
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Anthony Inc.
Petitioner
v.

ControlTec, LLC
Patent Owner

Patent No. 7,421,847
Issue Date: September 9, 2008

Title: REFRIGERATION UNIT CONDENSATION PREVENTION

Inter Partes Review No. IPR2025-00636

Patent Owner Response

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PATENT OWNER'S EXHIBIT LIST

EX.2001	Anthony corporate history webpage, https://www.anthonyintl.com/Aboutus/History.aspx
EX.2002	U.S. Patent No. 4,261,179 to Dageford
EX.2003	U.S. Patent No. 5,778,147 to Kim
EX.2004	Declaration of John “Weeb” Bunch under 37 C.F.R. § 1.68
EX.2005	Photographs of ControlTec LLC’s AS-20 Anti-Sweat Controller case
EX.2006	Maintenance fee report for U.S. 7,207,847
EX.2007	WIPO(PCT) Application No. WO2006093751A2 to Murry
EX.2008	International Search Report for Application No. WO2006093751A2
EX.2009	Written Opinion of the International Searching Authority for Application No. WO2006093751A2
EX.2010	Information Disclosure Statement filed in U.S. Patent Application No. 12/337,981 on March 17, 2009.
EX.2011	Patent Assignment, Reel 023084, Frame 0117 (assigning U.S. Patent Application No. 12/337,981 to Anthony International).
EX.2012	Patent Assignment, Reel 027144, Frame 0103 (confirming Anthony International as a DBA of Anthony, Inc. and that U.S. Patent Application No. 12/337,981 was assigned to Anthony Inc.)
EX.2013	Declaration of Charles M. Jones
EX.2014 (NEW)	Declaration of Michael Pollock
EX.2015 (NEW)	Anthony Complete Infinity 60 Series Installation Manual - https://www.anthonyintl.com/docs/default-source/2022-documents/99-25726-i001-rev-a-_infinity-60-series-complete-installation-manual.pdf
EX.2016 (NEW)	https://www.anthonyintl.com/Solutions/door-selection-guide

EX.2017 (NEW)	https://www.anthonyintl.com/docs/default-source/2025-documents/why-anthony-tri-fold-flyer.pdf
EX.2018 (NEW)	https://www.anthonyintl.com/AboutUs/History.aspx
EX.2019 (NEW)	Transcript of Deposition of Dr. Gregor P. Henze (Dec. 11, 2025)
EX.2020 (NEW)	ASHRAE Psychrometric Chart #1, copyright 1992
EX.2021 (NEW)	U.S. Department of Energy Office of Scientific and Technical Information, Investigation of Energy-Efficient Supermarket Display Cases, Dec. 2004, available at https://doi.org/10.2172/885840.
EX.2022 (NEW)	U.S. Department of Energy, Guide for the Retrofitting of Open Refrigerated Display Cases with Doors, Nov. 2012, available at https://www1.eere.energy.gov/buildings/commercial/pdfs/cbea_open_case_retrofit_guide.pdf
EX.2023 (NEW)	https://www.anthonyintl.com/docs/default-source/service-support-documents/in-0051-energy-controller-installation-instruction-all-model-frames4085b55740c861768229ff0000ead2ac.pdf?sfvrsn=874dd48d_2
EX.2024 (NEW)	Curriculum vitae of Michael Pollock
EX.2025 (NEW)	Settlement Agreement from <i>Energex Enterprises, Inc. v. Anthony Doors, Inc. d/b/a Anthony International, Anthony Doors, Anthony, Inc. a/k/a Anthony Manufacturing Co., Inc.</i>, Case No. 02-K-397.
EX.2026 (NEW)	Co-Development Agreement
EX.2027 (NEW)	Department of Energy- Notice of Non-Compliance Determination
EX.2028 (NEW)	Anthony Energy Controller (60-22715-0002) Installation Instructions
EX.2029 (NEW)	Energy & Store Development Conference PowerPoint

EX.2030 (NEW)	KW Engineering- Product Testing Anti-Sweat Heater Control
EX.2031 (NEW)	Anthony Letter to ControlTec
EX.2032 (NEW)	Complaint, Civil Action No. 06-cv-00295-MSK
EX.2033 (NEW)	Joint Stipulation to Dismiss with Prejudice
EX.2034 (NEW)	Paul Artwohl email to Brad Geuke- 8/30/2004
EX.2035 (NEW)	Hill Phoenix Patent, US. Patent 11160393
EX.2036 (NEW)	Anthony Patent, US. Patent 8250873 (Artwohl inventor)
EX.2037 (NEW)	Declaration of Michael Pollock

I. Introduction

Patent Owner ControlTec invented a novel way of monitoring and preventing condensation *on refrigerated display cases in retail stores*. This technique—called an anti-sweat system—prevents condensation from forming by activating frame/door heaters before the dew point temperature is reached and then cycling them off at a predetermined set point above dew point, thus conserving energy and providing retail stores significant savings. Praised by operators and copied by competitors including Petitioner, who later filed a patent essentially covering the same subject matter, ControlTec’s novel anti-sweat system is protected by U.S. Patent No. 7,421,847 (“the ’847 Patent”).

One competitor, Petitioner Anthony, Inc., seeks to invalidate the ’847 Patent, but does so with conventional, non-analogous prior art systems that lack the novel anti-sweat system. The Petition lacks particularity, has disclosure gaps, and makes unsupportable obviousness assertions. For example, the Petition has the following fatal deficiencies:

1. The Petition fails to address the “refrigerated display case” and “array of refrigerated display cases” limitations set forth in the preambles of Claims 1, 8 and 14.
2. U.S. Patent No. 7,137,262 (“Carter”)—which the Petition relies on for each ground—fails to disclose: (i) a system that is activated and

deactivated “in anticipation of condensation” (Carter describes shutting off at ambient temperature, which is not “in anticipation of condensation”); (ii) a “dew point sensing unit” that is specifically mounted on a display case (Carter lacks a “display case” and the “sensing unit” of U.S. Patent No. 6,422,062 (“King”) is an automotive sensor and not mounted on a display case); and (iii) monitoring “ambient air temperature and relative humidity outside the display case”.

3. Petitioner’s proffered expert, Dr. Henze, is not a POSITA—he has never worked on or with refrigerated display cases and his testimony is entitled to no weight.

In short, the Petition fails to show that any claim is unpatentable.

ControlTec respectfully requests that the Board uphold the patentability of the challenged claims.

II. Technical Background

A. Refrigerated display cases in retail stores and energy conservation.

Refrigerated merchandising moved from ice boxes to mechanical systems in the early-to-mid 20th century. By the 1970s, supermarkets widely adopted open, multi-deck ‘air-curtain’ cases to maximize product visibility and access. These open vertical cases provided strong merchandising, but the open design was

massively inefficient as it did little to contain cold air or to keep out warmer ambient air. In the industry, this problem was referred to as a high infiltration load. Keeping products cold required a near-continuous supply of cold air, which drove large refrigeration and defrost energy use. Store comfort also suffered due to cold air spilling out into the aisles and other customer spaces.

Following the energy shocks in the 1970s, retailers and manufacturers began making incremental efficiency improvements, including: (1) reduced infiltration and heat gain through better case insulation and tighter construction; (2) night curtains on open cases to reduce off-hours electricity consumption; and (3) more systematic defrost control. Technical research through the 1990s quantified case heat loads and highlighted that open, multi-deck cases' infiltration dominated medium-temperature loads, underscoring the energy advantage of doors over open fronts.¹ In the early 2000s, the Department of Energy (DOE) and U.S. industry developed best-practice guidance for retrofitting open cases with glass doors, showing 50–80% load reductions on those lines when paired with system reconfiguration (e.g., compressor staging, defrost reduction, raised evaporating temperatures).² One significant downside to putting glass doors on refrigerated

¹ See EX.2021, P.1.

² See EX.2022, P.4.

display cases, however, was that water vapor in the ambient air would condense on the cold surface of the glass. This “sweat” effect would begin occurring naturally whenever the glass temperature fell to or below the dew point. The condensation on the glass would then obscure the products for sale and defeat the *display* purpose of the refrigerated display case. Early solutions to the sweating problem involved adding heating elements to the glass or to the doorframe carrying the glass. Heating the glass to prevent condensation, however, increased energy consumption both directly (to run the heating elements) and indirectly (to remove the added heat from the case interior).

B. ControlTec’s Innovation, the ’847 Patent and Continued DOE Regulation.

In 2005, ControlTec believed that further efficiencies remained possible. To meet the need for even greater energy conservation in retail display cases, ControlTec developed its novel anti-sweat system and began deploying it at scale across U.S. supermarkets. ControlTec’s novel anti-sweat system addressed one of the largest avoidable loads in doored display cases: unnecessary heater runtime and the secondary refrigeration penalty caused by that heat. The system’s core innovation is a dedicated dew point sensing and case-specific control architecture that anticipates condensation and energizes heaters only when and where needed, replacing the legacy “always on” or coarse, store-level pulse approaches that compromised energy performance and visual clarity.

The claims of the '847 Patent embody ControlTec's anti-sweat system. At the device level, the anti-sweat system relates to frame and/or door heating to remediate condensation build-up in refrigerated display cases EX.1001, 1:22-24, by activating frame/door heaters before the dew point temperature at frame and door surfaces is reached EX.1001, 3:25-29, which prevents the formation of condensation. The system then cycles off at a set point above dew point. EX.1001, 2:26-27. The apparatus achieves this functionality by thermally isolating temperature sensors and constantly updating data. EX.1001, 2:29-31. The system activates when frame/door temperature drops below a first preselected setpoint above a dew point value and deactivates when it rises above a second preselected set point above said dew point value. EX.1001, 2:51-55.

ControlTec's anti-sweat system cycles anti-sweat heat only to the extent necessary to keep the glass and frame a few degrees above dew point. EX.1001, 2:20-37. Because it does not need to overheat frames to cover the worst-case conditions elsewhere in the store, the system avoids both wasted heater energy and excess refrigeration capacity needed to remove that added heat from the case interior. *Id.* This granular modulation is especially valuable in medium-temperature applications where modern glass and warmer setpoints often mean little or no heater power is needed for long stretches of the year. ControlTec's novel

innovations provide a substantial improvement over prior systems and provide retailers with substantial cost savings.

Beginning in 2017, the DOE required enhanced anti-sweat heater controls, requiring that “the antisweat heat controls shall reduce the energy use of the antisweat heater in a quantity corresponding to the relative humidity.” *See* 10 C.F.R. § 431.306. In practice, “enhanced anti-sweat control” refers to humidity/temperature sensing control that prevents condensation while minimizing heater energy and the secondary refrigeration penalty from heater heat. *Id.* Functionally, the 2017 standards and accompanying test procedures drove manufacturers to incorporate:

- Sensing/control functionality that turns anti-sweat heat off or modulates output at lower humidity/temperature; and
- Updates to door/frame designs and glazing that reduce the need for heater power altogether in many medium-temperature applications.

These 2017 DOE standards drove many manufactures, like Petitioner, to alter their anti-sweat controllers in a manner that utilizes ControlTec’s innovations embodied by the claims of the ’847 Patent.

III. Claim Construction and § 112(f)

For purposes of this proceeding, only a few claim terms require construction.

A. The preambles are limiting.

The preambles of the '847 Patent independent claims are limiting because they supply essential structure, provide antecedent basis for terms in the bodies of the claims, and define the very context that gives life and patentable distinction to the claims. Whether a preamble is limiting is determined “on review of the entire patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim,” and a preamble is limiting where it “recites essential structure or steps” or is “necessary to give life, meaning, and vitality” to the claim. *Shoes by Firebug LLC v. Stride Rite Children’s Grp.*, 962 F.3d 1362, 1367 (Fed. Cir. 2020) (internal quotations omitted). Both bases apply here.

The independent claims’ preambles define positive, structural limitations that provide antecedent basis for later terms. This supports construing the preambles as limiting. *Shoes by Firebug*, 962 F.3d at 1367.

The terms “a refrigerated display case” (Claims 1 and 8) and “a plurality of refrigerated display cases” (Claim 14) appear in the preamble. These preamble terms provide antecedent basis for later claim elements:

- Claims 1: “...the display case ...”;
- Claim 8: “...the display case...”
- Claim 14: “...the display cases...”

EX.1001, 9:26-33, 10:6, 10:33-35.

In addition to providing antecedent basis, the preambles also give life, meaning, and vitality to the claims. For example, the '847 Patent is titled “**Refrigeration unit** condensation prevention.” EX.1001, code (54). The Abstract describes the claimed invention as “Apparatus, systems, and methods are disclosed for efficient elimination of door and frame condensation at widely utilized commercial **freezer/refrigeration display cases**.” EX.1001, code (57). Every embodiment of the '847 Patent relates to freezer and/or refrigerated display cases. Therefore, the preamble of Claims 1, 8, and 14, should be construed as limiting. *See In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1347–48 (Fed. Cir. 2002); *Poly-America, L.P. v. GSE Lining Tech., Inc.*, 383 F.3d 1303, 1310–11 (Fed. Cir. 2004).

Accordingly, Patent Owner respectfully requests that the Board construe the preambles of Claims 1, 8, and 14—and specifically the terms “refrigerated display case” and “plurality of refrigerated display cases”—as limiting.

IV. POSITA

A. Definition of a POSITA

A POSITA would have a bachelor’s degree in mechanical engineering, electrical engineering, or a related field, and at least two years’ professional experience working with refrigerated display cases. EX.2037, ¶10. The reason for this is multifold. First, the Field of Invention of the '847 Patent is “remediat[ing]

condensation build up *in refrigerated display cases.*” EX.1001, 1:14-16 (emphasis added). Thermal characteristics of refrigerated display cases present unique challenges compared to ordinary refrigerators, due to the frame and glass combination used. EX. 2037, ¶10. Additionally, experience working on supermarket display cases affords an appreciation that condensation control requires careful coordination of sensors, packaging, airflow, and control hysteresis, and that small differences in sensor placement, thermal isolation, and algorithm design materially affect performance, energy use, and reliability. *Id.* Therefore, a POSITA would have experience working with refrigerated display cases. *Id.*

Second, the '847 Patent is specifically directed to refrigerated display cases. The Summary of the Invention begins with the statement “[t]he purpose of the apparatus, systems and methods of this invention is to efficiently eliminate door and frame condensation at widely utilized commercial *freezer/refrigeration display cases.*” EX.1001, 2:20-23. Most paragraphs of the Summary of the Invention start with a sentence specifically referencing *refrigerated display cases* and/or the features thereof. *See, e.g.,* EX.1001, 2:20-23, 2:38-41, 2:46-52, 2:61-63, 3:3-5, 3:15-17, 3:19-23, 3:25-31, 3:32-35, 3:40-45, 3:63-66, 4:22-26. The Detailed Description describes the invention as being “in association with a common commercial freezer/cooler display unit 21 including a *display container* 23 having a frame (not shown in this FIGURE) and doors 25 in frame 27 (hereinafter,

refrigeration case(s).” EX.1001, 5:17-20. Every embodiment in the specification refers to freezers/coolers that are also a display case.

Third, every claim specifically recites refrigerated display cases. Claim 1 recites a “condensation control at a refrigerated display case,” and forms the antecedent for claims 2-7. EX.1001, 9:26:27. Claim 8 recites a “a refrigerated display case,” and forms the antecedent for claims 9-13. EX.1001, 10:1-2. Claim 14 recites “a plurality of refrigerated display cases,” and forms the antecedent for claims 15-20. EX.1001, 10:28-30. All the claims require a refrigerated display case and many claims recite specific features of such cases and how the invention is tailored to them.

Additionally, Petitioner acknowledges that refrigerated display cases are a specific field of endeavor. Petitioner’s marketing materials tout its history working specifically with specialty glass doors and display equipment. EX.2017, 5 (“you’re not just buying doors”). Petitioner pins its over-fifty years of commercial success on its specialized focus: “Anthony’s quality products and excellent after-sale service are what later established it as a prominent manufacturer of *glass doors and display equipment.*” EX.2018 (emphasis added). The field of refrigerated display cases is a specific field of endeavor, and a POSITA needs expertise in that specific area.

The Board’s analysis in *Axonics Modulation Techs., Inc. v. Medtronic, Inc.*, IPR2020-00715 (PTAB Sept. 13, 2021) is instructive. There, the Board found that experience in the specific field of “sacral neuromodulation” was needed because the patent defined the field of the invention as medical electrical leads for sacral neuromodulation, not implantable medical devices more generally. *Id.* at 14. Here, both the specification and the field of invention are specific to “refrigerated display cases.” The inventive concepts are described in relation to refrigerated display cases, including the specific structures of housings and sensors. Moreover, the ’847 Patent goes beyond *Axonics*—the claims recite the context of refrigerated display cases including specific adaptations therefor, making it clear that a POSITA needs experience with refrigerated display cases.

As indicated by Mr. Pollock, Patent Owner’s expert, “[a] POSITA would appreciate that systems must be properly adapted to such cases. Petitioner has built a business on these specialized refrigerated display cases and the need to adapt systems specifically for them.” EX.2037, ¶18. Simply stated, a POSITA here would have a bachelor’s degree in mechanical or electrical engineering or a related field and at least two years working with refrigerated display cases. Dr. Henze lacks these qualifications.

B. Dr. Henze is not a POSITA.

Dr. Henze is not a POSITA for the '847 Patent. He does not have any experience working with refrigerated display cases. EX.2019, 163:10–167:14. Consequently, his testimony directed to what a POSITA would have known or found to be obvious is entitled to no weight.

To testify as an expert, a witness must at least meet the definition of a POSITA for the patent-in-suit. *Kyocera Senco Indus. Tools Inc. v. Int'l Trade Comm'n*, 22 F.4th 1369, 1377 (Fed. Cir. 2022).

Condensation control, specifically as applied to refrigerated display cases, is a critical aspect of the inventions claimed in the '847 Patent. Dr. Henze has no experience with refrigerated display cases:

Q: Have you ever designed such a device for use on refrigerated display cases?

A: I have not.

Q: Have you ever designed a refrigerated display case?

A: I have not.

Q: Have you ever designed the doors or frame units of a refrigerated display case?

A: I have not.

Q: Have you ever worked on refrigerated display cases?

A: No, I have not.

Q: Have you ever written -- you disclosed, sir -- and you're welcome to turn to the back of your declarations. They are the

same. Your CV, incredibly impressive. . . . You list dozens and dozens and dozens of papers there that you've written or coauthored?

A: Yes.

Q: Have you ever written, alone or with others, any paper that ever touched on refrigerated display cases?

A: No, I have not.

Q: Have you ever written, alone or with others, any paper of any kind that discuss control of condensation in refrigerated display cases?

A: In the HVAC&R field generally, yes, condensation control in buildings, in rating cooling systems, yes. In the context of refrigerated display cases, no.

Q: Have you ever, alone or with others, written any paper of any kind that discusses control of condensation in refrigerated cases of the kind disclosed in Carter?

A: No, I have not.

Q: Have you ever obtained any grants for work on refrigerated cases or refrigerated display cases of the kinds disclosed in Carter, the '181, and/or the '847?

A: I have not.

Q: Have you ever supervised a student in university of any kind that worked on refrigerated cases or refrigerated display cases?

A: I have not.

Q: Sure. Did you work on the design of refrigerated cases?

A: I think we've established that the answer is no.

Q: Ever; right?

A: Mm-hmm; correct.

EX.2019, 163:10–167:14 (with portions omitted).

The impact of Dr. Henze’s lack of knowledge of refrigerated display cases is consequential. Dr. Henze was unable to identify where specific characteristics in the pointed to prior art of Carter or King, where what the Petition claims is the temperature sensing unit has been adapted to refrigerated display cases or specific adaptation to refrigerated display cases in the Petition. EX.2037, ¶13. Dr. Henze also misinterprets or does not understand the use of the term “frame” in the context of refrigerated display cases. EX. 2037, ¶13-18.

These facts lead to three conclusions. First, Dr. Henze is not a POSITA because he has no experience with refrigerated display cases. Under *Kyocera*, Dr. Henze’s testimony is entitled to no weight. Second, to the extent the Board considers Dr. Henze’s testimony at all, the Board should greatly discount the weight of Dr. Henze’s testimony due to his failure to understand the specifics of the ’847 Patent invention, especially as it relates to the detailed features of refrigerated display cases. *See Centricut, LLC v. Esab Grp., Inc.*, 390 F.3d 1361, 1368–70 (Fed. Cir. 2004) (court may exclude or discount opinions from alleged expert lacking knowledge of the technology at issue). Third, because of Dr.

Henze's lack of knowledge, the Petition fails to address specific claim elements relating to refrigerated display cases.

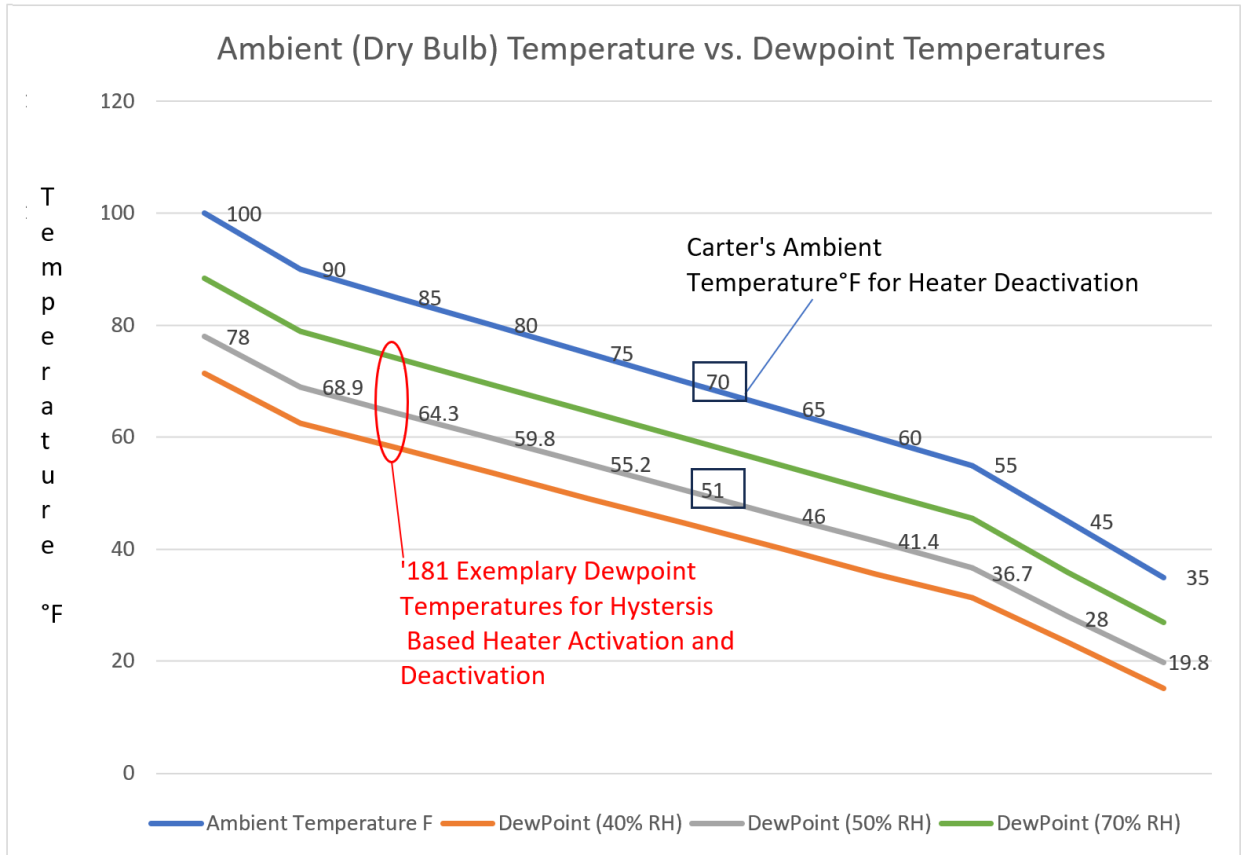
V. Failings of the Petition

A. Carter lacks the claimed control logic.

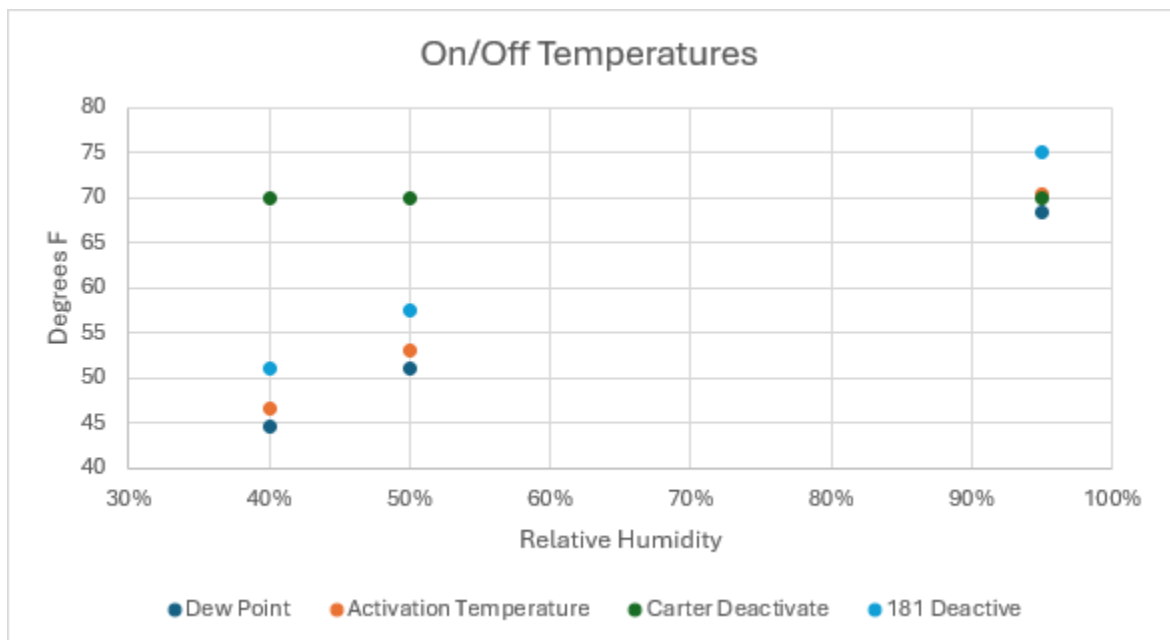
Carter's heater control scheme does not teach or suggest the '847 Patent's claimed algorithm. Carter triggers heat at dew point + constant but deactivates heat when the ambient and surface temperatures are equal. EX.1004, 5:34-63. Carter makes no use of the dew point reference at shut-off. The '847 Patent, by contrast, uses a single, dew point-referenced hysteresis with distinct, preselected set points for both actuation and termination. EX.2037, ¶34. As Mr. Pollock explains, the Petition's attempt to label Carter's scheme "insubstantial" and "mathematically equivalent" ignores that Carter's mixed criteria removes dew point from the termination decision, introducing a floating, humidity-dependent offset in one direction and a non-dew point termination in the other. EX.2037, ¶34. That is not a trivial implementation choice; it is a different control logic with different stability, energy, and performance consequences.

The differences between Carter and the '847 Patent's controls are illustrated in the two charts below. In the first chart, a band of three dewpoint temperatures illustrate how the dewpoint varies with both the ambient temperature (top blue line) and the relative humidity ("RH") of the air, such as 40%-70% as shown.

EX.2037, ¶38. The second chart shows Carter heating the sealing surface of the refrigerator to the substantially higher ambient room temperature (top green data set of the chart) in comparison to the '847 Patent's hysteresis-based control, which maintains lower dewpoint-based temperatures. The second chart below shows how Carter deactivates late in lower humidity as compared to the '847 Patent and early or only momentarily at high humidity. EX.2037, ¶39. This results in a wasted energy at lower humidity and insufficient warming to prevent condensation at higher humidity. EX.2037, ¶39. In fact, in Carter, at high humidity, the off setpoint is under the on setpoint. EX.2037, ¶39. With setpoints based on the dewpoint, the '847 Patent functions more efficiently by not raising the refrigerated display case to an excessively high temperature. The specification explains the system "efficiently cycles duty time of frame/door heaters thus lowering the installation's energy costs..." and facilitates compliance with DOE regulations that require that "the antisweat heat controls shall reduce the energy use of the antisweat heater in a quantity corresponding to the relative humidity." *See* EX.1001, 2:28-29; 10 C.F.R. § 431.306. In Carter's system, the deactivation does not correspond to the relative humidity.



EX.2037, ¶39; EX.2020 (for dew point data at various humidities and temperatures).



EX.2037, ¶39; EX.2020 (for dew point data at various humidities and temperatures).

In the first chart, the Y-axis provides temperature for ambient air conditions of 70°F, 50% relative humidity, and standard barometric pressure. In these conditions, air has a dewpoint temperature of approximately 50°F. EX.2037, ¶39. Carter would activate its sealing surface heater at approximately 53.5°F (dewpoint + 2°C) until the sealing surface of the refrigerator reaches 70°F, for a temperature gain of over 16°F. EX.2037, ¶39; EX.1004, 5:41-54. Under the same conditions, the '847 Patent targets and maintains the door 5°F above the dewpoint of 50°F, or at 55°F. EX.2037, ¶39. Under this scenario, the frame heater activates at 52°F (as preselected through dewpoint plus 2°F) with deactivation of the frame at 56.5°F (as preselected through dewpoint plus 6.5°F). EX.2037, ¶39. This leads to a gain of 4.5°F for the frame. EX.2037, ¶39. In comparison, Carter's heating of the sealing surface of the refrigerator to ambient temperature leads to significant and unnecessarily warmer conditions along with higher heat transfer to the surrounding environments. EX.2037, ¶39. This increased heater transfer increases the thermal load to the refrigerator space while also consuming the added energy for heating of the sealing surface of the refrigerator to be the same as ambient temperature. EX.2037, ¶39. The '847 Patent saves energy by shutting off at a certain point

above the dew point so that the shutoff is “in anticipation of condensation.”

Shutting off at ambient temperature, like Carter, wastes energy.

Moreover, Carter does not disclose the '847 Patent's data handling features—averaging sensor inputs and using stored dew point tables tied to the local controller. EX.2037, ¶40. Those features serve specific functional roles in suppressing temperature measurement noise and delivering rapid, stable decisions in a packaged case controller which turns the frame heater off and on and relates to reliability and energy efficiency of the system. EX.2037, ¶40. Dismissing them as “simple design choices” obscures their contribution to the functioning of the claimed algorithmic structure. The consequences are practical and material: “control stability, hysteresis width, and insulation from noise are not abstract algebraic choices,” (EX.2037, ¶58) and substituting ambient-based deactivation “has practical effects on cycling, dwell times, and energy use,” particularly in high-traffic conditions. EX.2037, ¶58.

Carter also monitors the “external surface temperature of freezer/refrigeration equipment”—not the temperature of a retail “display case frame.” EX.1004, 1:19-20. In other words, Carter's control logic is structurally and functionally different: it ignores dew point at shut off, lacks the '847 Patent's preselected dew point referenced set points, and targets a substantially higher temperature with attendant energy and load penalties. These are not

“insubstantial” differences. Rather, Carter lacks limitations that the Petition’s conclusory motivation statements cannot supply. And the Petition’s generic statements that a POSITA “would have been motivated to apply Carter’s apparatus” cannot supply these missing claim-specific limitations. *See In re Kahn*, 441 F.3d at 988-89.

B. The Petition does not address or make obvious deactivating the control means in anticipation of the formation of condensation.

The Petition sidesteps a core requirement of Claim 8: that heater control be activated and deactivated responsive to the anticipation of condensation. EX.1001, 10:9-13. The Petition neither identifies, nor reasonably extrapolates from Carter, any control logic that deactivates heat in anticipation of condensation. Instead, the Petition relies on a bright-line “ambient-equals-surface” shutdown that is not keyed to dew point or to any anticipation of condensation, and it attempts to retrofit that shortcoming with speculative, inaccurate assertions about “floating offsets.” Pet., at 15. Accordingly, Petitioner fails to meet its burden to show that Carter discloses or renders obvious the claim’s deactivation requirement.

Claim 8 expressly requires anticipating the formation of condensation at the display case and activating and deactivating the frame/door heater responsive to that anticipation: “to anticipate formation of condensation at the display case and activating and deactivating the frame/door heater responsive thereto.” EX.1001,

10:9-13. The Petition does not identify where Carter teaches or suggests deactivating heat based on anticipated condensation.

The Petition instead relies on Carter’s disclosure that supplemental heat is deactivated when the cabinet surface temperature equals ambient temperature. *See* EX.1004, 5:55-63, Figure 3. However, this brightline deactivation is ***not*** related to the anticipation of the formation of condensation. In fact, in certain scenarios, such as 100% humidity or nearly 100% humidity, the dew point may be approximately equal to the ambient temperature. EX.2037, ¶42. Therefore, if the surface temperature is heated to ambient temperature, condensation may still occur. *Id.* This is especially true where, as disclosed in the ’847 Patent, the “accuracy of frame temperature measurements has been documented by testing to be with 1 or 2 degrees Centigrade.” EX.1001, 6:65-67. A two-degree offset is enough to cause condensation in high humidity circumstances. EX.2037, ¶42. Therefore, Carter’s deactivation is not related to the anticipation of the formation of condensation, and the Petition fails as to this claim term.

The Petition’s contrary framing—that Carter activates heat only when condensation conditions exist and deactivates when condensation is no longer anticipated—confuses what Carter actually does. Carter does not disclose any deactivation keyed to dew point or to an anticipation threshold derived from dew point. EX.2037, ¶42-43. Rather, Carter switches reference variables: it actuates

heat using a dew point–based trigger (e.g., “dew point + 2°C”) but deactivates based on a different condition entirely (“surface = ambient”). EX.2037, ¶42-43. That is not dew point-based hysteresis keyed to condensation risk on both conditions; it is a mixed scheme that abandons the dew point reference on shutdown. This means the activation side embodies a humidity-dependent offset, while the deactivation side does not—undermining the very anticipation the claim requires. EX.2037, ¶42.

Recognizing this mismatch, the Petition resorts to an unsupported mathematical gloss through Dr. Henze, asserting that “surface = ambient” is “mathematically equivalent” to “surface = dew point + floating offset” because ambient is “virtually always” greater than dew point. Pet., 16. That reasoning fails on its own premises. First, as relative humidity approaches saturation, the purported “floating offset” collapses toward zero, which would mean less, not more, safety margin precisely when condensation risk is highest. EX.2037, ¶42. Second, Carter does not teach or suggest employing any “floating offset” above dew point as a deactivation criterion; Dr. Henze’s offset is reverse-engineered and untethered to Carter’s actual control rule. EX.2037, ¶42. Third, Claim 8 requires heater deactivation responsive to anticipating condensation. EX.1001, 10:9-13. A rule that deactivates at “surface = ambient” does not anticipate condensation at all, because ambient provides no assurance of a positive margin above dew point and

can coincide with it in boundary conditions that are common in the field.

EX.2037, ¶42-43.

Petitioner's own design also underscores this point. Petitioner's system targets a positive margin above dew point (e.g., +4°F), not above ambient, which in high-humidity environments necessarily places the controlled surface above ambient to maintain a dew-point margin. *See* EX.2023, P.11. That practical choice reflects what Claim 14 requires and what Carter's "surface = ambient" deactivation does not provide: deactivation responsive to the anticipation of condensation. The Petition offers no cogent motivation to modify Carter's ambient-based deactivation with dew point-based anticipation, nor does it explain how a POSITA would implement such a change in view of measurement error and humidity variability.

Further, the Petition's suggestion that these differences are "insubstantial" overlooks that Carter's deactivation is objective and reference-variable distinct from the '847 Patent's design, which uses preselected dewpoint-referenced setpoints on both activation and deactivation to maintain a stable, anticipatory margin. Accordingly, Carter's scheme lacks the claimed deactivation responsive to anticipated condensation. A bright-line "surface = ambient" shutdown is not a proxy for dew point anticipation, is scientifically unreliable under realistic humidity and tolerance conditions, and is not rendered obvious by an expert-invented "floating offset" that Carter does not teach. EX.2037, ¶44-46. Therefore,

the Petition both fails to address and render obvious the deactivation in relation to anticipated condensation limitation.

**C. The Petition improperly relies on inherency to supply
“deactivation in anticipation of condensation.”**

The Petition’s obviousness theory hinges on reading a limitation into Carter that it does not disclose: deactivating the heater in anticipation of condensation. This is an impermissible appeal to inherency, not a disclosure supported by substantial evidence. The Federal Circuit’s decision in *LBT IP I LLC v. Apple Inc.*, 2023 U.S. App. LEXIS 14376, is directly on point. There, the Federal Circuit reversed the Board where the petitioner, lacking an express teaching, tried to fill a dispositive gap with expert say-so and inherency. The same flaw pervades the Petition here. Carter expressly teaches activation when condensation is anticipated and deactivation when a temperature condition is met; it does not teach deactivation responsive to anticipating condensation. EX.2037, ¶42. The Petition’s expert-driven “common sense” rewrite of Carter confirms that the missing limitation is not “necessarily present” or the “natural result” of Carter’s disclosed control logic and, thus, cannot be supplied by inherency.

In *LBT IP*, the ’618 Patent at issue had an exemplary claim which (in part) recites selectively activating and deactivating a transceiver. Comparable claim sections from the ’618 Patent and the ’847 Patent are presented below:

’618 Patent – Pertinent Claim	’847 Patent – Pertinent Claim
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Section from Claim 1	Section from Claim 14
a battery power monitor <i>configured to selectively activate and deactivate at least one portion of the transceiver circuitry and location tracking circuitry to conserve battery power in response to a signal level of the at least one portion of the receive communication signal;</i>	utilizing monitored case frame temperature, ambient air temperature and relative humidity <i>to anticipate formation of condensation at the display case and activating and deactivating the frame/door heater responsive thereto.</i>

In *LBT IP*, Petitioner here sought to infer the missing “deactivate” limitation based on expert testimony.

Similarly here, the Petition relies on Carter’s teaching to “deactivate the supplemental heat.” Pet., 14. But Carter’s approach to deactivation is different from the ’847 Patent’s: Carter ties deactivation to ambient temperature, not to a renewed anticipation-of-condensation judgment responsive to ambient air temperature and relative humidity. EX.1004, 5:55–63; Fig. 3. In Carter, after heat is applied, the system “compare[s] the cabinet surface temperature with respect to the ambient temperature,” and upon reaching the ambient target, “the control unit will deactivate the supplemental heat.” EX.1004, 5:55–63. Deactivation is thus keyed to meeting a temperature condition, not to an anticipatory condensation determination. EX.1004, 5:55–63; Fig. 3.

Dr. Henze’s own analysis reinforces this point rather than curing it. He posits that if Carter required an exact match to the target, the heater could remain on “even though there is no imminent risk of condensation,” and that a POSITA would

“interpret” or “implement” Carter so deactivation occurs when the frame temperature “reaches or exceeds” the target. EX.1003, ¶90. That is a proposal to modify Carter for efficiency, not evidence that Carter inherently performs deactivation in anticipation of condensation. EX.1003, ¶¶90-91. Indeed, by acknowledging the heater remains active despite no imminent risk, Dr. Henze confirms that Carter’s deactivation does not depend on an anticipation assessment. EX.1003, ¶90.

Dr. Henze further demonstrates that Carter’s control can deactivate “too early” in humid conditions and “too late” in dry conditions because the offset varies with environment. EX.1003, ¶93. That concession—risking “running the heater for too short an amount of time” or “longer than necessary”—is fundamentally at odds with the notion that Carter’s deactivation is made in anticipation of condensation. EX.1003, ¶93. If deactivation were truly driven by anticipation, it would not systematically mis-time shutoff as humidity varies. EX.1003, ¶93.

Unable to locate the claimed function in Carter, the Petition substitutes the ’847 Patent’s claimed approach by indicating that the ambient temperature is related to the anticipation of condensation and introduces a newly coined “floating offset” construct. EX.1003, ¶¶81-82 (dew-point plus preselected set point); EX.2019, 45:7–18; 50:3–5; 67:5–10 (terminology “floating offset” is Henze’s). Dr.

Henze admits this “floating offset” and its governing equation are his analysis and terminology, not Carter’s or the ’847 Patent’s. EX.2019, 45:7–18; 50:3–5; 67:5–10. Dr. Henze further asserts that a POSITA “would have been motivated to augment or replace” Carter with a “preselected set point” to achieve flexibility. EX.1003, ¶¶94. That is an obviousness-motivation argument premised on hindsight—adding the claim’s structure and function to Carter—not an inherency argument that the function is necessarily present in Carter. EX.1003, ¶¶94-96. Dr. Henze’s argument also underscores the central defect with Carter: the claimed deactivation responsive to anticipating condensation is not the natural result of Carter’s disclosed system. EX.1004, 5:55–63; EX.1003, ¶¶92–96.

The Petition seeks to bridge a dispositive gap with inherency, just as in *LBT IP*. 2023 U.S. App. LEXIS 14376 at *7–*8. Carter expressly teaches activation when condensation is anticipated and deactivation upon satisfying a temperature condition, not deactivation responsive to anticipating condensation. EX.1004, 2:4–32, 5:55–63, Fig. 3. The Petition’s reliance on expert reinterpretation, introduction of new control constructs, and wholesale substitution of Carter’s shutoff target with the ’847 Patent’s dew-point set point confirm that the missing limitation is neither “necessarily present” nor the “natural result” of Carter’s disclosure. EX.1003, ¶¶92–96; EX.2019, 45:7–18, 50:3–5, 67:5–10. Accordingly, the Petition fails to demonstrate that Carter teaches or renders obvious the claimed “utilizing

monitored case frame temperature, ambient air temperature and relative humidity to anticipate formation of condensation at the display case and activating and deactivating the frame/door heater responsive thereto” limitation, and the Board should reject the Petition’s unsupported inherency theory. *LBT IP*, 2023 U.S. App. LEXIS 14376 at *7–*8; EX.1004, 5:55–63; EX.1003, ¶¶128–132.

D. The Petition misstates the field of invention and ignores preamble-limiting terms.

The Petition improperly recasts the field of invention at an impermissibly high level of abstraction and attempts to retrofit the missing “refrigerated display case” context through expert gloss. That approach sidesteps the claim language, the specification’s consistent framing, and well-settled law requiring reasoned analysis tethered to the claim language. The Board should reject the Petition’s attempted reframing. *See In re Kahn*, 441 F.3d at 988 (requiring “articulated reasoning with some rational underpinning”); Pet. 37–38; EX.2037, ¶40.

The ’847 Patent does not claim a generic “control of heating functions” for undifferentiated refrigeration equipment. *See* Pet., 62 (misstating the field of invention). Rather, the ’847 Patent’s field of invention is specific and consistently articulated: the remediation of condensation buildup in refrigerated display cases through the activation and deactivation of frame and/or door heating. EX.1001, 1:14-17. The specification explains that the system activates frame and door heaters before dew point is reached and deactivates above the dew point, all within

the architecture of a commercial freezer/cooler display unit comprising a frame, doors, and sensors such as an external case frame temperature sensor and a dew point sensor. EX.1001, 2:23–26; 5:16–26; EX.2037, ¶23. That structural and operational context is not surplusage; it is the platform on which the claims are built. *See* EX.1001, 1: 14-17; 5:16–26.

The claims likewise anchor the '847 Patent's invention to refrigerated display case structure. *See* EX.1001, 1:14-17; 2:23–26. The preamble recites a “refrigerated display case,” and the bodies of the claims repeatedly refer back to that structure by using terms such as “*the* display case” and “the plurality of display cases.” *See* EX.1001, EX.1001, 9:26-33, 10:6, 10:33-35. (emphasis added). Because those terms derive antecedent basis from the preamble, the preamble provides limiting structural context that must carry through the body of the claim. *See Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 781–83 (Fed. Cir. 2010). The Petition does not identify where Carter discloses a refrigerated display case, a display case frame, or a display case frame/door heater. *See* Pet. 10; EX.1004, 1:15–2:32; EX.1003, ¶67. Relabeling Carter's “refrigeration or freezer equipment” as a “display case” by parenthetical shorthand cannot supply the missing structure or rewrite the claims to cover something they do not. *See* EX.1004, 1:19–20; *Haemonetics*, 607 F.3d at 781–83.

The Petition itself underscores the gap. Carter describes monitoring the

external surface temperature of freezer/refrigeration equipment, not the frame of a retail display case. EX.1004, 1:19–20. Rather than point to disclosure of the required display case elements, the Petition asserts that a skilled artisan would have been motivated to apply Carter to the “well-known” use case of refrigerated display cases used for retail food items. Pet. 10; EX.1003, ¶67. Motivation, however, is not a substitute for disclosure, and it cannot erase claim language or the specification’s repeated tie to display case architecture and frame/door heating. *See In re Kahn*, 441 F.3d at 988. Nor does the Petition attempt to address the fact that the ’847 Patent and Carter endeavor to solve entirely different problems—namely, the ’847 Patent endeavors to maintain product visibility and avoid safety hazards from condensation while Carter’s invention addresses concerns about specimen storage or spoilage in different equipment and settings. *See* EX.1001, 1:14-17; 2:23–26; EX.1004, 1:15–2:32. Accordingly, because Carter neither discloses nor addresses the claimed display-case architecture and frame/door heating—and the Petition’s “motivation” cannot cure that omission or rewrite the claims—the asserted grounds fail.

In Claims 1, 8, and 14 of the ’847 Patent, and those that depend, the preamble must be construed as limiting. *See supra*, § III. But the Petition fails to address those limitations set forth in the preamble and carried throughout the remaining claim body. Because the Petition fails to articulate how the asserted

prior art discloses the claimed refrigerated display case structure and associated frame/door heating, the Petition fails on all grounds. *See Haemonetics*, 607 F.3d at 781–83; *In re Wilson*, 424 F.2d at 1385.

E. Carter and Bunch cannot supply the '847 Patent's ambient-control limitations.

Ground 1B of the Petition assumes a POSITA would graft Carter's ambient-condition, dew-point-based control onto Bunch's time-scheduled anti-sweat system to arrive at the '847 Patent's ambient-driven control. *See* EX.1003, ¶¶111–119. That assumption is incorrect. Bunch's core paradigm is time-based scheduling with a local surface-wetness override; the '847 Patent requires continuous control responsive to ambient conditions rather than fixed duty cycles. Replacing Bunch's time schedules with Carter's ambient algorithm is not a routine substitution—it is a wholesale change in Bunch's principle of operation. Accordingly, the Petition's proffered “motivations” are nothing more than hindsight-driven, conclusory assertions that cannot satisfy Petitioner's burden or supply the missing limitations, and thus fail as a matter of law. *See TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016); *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380–81 (Fed. Cir. 2016).

Bunch teaches time-based duty cycles with a local moisture override, not the ambient dew-point control system of the '847 Patent. Bunch is explicit: the controller “signals when the heater should be on prior to the formation of

condensation” via “pre-set start and stop times” implementing duty cycles (e.g., 15-minute cycles during specified hours tied to busy periods). If a duty cycle is “insufficient to prevent condensation,” a local condensation sensor “override[s] the pre-set ‘off’ time” until moisture clears. EX.1006, 4:26–43. The Bunch sensor is a local resistivity detector mounted at door/frame surfaces where moisture first appears; it is not an ambient temperature/humidity sensor, and Bunch neither computes nor references dew point or any ambient threshold. EX.1006, 3:11–26 (resistive condensation sensor on door/frame), 2:58–63 (control unit signaling heater). The ’847 Patent, by contrast, governs heater operation continuously based on ambient conditions—e.g., aisle temperature and humidity to infer dew point—without reliance on pre-set schedules. *See* EX.1001, Abstract; 2:4–31; 4:13–5:54; Figs. 1–3. The Petition’s attempt to recast Bunch as ambient-driven disregards this plain distinction. Bunch identifies problems with humidistat-based controls and adopts scheduled duty cycles with a local surface-wetness override—not ambient dew-point control. *See* EX.1006, 1:24–43 (criticizing humidistat-based controls); *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (teaching away where reference criticizes or discourages the path taken).

The Petition’s asserted “motivations” are hindsight reconstructions that contradict Bunch’s principle of operation. The Petition asserts that because Carter and Bunch both aim to prevent condensation efficiently, a POSITA would import

Carter’s ambient sensors and dew-point algorithm into Bunch. *See* EX.1003,

¶¶111–117. Generic goals, however, cannot supply a missing limitation or justify replacing a reference’s core control scheme. *See Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361–63 (Fed. Cir. 2016); *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017).

Bunch distinguishes two prior approaches—waiting for surface condensation and using aisle humidistats—and proposes a different solution: scheduled duty cycles aligned with known high-risk times, plus a local moisture override.

EX.1006, 1:24–43; 4:26–43. Far from pointing toward ambient dew point, Bunch deliberately eschews ambient triggers in favor of time scheduling. Substituting Carter’s ambient control would replace, not “supplement,” Bunch’s principle of operation. *See Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019). The proposed combination is not a mere substitution; it demands reengineering Bunch’s logic, hardware, and system behavior.

The Petition frames the combination as a swap of “known elements,” replacing Bunch’s condensation sensor and schedule with Carter’s ambient and surface temperature sensors and corresponding algorithm. *See* EX.1003, ¶¶118–119. That framing oversimplifies the engineering and functional implications:

- Control logic replacement. Bunch’s microcontroller executes time schedules with a binary moisture override. EX.1006, 4:26–43; 3:11–

26. Carter's dew point control requires continuous acquisition and fusion of ambient temperature and humidity with surface temperature, computation of dew point, comparison to surface temperatures, and responsive control. EX.1004, 2:4–31; 4:13–5:54. Implementing Carter's algorithm displaces Bunch's scheduling logic and associated programmer settings (e.g., pre-set start/stop times), thereby eliminating Bunch's principal disclosed feature. EX.2037, ¶49.

- Sensor domain and placement. Bunch's resistive sensor is a door/frame surface wetness detector. EX.1006, 3:11–26. Carter's approach requires ambient temperature and humidity sensors, and surface temperature sensors at relevant case locations. EX.1004, 2:4–31; 4:13–5:54. Adding these is not a plug in replacement; it imposes different signal conditioning, calibration, and stability requirements absent from Bunch. EX.2037, ¶49.
- System objectives and tradeoffs. Bunch achieves energy savings by targeting heater operation to store defined busy periods and allowing a local override only as needed. EX.1006, 4:26–43. Carter's objective is to limit heater operation strictly to ambient risk periods independent of time. EX.1004, Abstract; 2:4–31. The Petition's combination abandons Bunch's schedule-based demand management benefits and

replaces them with an entirely different operating policy. That is not “supplementing” Bunch; it is discarding it. EX.2037, ¶49.

- Programmer and network configuration. Bunch’s programmer and communications host are designed to identify units, set schedules, and manage duty cycles. EX.1006, 2:58–63; 3:11–26 (programmer and control unit functions). Converting to Carter’s ambient algorithm requires reprogramming to set sensor thresholds, dew point parameters, and control logic—none of which Bunch teaches or suggests. The Petition does not explain how Bunch’s programmer would be repurposed for ambient control, underscoring the reconstructive nature of its proposal. EX.2037, ¶49.

Ground 1B fails because the Petition has not shown that Bunch discloses or suggests ambient condition control or that a POSITA would have been motivated to replace Bunch’s time-based duty cycles with Carter’s ambient dew point algorithm with a reasonable expectation of success. *See Magnum Oil*, 829 F.3d at 1380–81; *TriVascular*, 812 F.3d at 1068. The proposed combination changes Bunch’s principle of operation, contradicts its stated approach to prior art ambient triggers, and requires substantial reengineering rather than mere substitution. *See Henny Penny*, 938 F.3d at 1332. And Bunch teaches away from the ambient triggered path the Petition suggests. *See Gurley*, 27 F.3d at 553. The asserted

motivations are hindsight driven and do not establish obviousness of the '847

Patent's ambient condition-based claims.

F. King is non-analogous art and irrelevant to refrigeration control.

The Petition's Ground 1C fails because King neither supplies any missing claim element nor provides a non-hindsight rationale to modify Carter or Bunch.

King is an automotive windshield fog sensor that packages three sensors—glass surface temperature, ambient air temperature, and ambient humidity—within a single housing adhered to a windshield, with a flex circuit and a protective dome. *See* EX.1005, Abstract; 1:54–2:7; 2:40–50; Fig. 2. It does not teach heater control for refrigeration cases, does not disclose or suggest replacing Bunch's time-based control with ambient dew-point logic, and offers no algorithmic control beyond providing data for predictive fog detection in a vehicle cabin.

As a threshold matter, King is not analogous art. The '847 Patent addresses condensation control for refrigerated display cases; King addresses fog prediction in automotive cabins using a unit adhered to a windshield. *See* EX.1001, 1:14–18, 1:48–54; EX.1005, Abstract; 1:4–6; 1:54–60. The Petition's attempt to define the field as broadly as “remediating condensation build up” ignores the different environments, problems, and constraints. *See Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359–61 (Fed. Cir. 2020). The fog sensing concerns of

King are not the problems the '847 Patent inventors were solving, and King's teachings are not reasonably pertinent to the control logic at issue.

Even if King were considered analogous art, King does not cure the Petition's fundamental defect: neither Bunch nor King discloses ambient-condition-based heater control for refrigeration cases. King provides a sensor assembly; Carter already teaches the same sensing modalities and a dew-point algorithm for activation. *See* EX.1001, Abstract; 2:4–31; 4:13–5:54; Figs. 1–3. Merely pointing to King's integrated housing adds nothing material to the claim limitations or to the Petition's theory for replacing Bunch's time-scheduled control. *See In re Magnum Oil Tools*, 829 F.3d at 1380–81.

The Petition's "sensor packaging" rationale is also deficient because it fails to provide for a reasoned motivation with a rational underpinning. *See Metalcraft*, 848 F.3d at 1367; *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). In refrigerated display cases, ambient sensors are typically located and exposed to aisle airflows and conditions without bias from nearby cold surfaces and without enclosures that distort readings. King's protective dome and thermal barrier are specifically tailored to an automotive cabin and a windshield mounting, ensuring the ambient sensors are thermally isolated from the cold glass while still sampling in-cabin air. *See* EX.1005, 1:61–2:7; 2:40–50; 2:48–50. Transplanting King's dome-and-tray package to a refrigerated case risks corrupting ambient readings by

housing the ambient sensors in a localized enclosure near cold components, contrary to Carter’s requirement to measure true ambient conditions to compute dew point. The Petition identifies no disclosure explaining how King’s housing would be adapted to a display case environment, no analysis of airflow and thermal gradients, and no evidence that such packaging would preserve Carter’s ambient-control accuracy. *See Arendi*, 832 F.3d at 1361–63.

Nor does King provide any teaching that would overcome the core legal defect identified in Ground 1B: adopting Carter’s ambient dew-point algorithm would replace Bunch’s time-based duty cycles and alter Bunch’s principle of operation. King says nothing about preserving time scheduling, nothing about a moisture-override schedule, and nothing about reconciling ambient dew-point control with Bunch’s pre-set start/stop times. *See* EX.1006, 4:26–43; EX.1005. The combination still collapses into Carter supplanting Bunch—precisely the sort of change in principle of operation that precludes obviousness. *See Henny Penny Corp.*, 938 F.3d at 1332–33.

The Petition’s asserted benefits for King—compactness, shared grounding, simplified wiring, lower cost—are packaging conveniences untethered to any claimed limitation that is missing from Carter or to any control limitation missing from Bunch. *See* EX.1005, 1:36–45; 2:8–16. Cost and convenience cannot justify a combination that would undermine measurement fidelity required by ambient-

driven control, nor can they retroactively supply the missing ambient-control logic in Bunch.

King is, at best, an automotive sensor-packaging reference that neither discloses nor suggests the ambient-condition heater control required by the '847 Patent, does not remedy the Petition's failure to reconcile Carter with Bunch's time-based control, and introduces packaging features ill-suited to supermarket refrigeration environments. Accordingly, adding King does not supply the missing limitations, provide a non-hindsight motivation, or preserve the principle of operation. The Carter–Bunch–King theory therefore fails as a matter of law.

G. Gatling does not supply the claimed ambient-control elements.

The Petition's Carter–Bunch–Gatling combination of Ground 1D does not render the challenged claims obvious because Gatling concerns wireless product-temperature monitoring and case refrigeration control, not ambient-condition–based anti-sweat heater control. Gatling describes placing a “product-simulating probe” in each refrigerated case and wirelessly transmitting that simulated product temperature to a receiver and a centralized refrigeration controller, which then adjusts evaporator pressure and case temperature. *See* EX.1007, Abstract; 1:7–10; 4:58–5:15; 6:15–24; 7:20–8:12; Figs. 1, 5–8. The data Gatling logs and uses to control the system are case–and product–related temperatures for refrigeration setpoint control, not the ambient humidity, ambient temperature, and door/frame

surface temperature outputs that the '847 Patent uses for dew-point based anti-sweat heater control. *Compare* EX.1007, 3:40–43; 6:15–24; 6:62–7:3 (logging and using case/product temperatures for refrigeration control); with EX.1001, Abstract; 2:4–31; 4:13–5:54; Figs. 1–3 (ambient RH, ambient temperature, surface temperature; dew-point comparison; selective anti-sweat heater operation).

VI. Claim by Claim Analysis

A. Ground 1A: Claims 8-12 over Carter.

The Petition's Carter-only ground fails because it lacks the claimed platform, structures, and control algorithm. Rather than mapping Carter to the claim language, the Petition relies on a conclusory “apply it to display cases” motivation, which is insufficient to cure missing limitations or substitute capability for required structure. Pet., 13.

First, Carter does not disclose the claimed “refrigerated display case,” “display case frame,” or “display case frame/door heater.” The Petition treats Carter's laboratory-style freezer/refrigerator apparatus as interchangeable with retail display cases, but the claims expressly tie the sensors, housing, and control logic to the case frame and door/heater context (*see* Section IV.E). The Petition's hindsight motivation to adapt Carter to retail display cases does not supply the missing platform or the specific frame/door-heater configuration recited in the claims. Pet., 12–14; EX.1004.

Second, the Petition does not show how Carter meets the preamble of the claim which requires “a refrigerated display case having at least one door, a frame and at least one frame/door heater,” as recited in the limiting preamble. Simply asserting in conclusory fashion that a POSITA would apply Carter to retail display cases does not explain what modifications would be made to Carter’s apparatus to achieve provide a refrigerated display case. Pet., 8-9; *see* Section IV.A.

Third, Carter’s control logic is not equivalent to the claimed dual setpoint algorithm referenced to dew point. Carter activates heat when surface temperature drops below dew point plus a constant, but deactivates when ambient equals surface temperature. That deactivation condition is not a second, dew-point-referenced setpoint. Substituting a non-dew-point reference for deactivation changes control stability and hysteresis in ways material to real-world, high-traffic retail environments. EX.2037, ¶¶34-35. The Petition’s assertion of mathematical equivalence by moving constants across inequalities ignores the change in reference variable and transient response; it identifies no algorithm in Carter that matches the claimed two preselected, dew-point-referenced setpoints. EX.1004, 5:55–63 & Fig. 3; Pet. 29; EX.2037, ¶¶34–36.

Fourth, Carter’s latch-cover arrangement does not reduce inaccuracy by “thermally isolating” the sensing units. Carter merely integrates sensors within a latch to improve readings, but that latch system is likely to conduct heat and defeat

the intended thermal isolation. EX.2037, ¶54. Also, Carter actually localizes the measurements of the sensors, which likely defeats the possibility of monitoring the conditions for the glass front refrigerated display case. EX.2037, ¶62; *see also* EX.1004, 5:11-14. Thus, the Petition’s Carter-only ground should be rejected.

B. Ground 1B: Claims 1-20 over Carter and Bunch.

Ground 1B fails for the same reasons set forth above regarding Carter’s inability to meet the ’847 Patent’s ambient-condition, dew-point–based control. Independently, the Petition also fails because it does not bridge critical gaps in Carter’s disclosure with respect to Element [8.b] or the “constantly updatable on-site automated control parameters” of claims 7 and 20.

First, Carter does not render Element [8.b] obvious. Element [8.b] requires “mounting a dew point sensing unit on the display case to monitor ambient air temperature and relative humidity outside the display case.” Pet., 11. Carter does not teach mounting the dew-point sensing unit on a “display case,” nor does it teach monitoring ambient air temperature and relative humidity “outside the display case.” Carter’s disclosure and figures are directed to refrigerator/freezer equipment generally, not supermarket display cases, and Carter’s mounting guidance is tied to specific equipment surfaces—not the structural realities of a multi-case display line. *See* EX.1004, 4:36–43 (preferred locations “along the refrigerator or freezer equipment at a lower side surface 36, a lower front surface

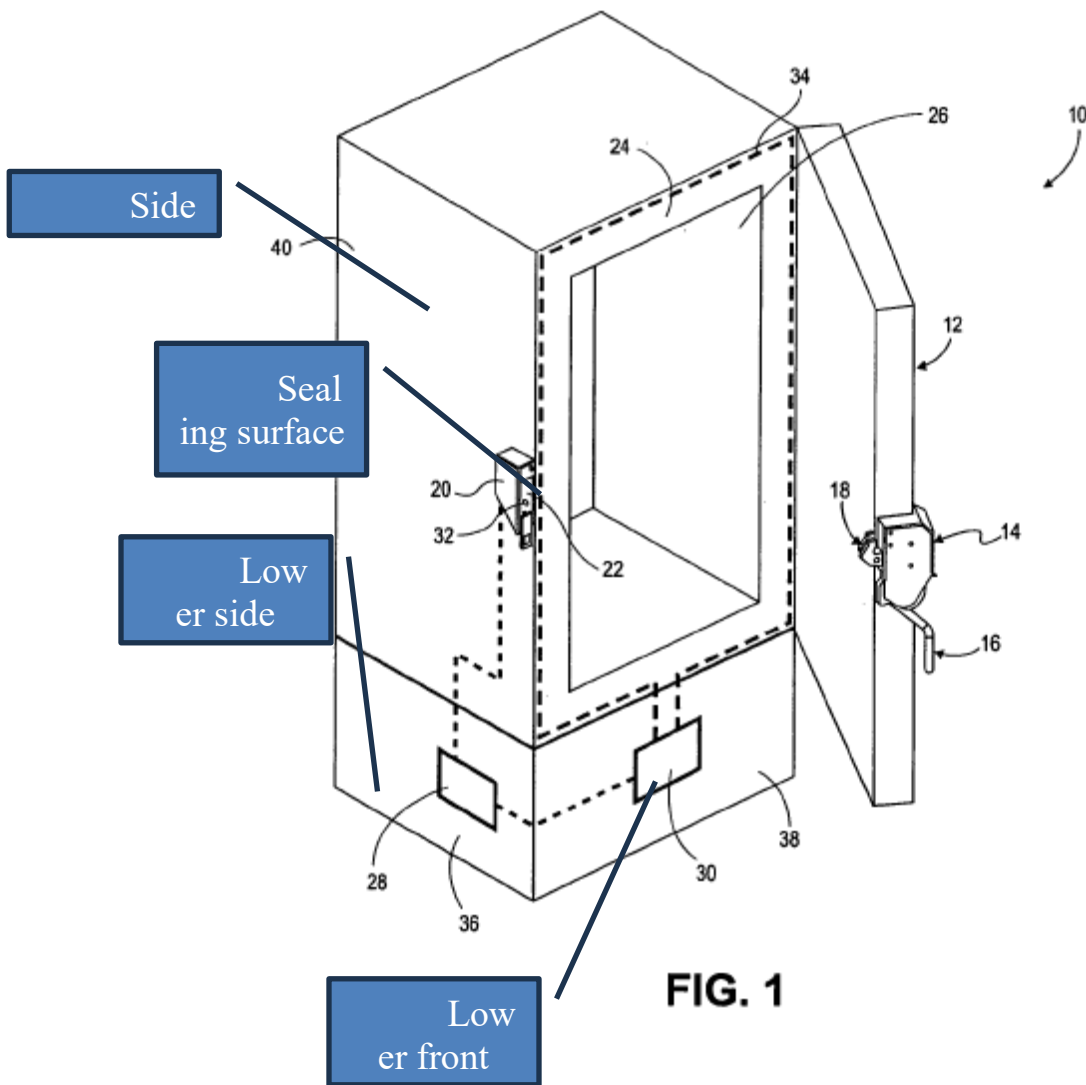
38, a side surface a cabinet surface 40 and along the sealing surface 24”). The Petition repeats that the “sensor assembly unit 32” comprises a surface temperature sensor, an ambient air temperature sensor, and an ambient relative humidity sensor and is “mounted in a preferred location,” but it never explains how Carter’s preferred mounting translates to a supermarket display case or satisfies Element [8.b]’s requirement that the unit be mounted “on the display case” to monitor ambient conditions “outside the display case.” *See* EX.1004, 5:1–20; 4:36–43; 5:31–40; 7:1–9. As Mr. Pollock explains, Carter does not account for practical display-case constraints such as abutting cases with no accessible side surfaces, the risk of customer/cart impacts at lower front surfaces, or the unsuitability of a sealing surface for mounting an ambient sensor package. EX.2037, ¶¶60–61. The ’847 Patent addresses these real-world constraints—for example, providing voids and airflow gaps to allow accurate ambient sampling at the case perimeter. *See* EX.1001, 7:17–18. The Petition and cited art do not.

Second, Carter’s ambient sensing is localized to the door-latch/sealing region rather than monitoring ambient conditions “outside the display case” as claimed. Carter expressly states that the “door latch cover assembly 20 also helps localize the measurements of the sensor assembly unit to generally produce more accurate temperature readings.” EX.1004, 5:11–14. That is the opposite of the ’847 Patent’s requirement to monitor true ambient aisle air for dew-point calculation

outside the case. The Petition's quotation of Carter's dew-point calculation passages (e.g., EX.1004, 2:44–67; 5:31–40; 6:30–40; 7:1–9) does not cure this mismatch; it remains silent on where and how the ambient sensors are mounted and what air they sample in a display-case environment. Simply put, Carter's localized sensing at the sealing surface is not the '847 Patent's ambient monitoring outside a display case, and the Petition does not provide the missing implementation details to make Carter's localized scheme satisfy Element [8.b]. *See* EX.2037, ¶62.

There are real world concerns that a POSITA would address in mounting sensors on a refrigerated display case. As Mr. Pollock explains, “Carter's preferred locations” (labeled in Figure 1 below) are not “good locations for a refrigerated display case to have sensors mounted.” EX.2037, ¶61.

The reason is that the side surfaces are likely not available in the context of refrigerated display cases, since typically numerous cases directly abut each other so there is no space along the side. In terms of the lower front surface, this also is not a good location, since carriages belonging to consumers may impact the sensor there or consumers may brush or contact this surface. Along the sealing surface is not a good place for mounting. It is apparent in the '847 Patent that the sensors are specifically designed to be mounted in void spaces between portions of the refrigerated display cases, not considered by Carter. EX.2037, ¶61 (internal citations omitted).



EX.2037, ¶61.

Third, Bunch does not supply the missing mounting or ambient-monitoring specifics. Bunch teaches a time-scheduled anti-sweat control with a local moisture override; it does not teach ambient-condition-based heater control, much less the structural specifics of mounting an ambient sensor assembly on a display case to measure aisle air. See EX1006, 4:26–43. The Petition’s reliance on Bunch to “fill

in” Carter’s display-case mounting and ambient monitoring is therefore misplaced.

Fourth, the Petition’s treatment of claims 7 and 20 is deficient. Those claims require “establishing constantly updatable on-site automated control parameters” for processing the first and second output data—frame/door surface temperature and ambient temperature/humidity—to anticipate condensation and control the heaters (claim 7), and “constantly updatable automated control parameters” for anticipating condensation status and establishing measures across cases (claim 20). The Petition equates these “constantly updatable ... automated control parameters” with Bunch’s example of a shopkeeper manually adjusting parameters to achieve demand savings. Pet., 42–43, 51. That is not what the claims require. The ’847 Patent emphasizes automated control “accomplished by ... thermally isolating temperature sensors and *constantly updating data to reliably provide the ability to accurately anticipate condensation at case surfaces.*” EX.1001, 1:27–32 (emphasis added). Constantly updated, automated parameters for processing the ambient and surface measurements are fundamentally different from occasional, manual shopkeeper adjustments to time-based schedules. See EX.2037, ¶¶63–64. And the Petition identifies no passage in Bunch suggesting automated, constant updating of control parameters for processing the ’847 Patent’s first and second outputs (ambient RH/temperature and frame/door temperature). Its assertion that “nothing within the ’847 Patent” suggests the update rate matters is flatly

contradicted by the '847 Patent specification's emphasis on "constantly updating data" to anticipate condensation. EX.1001, 1:27–32.

For these reasons, the Petition has not shown that Carter discloses or renders obvious Element [8.b]'s display-case mounting and outside-ambient monitoring, nor has it shown that Bunch provides the "constantly updatable on-site automated control parameters" required by claims 7 and 20. Accordingly, the Board should reject Ground 1B.

C. Ground 1C: Claims 3, 9-10, 19 over Carter, Bunch, and King.

The Petition's Carter–Bunch–King combination collapses at the threshold—it neither satisfies the '847 Patent's thermal-isolation requirements in the supermarket display-case context nor articulates a cogent rationale to combine. By treating King's automotive "dome-and-tray" fog-sensor package as a drop-in substitute, the Petition sidesteps the central question: how would that enclosure, when mounted on a refrigerated case for dew-point–based anti-sweat control, maintain uncompromised exposure to true aisle air and simultaneous, high-fidelity coupling to frame/door surfaces? The Petition offers only insufficient conclusory statements.

Element [3]: "reducing data inaccuracy by thermally isolating units utilized for monitoring." The Petition points to King's protective dome, flex circuit, and thermal-barrier tray and asserts that these structures "thermally isolate" the sensors.

But in King, the barrier’s purpose is to prevent the cold windshield from biasing ambient sensors in a small, in-cabin environment while those sensors remain under a protective dome. EX.1005, 1:48–65; 2:55–63. The ’847 Patent, by contrast, requires accurate measurement of true aisle ambient conditions and frame/door temperature for dew-point control in a supermarket environment, and it addresses cross-coupling using case-appropriate structures (e.g., airflow gaps/voids) that maintain exposure to aisle air rather than enclosing the sensors in a dome. EX.1001, 7:17–18. Transplanting King’s dome-and-tray enclosure to a display case risks creating a localized micro-environment and impeding airflow, thereby compromising the very “ambient” measurement the ’847 Patent demands. The Petition does not explain how such an enclosure would reduce data inaccuracy in this context rather than introduce it, and it identifies no display-case implementation that preserves accurate ambient sampling and responsive frame/door sensing. Absent that explanation, the proposed combination is hindsight-driven and legally inadequate. *See TriVascular, Inc.*, 812 F.3d at 1068.

Element [9]: “thermally isolating said dew point sensing unit from variations in temperature of the display case frame or display case door.” The dew point sensing unit in the ’847 Patent must be exposed to true aisle air while being thermally isolated from the case structure to avoid bias. EX.1001, Abstract; 2:4–31; 4:13–5:54. The Petition recycles King’s barrier to claim isolation of ambient

sensors from the cold surface beneath the housing. EX.1005, 2:55–63. But King’s package is tailored to an automotive windshield: a dome with apertures over ambient sensors held off the glass by a tray, while the glass sensor sits in a hole to maintain contact with the glass. EX.1005, 1:61–2:7; 2:40–50. In a supermarket aisle, isolating the dew point sensing unit from frame/door temperature must be accomplished while exposing the ambient sensors to aisle air. The ’847 Patent addresses this requirement; King does not. The Petition never shows how an on-case dome would preserve aisle-air exposure and dew-point accuracy when mounted on a display case frame/door. Nor does Carter help: Carter intentionally localizes the sensors at the sealing surface—“the door latch cover assembly 20 also helps localize the measurements”—which is the opposite of isolating the dew point sensing unit from case-structure temperature variations so that it reads true ambient aisle air. EX.1004, 5:11–14. Accordingly, the Petition has not demonstrated that the combination satisfies Element [9].

Element [10]: “thermally isolating said temperature sensing unit from variations in temperature of ambient air.” The Petition argues that if King’s tray and flex circuit isolate ambient sensors from the cold surface (Element [9]), they likewise isolate the surface temperature sensor from ambient air (Element [10]). EX.1005, 1:48–65; 2:55–63. That is speculative and ignores what is required for accurate condensation prediction: the surface temperature sensor must be in good

thermal contact with the frame/door surface and respond accurately to that surface's temperature dynamics, not be insulated by an enclosure that introduces thermal lag or measurement bias. While King's glass temperature sensor sits in a hole to maintain contact with the windshield surface, EX.1005, 2:48–50, the Petition does not identify any display-case-specific implementation showing that a dome-and-tray adhered to a case frame/door would both preserve responsive, high-fidelity surface coupling and “thermally isolate” that sensor from ambient air. The '847 Patent's solution is case-specific thermal design and placement, not grafting an automotive dome onto a refrigerated display case. Without an articulated reason to believe King's packaging would improve—rather than degrade—measurement fidelity in this different environment, the Petition's theory fails. *See Metalcraft*, 848 F.3d at 1367 (requiring a “clear and explicit” motivation with rational underpinning).

Element [19]: “reducing output data inaccuracy by thermally isolating units utilized for monitoring.” This rises or falls with Element [3]. For the reasons above, the Petition has not shown that adapting King's automotive dome-and-tray packaging to the '847 Patent's supermarket setting reduces output data inaccuracy in the manner claimed. The Petition's reliance on general propositions about “thermal isolation,” without addressing aisle-air exposure, airflow, proximity to cold components, sensor lag, and bias introduced by on-case domes, is insufficient.

See Magnum Oil, 829 F.3d at 1380–81 (conclusory assertions cannot carry the petitioner’s burden).

In sum, the Petition does not demonstrate that the Carter–Bunch–King combination meets Elements [3], [9], [10], or [19]. King’s automotive enclosure is not shown to provide the claimed thermal isolation in a way that preserves the ’847 Patent’s required measurements in a supermarket display-case environment; Carter’s sealing-surface localization points the other way; and Bunch’s time-scheduled approach offers nothing about case-specific thermal isolation of sensing units. Accordingly, Ground 1C should be rejected. *See Henny Penny Corp.*, 938 F.3d at 1332.

D. Ground 1D: Claims 2, 11-13, 17 over Carter, Bunch, and Gatling.

Ground 1D similarly fails even with Gatling. Element [2] (wireless communications) is not satisfied by simply pointing to Gatling’s wireless links. The ’847 Patent’s claimed “first and second output data” and “record” are specific to ambient-condition anti-sweat control—i.e., outputs from ambient humidity, ambient temperature, and frame/door surface temperature sensing and records associated with frame/door heater operation—communicated to a processing location. *See EX.1001*, 5:35–6:9. Gatling’s wireless pathway transmits different content for a different control loop: simulated product temperature (and optionally discharge air temperature or other case-internal signals) for refrigeration setpoint

control. *See* EX.1007, 4:58–65; 5:12–30; 6:25–61; Figs. 5–7. Substituting “wireless in general” for the claimed wireless communication of the ’847 Patent’s ambient/surface outputs and heater-operation record impermissibly abstracts away the missing limitations. *See Arendi*, 832 F.3d at 1361–63 (generic “common sense” cannot supply a missing claim limitation); *In re Magnum Oil Tools*, 829 F.3d at 1380–81 (burden rests with the petitioner; conclusory assertions insufficient).

Element [11] (mounting an internal case temperature sensing unit inside the display case and monitoring internal case temperature) does not advance the Petition’s obviousness theory as to ambient-driven anti-sweat control. Gatling’s internal case sensors and product-simulating probe are directed to refrigeration control (floating circuit temperature via ESRs) and food-safety targets, not to predicting or preventing condensation on door frames or mullions. *See* EX.1007, 1:40–54; 4:58–65; 7:20–8:12; Fig. 9. The Petition offers no reasoned explanation, supported by evidence, why a POSITA would integrate Gatling’s product-temperature loop into Carter’s dew-point anti-sweat loop—which already relies on ambient humidity/temperature and surface temperature—nor how such integration would affect or improve anti-sweat heater actuation. *See Metalcraft*, 848 F.3d at 1367 (motivation must be “clear and explicit” with a rational underpinning); *KSR*, 550 U.S. at 418 (requiring articulated reasoning).

Elements [12] and [13] (storing data related to readings at the sensing units and operation of the frame/door heater; wirelessly accessing that stored data) likewise are not met by Gatling's generic logging and wireless retrieval of case/product temperature data for refrigeration control. Gatling's "logging capabilities" record refrigeration-related signals and events. *See* EX.1007, 3:40–43; 6:15–24; 6:62–7:3. The Petition does not identify where Gatling (or Carter/Bunch) discloses storing and wirelessly accessing records "related to ... operation of the frame/door heater" as required. EX.1001, 5:35–6:9. Recasting Gatling's refrigeration logs as the '847 Patent's anti-sweat heater operation records is an unsupported equivalence that cannot carry the burden of proof. *See TriVascular, Inc.*, 812 F.3d at 1068 (rejecting conclusory, hindsight rationales).

Element [17] (monitoring internal case temperatures across cases and compiling a record) does not cure the fundamental deficiency that the combination still fails to disclose or suggest the '847 Patent's ambient-driven anti-sweat heater control and associated data architecture. Even accepting that internal case temperatures may be monitored and recorded (as Gatling teaches), the Petition does not bridge the gap between refrigeration setpoint control and the claimed dew-point-based anti-sweat control, nor does it show why a POSITA would commingle those loops to meet the claim's specific communications and recordkeeping for frame/door heater operation. *See Henny Penny Corp.*, 938 F.3d

at 1332 (no obviousness where modification changes a reference's principle of operation).

Finally, the Petition's wireless "predictable alternative" theme does not withstand scrutiny without a specific, supported linkage to the claimed data types, network topology, and use case. That wireless communications existed in refrigeration (EX.1007, 1:40–54; 5:12–30; 6:25–61) does not show that the '847 Patent's particular ambient and surface data, heater-operation records, and processing flows would be wirelessly communicated in the manner claimed, or that grafting Gatling's product-temperature telemetry into Carter/Bunch's anti-sweat system preserves the principle of operation. The Petition never explains how, or why, a POSITA would merge Gatling's product-temperature control loop with Carter's dew-point anti-sweat loop, nor how Gatling's wireless and logging features would be repurposed to store and wirelessly access records of frame/door heater operation as the '847 Patent requires. Accordingly, Gatling does not supply the missing ambient-control limitations, does not provide a non-hindsight motivation, and does not preserve the combined system's principle of operation. Ground 1D therefore fails.

VII. Objective Indicia Corroborate Non-Obviousness

The objective indicia here strongly corroborate non-obviousness. The record shows sustained industry adoption of controllers implementing the claimed dual

set-points and co-located, insulated-pocket housings, indications of copying by Anthony to compete on the same architecture, and marketplace recognition that the invention solved a persistent problem that prior approaches—continuous heating and crude duty cycles—had not. EX.2037, ¶65; EX.2004, ¶¶3–6. The technology disclosed in the '847 Patent truly advanced the art, including anticipating condensation reliably while maintaining energy efficiency and stabilizing sensing accuracy in a compact, case-mounted housing. EX.2037, ¶65. Practical, robust dew-point anticipation with reliable hysteresis at the case-level controller was not a solved problem by 2005 and required the holistic structural and algorithmic integration disclosed in the '847 Patent. EX.2037, ¶65.

A. Background between the parties.

ControlTec and Anthony have coexisted in the refrigeration controls marketplace for almost 30 years. They have, at times, collaborated, but most often competed in this space, as the two major providers of anti-sweat systems in the United States. EX.2004, ¶5. Over the past twenty years, ControlTec and Anthony have been responsible for approximately 90% of the sales of anti-sweat systems in the United States, and it is common for these parties to be the only two vendors considered by a customer when evaluating purchase options for anti-sweat systems. EX.2004, ¶5.

In the early 2000s, ControlTec (through its predecessor Energex Enterprises, Inc.) entered into a business relationship with Anthony where Anthony would purchase the “Door Miser” from Energex, a patented product designed to conserve energy for glass refrigeration display doors and install it in Anthony’s refrigeration doors. *Energex Enters. v. Anthony Doors, Inc.*, 250 F. Supp. 2d 1278, 1280 (D. Colo. 2003). After disclosing certain confidential information and trade secrets regarding Energex and the Door Miser, Energex discovered Anthony had developed the “Optimiser,” a product largely the same as the Door Miser, which was being manufactured and marketed in direct competition with Energex’s Door Miser. *Id.* As a result, Energex sued Anthony for breach of the disclosure agreement, wrongful interference of business opportunity, bad faith breach, misappropriation of confidential information, and unfair competition. *Id.* (Civil Action No. 02-K-397). That case settled quickly. EX.2025.

In settling, the companies agreed to co-develop a new anti-sweat controller system (the co-developed product), which would be designed by Energex and distributed and sold by Anthony on an OEM basis. *See* EX.2026. The co-development agreement stipulated that Energex would patent the co-developed product—which it did via the ’847 Patent and related ’181 Patent. *See* EX.2026, ¶1.2(b); EX.1001. The co-developed product, ControlTec’s AS-20 controller, was to be made available for Anthony to be marketed, sold and delivered to end-users

on or prior to March 15, 2005, which occurred. *See* EX.2026, ¶1.2(a). The co-development agreement provided that Anthony pay Energex monthly for 18 months for the co-developed product, and that Energex pay Anthony a royalty for the sales. *See* EX.2026, ¶2.1(b)(i)-(ii). Anthony was also forbidden during this time, as well as 3 years following the completion of the agreement, from selling or providing any other anti-sweat controllers except the co-developed product purchased from Energex. *See* EX.2026, ¶3.1, 4.1(b). Anthony and Energex jointly enjoyed the benefits of the co-developed product's intellectually property rights during the term of the agreement, and upon termination, Anthony transferred all rights, title and interest to the co-developed product's intellectual property to Energex. *See* EX.2026, ¶5(a)-(b).³ The co-development agreement was to terminate 48 months from the initial delivery date. *See* EX.2026, ¶7.

However, in January 2006, well before the 48-month expiration, Anthony attempted to terminate the co-development agreement. *See* EX.2031, EX.2026, ¶¶7.1-7.2. Again, ControlTec was forced to sue Anthony. *See* EX.2032 (Civil Action No. 06-cv-00295-MSK). That case also settled quickly. *See* EX.2033.

³ Anthony's transfer of intellectual property rights regarding the '847 and '181 Patent after the termination of the co-development agreement prevents it in the currently stayed District Court proceeding from challenging the validity of these patents in that forum under the doctrine of assignor estoppel. *See Diamond Scientific Co. v. Ambico, Inc.*, 848 F.2d 1220, 1224-27 (Fed. Cir. 1988); *Minerva Surgical, Inc. v. Hologic, Inc.*, 594 U.S. 559, 576 (2021).

Shortly thereafter, Anthony attempted to develop its own anti-sweat controller by and through Paul Artwohl, who had been involved in developing the co-developed product (*see* EX.2034), but the resulting controller could not replace the co-developed product and was not comparable in energy efficiency. *See* EX.2035 (US Pat. No. 8250873) (The '873 Patent relies on very similar systems to that of Bunch, to the point of copying it, which was also proven not to be an effective system in anti-sweat market (*see* EX.2029, P.13-18)).

Beginning in 2017, DOE regulations required “enhanced anti-sweat heat controls” that reduce heater energy “in a quantity corresponding to the relative humidity,” 10 C.F.R. § 431.306, effectively driving the market toward humidity/temperature-sensing controls that prevent condensation while minimizing energy use. Those regulations increased the importance of the capabilities provided by the '847 Patent—anticipatory dual set-point control with reliable hysteresis and stabilized case-level sensing. EX. EX.2037, ¶¶65–66. In December 2018, Anthony self-reported to the DOE that it had been non-compliant with the new DOE regulations since 2009:

Per the Report, Anthony’s failure to provide the antisweat door heater controllers resulted in the sale of 141,826 noncompliant WICF [walk-in coolers and freezers] doors since 2009.

Anthony also reported that it distributed in commerce at least 44,774 WICF display doors that do not meet the applicable energy

conservation performance standards at 10 C.F.R. § 431.306(d), regardless of the use of an anti-sweat heat controller.

EX.2027, P.2.

The DOE mandated that Anthony (1) “modify a basic [anti-sweat controller] model to bring it into compliance with the current applicable standard” EX.2027, P.4; and (2) “assign new model numbers and . . . maintain, and provide upon request to DOE, records that demonstrate that modifications have been made to all units of the new basic model prior to distribution in commerce.” EX.2027, P.4. The DOE further stipulated that “after [] testing, DOE determines that the modified basic model complies with the applicable standard, DOE shall issue a Notice of Allowance to permit Anthony to resume the distribution of the modified basic model in the United States” (EX.2027, P.5), and that “[s]hould Anthony fail to cease immediately the distribution in the United States of all units of models within the basic model, this letter serves as notice that DOE will seek a judicial order within 30 calendar days to restrain further distribution.” EX.2027, P.5.

Anthony then modified its energy controller in a manner that utilizes ControlTec’s innovations embodied by the claims of the ’847 Patent. *See* EX.2028, P.4 (Anthony Energy Controller (60-22715-0002) Installation Instructions, dated 11/15/2019) (depicting installation of a system of a refrigerated display case having a door and a frame); *id.* at P.7, step 6 (placing of the temperature sensing using in contact with the display case frame to monitor the case frame temperature); *id.* at

P.3 (mounting of the dew point sensing unit outside the display case); *id.* (utilizing monitored case frame temperature, ambient air temperature and relative humidity to anticipate formation of condensation at the display case and activating and deactivating the frame/door heater responsive thereto). Indeed, Anthony, through its affiliate Hill Phoenix, filed in 2019 its own patent application, resulting in US Patent No. 11,160,393 (the '393 Patent). Anthony and Hill Phoenix failed to identify in an IDS the '847 Patent or the '181 Patent, even though Anthony had been involved with their co-development, testing and nationwide distribution. *See* EX.2026; EX.2034. After pressure from the DOE, Anthony resorted to copying rather than innovating, as seen more clearly in the claim chart below:

'847 Patent	'393 Patent - Petitioner	Comments
8. A method for condensation control at a refrigerated display case having at least one door, a frame and at least one frame/door heater, said method comprising the steps of:	14. A method for reducing sweating in a temperature-controlled display device , the method comprising:	Both patents function in the context of a display case. The '393 Patent uses the term display device, and indicates that this may be a “a refrigerated display case.” EX.2036, 4:47-48. Also, the background section starts with describing “a refrigerated display case.” <i>Id.</i> , 1:7. Sweating is equivalent to condensation and the '393 Patent confirms this indicating “the control system 500 reduces the likelihood of sweating and/or condensation ...” <i>Id.</i> ,

		10:11-13.
placing a temperature sensing unit in contact with the display case frame to monitor case frame temperature ; mounting a dew point sensing unit on the display case to monitor ambient air temperature and relative humidity outside the display case; and	receiving values of an ambient temperature, a door frame temperature, and relative humidity ;	Both methods monitor the frame temperature. Both methods monitor the ambient temperature. Both methods monitor the relative humidity.
utilizing monitored case frame temperature, ambient air temperature and relative humidity to anticipate formation of condensation at the display case and activating and deactivating the frame/door heater responsive thereto.	estimating a value of a dewpoint temperature using the values of the ambient temperature and the relative humidity; determining control decisions for a door frame heater of the temperature-controlled display device using the value of the dewpoint temperature and the door frame temperature; and transitioning the door frame heater between an on-state and an off-state using the control decisions to maintain the value of the door frame temperature at or above the value of the dewpoint temperature.	Both methods use the dew point to anticipate the formation of condensation. Although the claims of the '847 merely call out a "dew point sensing unit," this unit is using dew point for on and off decisions. The specification makes this clear indicating "Heaters are activated just above dew point and thus just before moisture appears on freezer surfaces." EX.1001, 8:51-53. Then, once "the monitored frame temperature rises to a preselected set point above the dew point, the heaters are relayed off." <i>Id.</i> 8:67-9:2.

EX.2037, ¶66.

To invalidate the '847 Patent and allow Petitioner to continue to copy and patent Patent Owner's technology would be an obvious miscarriage of justice.

B. Legal framework and nexus.

Objective indicia such as commercial success, copying, industry praise, and long-felt but unsolved need are highly probative of non-obviousness because they guard against hindsight, and they must be considered as part of the totality of the obviousness analysis. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 734, 747 (Fed. Cir. 2016).

That nexus is satisfied in two independent ways here. First, the ControlTec product practicing the '847 Patent (the ControlTec AS-20 controller) implements the precise elements the petition challenges—dual set-points enabling dew-point anticipation and reliable hysteresis, together with a co-located, insulated-pocket housing that stabilizes sensing accuracy at the case. *See generally*, EX.1001; EX.2037, ¶¶65–66. Where, as here, the commercial product embodies the challenged claims, a presumption of nexus applies. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392–94 (Fed. Cir. 1988). Second, even apart from that presumption, the marketplace attributes of success track those same claimed advantages, including reduced energy consumption without increased fogging or sweating and improved sensing stability in the compact controller

package. *See* EX.2029, P.13-18 (comparing anti-sweat control strategies and finding that cycling via case-specific dew point (ControlTec’s method) produced the most energy savings against all other methods). Where the evidence demonstrates that the commercial products embody the claims and that customers and competitors prized the specific claimed capabilities, the required nexus is established.

C. Commercial success in a competitive market.

Commercial success is especially probative where, as here, it occurs in a competitive market. Commercial success is meaningful when tied to the claimed features rather than extraneous factors. *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.*, 699 F.3d 1340, 1350–57 (Fed. Cir. 2012).

Indeed, the inventor of one of Petitioner’s key references, John “Weeb” Bunch, confirms that for at least two decades there have been two principal competitors supplying anti-sweat systems to U.S. supermarkets: ControlTec and Anthony. EX.2004, ¶¶4–6. He further explains that these two companies account for the vast majority of sales and commonly are the only vendors serious customers evaluate when purchasing anti-sweat controls. EX.2004, ¶¶4–6. Widespread deployment by major chains and case manufacturers, repeat purchases, and growth tied to the models practicing the ’847 Patent reflect that customers valued the very features claimed. EX.2037, ¶¶65-66. That pattern began before the 2017 DOE

standards and continued afterward as the market converged on humidity/temperature-responsive anti-sweat control; in both periods, buyers selected ControlTec's architecture for its ability to anticipate condensation with dual set-points and maintain accuracy via the insulated, co-located sensing pocket. EX.2037, ¶¶65–66. Those capabilities were not offered by the prior continuous-heat approaches or crude duty-cycle timers, and customers' decisions to standardize on ControlTec's architecture demonstrate that the claimed solution drove demand. EX.2037, ¶¶65-66. In a market dominated by two capable suppliers, persistent commercial success attributable to the claimed design establishes non-obviousness. *Transocean*, 699 F.3d at 1350–55.

D. Copying by Anthony confirms that the market recognized the invention's value.

Indications of copying are also present. *Compare* EX.1001, *with* EX.2035; *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004) (circumstantial evidence of access, similarity, and timing can establish copying). Copying by a competitor as probative of non-obviousness when supported by reliable evidence. *Transocean*, 699 F.3d at 1351–55.

Shortly after the DOE's Notice of Noncompliance Determination, Anthony modified its energy controller to copy the functionality of ControlTec's AS-20 controller. *See* EX.2028; EX.2035. Indeed, the modified Anthony Energy

Controller from 2019 incorporated the same dual set-point condensation-anticipation strategy and co-located, insulated sensor housing approach to stabilize sensing at the case. *See* EX.2028, P.3-10; EX.2035. This alignment is not coincidental or the product of vague convergence; Anthony had access to ControlTec's product information under the co-development agreement, (*see* EX.2026, ¶1.1(a)), and by and through Paul Artwohl, Anthony's VP of Engineering, who was involved in both the development of the co-developed product and Anthony's 2019 Energy Controller. EX.2034. In a two-company market, the decision by Anthony to adopt the same structural and control architecture is cogent evidence that Anthony perceived value in the claimed solution and sought to emulate it to remain viable. EX.2004 ¶¶4–6.

E. Industry praise and adoption demonstrate problem-solving beyond the prior art.

Industry materials praise ControlTec's architecture for anticipating condensation reliably while preserving energy efficiency, and for stabilizing sensing accuracy at the case through the compact, insulated housing. For example, at the Energy & Store Development Conference in September 2018, the non-profit VEIC addressed the question of what anti-sweat heater controller works best. EX.2029, P.1-2. After testing various designs, the consensus was that ControlTec's controller method, i.e. "Cycling via Case Dew Point," generated incremental savings versus all other methods. EX.2029, P.13-18. That praise also tracks

another independent report performed by KW Engineering, which determined that ControlTec's AS-20 anti-sweat heater controller, when tested and monitored on a 5-door refrigerated case, saved 6,228 kWh annually and reduced average annual peak demand by 0.63kW—a “reduction in energy use of the door and frame anti-sweat heats of 72%.” *See* EX.2030, Pg. 5-10; *see also* *Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1358 (Fed. Cir. 2013). The rapid adoption of these controllers by sophisticated supermarket operators—entities that measure sweating, fogging, and energy costs closely—corroborates that the invention delivered benefits the prior art did not.

F. Long-felt need and failure of prior approaches.

Prior to ControlTec's innovation, there was long-felt need to reduce energy consumption without sacrificing condensation control. EX.2037, ¶¶64–66; *see also* *WBIP v. Kohler Co.*, 829 F.3d 1317, 1329–31 (Fed. Cir. 2016). Continuous heating wasted energy; crude timers failed to align with actual condensation risk and either under-protected against sweating or over-consumed energy. By 2005, robust dew-point anticipation with reliable hysteresis at the case-level controller remained unsolved precisely because it required both algorithmic sophistication and hardware placement and insulation choices that the prior art did not teach or successfully implement. EX.2037, ¶¶65–66. The '847 Patent's architecture addressed that need by pairing dual set-points for anticipation and recovery with a

co-located, insulated sensor pocket that made the control inputs trustworthy in the real thermal environment of the case. EX.2037, ¶¶54–66. Subsequent industry uptake and competitor copying confirm that this solution met a need that others could not satisfy. EX.2004, ¶¶4–6.

G. Taken together, the objective indicia compel affirming the patentability of the claims.

Commercial success tied by a clear nexus to the claimed features, deliberate copying by the principal competitor, industry praise and rapid adoption, and the satisfaction of a long-felt need together provide powerful, independent confirmation that the claimed inventions of the '847 Patent were not obvious. Weighing these objective indicia alongside the flaws in Petitioner's hindsight-driven obviousness theory compels the conclusion that the challenged claims are not obvious.

VIII. Conclusion

Patent Owner requests that the Board find the Challenged Claims not unpatentable.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

Under 37 C.F.R. § 42.24(b)(1), the undersigned attorney for the Patent Owner declares that the argument section of this Patent Owner Response (Sections I-VIII) has 13,966 words, according to the word count tool in Microsoft Word™.

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that a true and correct copy of the foregoing was served on the Petitioner as detailed below:

Date of service January 21, 2026

Manner of service Electronic Email: IPR43789-0260IP1@fr.com;
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Documents served ***PATENT OWNER RESPONSE AND EXHIBITS
EX.2014 – EX.2037***

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