2.0 specification. *Id.* Moreover, in 2004, well before the invention date, Apple released the fourth generation iPod which provided for the ability to "conveniently charge iPod with either the included FireWire or USB cable." Accordingly, the use of USB ports for charging electronic devices, was normalized

and well known to a POSITA. *Id.*

A POSITA would have understood that modifying Emma's microwave panel to add a USB port or substitute the auxiliary outlet for a USB port would yield a reasonable expectation of success and allow for charging of electronic devices, like cell phones. *Id.* A POSITA would have understood, for example, that AC/DC conversion and USB ports were common-place and becoming the worldwide standard at the time for charging small electronic devices, and that such USB ports were being utilized for charging in several different implementations, including in home computers, vehicles, and wall outlets. *Id.* A POSITA would have recognized that a commercially sold microwave appliance already used as a source for charging small electronic devices through its auxiliary outlets, as taught by Emma, would similarly benefit from using USB ports for charging given its standardization, smaller size, and ability to directly connect with USB cables supplied by device manufacturers, like cell phone companies. *Id.*

Further, it would have been no more than a simple substitution of one known element in Emma for another to obtain predictable results. *Id.* Emma teaches utilizing the included auxiliary port to charge small electronic devices like cell phones. *Id.* A POSITA would have included USB ports or substituted one or more of the Emma auxiliary ports with a USB port given the increasing acceptance and standardization of using USB ports for charging small electronic devices, and the

results would have been predictable, i.e. the USB ports would charge small electronic devices just as they did when used in other devices (e.g., cars, wall outlets adapters, etc.). *Id.*

Lastly, it would have been “obvious to try” to add a USB port to deliver power to small electronic devices as discussed previously, because this type of power charging was common at the time of the invention. *Id.* There was a finite number of potential solutions and conditions for charging small electronic devices at the time, and USB ports for charging were standardized under the USB Battery Charging Specification 1.1. *Id.* A POSITA would have included such a feature with a reasonable expectation of success, as discussed above. *Id.*

e. ***Grounds 7 and 8: Obvious in View of Emma combined with either ISDU or Smith, and further combined with Quezada***

Grounds 7 and 8 are that dependent claims 4, 7, 8, 12, 18 and 19, which claim USB ports with certain functionalities, are invalid because it would have been obvious to combine USB ports, as taught by Quezada, for charging electronic devices with the Emma microwave-refrigerator combination auxiliary low power receptacles / outlets (as modified with the smoke sensors taught in ISDU or Smith, discussed above). Ex. 1023 at ¶[262].

The bases for combining Emma’s microwave refrigerator with the smoke sensors taught in ISDU or Smith are provided in Sections VI.C.2.a and VI.C.2.b,

incorporated herein by reference. With respect to USB ports, there are numerous reasons why a POSITA would have combined the USB ports, and accompanying AC/DC power conversion circuitry, taught in Quezada with Emma's microwave auxiliary port charging. Ex. 1023 ¶[262]. First, Emma teaches that a standard household electrical outlet is included in the Emma microwave as "low power" auxiliary ports to charge small electronic devices, like cellular phones. *See* Section VI.C.1.g.i.(A).

Quezada teaches incorporating USB ports as an alternative to or in combination with standard AC electrical outlets. Ex. 1023 ¶[262]. Specifically, Quezada teaches a combined power sourcing receptacle that can include both standard AC electrical receptacle and USB ports for charging small electronics. *Id.* In Quezada's combined mountable sourcing unit, power is provided to an AC electrical receptacle and also to a USB regulated voltage sourcing unit that converts AC to DC and sends regulated DC voltage to the USB ports. *Id.* Thus, Quezada teaches a system for powering devices through both USB and standard AC electrical ports, mountable in a small area. *Id.* All of the claimed elements were thus known in the prior art, and a POSITA would have combined the elements as disclosed by known methods for the purpose of providing Quezada's USB port charging to Emma's microwave auxiliary port charging. *Id.* Such a combination would have yielded nothing more than predictable results to a

POSITA. *Id.* Any inclusion of Quezada's USB technology to Emma would result in such elements merely performing the same function as they do separately, i.e., charging small electronic devices with DC. *Id.* A POSITA would have recognized the results of this combination were predictable because Quezada functions in the same way as Emma, i.e., to deliver power for charging devices. *Id.*

A POSITA would have understood that including Quezada's USB port system in Emma's microwave auxiliary outlet system would yield a reasonable expectation of success, including providing for charging of electronic devices like cell phones. *Id.* A POSITA would have understood, for example, that Quezada's AC/DC and USB port system could be substituted into any device utilizing a standard electrical outlet, including a microwave oven as taught by Emma. *Id.* Even more so, such a substitution would function similarly to Emma, i.e., Emma provides for the Withhold and Deliver Electrical Power feature via Emma's Control Circuit to Emma's auxiliary outlet, so too would electrical power be withheld and delivered to the combined AC / USB port outlet of Quezada. So long as a power circuit is connected to the device, such as Emma's power control circuit, Quezada's system will work as intended to supply AC power to an auxiliary port and DC power to a USB port. *Id.* In other words, Quezada's system functions as expected when receiving power regardless of its location, whether it is a wall mounted electrical box or a microwave mounted outlet, as taught by Emma.

Id. A POSITA would have also understood that a microwave is a commercially sold appliance, and it would be desirable to not only have auxiliary outlets to power small devices as taught by Emma, but also USB ports for charging as taught by Quezada, particularly when USB charging had become widespread at the time of the invention. *Id.*

Moreover, all the claimed elements were known in the prior art, and a POSITA would have combined the elements as disclosed by known methods for the purposes of providing Quezada's USB port charging system to Emma's microwave. *Id.* Such a combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *Id.* Any inclusion of Quezada's USB port system into Emma would result in such elements merely performing the same function as they do separately, i.e., converting AC to DC for USB port charging. *Id.* A POSITA would have recognized that the results of said combination were predictable because while Quezada teaches the USB port system on a wall mount, its location is irrelevant to its function. So long as the system receives power, it will function as intended, i.e., charge small electronic devices. *Id.*

Lastly, a POSITA would have found the asserted combinations "obvious to try." As explained above in Section VI.C.2.d, at the time of the invention USB ports had become prolific for charging small electronic devices. *Id.* A POSITA

would have known this at the time of the invention and would have tried Quezada's system on Emma's microwave because it is a desirable way to charge small devices, given the smaller size of USB ports and USB cables provided by distributors of small electronic devices. *Id.*

D. Objective Indicia of Nonobviousness do not weigh in favor of Patentability

Petitioner is currently unaware of any objective indicia that could overcome the strong showing of obviousness set forth above. Should Patent Owner identify any objective indicia, Petitioner requests an opportunity to rebut any such evidence. *Amneal Pharms. v. Supernus Pharms.*, IPR2013-00368, Paper 8, at 12-13 (PTAB Dec. 17, 2013).

E. All of the Claims are Indefinite

a. *Ground 9: All of the Claims are Indefinite (“operative connection with the cooking area”)*

Ground 9 is that claims 1-24 are invalid as being indefinite. “[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” Nautilus, Inc. v. Biosig Instruments, Inc., 572 U.S. 898, 901 (2014); 35 U.S.C. §112, ¶2. Independent Claims 1, 15 and 22 recite “a smoke sensor...in operative connection with the cooking area...” Ex. 1001 '746 patent. Those claims are indefinite because a POSITA cannot determine with reasonable certainty the scope of those claim

limitations. Ex. 1023 ¶[264].

Specifically, the claim language does not provide any indication of what it means for a smoke sensor to be in “operative connection” with an area. *Id.*, ¶[265]. It is unclear 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. *Id.* While the specification shows circuit diagrams having hardware and logic in operative electrical or operative logical connection, it does not provide any guidance on the meaning of the term “operative connection with the cooking area.” *Id.* Furthermore, while the specification provides certain specific examples of a safety sensor being positioned, e.g., “in the microwave cavity 332 adjacent air exhaust vents 338, 340 of the microwave, which comprises an air passage that connects an area where food is cooked in the microwave oven to the air outside the housing of the microwave oven.” Ex. 1001 at 16:27-30. But the claims are not so limited – a POSITA would have to guess as to what “operative connection” means in the context of the claims as written. Ex. 1023 ¶[265]. Lastly, because the term is indefinite, Petitioner has no basis for determining whether it is enabled or not.

- b. ***Ground 10: Claim 10 is Indefinite, and/or Lacks Written Description, and/or Lacks Enablement (“sensing the level of smoke continuously for a predetermined time”)***

Ground 10 is that dependent claim 10 is invalid for lacking written description, and/or lacking enablement, and/or being indefinite. *Id.*, ¶[266]. Claim 10 recites “wherein the at least one power control circuit is operative to cause cooking power to the magnetron to be withdrawn to end the cooking session responsive at least in part to *sensing the level of smoke continuously* for a predetermined time. Ex. 1001 Claim 10 (emphasis added). That claim language is indefinite because a POSITA is not able to determine what “sensing the level of smoke continuously” means based on the claim language and specification. *Id.*, ¶[267]. While the specification references “continuously” once in the context of monitoring power draw, there is no discussion regarding what “continuously” means with respect to monitoring that power draw, let alone with respect to sensing the level of smoke. *Id.*; Ex. 1001 at 23:14. For example, does “sensing the level of smoke continuously” require the control circuit to sense the level of smoke uninterrupted without any process devoted to any other action? Ex. 1023 ¶[267]. How often does the control circuit need to sense smoke in order for it to be “continuously?” Does it require the level of smoke sensed to not change for some period of time or is it that the act of sensing of smoke must be continuous? *Id.* A POSITA would have to guess as to what “sensing the level of smoke continuously for a predetermined time” means in the context of the claims as written and would not have been able to determine the metes and bounds of the claim. *Id.* Further, as

noted above, the specification does not describe “sensing the level of smoke continuously for a predetermined time” or what is required to be continuous. *Id.* Accordingly, the specification lacks a written description with respect to this term. *Id.* And the specification does not enable a POSITA to make or use a control circuit to “[sense] the level of smoke continuously” as claimed. *Id.*

c. ***Ground 11: Claim 14 Lacks a Written Description and/or is Indefinite (“preset minimum period after the magnetron becomes inoperative”)***

Ground 11 is that dependent claim 14 is invalid for lacking written description, and/or being indefinite. Claim 14 recites “wherein the at least one power control circuit is operative to cause electrical power to be unavailable to the at least one electrical connector while the magnetron is operative and for at least a ***preset minimum period after the magnetron becomes inoperative.***” Ex. 1001 Claim 14 (emphasis added). While the specification describes a time delay feature based on when the compressor is shut down, for example 3 minutes, to “prevent rapid restart of the compressor that may otherwise result in damages,” *Id.*, ¶[268]. Nowhere in the specification does it discuss causing electrical power to be unavailable to the at least one electrical connector (e.g., the refrigerator), for a preset minimum period after the magnetron becomes inoperative, that is after cooking / cooking power ceases. *Id.* Accordingly, the specification lacks a written description of the claim terms. *Id.* Further, the specification does not discuss

what a “preset minimum period” is with respect to the magnetron becoming inoperative; there is no discussion of what minimum is required or how a POSITA would understand the metes and bounds of such preset minimum period. *Id.* Therefore, that term is also indefinite. *Id.*

VII. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests that trial be instituted and that all Challenged Claims of the '746 Patent be cancelled.

Dated: October 9, 2023

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

I hereby certify that the foregoing Petition complies with the type-volume limitation of 37 C.F.R. §42.24(a)(1)(ii) and contains 14,861 words based on the word count indicated by the word processing system used to prepare this Petition, excluding those portions exempted by §42.24(a)(1). I also certify that the foregoing Petition complies with the general format requirements of 37 C.F.R. §42.6(c) and has been prepared using Microsoft® Word in 14-point, Times New Roman font.

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CERTIFICATE OF SERVICE

I hereby certify that on this 9th day of October 2023, a copy of this Petition for Post Grant Review and Petitioner's Exhibits 1000–1023 were served by Federal Express on the following correspondence address of record for patent owner, pursuant to 37 C.F.R. §42.205(a):

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Courtesy copies of these documents were also sent via electronic mail to Patent Owner's litigation counsel listed below:

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Petition Appendix A

Listing of Challenged Claims for U.S. Patent No. 11,674,746⁷

Descriptor Claim	“Microwave Oven”	“Control Circuit”	“Withhold and Deliver Electrical Power”	“Smoke Sensor”	“Shutdown Function”	“Reset Enable Function”	“USB Port”	“Refrigerator”
Claim 1: Apparatus Comprising	a microwave oven, wherein the microwave oven includes a magnetron, wherein the magnetron is configured to cook items in a cooking area within the microwave oven, at least one externally accessible electrical connector	a power cord, wherein the power cord is configured to be releasably connected to a source of electrical power, ... wherein each electrical connector is configured to deliver electrical power that is received through the power cord through the respective electrical connector to a respective electrically powered device that is outside of the microwave oven, at least one power control circuit, wherein the at least one power control circuit is in operative electrical connection with each of the power cord, the at least one electrical connector, the magnetron, and the smoke sensor,		a smoke sensor, wherein the smoke sensor is positioned in operative connection with the cooking area,	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 to end a current cooking session prior to a set end time of the current cooking session,	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 2: The apparatus			wherein the at least one power control circuit is					

⁷ Certain claim elements of the claims have been reordered in this chart to align like claim elements with the same descriptors.

Descriptor Claim	“Microwave Oven”	“Control Circuit”	“Withhold and Deliver Electrical Power”	“Smoke Sensor”	“Shutdown Function”	“Reset Enable Function”	“USB Port”	“Refrigerator”
according to claim 1			operative to cause electrical power to be unavailable to the at least one electrical connector during at least a portion of the time that the magnetron is operative.					
<u>Claim 3:</u> The apparatus according to claim 1	wherein the at least one electrical connector comprises an electric outlet configured to releasably receive a plug in electrical connection therewith,		wherein the at least one power control circuit is operative to cause electrical power to be unavailable to the electric outlet during at least a portion of the time that the magnetron is operative.					
<u>Claim 4: The apparatus according to claim 1</u>			wherein the at least one power control circuit is operative to cause electrical power to be unavailable to the USB port during at least a portion of the time that the magnetron is operative.				wherein the at least one electrical connector includes a USB port,	
<u>Claim 5 (See below)</u>								
<u>Claim 6:</u> The apparatus according to claim 1	wherein the at least one electrical connector comprises an electric outlet configured to releasably receive a plug of a refrigerator in electrical connection therewith,		wherein the at least one power control circuit is operative to cause electrical power to be unavailable to the electric outlet during at least a portion of the time that the magnetron is operative.					
<u>Claim 7:</u> The apparatus according to claim 1		wherein the power cord comprises a single power cord					wherein the at least one electrical connector includes an electric outlet, and a USB port.	

Descriptor Claim	“Microwave Oven”	“Control Circuit”	“Withhold and Deliver Electrical Power”	“Smoke Sensor”	“Shutdown Function”	“Reset Enable Function”	“USB Port”	“Refrigerator”
Claim 8: The apparatus according to claim 1	wherein the at least one electrical connector includes at least one of an electric outlet, [and a USB port],	wherein the power cord comprises a single power cord,	wherein the at least one power control circuit is operative to cause electrical power to be unavailable to at least one of the electric outlet and the USB port during at least a portion of the time that the magnetron is operative.				[wherein the at least one electrical connector includes] at least one of an electric outlet, [and a USB port,	
Claim 9: The apparatus according to claim 1			wherein the at least one power control circuit is operative to cause electrical power to be unavailable to the at least one electrical connector during at least a portion of the time that the magnetron is operative, and for a predetermined time period after electrical power becomes unavailable to the at least one electrical connector.					
Claim 10: The apparatus according to claim 1					wherein the at least one power control circuit is operative to cause cooking power to the magnetron to be withdrawn to end the cooking session responsive at least in part to sensing the level of smoke continuously for a predetermined time.			
Claim 11: The apparatus according to claim 1	wherein the microwave oven includes a front side and a back side, wherein the front side includes a control panel, an opening and a movable door, wherein in an open position of the door, the cooking area is	wherein the power cord comprises a single power cord,						

Descriptor Claim	“Microwave Oven”	“Control Circuit”	“Withhold and Deliver Electrical Power”	“Smoke Sensor”	“Shutdown Function”	“Reset Enable Function”	“USB Port”	“Refrigerator”
	accessible from outside the microwave oven, . . . wherein the at least one electrical connector includes an electric outlet on the back side.							
Claim 12: The apparatus according to claim 1	wherein the microwave oven includes a front side and a back side, wherein the front side includes a control panel, an opening and a movable door, wherein in an open position of the door the cooking area is accessible from outside the microwave oven, . . . wherein the at least one electrical connector includes an electric outlet on the back side,	wherein the power cord comprises a single power cord,	wherein the at least one power control circuit is operative to cause electrical power to be unavailable to at least one of the electric outlet and the USB port during at least a portion of the time that the magnetron is operative.				and a USB port on the front side, wherein the at least one	
Claim 13: The apparatus according to claim 1 and further comprising:			wherein the at least one power control circuit is operative to cause electrical power to be unavailable to the refrigerator during at least a portion of the time that the magnetron is operative.					a refrigerator, wherein the refrigerator is electrically connected to the at least one externally accessible electrical connector,
Claim 14: The apparatus according to claim 1			wherein the at least one power control circuit is operative to cause electrical power to be unavailable to the at least one electrical connector while the magnetron is operative and for at least a preset minimum period after the magnetron becomes inoperative.					
Claim 15: Apparatus comprising:	a microwave oven, wherein the microwave oven includes	wherein each electrical connector is configured		at least one smoke sensor, wherein the smoke sensor is	wherein responsive at least in part to a level of smoke	wherein after the cooking session has been caused to end		

Descriptor Claim	“Microwave Oven”	“Control Circuit”	“Withhold and Deliver Electrical Power”	“Smoke Sensor”	“Shutdown Function”	“Reset Enable Function”	“USB Port”	“Refrigerator”
	a cooking area within the microwave oven, a magnetron, wherein the magnetron is configured to cook items in the cooking area, at least one externally accessible electrical connector,	to deliver electrical power from the microwave oven, at least one power control circuit, wherein the at least one power control circuit is in operative electrical connection with the magnetron, the at least one smoke sensor, and the at least one electrical connector,		positioned in operative connection with the cooking area,	sensed by the at least one smoke sensor during a cooking session, the at least one power control circuit is operative to cause power to the magnetron to be withdrawn to end the cooking session prior to a 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 power to commence a next subsequent cooking session.		
Claim 16: The apparatus according to claim 15			wherein the at least one power control circuit is operative to cause power to be unavailable from the at least one electrical connector when cooking power is delivered to the magnetron.					
Claim 17: The apparatus according to claim 15	wherein the at least one electrical connector comprises an electric outlet configured to deliver household current and to releasably receive a plug in electrical connection therewith.							
Claim 18: The apparatus according to claim 15							wherein the at least one electrical connector comprises a USB port.	
Claim 19: The apparatus according to claim 15	wherein the at least one electrical connector comprises an electric outlet configured to deliver household current,		wherein the at least one power control circuit is operative to cause electrical power to not be deliverable from each of the electric outlet and the USB port when cooking power is				and a USB port,	

Descriptor Claim	“Microwave Oven”	“Control Circuit”	“Withhold and Deliver Electrical Power”	“Smoke Sensor”	“Shutdown Function”	“Reset Enable Function”	“USB Port”	“Refrigerator”
			delivered to the magnetron.					
Claim 20: The apparatus according to claim 15								and further comprising: at least one of a refrigerator, [and a safe,] wherein the at least one of the refrigerator [and the safe] is in operative electrical connection with the at least one power control circuit
Claim 21: The apparatus according to claim 15	wherein the electrical connector includes an electric outlet . . . ,		wherein the at least one power control circuit is operative to cause electrical power to be unavailable from the electric outlet while cooking power is delivered to the magnetron and for a period of time thereafter.					configured to receive a plug that is in electrical connection with a refrigerator
Claim 22: Apparatus comprising:	a microwave oven, wherein the microwave oven includes a cooking area within the microwave oven, a magnetron, wherein the magnetron is configured to cook items positioned in the cooking area,	at least one power control circuit, wherein the at least one power control circuit is in operative connection with each of the magnetron and the at least one smoke sensor,		at least one smoke sensor, wherein the at least one smoke sensor is positioned in operative connection with the cooking area,	wherein the at least one power control circuit is operative to cause responsive at least in part to a level of smoke sensed by the at least one smoke sensor, cooking power being currently delivered to the magnetron to be withdrawn whereby a current cooking session is ended	wherein the at least one power control circuit is operative to cause . . .after the current cooking session has been caused to end prior to the set end time based on the sensed level of smoke, cooking power to be delivered to the magnetron to commence a next subsequent cooking		

Descriptor Claim	“Microwave Oven”	“Control Circuit”	“Withhold and Deliver Electrical Power”	“Smoke Sensor”	“Shutdown Function”	“Reset Enable Function”	“USB Port”	“Refrigerator”
					prior to a set end time, and	session.		
Claim 23: The apparatus according to claim 22	wherein the microwave oven further comprises at least one externally accessible electrical connector,	. . . wherein each electrical connector is configured to deliver electrical power from the microwave oven through the respective electrical connector, wherein the at least one electrical connector is in operative connection with the at least one power control circuit,	wherein the at least one power control circuit is operative to cause electrical power to be unavailable from the at least one electrical connector when cooking power is being delivered to the magnetron.					
Claim 24: The apparatus according to claim 22	at least one externally accessible electrical outlet,	wherein the electrical outlet is in operative connection with the at least one power control circuit,	wherein the at least one power control circuit is operative to cause electrical power to be unavailable from the electrical outlet when cooking power is being delivered to the magnetron and for a period of time after cooking power is no longer delivered to the magnetron.					

Descriptor Claim	"Sensor"
Claim 5: The apparatus according to claim 15,	wherein 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.