
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Anthony Inc.
Petitioner
v.

ControlTec, LLC
Patent Owner

Patent No. 7,207,181
Issue Date: April 24, 2007

Title: REFRIGERATION UNIT CONDENSATION PREVENTION

Inter Partes Review No. IPR2025-00559

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. 7,207,181
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

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, ControlTec’s novel anti-sweat system is embodied in and protected by the claims of U.S. Patent No. 7,207,181 (“the ’181 Patent”).

One of those competitors, Petitioner Anthony, Inc., seeks to invalidate the ’181 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 “adapted for” claim limitations and, instead, relies on unsupported (and incorrect) inherency arguments, which requires rejection of each ground.
2. 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.

3. 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 “adapted for mounting at the 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 “adapted for mounting at the display case”); and (iii) a housing that has thermal isolation¹ (Carter’s alleged “dew point sensing unit” sits in a latch, which is generally made of heat transferring metal, and is in thermal communication with the freezer surface, and, therefore, is not thermally isolated).
4. 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.

Due to these failures, the Petition cannot support a finding that the ’181 Patent is unpatentable. As such, ControlTec respectfully requests that the Board uphold the patentability of the challenged claims.

¹ See, e.g., ’181 Patent, Claim 15 (“...means for thermally isolating said dew point sensing unit from variations in temperature of the display case frame or display case door...”).

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.² 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).³ One significant downside to putting glass doors on refrigerated 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 ’181 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,

² See EX.2021, P.1.

³ See EX.2022, P.4.

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 '181 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, 1:14-16, by activating frame/door heaters before the dew point temperature at frame and door surfaces is reached EX.1001, 3:21-24, 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, 2:14-21. 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 '181 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 '181 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) (quoting *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002); *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). Both bases apply here.

The '181 Patent independent claims rely on both the preamble and the claim body to define positive, structural limitations in the body of the claims, including by providing antecedent basis for those terms. While there is no specific test, when the preamble provides antecedent basis for claim terms found within the body of the claim, the preamble is often construed as limiting. *Shoes by Firebug LLC*, 962 F.3d at 1367 (“[D]ependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention.”) (internal citation omitted).

With respect to the challenged claims, the terms “a refrigerated display case” (Claims 1 and 14) and “an array of refrigerated display cases” (Claim 8) appear in the preamble. These preamble terms provide antecedent basis for later claim elements found within the bodies of those claims:

- Claims 1: “...the display case door or display case frame...”;
- Claim 8: “...at each display case in the array of display cases...”
- Claim 14: “...the display case frame...”

EX.1001, 9:33-34, 10:39, 11:23-24.

In addition to providing necessary antecedent basis for structural claim elements, the preambles also give life, meaning, and vitality’ to the claims. For example, the '181 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 ’181 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) (holding the preamble limiting where the phrase describing sprouts “rich in glucosinolates” gave life and meaning to the claimed methods and was relied on to distinguish the prior art); *Poly-America, L.P. v. GSE Lining Tech., Inc.*, 383 F.3d 1303, 1310–11 (Fed. Cir. 2004) (concluding “blown-film” in the preamble is limiting because it recited essential structure and characteristics of the claimed liner bags and was central to patentability, thereby giving the claims life and meaning).

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 “array of refrigerated display cases”—as limiting.

B. “adapted for” limitations

The challenged independent Claims 1 and 8 include the term “adapted for.” Patent Owner contends “adapted for” should be construed consistent with its plain and ordinary meaning. As explained in Section V.A below, the Board must take

caution when applying the plain and ordinary meaning so as not to equate “adapted for” with “capable of”—a narrower interpretation (and application) is required.

Claim 1 recites: “a frame temperature sensing unit *adapted for* monitoring temperature of one of the display case door or display case frame” and “a dew point sensing unit *adapted for* monitoring ambient air temperature and relative humidity outside of the display case.” EX.1001, 9:32-34, 36-38. Claim 8 recites: “a frame temperature sensing unit *adapted for* mounting at the display case for monitoring temperature of one of the display case door or display case frame, a dew point sensing unit *adapted for* mounting at the display case for monitoring ambient air temperature.” EX.1001, 10:40-45. These terms are referred to as the “adapted for” limitations.

When read in context, the “adapted for” terms require that the claimed “sensing unit” be designed or constructed for its intended purpose: (i) to monitor the temperature(s) of various factors/components (as set forth in each claim); and (ii) to function in connection with a display case and a display case frame. The claimed “sensing units” must specifically be “adapted” in this way—it is insufficient that the claimed “sensing units” be merely “capable of” such functions. *See In re Giannelli*, 739 F.3d 1375, 1379 (Fed. Cir. 2014).

In *In re Giannelli*, the Federal Circuit reversed the Board’s claim construction and application of “adapted to” that was akin to “capable of.” There,

Claim 1 described a row exercise machine with a first handle portion “adapted to be moved from a first position to a second position by a pulling force exerted by a user on the first handle portion in a rowing motion.” *Id.* at 1379. The Board concluded that the prior art chest press apparatus, which was ***designed for pushing motions***, was nonetheless “***capable of***” ***being used in a rowing motion*** by pulling the handles, rendering the claims obvious. *Id.* The Federal Circuit determined that the Board erred in its interpretation and application of “adapted to.”

In reversing the finding of unpatentability, the Federal Circuit emphasized that the phrase “adapted to” required a narrower meaning than mere capability, especially because the claimed machine at issue was “designed or constructed to be used” in a particular manner. *Id.* at 1379. Specifically, because the written description of the challenged patent specifically described structural features such as the position of handles and the resistance mechanism that were designed to facilitate a pulling motion in a linear path, the prior art chest press—which was configured for pushing and, therefore, had a different structural configuration—could not render the challenged claims obvious. *Id.* at 1379-80. This analysis was later codified in MPEP 2111.04: “an ‘adapted to’ clause limited a machine claim

where ‘the written description makes clear that ‘adapted to,’ as used in the [patent] application, has a narrower meaning.’”⁴ *Id.*

The Federal Circuit’s analysis from *In re Giannelli* and MPEP 2111.04 is equally applicable here. The ’181 Patent specification and figures describe structures that are specifically designed and “adapted for” freezer/refrigeration display case doors, as discussed in more detail in section V.A below. As such, “adapted for” in Claims 1 and 8 should be given its plain and ordinary meaning, but in analyzing the prior art, the Board must not equate “adapted to” with “capable of”—a narrower application is appropriate. *Id.*

C. Means-plus-function limitations

The challenged claims contain multiple means-plus-function terms. The ’181 Patent specification provides the corresponding structures and algorithms with specificity:

1. A processing means / control means: A microprocessor executing a defined, dual-setpoint algorithm “for activating the display case frame/door heater when monitored display case door or frame temperature drops below a preselected set point above a dew point value derived from monitored ambient temperature and relative humidity. The processor also deactivates

⁴ MPEP 2111.04(I)(A) instructs that “adapted to” and “adapted for” clauses are treated the same.

the frame/door heater when monitored display case door or frame

temperature rises above a second preselected set point above the dew point value.” EX.1001, 2:47-54; EX.2014, ¶28.

2. The portion of the claims that recites a housing means includes sufficient structure to define the means language within the claim itself. Claim 1 recites “housing means for locating said sensing units including structure establishing thermal isolation of said sensing units by minimizing heat transfer contacts between said sensing units and said housing means and locating said temperature sensor and said at least one dew point sensing component amid insulated air pockets formed by said structure of said housing means.” EX.1001, 9:47-50; EX.2014, ¶29. The housing means has a “structure establishing thermal isolation of said sensing units by minimizing heat transfer contacts between said sensing units and said housing means and locating said temperature sensor and said at least one dew point sensing component amid insulated air pockets formed by said structure of said housing means.” As articulated by Mr. Pollock, this structure is sufficient for a POSITA to understand the housing means aspect. EX.2014, ¶22-23.
3. “A means for thermally isolating said dew point sensing unit from variations in temperature of the display case frame or display case door.” EX.1001,

12:4-7; EX.2014, ¶30. The supporting structure includes two characteristics:

- (1) the housing assures the dew point sensor is held away from the frame;
- and (2) there is an air pocket behind the board/carrier of the sensor.

EX.1001, 7:1-62, Figs. 7-9; *see also* EX.1001, 7:33-43.

4. A data storing means: A “processor” or “microprocessor.” *See* EX.1001, 2:59–63) (“The processor stores data related to readings at the sensing units and operation of the frame/door heater...”), 5:34–45 (“microprocessor 53”), 8:29–45, 8:63–9:11 (“Microprocessor 53 looks up the dew point value from a stored table...”), Figs. 13, 14b; *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1316 (Fed. Cir. 2011) (a patent need not disclose anything beyond “the general purpose processor” for basic functions like “storing” data); EX.2014, ¶31.

Under § 112(f), the prior art must disclose the same or equivalent structure that performs the claimed function in the same way to achieve the same result—showing a similar structure is not enough. *See Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1364 (Fed. Cir. 2000) (equivalence under § 112(f) requires that the prior art element perform the identical function “in substantially the same way” and produce “substantially the same results”). And where the corresponding structure is a microprocessor “execut[ing] a particular algorithm,” the prior art must disclose that same or equivalent algorithm—not just any

processor that achieves a rough functional outcome. *See Aristocrat Techs. Austl.*

PTY Ltd. v. Int’l Game Tech., 521 F.3d 1328, 1338 (Fed. Cir. 2008).

For the “processing means” and “control means,” the corresponding structure is a microprocessor programmed with an algorithm “for activating the display case frame/door heater when monitored display case door or frame temperature drops below a preselected set point above a dew point value derived from monitored ambient temperature and relative humidity.” EX.1001, 9:41-46. “The processor also deactivates the frame/door heater when monitored display case door or frame temperature rises above a second preselected set point above the dew point value.” EX.1001, 2:47-54; EX.2014, ¶32-33.

The ’181 Patent’s dual dew-point-referenced setpoint algorithm preselects distinct ON and OFF thresholds above dew point that create a defined range of temperatures that prevents overheating and anticipate condensation accurately in the retail-store environment. The challenged claims recite concrete, interlocking structural and algorithmic implementations for condensation control in refrigerated display cases. EX.2014, ¶32-33.

For the “housing means,” the corresponding structure is set forth in the claim itself and is a structure “for locating said sensing units including structure establishing thermal isolation of said sensing units by minimizing heat transfer contacts between said sensing units.” EX.1001, 9:47-50. Thus, the construction of

the housing means should be a structure “for locating said sensing units including structure establishing thermal isolation of said sensing units by minimizing heat transfer contacts between said sensing units.” The Petition proposes that the structure includes a base and a cover. Pet., 5. This cannot be correct because the dependent claims already include these limitations. EX.2014, ¶34.

For example, ’181 Patent Claim 2 recites (in part):

said housing means includes a frame temperature sensing unit housing, said frame temperature sensing unit housing including *a base and a cover*, said cover having a depth *creating a first one of said air pockets* at one side of said temperature sensing unit...

EX.1001, 9:55-59 (emphasis added); EX.2014, ¶34. Construing the independent claims to also include these limitations would violate the principles of claim differentiation (the dependent claims would no longer further limit the claims from which they depend) and would improperly render those limitations in the dependent claims superfluous. *Pfizer Inc. v. Ranbaxy Labs. Ltd.*, 457 F.3d 1284, 1291–92 (Fed. Cir. 2006) (invalidating a dependent claim because it did not “specify a further limitation of the subject matter of the claim to which it refers,” underscoring that dependent claims must further limit, not duplicate or expand). Thus, Petitioner’s proposed construction cannot be correct.

The '181 Patent specification also clearly articulates the meaning of the “housing means” limitation. As set forth in the specification, the housing means provides thermal isolation:

Housing 115 is configured to *thermally isolate dew point sensor 37* so that accuracy of the dew point sensor is maintained within to 1 to 3 degrees Centigrade. First, by *assuring that sensor 37 is held away from the unnaturally heated frame* (either cooled by the freezer or heated by frame heaters) with spacer ribs 147, the frame temperature will not influence the relevant dew point readings (primarily ambient air temperature). *The air pocket (155 in FIG. 9) behind board/carrier 121* and extending all the way to the mounting surface at unit 151 prevents thermal transfer through housing 115 from the mounting surface of frame unit 151.

EX.1001, 7:33-43 (emphasis added).

Therefore, the “means for thermally isolating” which provides thermal isolation to the dew point sensor includes two characteristics: (1) the housing holds the dew point sensor away from the frame; and (2) there is an air pocket behind the board/carrier. The claim should be construed accordingly—namely, that the dew point sensor is held away from the frame and there is an air pocket behind the board/carrier.

For “data storing means,” “means for wirelessly accessing,” and the “communication control unit,” the corresponding structure is the integrated

board/transmitter/receiver coordinated by the control unit to store sensing/operation data at the case controller and to provide wireless access and remote updating of control parameters, including the reset/programming interface at the case. As set forth in the specification, “[t]he entire system preferably includes wireless communication for receiving data from multiple control units 31 at different cases 21. Controller unit 31 and communications board/transmitter/receiver 59 transfer data to central processing 59 for data viewing, tracking and report preparation.” EX.1001, 1:10-14. These elements provide structure for the data storing means, the means for wirelessly accessing, and the communication control unit. EX.2014, ¶39.

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.2014, ¶11. The reason for this is multifold. First, the Field of Invention of the ’181 Patent is “remediat[ing] condensation build up *in refrigerated display cases*.” EX.1001, 1:6-8 (emphasis added). Thermal characteristics of refrigerated display cases present unique challenges compared to ordinary refrigerators, due to the frame and glass combination used. EX.2014, ¶11. 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 '181 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, 2:14-17. 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, 2:14-17, 2:32-35, 2:40-46, 2:55-57, 2:64-66, 3:9-12, 3:13-17, 3:19-25, 3:26-29, 3:34-39, 3:57-60, 4:16-20. 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, 5:14-17. 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 “[c]ondensation control apparatus for a refrigerated display case,” and

forms the antecedent for claims 2-7. EX.1001, 9:29:30. Claim 8 recites a “an array of refrigerated display cases,” and forms the antecedent for claims 9-13.

EX.1001, 10:33-34. Claim 14 recites “a refrigerated display case,” and forms the antecedent for claims 15-20. EX.1001, 11:20-21. All the claims require a refrigerated display case and many of the claims delve into the 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 glass doors and display equipment:

For over 60 years, Anthony has set the standard in door solutions trusted by retailers nationwide When you choose Anthony, ***you’re not just buying doors — you’re selecting decades of proven innovation that retailers depend on today.***

EX.2017, 5 (emphasis added).

Petitioner pins its over-fifty year’s 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 here. The issue in *Axonics*

was whether a POSITA (with respect to the patent in that case) would have experience in implantable medical devices or, more specifically, experience in sacral neuromodulation. *Id.* at 12. The Board found that experience in the specific subfield was needed because the patent defined the field of the invention as medical electrical leads for sacral neuromodulation, and the specification described the invention with respect to the sacral anatomy. *Id.* at 14. Here, both the specification and the field of invention are specific to “refrigerated display cases.” Much of the structure, as explained above, is described in relation to refrigerated display cases, including the specific structures of housings and sensors. Moreover, the ’181 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.2014, ¶22. 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 '181 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.

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

Condensation control, specifically as applied to refrigerated display cases, is a critical aspect of the inventions claimed in the '181 Patent. In his deposition, Dr. Henze confirmed that he 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 not inconsequential. For example, 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.2014, ¶14-16. Dr. Henze also misinterprets or does not understand the use of the term “frame” in the context of refrigerated display cases. EX.2014, ¶21.

These failings 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 ’181 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) (recognizing that expert testimony on issues requiring specialized technical knowledge must come from a witness qualified in the

relevant art; district court may exclude or discount opinions from experts 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. *See infra* Sections III.A, V.A.

V. Failings of the Petition

A. The Petition fails to address the “adapted for” limitations of Claims 1 and 8.

As explained in Section III.B, which is incorporated herein, the terms “adapted for” must be construed (and applied) more narrowly than “merely capable of.” The Federal Circuit has held that “adapted to” connotes a configuration or design arranged for a particular purpose, not mere capability. *See In re Giannelli*, 739 F.3d at 1378–80. The Petition is silent on this issue. EX.2014, ¶45.

The '181 Patent specification and figures describe structures that are specifically designed and “adapted for” freezer/refrigeration display case doors. For example:

Temperature sensing chip 91 is located on board/carrier 89 so that when received in housing 83 it is located through sensor opening 99 at base 87. With proper materials sizing, chip 91 will be in direct contact with the surface of unit 93 being monitored when base 87 is mounted on frame unit 93.

EX.1001, 6:40-44.

Housing 83 is configured at cover 85 and base 87 to thermally isolate sensing chip 91 from the warming effects of ambient air temperature in the vicinity of the chip and transfer thereof by the housing to the chip. Air space pockets 105 and 107 above and around chip 91, respectively, and limited housing contact (see FIG. 5 wherein only a single locating post 109 maintains board/carrier 89 at its position in housing 83) isolate chip 91 from the housing.

EX.1001, 6:50-57.

Air space pocket 105 is created by the depth of cover 85 adjacent board/carrier 89, the cover also insulating the sensor chip from the ambient. Air space pocket 107 is created by opening 99 having an opening area greater than surface area of chip 91.

EX.1001, 7:1-7:5.

These purpose-built structures and configurations for display-case mounting and operation are absent from cited prior art. Rather than addressing the substantive “adapted for” limitations, the Petition relies on a generalized assertion that a POSITA “would have been motivated to apply Carter’s apparatus to the well-known use case of refrigerated display cases that store retail food item....” Pet., 13. This conclusory assertion of an alleged “motivation” is inadequate.

The Petitioner must “make [its] case in [the] petition,” which must include a specific and credible explanation of how and why a POSITA would modify the prior art to satisfy each claim requirement, particularly limitations requiring

adaptation to a defined function. *See Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–69 (Fed. Cir. 2016) (holding that IPR petitioners must “make their case in their petition” and may not rely on conclusory expert assertions; affirming where the petition failed to provide a “specific or credible explanation” of how and why a POSITA would modify the prior art to meet the claim limitations). Here, the Petition never explains what structural or control changes would be made to configure the prior art so that the claimed temperature sensing units would be adapted for monitoring the display case door or the display case frame, as Claims 1 and 8 require.

Giannelli also forecloses the Petition’s implicit “capable of” theory. Where the claims require components “adapted for” a specific application, the Petition must show that the prior art teaches those components as arranged or configured for that use, not merely that they could, in theory, be repurposed. 739 F.3d at 1378–80. That showing is especially necessary here because Carter’s system is deployed in a materially different environment and relies on features not present in refrigerated display cases.

Specifically, Carter describes a “door latch cover assembly.” EX.1004, 5:4–7; Fig. 1. By contrast, refrigerated display cases ordinarily lack such a latch cover assembly. *See, e.g.*, EX.1006 (Beatenbough) (depicting a refrigerated display case without a door latch cover assembly). The Petition does not explain how Carter

would be reconfigured to monitor the display case door or frame in this different platform, nor how Carter’s sensors and controls would be adapted for the specific frame/door monitoring functions recited in the claims. Absent a reasoned explanation, supported by evidence, of the modifications necessary to adapt Carter’s system to the claimed display case structures and functions, the Petition fails to establish that the ’181 Patent is unpatentable. Conclusory statements of motivation or possibility do not supply the required “articulated reasoning with some rational underpinning.” *In re Kahn*, 441 F.3d 977, 988–89 (Fed. Cir. 2006). Because the Petition fails to adequately address the “adapted to” limitations, the Petition fails in its entirety.

Nevertheless, the Petition asserts that King’s sensor system could be placed on the glass of Beatenbough. Pet., 41. But that does not explain how the sensor system would be adapted for monitoring the temperature of one of the display case door or frame. EX.2014, ¶47. King is not adapted for monitoring a display case door or frame. *Id.* Rather, King’s Field of Invention states: “[t]his invention relates to an automotive windshield fog sensor. More particularly, this invention relates to an integrated glass fog sensor unit terminated on a flex circuit.” EX.1005, 1:4–6. King is thus non-analogous art. EX.2014, ¶47.

The Petition also states in conclusory fashion that it would have been an obvious alternative to locate a “sensor unit” like King’s against the display case

frame to monitor frame temperature. Pet., 43-46. But the Petition provides no explanation regarding how the sensor unit would be adapted for “monitoring temperature of one of the display case door or display case frame.” EX.2014, ¶48. The Petition identifies no modifications beyond merely moving the sensor. *Id.* Because the Petition does not address these claim requirements, it fails on this basis as well. *See In re Kahn*, 441 F.3d at 988–89.

B. Carter lacks the claimed control logic.

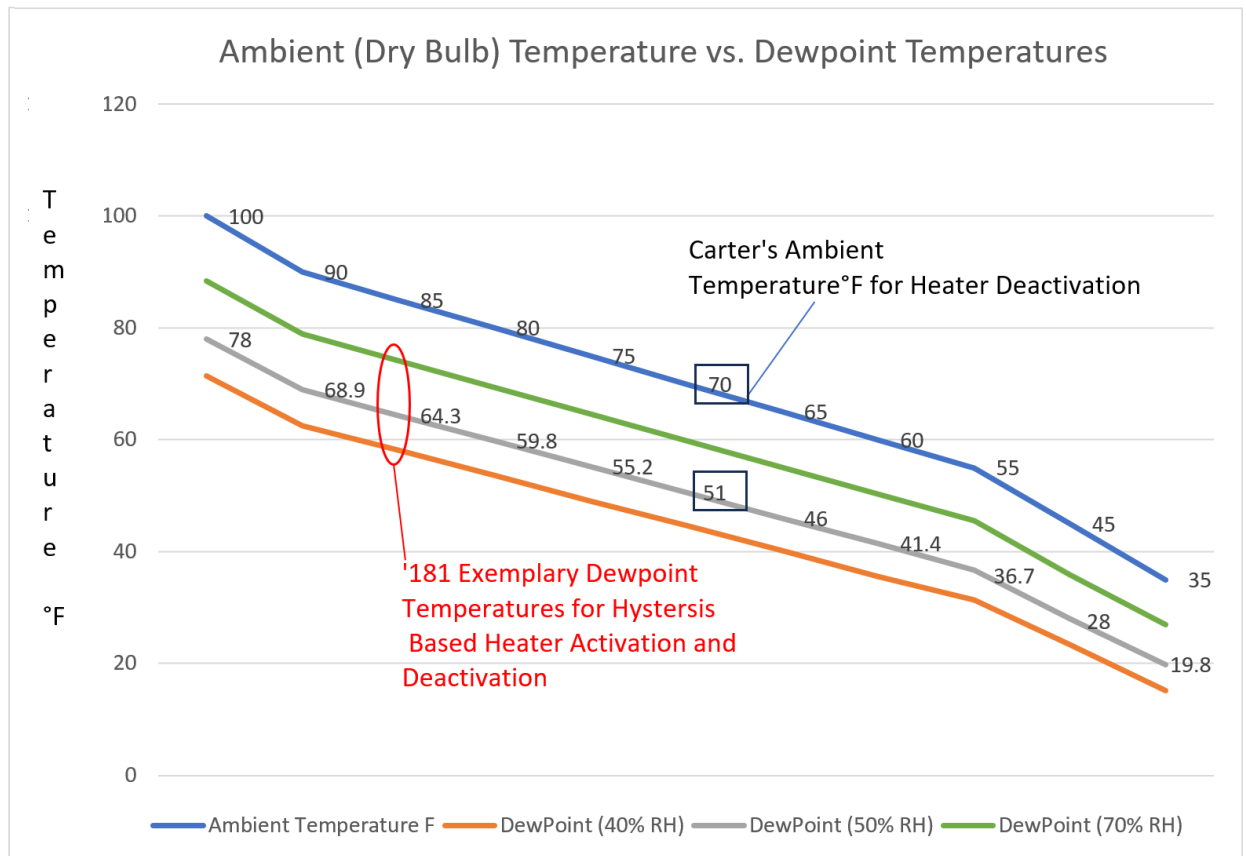
Carter’s heater control scheme does not teach or suggest the ’181 Patent’s claimed algorithm. Carter triggers heat at dew point + constant but deactivates heat when the ambient and surface temperatures are equal. EX.1004, 5:34-63. In other words, Carter makes no use of the dew point reference at shut-off. The ’181 Patent, by contrast, uses a single, dew point-referenced hysteresis with distinct, preselected set points for both actuation and termination. EX.2014, ¶20. 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.2014, ¶19.

That is not a trivial implementation choice; it is a different control logic with different stability, energy, and performance consequences.

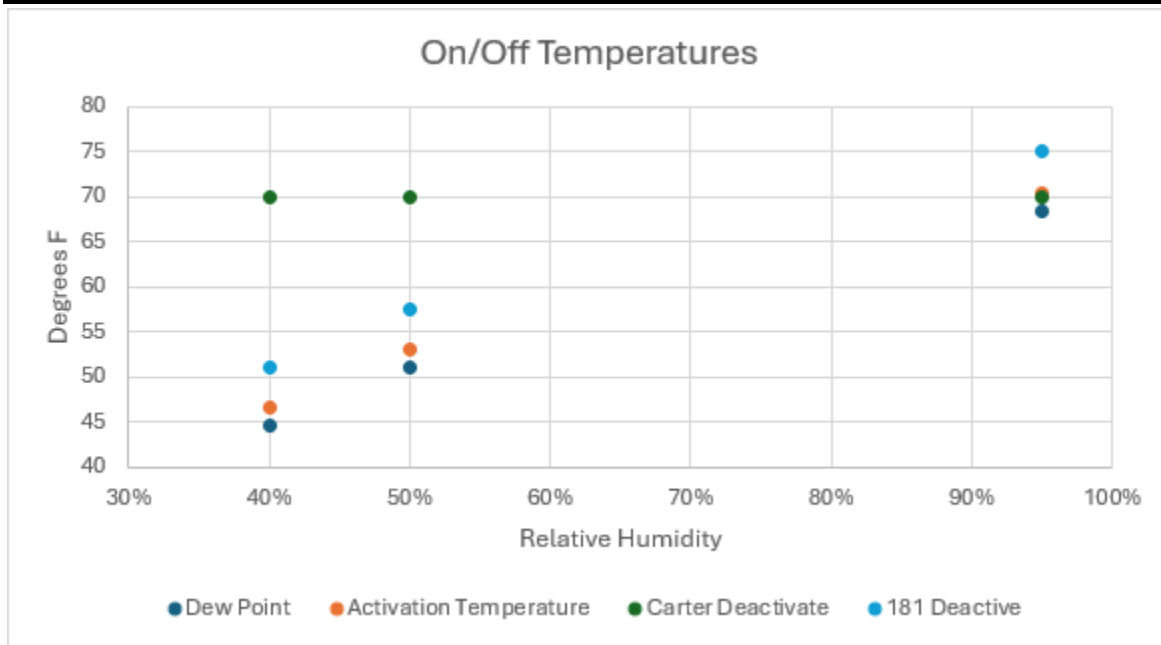
The differences between Carter and the '181 Patent's controls are illustrated in the two charts below. In the first chart, a band of three dewpoint temperatures illustrate how the dewpoint varies with both the ambient temperature (top blue line) and the relative humidity ("RH") of the air, such as 40%-70% as shown. EX.2014, ¶56. 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 '181 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 '181 Patent and early or only momentarily at high humidity. EX.2014, ¶56. This results in a wasted energy at lower humidity and insufficient warming to prevent condensation at higher humidity. EX.2014, ¶56. In fact, in Carter, at high humidity, the off setpoint is under the on setpoint. EX.2014, ¶56. With setpoints based on the dewpoint, the '181 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.2014, ¶56; EX.2020 (for dew point data at various humidities and temperatures).



EX.2014, ¶56; 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.2014, ¶57. 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.2014, ¶57; EX.1004, 5:41-54. Under the same conditions, the '181 Patent targets and maintains the door 5°F above the dewpoint of 50°F, or at 55°F. EX.2014, ¶57. 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.2014, ¶57. This leads to a gain

of 4.5°F for the frame. EX.2014, ¶57. 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.2014, ¶57. 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.2014, ¶57. The ’181 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 ’181 Patent’s data handling choices—averaging of sensor inputs and use of stored dew point tables tied to the local controller. EX.2014, ¶58. Those choices 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.2014, ¶58. 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.2014, ¶81) and substituting ambient-based deactivation “increase[s] sensitivity to ambient air stratification and differing system cycling

risk in high-traffic conditions,” particularly in high-traffic conditions. EX.2014, ¶20, 55-58, and 67.

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 ’181 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.

C. 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 14: that heater control be activated and deactivated responsive to the anticipation of condensation. EX.1001, 11:28-12:1-3. 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 30. Accordingly, Petitioner fails to meet its burden to show that Carter discloses or renders obvious the claim’s deactivation requirement.

Claim 14 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, 11:30-12:3. 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.2014, ¶60. Therefore, if the surface temperature is heated to ambient temperature, condensation may still occur. *Id.* This is especially true where, as disclosed in the ’181 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 certainly enough to cause condensation in high humidity circumstances, where the

frame might be 2 degrees colder than the ambient temperature. EX.2014, ¶60.

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.2014, ¶60-61. 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.2014, ¶60-61. 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.2014, ¶60.

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., 30. 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.2014, ¶60. 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.2014, ¶60. Third, Claim 14 requires heater deactivation responsive to anticipating condensation. EX.1001, 11:28-12:1-3. 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.2014, ¶60-61.

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, 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 ’181 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.2014, ¶¶63-64. Therefore, the Petition both fails to address and render obvious the deactivation in relation to anticipated condensation limitation.

D. The Petition improperly relies on inherency to supply “deactivation in anticipation of condensation,” mirroring the error reversed in *LBT IP*.

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.2014, ¶60. 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 ’181 Patent are presented below:

’618 Patent – Pertinent Claim Section from Claim 1	’181 Patent – Pertinent Claim 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>	control means for receiving data from said sensing units and 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>

As in *LBT IP*, Petitioner requests that the Board to infer the missing “deactivating responsive to anticipating” limitation from an expert’s interpretation of a different control action disclosed in the prior art. That is not inherency.

In *LBT IP*, the Board found that one of the prior art references, Sakamoto, disclosed “activating/reactivating the GPS receiver when it transitions from stop-position mode into normal sensitivity positioning mode or high sensitivity positioning mode. 2023 U.S. App. LEXIS 14376, *6. The Federal Circuit

overturned this conclusion as not being supported by substantial evidence. *Id.* at 11.

Sakamoto was identified as “not explicitly identify moving out of the stop-position mode as a result of the cyclic signal level checking.” *Id.* at 7. The Petitioner relied on testimony to fill in the gap in this disclosure:

Mr. Andrews testified that a skilled artisan would have understood that if Sakamoto’s receiver is in stop-position mode and the periodically-measured signal level is greater than a predetermined threshold level, the GPS receiver reactivates by transitioning into normal or high sensitivity positioning mode. He also testified that a skilled artisan would have understood a device that transitioned into stop-position mode and never transitioned into one of the other positioning modes would be useless. (Andrews deposition) ([Sakamoto] doesn’t contemplate that once the – once the GPS signal level went below that threshold, the system would turn off and never turn on again. That would be – that wouldn’t be very practical.’).

Id. at 7-8 (internal citations omitted).

The Federal Circuit identified this argument as being one of inherency. *Id.* at 8. While the Petitioner conceded that there was no “explicit disclosure of a transition out of stop-position mode in Sakamoto,” it nevertheless argued that “a skilled artisan would understand this transition is present in the cycle set in advance embodiment. *Id.* To prove this, the Petition needed show that the recited limitation is “necessarily present” or “the natural result of the combination of elements explicitly disclosed by the prior art.” *Id.*

Similarly here, the Petition relies on Dr. Henze’s assertion that Carter

“teaches or renders obvious the claimed function of deactivating the frame/door heater responsive to anticipating the formation of condensation,” citing Carter’s statements that supplemental heat is “only activated under conditions that would promote surface condensation,” and that “when condensation is no longer anticipated...the control unit will deactivate the supplemental heat.” EX.1003, ¶120; EX.1004, 2:4–32; 3:42–53. But Carter says something different: Carter ties deactivation to ambient temperature, not to a renewed anticipation-of-condensation judgment. 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, ¶128. That is a proposal to modify Carter for efficiency, not evidence that Carter inherently performs deactivation in anticipation of condensation. EX.1003, ¶128–129. Indeed, by

acknowledging the heater could remain active despite no imminent risk, Dr. Henze confirms that Carter’s deactivation does not depend on an anticipation assessment. EX.1003, ¶128.

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, ¶131. 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, ¶131. If deactivation were truly driven by anticipation, it would not systematically mis-time shutoff as humidity varies. EX.1003, ¶131.

Unable to locate the claimed function in Carter, the Petition substitutes the ’181 Patent’s claimed approach by “replac[ing] Carter’s ambient temperature target for heater deactivation with a target temperature equal to dew point plus a preselected set point,” and introduces a newly coined “floating offset” construct. EX.1003, ¶132 (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 ’181 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, ¶130. 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, ¶130–132. 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, ¶¶128–132.

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 ’181 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, ¶¶120, 128–132; 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 “deactivating...responsive to anticipating [condensation]” 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.

E. 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 what the claims actually require. The Board should reject the Petition’s attempted reframing at the outset. *See In re Kahn*, 441 F.3d at 988 (requiring “articulated reasoning with some rational underpinning”); Pet. 37–38; EX.2014, ¶40.

The ’181 Patent does not claim a generic “control of heating functions” for undifferentiated refrigeration equipment. *See* Pet., 37–38 (misstating the field of invention). Rather, the ’181 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, 1:6–10. 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, 2:18–21; 5:14–24; EX.2014, ¶41. That structural and operational context is not surplusage; it is the platform on which the claims are

built. *See* EX.1001, 1:6–10; 5:14–24.

The claims likewise anchor the '181 Patent's invention to refrigerated display case structure. *See* EX.1001, 1:6–10; 2:18–21. As described in Section III.A, which is incorporated herein, 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 frame” and “*the* display case frame/door heater.” *See* EX.1001, 1:6–10; 2:18–21 (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—or any other asserted reference—discloses a refrigerated display case, a display case frame, or a display case frame/door heater. *See* Pet. 12–14; EX.1004, 1:15–2:32; EX.1003, ¶81. 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 an actual 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. 13; EX.1003, ¶81. 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 ’181 Patent and Carter endeavor to solve entirely different problems—namely, the ’181 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, 1:6–10; 2:18–21; 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.

All words in the claims must be given effect including, where appropriate, the limitations set forth in the preamble. *See In re Wilson*, 424 F.2d 1382, 1385 (C.C.P.A. 1970); *Shoes by Firebug LLC*, 962 F.3d at 1367. In the case of the ’181 Patent Claims 1 and 8, and those that depend, the preamble must be construed as limiting. *See* Section III.A. 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.

F. Carter and King do not disclose a housing that provides thermal isolation.

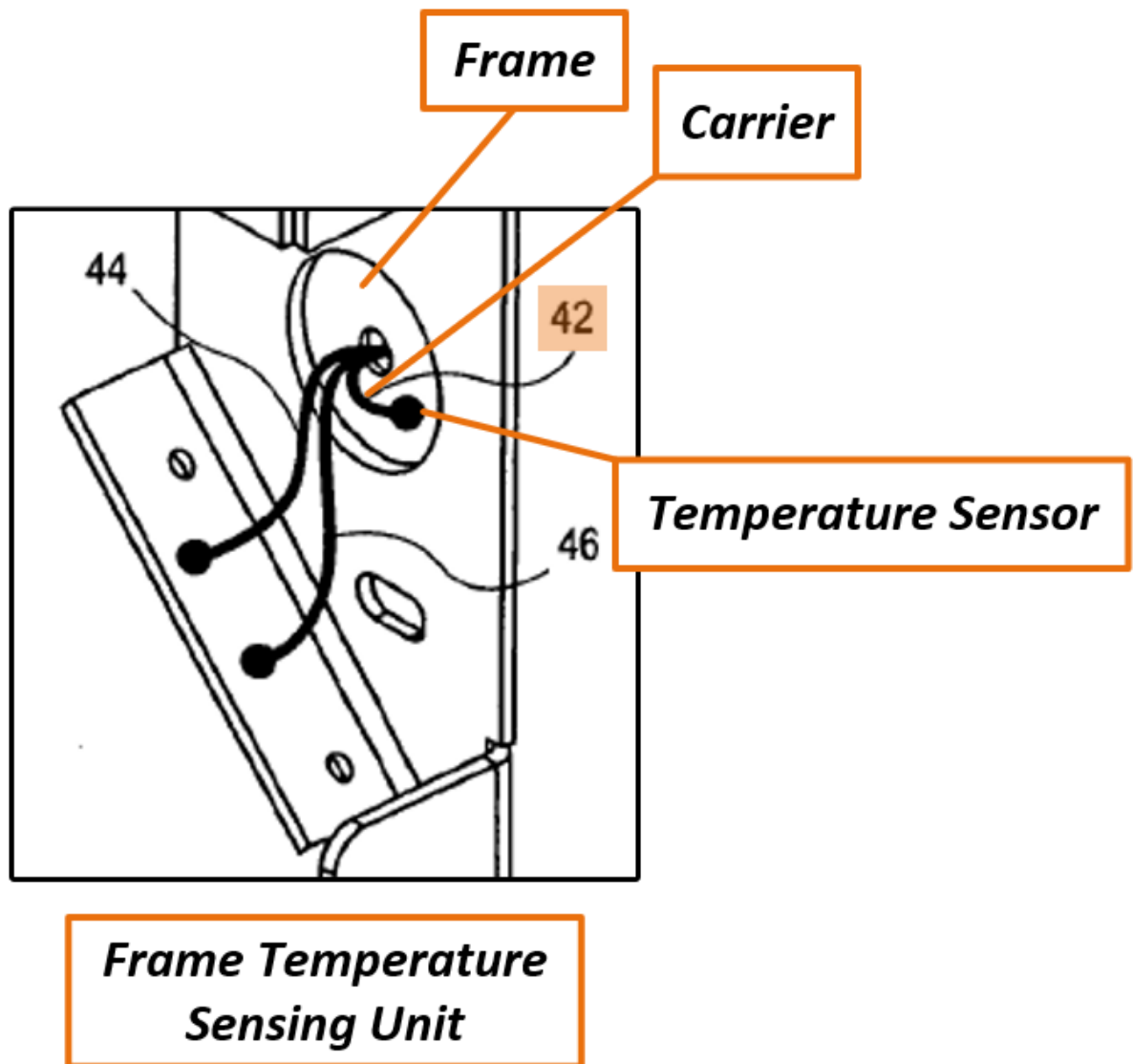
The challenged claims require more than merely enclosing sensors within a cover or positioning them in proximity to one another. Rather, the claims expressly recite a housing means configured to both minimize heat transfer contacts and to locate the temperature sensor and the dew point sensing component amid insulated air pockets formed by the housing itself. EX.1001, 9:47–53; EX.2014, ¶71. The specification describes purposeful structures—mated base-and-cover geometries that create defined insulated pockets, controlled venting paths across the dew-point component, and retaining features that limit conductive pathways—so that the sensors are thermally isolated from the housing and from each other. EX.1001, 6:63–7:25; EX.2014, ¶70–71. As Mr. Pollock explains, the claimed function is to co-locate, thermally decouple, and stabilize sensing accuracy in a compact, case-mounted housing that simultaneously measures frame temperature accurately while not thermally polluting ambient T/RH (temperature/ relative humidity) readings. EX.2014, ¶71. The Petition fails to articulate how Carter and King meet these requirements.

Claim 1 recites a “housing means” that establishes thermal isolation by

minimizing heat transfer contacts between the sensing units and the housing, and that locates both the temperature sensor and the dew point sensing component amid insulated air pockets formed by the housing. EX.1001, 9:47–53. Claim 15 recites a means for thermally isolating the dew point sensing unit from variations in temperature of the display case frame or door. EX.1001, 12:4–7. As set forth in Section III.C, the claimed housing and means for thermal isolation require at least that the dew point sensor be held away from the frame and that there be an air pocket behind the board or carrier of the sensor. EX.2014, ¶74–77. Even under the Petition’s proposed constructions—where Claim 1 requires insulated air pockets formed by the housing structure and Claim 15 requires a mated base and cover establishing an air pocket around the dew point sensing unit—Carter and King do not render obvious the claimed thermal isolation. Pet., 24–46; EX.2014, ¶74–77. Also, as described below, in section VI.F., these two means claim aspects cannot necessarily be read in the same way. One is “establishes thermal isolation” and the other “thermally isolating the dew point sensing unit from variations in temperature of the display case frame or door.”

Carter’s latch cover is a generic enclosure that merely houses components—it does not create insulated air pockets or minimize heat transfer contacts as claimed. The Petition asserts that Carter’s figures illustrate minimal, if any, heat transfer contact between the sensing units and the latch cover because Carter does

not expressly state contact with the housing. EX.1003, ¶108; EX.1004, 5:1–20; Pet., 24. However, that conclusory inference is contradicted by the Petition’s own argument. For example, Figure 2 shows the three sensors in essentially identical arrangements, each mounted on the surface it touches. Pet., 14–16, 24; EX.1004, Fig. 2 (showing part 42, 44 and 46 shown in essentially identical arrangements against the frame).



EX.1004, Figure 2.

As shown above, the wire terminations indicate mounting on those respective surfaces, confirming that the sensors rest on and contact the frame or frame-conducting surfaces rather than being held away from them. EX.2014, ¶¶74–75. Figure 2 also shows that there is no air pocket behind the board or carrier of the sensors. EX.2014, ¶¶74–75. As Mr. Pollock explains, no pocketing geometry exists and that the latch assembly is typically metal, which would tend to conduct heat into the sensors, rather than minimize heat transfer contacts. EX.2014, ¶75. Accordingly, the claimed rib or post features that create insulated air pockets and interrupt conductive pathways are absent from Carter. EX.1001, 6:63–7:25; EX.2014, ¶¶74–76. Carter fails to provide the claimed structure or function of thermal isolation required in Claims 1 and 15.

King likewise does not provide thermal isolation. EX.2014, ¶¶76–77. The Petition posits that King’s “sensor unit” would be located against the display case frame to monitor frame temperature, mirroring Carter. Pet., 46; EX.1003, ¶169. That placement, however, concedes that the sensor unit sits on the frame without minimizing contact and without an air pocket behind the board or carrier. The Petition further points to King’s flex circuit as a “thermal barrier,” but that is not a housing means that minimizes heat transfer contacts between the sensing units and the housing. EX.1005, 1:54–60, 1:66–2:7, 3:3–19; Pet., 45; EX.2014, ¶76. The

flex circuit is part of the sensor assembly, not a structural housing that creates insulated air pockets as required by claim 1. The '181 Patent discloses sensors mounted on a circuit board, but the board is not the housing and does not by itself provide the required thermal isolation. EX.1001, 7:13–14, Fig. 8; EX.2014, ¶76. King's under-dome volume and tray are engineered for automotive glass and open-air exposure, not for a refrigerated display case, let alone a case-mounted housing that co-locates both the frame temperature sensor and dew-point sensor amid insulated pockets formed by the housing. EX.2014, ¶70. As Mr. Pollock concludes, King does not disclose locating both units amid insulated air pockets, as required. EX.2014, ¶70.

The additional references cited in the Petition do not cure these deficiencies. Pet., 46–49. Kotani's sealed "sensor room" is the opposite of what the claims require: it is a sealed chamber that prevents ambient exchange, not a vented, insulated pocketing that permits accurate ambient dew-point sensing while isolating from frame conduction. EX.2014, ¶78. Incidental voids in an enclosure or ad hoc under-cover volumes are not insulated air pockets formed by the housing in the manner and for the purposes required by the claims and specification.

In sum, even under the Petition's broad constructions, the combination of Carter and King fail to disclose or render obvious the claimed housing means that minimizes heat transfer contacts and locates both the temperature and dew-point

sensors amid insulated air pockets formed by the housing. EX.2014, ¶¶74–78; Pet., 24–49. Carter places sensors in contact with the frame and provides no air pocket behind the sensor carrier. EX.1004, Fig. 2; EX.2014, ¶¶74–75. King’s flex circuit is not a housing, and its arrangement neither minimizes housing contacts nor creates the required insulated air pockets. EX.1005, 1:54–60, 1:66–2:7, 3:3–19; EX.2014, ¶¶76–77. The Petition’s grounds do not establish that the claimed thermal isolation is taught or would have been obvious and, therefore, cannot support a finding that the ’181 Patent is unpatentable. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (requiring a reasoned rationale); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 (Fed. Cir. 2015) (means-plus-function requires corresponding structure); *Hockerson-Halberstadt, Inc. v. Avia Grp. Int’l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000) (drawings do not define the precise proportions of elements and cannot add limitations absent textual support); *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (inherency cannot rest on probabilities or possibilities).

G. King and Kotani are non-analogous art.

The Petition’s obviousness theory fails since it relies on non-analogous art. Prior art is analogous only if it is either in the same field of endeavor as the claimed invention or reasonably pertinent to the particular problem addressed by the inventor. *See In re Bigio*, 381 F.3d 1320, 1325–26 (Fed. Cir. 2004); *In re Clay*,

966 F.2d 656, 659–60 (Fed. Cir. 1992); *Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1358–60 (Fed. Cir. 2020). The ’181 Patent addresses a specific, practical problem unique to refrigerated display cases: a frame temperature sensor and dew-point sensing components at the display case frame while minimizing heat transfer contacts and situating both amid insulated air pockets to enable accurate dew-point control in that environment. *See* EX.1001, 1:6–15; 3:12–25; 6:4–20; 10:5–20; 17:6–22; 19:9–23; cl.1. The references on which the Petition relies—King and Kotani—are neither in the same field of endeavor nor reasonably pertinent to that problem articulated in the ’181 Patent and, therefore, cannot be combined to supply the claimed solution.

King concerns “an automotive windshield fog sensor,” and teaches an integrated glass fog sensor unit adhered to a windshield, with a protective dome and a thermal barrier tray tuned to laminated automotive glass and to cabin airflow conditions. EX.1005, 1:4-6, 48-65. The entire design is optimized for a laminated-glass substrate, vehicular thermal dynamics, and airflow particular to the cabin environment. Kotani concerns a bench-top humidity/temperature module that uses a sealed sensor room to isolate the sensing element from internal electronics. EX.1008, 3:18-31. Neither reference addresses, or even contemplates, refrigerated display case condensation control, let alone the ’181 Patent’s specific constraints of mounting at the display case frame, minimizing conductive and convective heat

transfer pathways, and maintaining exposure suitable for dew-point sensing within insulated air pockets. *See* EX.1001, 1:6–15; 6:4–20; 10:5–20; 17:6–22; 19:9–23.

The Petition attempts to resolve this deficiency by redefining the '181 Patent's field of invention as "condensation control" and labels King as being within that field. Pet., 36-37. However, the Petition's attempt to redefine the '181 Patent's field of invention is impermissibly overbroad and untethered to the '181 Patent's actual statement regarding the field of invention (i.e., "remediat[ing] condensation build-up in refrigerated display cases") and the details of the claimed refrigerated display case frame. EX.1001, 1:6-7; *see Donner*, 979 F.3d at 1358–60 (field of endeavor considers specification and claimed advance); *Bigio*, 381 F.3d at 1325–26; *In re Klein*, 647 F.3d 1343, 1348–49 (Fed. Cir. 2011). As Mr. Pollock explains, King's package "was designed for a laminated glass application...not the structure claimed and disclosed in the '181 patent," and it "does not disclose locating both units amid insulated air pockets as required," nor the claimed "minimizing heat transfer contacts" in the refrigerated case environment. EX.2014, ¶67–68.

Kotani fares no better. Kotani's sealed chamber architecture defeats the vented ambient exposure that is necessary for dew-point monitoring at a refrigerated display case frame. EX.2014, ¶78. In other words, Kotani's design goal—isolating the sensor from ambient exchange with its surroundings—

contradicts the '181 Patent's requirement that the dew-point sensing components be exposed to the relevant air conditions while thermally isolating from the frame.

Under either prong of the analogous art test, the Petition's references fall short—they are not in the same field of endeavor as refrigerated display case condensation control at the frame, and they are not reasonably pertinent to the specific problem the '181 patent solves. Because King and Kotani are non-analogous, they cannot supply the teachings necessary to render the challenged claims obvious, and the Petition must fail on all grounds. *See Klein*, 647 F.3d at 1348–49 (reversing obviousness where prior art not reasonably pertinent to problem); *Clay*, 966 F.2d at 659–60; *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238–39 (Fed. Cir. 2010); *Donner*, 979 F.3d at 1358–60.

H. Data storing means; means for wirelessly accessing; remote updating; communication control unit.

The Board should reject Petitioner's challenge to claims 18–20 because these limitations are governed by § 112(f) and require identification of the corresponding structure (or an equivalent) disclosed in the '181 Patent; high-level functionality alone is insufficient. When properly construed, Claims 18–20 recite an integrated communications architecture at the case controller that performs concrete tasks using concrete components: “*a data storing means*” that communicates with the control means to store sensor readings and heater-operation data; a “*means for wirelessly accessing*” that stored data; and configuration for

“remotely updating control parameters.” EX.1001, 12:16-24. These capabilities are all coordinated by a *“communication control unit”* and are accessible via a *“reset/programming interface.”* EX.1001, 12:16-24. The specification identifies the corresponding structure as a communication board/transmitter/receiver coordinated by a communication control unit at the case controller that “handle[s] programming, data download access, and remote parameter updates.” EX.1001, 12:16-28. Under § 112(f), the claim scope is limited to this disclosed structure and its statutory equivalents; reciting generic processors or untethered functionality does not satisfy this requirement. *See Williamson*, 792 F.3d at 1350. The Petition does not meet this standard. While the Petition points to generic processors and cites Gatling’s wireless elements, it never maps those generalities to the same or equivalent structures of the ’181 Patent, element-by-element and function-by-function. EX.2014, ¶80. Further, Gatling’s system “wirelessly logs food temperatures for HACCP compliance,” which is fundamentally different in both purpose and configuration from the ’181 Patent’s controller-resident communications board/transmitter/receiver governed by a communication control unit. Gatling also does not disclose wirelessly accessing the stored data of the claimed apparatus via the claimed communication control unit, nor does it disclose writing control parameters back to the local processor through a reset/programming interface to effect remote parameter updates. The Petition thus

replaces the claimed structural correspondence with high-level functional descriptions, which is insufficient under § 112(f). EX.1001, 12:16-28; EX.2014, ¶80; *Blackboard, Inc. v. Desire2Learn Inc.*, 574 F.3d 1371, 1384–86 (Fed. Cir. 2009).

Because the Petition fails to identify within the prior art the same or equivalent communications structure—namely, the communication board/transmitter/receiver coordinated by a communication control unit—the Petition fails to satisfy the means-plus-function limitations of Claims 18–20. The Petition’s reliance on generic processing and Gatling’s temperature-logging elements does not supply the required structural correspondence and therefore fails as a matter of law and fact under § 112(f). Accordingly, Petitioner has not met its burden as to Claims 18–20.

VI. Claim by Claim Analysis

A. Ground 1A: Claims 1–2 and 14–18 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 requirement of “a frame temperature sensing unit adapted for monitoring temperature of one of the display case door or display case frame” and its counterparts. 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 a unit adapted for frame or door monitoring as claimed. Pet., 13; *see* Section IV.A. The “*adapted for*” limitations require more than mere capability, and the Petition offers no concrete mapping or modification to satisfy these limitations. *See In re Giannelli*, 739 F.3d at 1379–80.

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.2014, ¶¶52–53. 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.2014, ¶¶52–53.

Fourth, Carter’s latch-cover arrangement does not satisfy the “housing means” corresponding structure. The claims require a case-mounted housing that provides thermal isolation by minimizing heat-transfer contacts and positioning both sensors within insulating air pockets formed by the housing. *See* Section IV.E. Carter merely integrates sensors within a latch to improve readings, without disclosing the engineered air-pocket geometry or minimized-contact features. EX.2014, ¶44.

Fifth, cross-references replace explanation in the Petition—improperly leaving it for Patent Owner to guess at what Petitioner’s arguments are. Claim portion 14.b recites “a dew point sensing unit *on the display case....*” EX.1001, 11:25-27 (emphasis added). For this, the Petition merely states “See Element[1.b], Ground 1A. EX1003, ¶117.” Pet., 28. But claim portion 1.b does not recite that the unit is “on” the display case. EX.1001, 9:36-39. It is unclear whether “adapted

for” is to be argued to be the same as “on”, as the Petition does not even acknowledge the difference in claim language. Such cursory allegations fail to inform Patent Owner of the issue in dispute or the evidence relied upon, let alone to carry Petitioner’s burden of proof.

Similarly, claim 15 recites “*thermally isolating ... from variations in temperature of the display case frame or display case door.*” EX.1001, 12:4-7. Claim portion 1.d, which the Petition relies on for claim 15, says “establishing thermal isolation.” The Petition neither argues that these two concepts are the same, nor explains how the prior art would allegedly render them obvious despite any differences. The Petition merely cites claim 1.d for support. Pet., 32. The Petition also does not address the concept of “variations in temperature of the display case” from claim 15. Claim portion 1.d does not even reference “the display case” let alone “variations in temperature” of it. EX.1001, 9:47-53. The Petition does not address whether “variations in temperature of the display case frame” are variations of the temperature of a particular place or the variation of the temperature over different locations on the display case, or both.

Claim 16 recites “thermally isolating from variations in temperature of ambient air.” Merely citing Claim aspect 1.d does not address this. Pet., 32. The Petition argues that Carter’s latch provides “‘added protection from outside elements’ and ‘helps localize the measurements...to generally produce more

accurate temperature readings.” Pet., 22. But the petition fails to explain how protection from elements and localizing measurements allegedly teaches “thermally isolating from variations in temperature of ambient air.” When Dr. Henze was asked how much air flow of ambient air was desirable, he admitted that there are numerous design considerations, indicating: “It’s hard -- hard to specify exactly how much air flow... you don’t want a stale air pocket to be measured, so you want air flow.” EX.2019, 126:22-127:3. Mere cross-referencing does not address these claim differences.

The Petition’s Carter-only ground does not meet claims 1–2 and 14–18 and should be rejected.

B. Ground 1B: Claims 1–7 and 14–18 over Carter, Beatenbough, and King.

Ground 1B fails because it relies on non-analogous art, omits the claimed dual-setpoint control, and advances an internally inconsistent construction of “carrier.” *See, e.g., In re Bigio*, 381 F.3d at 1325–26 (analogous-art test).

King’s disclosure concerns an automotive windshield fog sensor—adhered to the interior of laminated automotive glass, with multiple sensors positioned beneath a protective dome on a thermal barrier tray to interact with cabin airflow. *See* Section IV.F. That packaging problem, environment, and mounting strategy are fundamentally different from the claimed refrigerated display case, which houses a frame-temperature unit and a dew-point unit within or adjacent to

insulated air pockets of a case frame. Transplanting King’s automotive “integrated glass fog sensor unit” into a refrigerated case to supply the claimed housing is not a like-for-like substitution and King provides no teaching directed to the claimed co-location and thermal context of the asserted claims. *See Wyers*, 616 F.3d at 1238–39.

Similarly, Beatenbough does not provide the missing control logic. Rather, Beatenbough teaches maintaining door temperature at least two degrees above dew point via variable pulse-width duty cycling and user-set rotary dials, not the claimed ON/OFF thresholds both preselected above the dew point. *See* Section IV.B. The Petition identifies no integrated control structure that implements the claims’ dual-setpoint algorithm. *See In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380–81 (Fed. Cir. 2016).

Like Ground 1A, the Petition provides cross-references instead of explanations. In claim 14, the portion 14.b reciting “a dew point sensing unit *on the display case...*” goes unanalyzed. The Petition merely cites “See Element[1.b], Ground 1B. EX1003, ¶195.” Pet., 63.

In claim 15, the differences between portion 1.d (“establishing thermal isolation...”) and portion 15 (“thermally isolating...”) go unexplained. The Petition does not address whether these two concepts are argued to be the same.

And there is no analysis whatsoever of claim 15’s concept of “variations in temperature of the display case,” which is absent from portion 1.d.

Claim 16 recites “thermally isolating from variations in temperature of ambient air.” The Petition’s mere citation to portion 1.d does not address this, as claim 1 does not recite (and the Petition does not analyze in 1.d) any “variations in temperature of ambient air.” Pet., 63.

Finally, the Petition’s mapping of “carrier” to a mere wire in Carter and to a flexible/PCB substrate in King for the same claim element underscores its lack of a single, specification-tethered construction and highlights a failure of proof on a coherent element-by-element correspondence. *See Phillips*, 415 F.3d at 1315–19. The Board should reject Ground 1B on this basis.

C. Ground 1C: Claims 17–20 over Carter, Beatenbough, King, and Gatling.

Ground 1C fails because, even with Gatling, the Petition does not identify the claimed, case-mounted controller structures—or their coordinated functions—required by Claims 17–20. Additionally, Ground 1C lacks a reasoned motivation to substitute a different RF scheme for the wired sensor architecture with a reasonable expectation of success. *See In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d at 1380–81.

Gatling’s wireless temperature logging for HACCP compliance is not the claimed “means for wirelessly accessing stored data at said data storing means” of

a case-mounted controller. For means-plus-function limitations, obviousness requires showing that the prior art discloses the same or equivalent structure performing the identical function in the same way and for the same result. *See Williamson*, 792 F.3d at 1347–49. The Petition identifies no “communication control unit” coordinating programming and data-download access, nor the “reset/programming interface” corresponding to the ’181 patent’s disclosed structure. *See Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 948–53 (Fed. Cir. 2007).

D. Ground 1D: Claims 1–6 over Carter, Beatenbough, and Kotani.

Ground 1D fails because Kotani’s hermetic, PCB-mounted “sensor room” isolates sensors from ambient conditions. *See* Section V.G. The ’181 claims require the opposite: a case-mounted housing that couples frame-temperature and dew-point units, minimizes heat transfer with insulated air pockets, and still provides controlled ambient exposure at the case frame. The Petition’s piecemeal mapping never identifies an equivalent structure and cannot satisfy § 112(f). *In re Donaldson Co.*, 16 F.3d 1189, 1193–95 (Fed. Cir. 1994).

E. Ground 1E: Claims 8–13 over Carter, Beatenbough, and Gatling.

Ground 1E fails because the Petition’s three-way split—Carter for processing, Beatenbough for dew-point/setpoint concepts, and Gatling for wireless/data—fails to meet Claim 8’s system-level requirements, and lacks the

required articulated reasoning with a rational underpinning and proof of a reasonable expectation of success. *Intelligent Bio-Systems, Inc.*, 821 F.3d at 1367–68. The Petition fails to identify a processor executing the ’181 Patent’s dual setpoint, dew-point-referenced control algorithm; an equivalent “communication control unit” coordinating both on-controller data storage and remote parameter updates; or the claimed case-mounted housing that co-locates both sensing units with minimized thermal contacts and insulated air pockets. Accordingly, the cited prior art combination of Carter, Beatenbough, and Gatling does not yield the integrated design claimed, and Petitioner has not carried its burden to show otherwise. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d at 1376–78. As such, Ground 1E fails and does not render the ’181 Patent unpatentable.

VII. Objective Indicia Corroborate Non-Obviousness

Objective indicia confirm non-obviousness. The record reflects industry adoption of controllers implementing dual set-points and co-located, insulated-pocket housings, evidence of copying of the ’181 Patent’s architecture, and a long-felt need to move beyond continuous heating and crude duty-cycles. EX.2014, ¶84. Contemporaneous materials describe the invention’s benefits as “anticipat[ing] condensation reliably and maintain[ing] energy efficiency” and “stabiliz[ing] sensing accuracy in a compact, case-mounted housing,” underscoring that the claimed solution achieved results that the prior art did not. In Mr.

Pollock's experience, practical, robust dew-point anticipation with reliable hysteresis at the case-level controller was not a solved problem by 2005 and required the sort of holistic structural and algorithmic design disclosed in the '181 patent. EX.2014, ¶84.

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 13,934 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:

<i>Date of service</i>	December 29, 2025
<i>Manner of service</i>	Electronic Email: IPR43789-0259IP1@fr.com ; PTABInbound@fr.com
<i>Documents served</i>	<i>PATENT OWNER RESPONSE AND EXHIBITS EX.2014 – EX.2024</i>
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