

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ANTHONY INC.,
Petitioner,

v.

CONTROLTEC, LLC,
Patent Owner.

IPR2025-00636
Patent 7,421,847 B2

Before HUNG H. BUI, SCOTT A. DANIELS, and
BARRY L. GROSSMAN, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). Petitioner has the burden of proving unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e).

Anthony Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review of claims 1–20 (the “challenged claims”) of U.S. Patent No. 7,421,847 B2 (Ex. 1001, “the ’847 patent”), which is owned by ControlTec, LLC (“Patent Owner”). Based on the evidence and arguments presented by the parties, and the findings and conclusions in this Decision, we determine that Petitioner has established by a preponderance of evidence that claims 1–20 of the ’847 patent would have been obvious based on the asserted references, and, thus, are *not* patentable.

A. Background and Summary

Anthony Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review of claims 1–20 (the “challenged claims”) of U.S. Patent No. 7,421,847 B2 (Ex. 1001, “the ’847 patent”).

Patent Owner filed a request for a discretionary denial of the Petition by the Director (Paper 6) and a Preliminary Response to the Petition (Paper 7). The parties fully briefed the request for discretionary denial. Paper 8; *see also* related IPR2025-00559, Papers 10, 11 (authorized additional briefing). The Acting Director *denied* the request for discretionary denial. Paper 9 (this single decision applied to both the proceeding before us and related IPR2025-00559 (*see* IPR2025-00559, Paper 12)). In denying the request, the Acting Director stated:

Petitioner provides persuasive reasoning, supported by evidence, that the Office erred in a manner material to the patentability of the challenged patents during patent examination, and, accordingly, discretionary denial under 35 U.S.C. § 325(d) is not

appropriate. Specifically, at the beginning of patent examination, the patent examiner issued a restriction requirement for the application that eventually became the challenged patents. Ex. 1002, 72. Patent Owner elected a group of claims and filed a divisional patent application. *Id.* at 36. The patent examiner issued a notice of allowance of both patent applications as the first office action. *Id.* at 14. Petitioner persuasively explains that the patent examiner erred by overlooking the teachings of Carter. Although the challenged patents have been in force for approximately eighteen and seventeen years, Petitioner appears to show a material error by the Office, and it is an appropriate use of Office resources to review the potential error.

Paper 9, 2. Accordingly, the Petition was referred to the Board “to handle the cases in the normal course, including by issuing a decision on institution addressing the merits and other non-discretionary considerations, as appropriate.” *Id.* at 3.

In addressing the merits of the Petition and the Preliminary response, we concluded that Petitioner satisfied the burden, under 35 U.S.C. § 314(a), to show that there was a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Accordingly, on behalf of the Director (37 C.F.R. § 42.4(a)), and in accordance with *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1353 (2018), we instituted an *inter partes* review of all challenged claims, on all asserted grounds. Paper 10 (“Dec. Inst.”).

Patent Owner then filed a Request for Director Review of the Decisions to deny discretionary denial and to institute an *inter partes* proceeding. Paper 12. Petitioner filed a response. Paper 13. The Acting Director denied Patent Owner’s requests for Director review. Paper 14.

Patent Owner filed a Response to the Decision to Institute this proceeding. Paper 21 (“PO Resp.”). Petitioner filed a Reply. Paper 24 (“Pet. Reply”). Patent Owner filed a Sur-reply. Paper 26 (“PO Sur-reply”).

A hearing was held July 16, 2026. A transcript has been entered into the record. *See* Paper 33 (“Transcript” or “Tr.”).

B. Real Parties-in-Interest

Petitioner identifies itself as well as Dover Corporation and Hillphoenix, Inc. as the real parties-in-interest. Pet. 69. Petitioner qualifies its statement, however, by stating that Dover and Hillphoenix “may constitute real parties-in-interest, though Petitioner does not concede as much.” *Id.*

Patent Owner identifies itself as the sole real party-in-interest. Paper 4, 2.

C. Related Matters

The parties indicate that the ’847 patent is the subject of the following district court proceeding: *ControlTec, LLC v. Anthony, Inc.*, Case No. 1:24-cv-00883 (D. Del.). Pet. 69–70; Paper 4, 2. This proceeding is stayed pending the outcome of this IPR proceeding. Ex. 1045; Ex. 1046; *see also*, Ex. 3002¹. We have not been advised by the parties of any change in the status of the District Court proceeding.

The parties also identify IPR2025-00559, challenging Patent 7,207,181 B2 (the “’181 patent”) as a related matter. *Id.*

¹ Oral Order from District Court dated Sep. 9, 2025, Dkt. Entry 23 (which is the most recent entry) stating, in relevant part, “the case remains STAYED. The parties are also ORDERED to provide a joint status report by no later than fourteen (14) days after the Patent Trial and Appeal Board issues a Final Written Decision in . . . the inter partes review of the 847 patent”). Pacer search, Aug. 14, 2026, 4:13 PM.

The decision and Judgment of the case now before us is our Final Written Decision in the *inter partes* review of the ’847 patent.

The '847 patent in the proceeding before us is a “[d]ivision of application No. 11/069,378, filed on Mar. 1, 2005, now Pat. No. 7,207,181,” which is challenged in IPR2025-00559. Ex. 1001 code (62). The claims in the '181 patent are directed to a condensation control *apparatus* or *system* (see Ex. 3001), whereas the claims in the '847 patent in the proceeding before us are directed to a *method* for condensation control. Accordingly, method claims 1–20 in the '847 patent are substantially similar to apparatus and system claims 1–20 in the '181 patent. On August 25, 2026, we issued a Judgment and Final Written Decision in the 00559 IPR holding all claims of the '181 patent not patentable.

D. The '847 patent

The '847 patent involves preventing condensation at a refrigerated display case. Claims 1–20, all the claims, are directed to a method for using sensors to measure temperature of the display case frame, ambient air temperature, relative humidity, determining the dew point when condensation will occur, activating heaters in the frame/door of the display case to anticipate and prevent condensation at the display case, and deactivating the heaters when condensation is no longer likely.

We make the following findings of fact concerning the '847 patent. The '847 patent is titled “Refrigeration Unit Condensation Prevention.” Ex. 1001, code (54). The disclosed technology relates to frame and door heating to remediate condensation build-up in refrigerated display cases. *Id.* at 1:14–16. An exemplary method prevents condensation from forming by “activating frame/door heaters before the dew point temperature at frame and door surfaces is reached.” *Id.* at 2:23–27. In this example, the apparatus is configured to sense “frame temperature and dew point by thermally isolating temperature sensors and constantly updating data to reliably

provide the ability to accurately anticipate condensation at case surfaces.”

Id. at 2:27–32. Figure 1 of the ’847 patent is reproduced below.

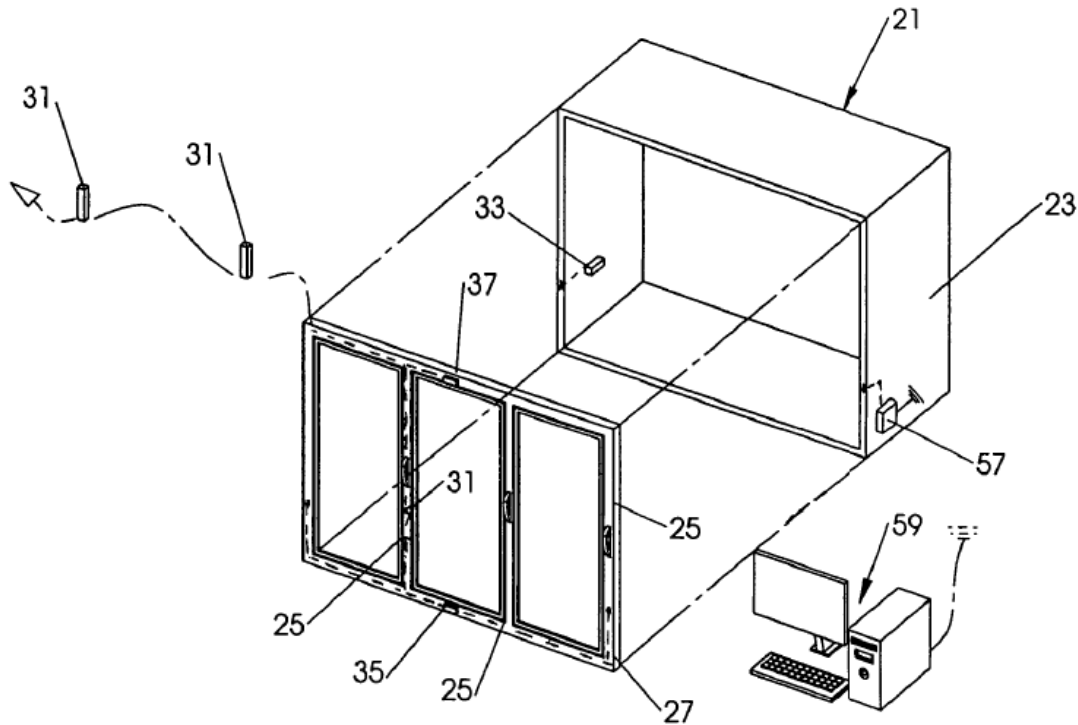


FIGURE 1

Figure 1, reproduced above, “is a diagrammatic illustration of one embodiment of the condensation prevention apparatus and system.” Ex. 1001, 4:47–49. Commercial freezer/cooler display unit 21 includes a display container 23 having doors 25 in frame 27. *Id.* at 5:16–19. Case 21 has “local controller unit 31 connected with an array of case sensors including internal case temperature sensor 33, external case frame temperature sensor 35 and dew point sensor 37.” *Id.* at 5:22–26.

Temperature sensors 33 and 35 are similar and are housed in housing 83, as shown in Figure 5, reproduced below. *Id.* at 6:28–32.

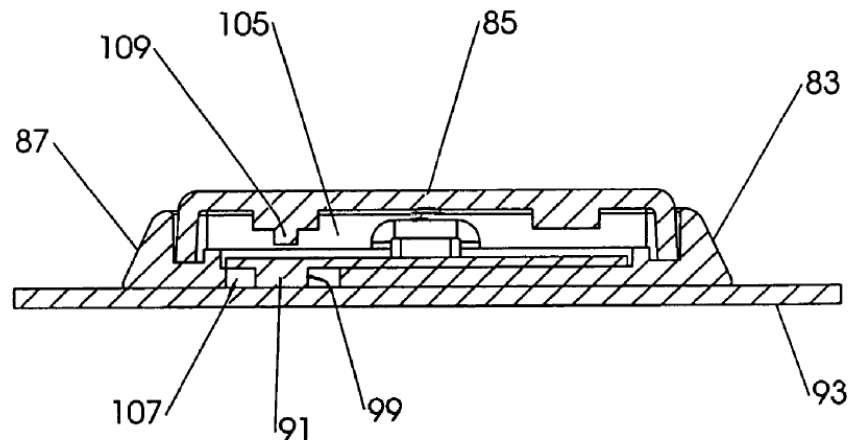


FIGURE 5

Figure 5, reproduced above, “is a sectional view of the sensor/housing.” Ex. 1001, 4:54. Housing 83 includes cover 85, sensor locating base 87 and circuit board/carrier 89 (shown in Figure 4) locating temperature sensor 35 including temperature sensing chip 91. *Id.* at 6:28–35. The housing assembly is mounted to case frame unit or door frame unit 93 of display case, shown in Figure 5. *Id.* at 6:35–39. Cover 85 and base 87 of housing 83 are configured 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.” *Id.* at 6:50–54. In particular, “[a]ir 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.” *Id.* at 6:54–58. According to the ’847 patent, housing 83 should be located at the coldest spot on the exterior of the freezer, which is usually in the center of the case between the bottom of door 25 and door or case frame unit 93. *Id.* at 6:46–49.

Controller unit 31 includes microprocessor 53 and communications board/transmitter/receiver 57 connected to controller unit 31. *Id.* at 5:35–46; Fig. 2. “Central processing” [sic] 59 (*see* Fig. 1) receives data from controllers 31 via communications board/transmitter/receiver 57, “including data enabling tracking, storing and making available reports of the history of ambient air temperature and humidity from dew point sensor 37, case frame and internal case temperatures from sensors 35 and 33, respectively, and power consumption of door heaters.” *Id.* at 5:65–6:5; *see* Fig. 15.

Figure 6 of the '847 patent is reproduced below.

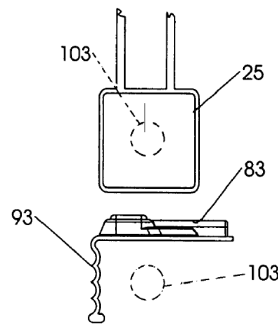


FIGURE 6

Figure 6, reproduced above, “is an illustration showing positioning of the sensor/housing.” Ex. 1001, 4:56–57. In Figure 6, door and frame heaters 103 are located inside door 25 and frame 93 of case 21. *Id.* at 6:45–50.

Figure 13 from the '847 patent is reproduced below.

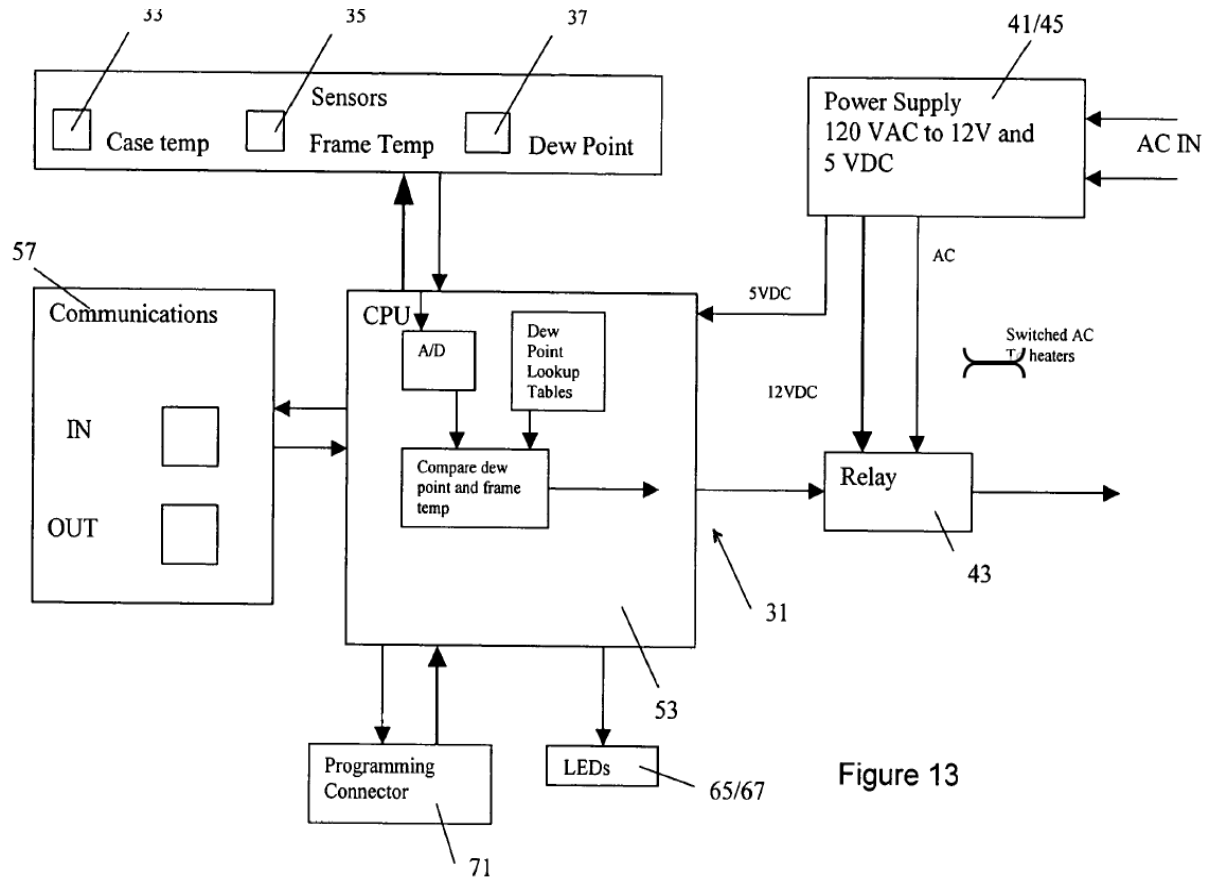


Figure 13

Figure 13, reproduced above, is an “electronics block diagram of the apparatus of [the] disclosed invention. *Id.* at 5:5–6. In the disclosed method, “[h]eaters are activated just above dew point and thus just before moisture appears on freezer surfaces.” *Id.* at 8:51–52. Controller unit 31 may use any known sensor(s) for monitoring ambient air temperature and relative humidity. *Id.* at 8:52–56. Microprocessor 53 looks up the dew point value from a stored table. This determines when to turn on the frame/door heaters as the frame temperature approaches the dew point (once the monitored frame temperature *drops below* a preselected set point *above* the dew point). *Id.* at 8:61–67. Once the monitored frame temperature *rises* to a preselected set point *above* the dew point, the heaters are turned off. *Id.* at 8:67–9:2.

E. Illustrative Claim

Petitioner challenges claims 1–20 of the ’847 patent. Claims 1, 8, and 14 are independent claims. Independent claims 1 and 8 are directed to a “method for condensation control at a refrigerated display case having at least one door, a frame and at least one frame/door heater.” *See, e.g.*, Ex. 1001, 9:27–29. Independent claim 14 is directed to a “method for condensation control at *any of a plurality of refrigerated display cases*, each of the display cases having at least one door, a frame and at least one frame/door heater.” *Id.* at 10:28–30 (emphasis added).

Independent claim 1 is illustrative and is reproduced below with bracketed labels employed by Petitioner to facilitate analysis and discussion. *See* Pet. viii.

[1.pre] A method for condensation control at a refrigerated display case having at least one door, a frame and at least one frame/door heater, said method comprising the steps of:

[1.a] monitoring case frame temperature and providing first output data related thereto;

[1.b] monitoring ambient air temperature and relative humidity outside the display case and providing second output data related thereto;

[1.c] processing said first and second output data at said display case to anticipate formation of condensation at the display case and activating and deactivating the frame/door heater responsive thereto; and

[1.d] communicating said first and second output data related to monitored case frame temperature, ambient air temperature and relative humidity and a record of display case frame/door heater activation and deactivation to a remote centralized processing location.

Ex. 1001, 9:27–43.

F. Prior Art and Asserted Grounds

Petitioner asserts that one or more of the challenged claims would have been obvious on the following four grounds, which Petitioner labels as Grounds “1A–1D” (Pet. 1):

Claim(s) Challenged	35 U.S.C. §²	Reference(s)/Basis
8–12	103(a)	Carter ³
1–20	103(a)	Carter, Bunch ⁴
3, 9, 10, 19	103(a)	Carter, Bunch, King ⁵
2, 11–13, 17	103(a)	Carter, Bunch, Gatling ⁶

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 296–07 (2011), took effect on September 16, 2011. The changes to 35 U.S.C. §§ 102 and 103 in the AIA do not apply to any patent application filed before March 16, 2013. Because the application for the patent at issue in this proceeding was filed before March 16, 2013, we refer to the pre-AIA version of the statute.

³ U.S. Patent No. 7,137,262 B2, Nov. 21, 2006, Ex. 1004 (“Carter”).

⁴ U.S. Patent No. 7,240,501 B2, July 10, 2007, Ex. 1006 (“Bunch”).

⁵ U.S. Patent No. 6,422,062 B1, July 23, 2002, Ex. 1005 (“King”).

⁶ U.S. Patent No. 6,502,409 B1, Jan. 7, 2003, Ex. 1007 (“Gatling”).

Petitioner also relies on the Declaration testimony of Dr. George P. Henze, Ph.D., P.E. *See* Ex. 1003.⁷ Patent Owner relies on the Declaration testimony of John Bunch⁸ and Michael Pollock *See* Ex. 2037.⁹

The Carter, King, and Gatling references also were relied on in the 00559 IPR.

⁷ Dr. Henze earned an undergraduate degree in Mechanical Engineering, Master's degrees in Mechanical Engineering, and a Ph.D. degree "in civil engineering, focusing on building systems engineering." Ex. 1003 ¶¶ 6, 7. He currently is "an endowed professor at the University of Colorado Boulder in the Department of Civil, Environmental, and Architectural Engineering in the College of Engineering and Applied Science." *Id.* ¶ 10. His extensive experience in academia and research is summarized in his testimony. *See id.* ¶¶ 5–14; *see also id.*, App. A (Dr. Henze's CV).

⁸ Mr. Bunch is the founder and President of Supermarket Energy Technologies LLC. Ex. 2004 ¶ 3. Mr. Bunch founded this company in 1996. *Id.* He has worked since the company's founding "in the area of refrigerated display cases."

⁹ Mr. Pollock earned a B.S. degree in Mechanical Engineering, with a "focus on thermal and mechanical systems, thermodynamics, and HVAC&R (Heating, Ventilation, Air Conditioning & Refrigeration. Ex. 2014 ¶ 3. Mr. Pollock testifies that he has "spent over twenty-five years in the product and manufacturing sector, with the majority of this time spent as a Dupont Energy Engineer focused on thermal systems products and projects, inclusive of: refrigeration systems, chillers, HVAC, heat and mass transfer, fluid flow, instrumentation and controls, power and electrical applications, steam and utilities, equipment/building thermal envelope applications, insulation etc." *Id.* ¶ 4. Mr. Pollock also testifies that he has "extensive forensic consulting and expert witness experience investigating refrigeration, condensation, insulation, Indoor Air Quality ("IAQ"), HVAC, building envelope, and roofing issues in food grade facilities (including supermarkets and FDA environments), as well as product, system, and controls performance disputes." *Id.* ¶ 5.

II. ANALYSIS

A. Legal Standards

Section 103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of other objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination based on a combination of references requires finding “both [1] ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and [2] that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016).

A reason to combine may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill.

Ericsson, Inc. v. Intellectual Ventures I LLC, IPR2014-00527, Paper 41, slip op. at 27–28 (May 18, 2015). However, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418; *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (a finding of a motivation to combine “must be supported by a ‘reasoned explanation’”).

As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR*, 550 U.S. at 421.

Applying these general principles, we consider the evidence and arguments of the parties.

B. Level of Ordinary Skill in the Art

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). “This reference point prevents . . . factfinders from using their own insight or, worse yet, hindsight, to gauge obviousness.” *Id.*

“The *Graham* analysis includes a factual determination of the level of ordinary skill in the art. Without that information, a . . . court cannot properly assess obviousness because the critical question is whether a claimed invention would have been obvious at the time it was made to one with ordinary skill in the art.” *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *see also Ruiz v. A.B. Chance*, 234 F.3d 654, 666 (Fed. Cir. 2000) (“The determination of the level of skill in the art is an integral part of the *Graham* analysis.”).

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Env't Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.* Moreover, these factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355.

The parties agree on the basic academic or educational training for a person of ordinary skill, which is a bachelor's degree in mechanical engineering, electrical engineering, or a related field. E.g., Pet. 4; PO Resp. 14; *see also* Ex. 2037 ¶ 10 (Mr. Pollock's declaration testimony on behalf of Patent Owner stating "I generally agree that a [person of ordinary skill] would have a bachelor's degree in mechanical or electrical engineering or a related field and several years' experience in HVAC&R."). Where the parties differ is the amount of experience and the specific field of experience.

Petitioner asserts 3–5 years of experience is required. Pet. 4. Patent Owner asserts only 2 years of experience is required. PO Resp. 14. Petitioner asserts that the experience is "related to heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems." Pet. 5 (citing

Ex. 1003 ¶¶ 31–32). Patent Owner asserts that the experience must be focused on “professional experience working with refrigerated display cases.” PO Resp. 14 (citing Ex. 2037 ¶ 10).

1. Level and Field of Experience

As stated above, Mr. Pollock, Patent Owner’s expert witness, testifies that “I generally *agree* that a [person of ordinary skill] would have a bachelor’s degree in mechanical or electrical engineering or a related field and *several years’ experience in HVAC&R.*” Ex. 2037 ¶ 10 (emphases added). This testimony supports Petitioner’s argument and is fully consistent with Dr. Henze’s testimony that “experience related to heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems” is the correct required field of expertise. We also note that in this same paragraph Mr. Pollock opines that the level of ordinary skill is “at least two years working with refrigerated display cases.” *Id.*

According to Petitioner, “nothing about the underlying science or technology behind the ’847 patent is unique to the applied setting of display cases.” Pet. Reply 15. Petitioner also asserts that the proposed level of skill “reflects that the relevant scientific principles come from the field of ‘heating, ventilating, air conditioning, and refrigeration (HVAC&R)’ and are not unique to refrigerated display cases.” *Id.* at 16 (citing Ex. 1061 ¶¶ 17–24).

Dr. Henze testifies in a Supplemental Declaration that “[t]he problems presented in the ’847 patent are archetypal HVAC&R considerations that are not unique to refrigerated display cases.” Ex. 1061 ¶ 18. Dr. Henze also testifies that “[r]efrigerated display cases do not operate under a unique set of physical laws.” *Id.* It is Dr. Henze’s opinion that refrigerated display cases “are governed by the universal principles of thermodynamics,

psychrometrics,¹⁰ and heat transfer that form the bedrock of a standard engineering curriculum and broader HVAC&R practice.” *Id.* ¶ 18.

Patent Owner focuses the level of ordinary skill solely on “refrigerated display cases” because, according to Patent Owner, “[t]hermal characteristics of refrigerated display cases present unique challenges compared to ordinary refrigerators, due to the *frame and glass combination* used.” PO Resp. 15 (citing Ex. 2037 ¶ 10) (emphasis added). Neither the written description nor the claims of the ’847 patent refer to the use of

¹⁰ Psychrometrics is “a branch of science that deals with the study of the physical and thermodynamic properties of moist air, plays a crucial role in various fields such as HVAC (heating, ventilation, and air conditioning), weather forecasting, and environmental engineering.” Ex. 3003 (available at <https://modern-physics.org/psychrometrics/> searched Aug. 20, 2026). As stated in this article, “Beyond basic concepts, psychrometrics involves advanced calculations to solve complex problems. These include determining the dew point temperature, which is the temperature at which air reaches saturation and condensation begins.” *Id.* at 2; *see also* Ex. 1001, 1:50–53 (“As is known, when a cold surface temperature is equal to or lower than the dew point of the ambient air, condensation forms on the cold surface.” References to “dew point” sensors and “dew point” measurement appear extensively throughout the written description and the claims. As further explained,

“Psychrometrics finds application in several real-world scenarios, ranging from designing comfortable living spaces to maintaining optimal conditions in industrial settings. For instance, in HVAC system design, psychrometrics helps in selecting the right equipment to control temperature and humidity levels efficiently. It also plays a crucial role in industrial processes like drying, where controlling the moisture content of the air is essential for product quality.”

Id. at 4–5.

“glass” for doors or any other component. Neither the written description nor the claims refer to a “frame and glass combination.”¹¹

Mr. Pollock testifies that “customer interactions with refrigerated display cases lead to different concerns related to the size, shape and location of *sensors* to prevent interference of customers with such systems.” Ex. 2037 ¶ 10 (emphasis added). According to Mr. Pollock, “a POSITA working on *supermarket* display cases appreciates 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.* (emphases added). This description sounds like a person skilled in psychrometrics, not generic refrigerated display cases. Moreover, a person with a bachelor’s degree in mechanical engineering, electrical engineering, or a related field, with minimal experience would recognize that small differences in sensor placement, thermal isolation, and algorithm design materially affect performance, energy use, and reliability of condensation control.

Also, we note that the word “supermarket” does *not* appear in the written description or claims of the ’847 patent. Thus, Mr. Pollock’s testimony about “supermarkets” is not relevant to the disclosed or claimed invention in the ’847 patent.

¹¹ The written description of the ’847 states “By thus configuring board/carrier 89 (made typically of FIBERGLASS material) and housing 83 (preferably made of plastic such as acrylonitrile butadiene styrene polycarbonate) little transfer of heat to sensor chip 91 occurs, assuring accurate measurement of surface temperature of unit 93.” Ex. 1001, 6:58–62. We have not been directed to any persuasive evidence that this refers to a “frame and glass combination.”

We find unpersuasive Petitioner’s argument and Mr. Pollock’s testimony that we limit the level of ordinary skill to “refrigerated display cases.” Limiting the level of skill to an engineer with experience “working with refrigerated display cases” does not relate to the technology disclosed, and the invention claimed, in the ’847 patent, which is controlling condensation and conserving energy. *E.g.*, Ex. 1001, 2:23–27 (“The invention is *proactive* in *preventing condensation* from forming by activating frame/door heaters before the dew point temperature at frame and door surfaces is reached. Power is then cycled off at a set point above dew point to *save energy*.” (emphases added)). An electrical engineer with a bachelor’s degree and 2 years of experience focused on lighting systems for refrigerated display cases would have “experience working with refrigerated display cases,” and thus meet Patent Owner’s proposed level of skill. Such a person, however, would *not* be experienced in controlling condensation, dew point sensor positioning, and condensation algorithm design, which is the focus of the disclosed and claimed invention, and which Mr. Pollock states “materially affect performance, energy use, and reliability” in controlling condensation in a refrigerated display case. Ex. 2037 ¶ 10.

We also note that Mr. Pollock’s qualifications include a “B.S. in Mechanical Engineering, . . . with focus on thermal and mechanical systems, thermodynamics, and HVAC&R (Heating, Ventilation, Air Conditioning & Refrigeration).” Ex. 2037 ¶ 3. His academic focus is consistent with our determination of the level of ordinary skill.

Accordingly, based on the prior art, the sophistication of the disclosed technology in the ’847 patent, finding Mr. Pollock’s testimony on this issue too general, and crediting Dr. Henze’s testimony with substantial probative weight, we adopt Petitioner’s definition of the level of ordinary skill. We

modify it to state that more academic training will offset less experience, and more experience will offset less academic training, as did Dr. Henze (Ex. 1003 ¶ 31).

Thus, in this proceeding a person of ordinary skill would have a bachelor's degree in mechanical engineering, electrical engineering, or a comparable field and at least three to five years of professional experience working with heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems, and that more academic training will offset less experience, and more experience will offset less academic training.

2. *Dr. Henze Is a Person of Ordinary Skill*

Patent Owner asserts that Dr. Henze is *not* a person of ordinary skill and thus is not qualified to provide expert testimony in this proceeding. PO Resp. 18–21 (citing *Kyocera Senco Indus. Tools Inc. v. Int'l Trade Comm'n*, 22 F.4th 1369, 1377 (Fed. Cir. 2022)). Patent Owner's argument requires a level of ordinary skill based on “working with refrigerated display cases,” which we have *not* adopted. PO Resp. 27. Based on the level of skill adopted in the previous section, we determine that Dr. Henze is qualified to provide expert testimony in this proceeding

C. *Claim Construction*

We construe each claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R. § 42.100(b) (2021). Under this standard, claim terms are generally given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc) (“We have

frequently stated that the words of a claim ‘are generally given their ordinary and customary meaning.’” (citations omitted)).

Petitioner states “the Board need not resolve any express constructions.” Pet. 5.

Patent Owner asserts the “preambles of the ’847 Patent independent claims are limiting because they supply essential structure, provide antecedent basis for terms in the bodies of the claims, and define the very context that gives life and patentable distinction to the claims.” PO Resp. 13. According to Patent Owner, the “terms ‘a refrigerated display case’ (Claims 1 and 8) and ‘a plurality of refrigerated display cases’ (Claim 14) appear in the preamble.” *Id.* Patent Owner concludes that “[t]hese preamble terms provide antecedent basis for later claim elements.” *Id.*

“Whether to treat a preamble as a limitation is a determination ‘resolved only on review of the entire[] ... patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim.’” *Shoes by Firebug LLC v. Stride Rite Children’s Grp., LLC*, 962 F.3d 1362, 1367 (Fed. Cir. 2020) citing *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989)) (alterations in original). “In general, a preamble limits the invention if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.” *Id.* (citations to quoted cases omitted in all the citations). “Conversely, a preamble is not limiting ‘where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.’” *Id.* “No litmus test defines when a preamble limits claim scope,” *id.*, but “dependence 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.” *Id.*

Petitioner does not address whether the preambles are or are not limiting. Neither Petitioner nor Patent Owner provides any specific construction of the words “display” or “frame,” or the term “display case,” each of which is included in the preambles of independent claims 1, 8, and 14.

The ’847 patent neither discloses nor claims a “glass door” or any type of transparent material for the door. Thus, the preamble may be limiting to a “refrigerated display case,” but there is no requirement of any specific construction or material for the refrigerated display case.

“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Whether the preamble is or is not limiting is not necessary to resolve this controversy because it would not affect the outcome of this case.

We also note that it is beyond reasonable dispute that Bunch, applied with Carter against all the challenged claims, discloses display cases with glass doors. Ex. 1006, 1:14–16. Bunch also discloses that, in the display cases, “[t]o combat condensation and frost, heaters are installed in refrigerator doors and frames, which raise the temperature of the door or frame sufficiently to eliminate condensation.” *Id.* at 1:24–26.

*D. Ground 1A¹² – Claims 8–12
Obvious Based on Carter*

Petitioner asserts claims 8–12 would have been obvious¹³ based on Carter. Pet. 6–26. Petitioner provides a clause-by-clause analysis of claims 8–12 and where each limitation is disclosed in Carter or how and why it would have been obvious to modify Carter to meet the claim limitation. Pet. 8–26. We agree with Petitioner’s analysis. We will address below Patent Owner’s specific argument against Carter in Ground 1A.

First, we summarize the Carter disclosure.

1. Carter (Ex. 1004)

We make the following findings of fact regarding the disclosure in Carter.

Carter is titled “Supplemental Heat Control Apparatus and Method for Freezer/Refrigeration Equipment.” Ex. 1004, code (54). Carter “relates to providing supplemental heat from a heat source based upon the operating environment of refrigeration or freezer equipment.” *Id.* at 1:9–11. As summarized in its Abstract, Carter discloses that “[t]he supplemental heat is

¹² We use Petitioner’s alpha-numeric designation of the four distinct grounds for consistency with the record. *See* Pet. 1.

¹³ Petitioner states that claims 1–20 “are obvious.” Pet. 6. Consistent with 35 U.S.C. § 103, we understand this asserted basis of unpatentability to be that these claims “would have been” obvious, recognizing the temporal component in the statute. *See* 35 U.S.C. § 103 (pre-AIA) (stating that a patent may not be obtained “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole *would have been obvious at the time the invention was made* to a person having ordinary skill in the art to which said subject matter pertains.” (emphasis added)); *see also* Howard T. Markey, Why Not the Statute, 65 J. PAT. OFF. Soc’y 331, 336 (1983) (noting “This requirement of the statute is one of the most difficult for the decision maker to meet, for it requires a transport of the mind back to an earlier time.”).

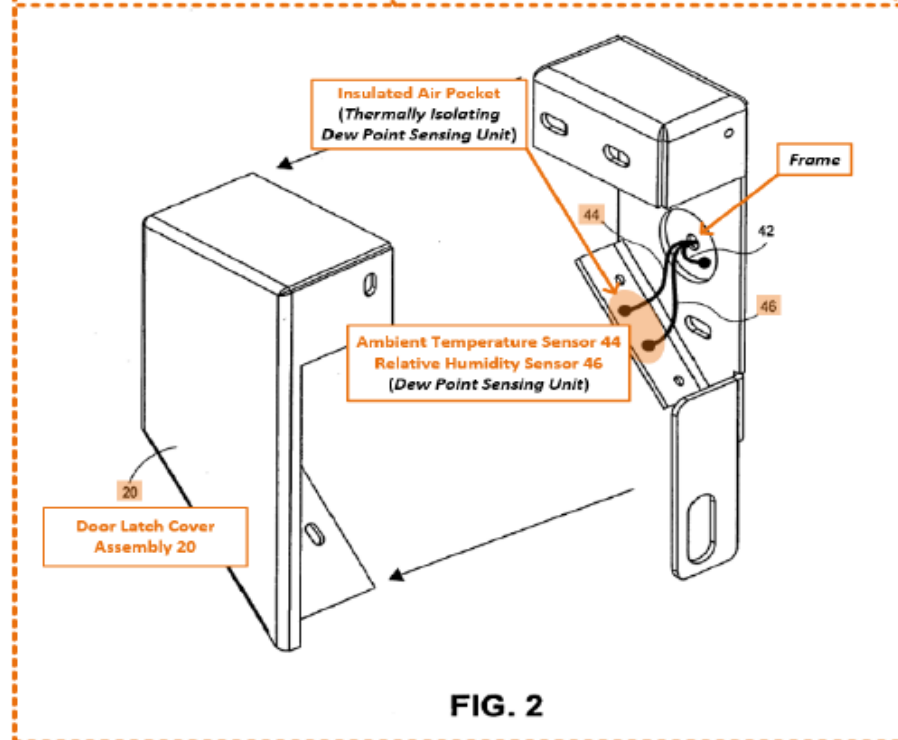
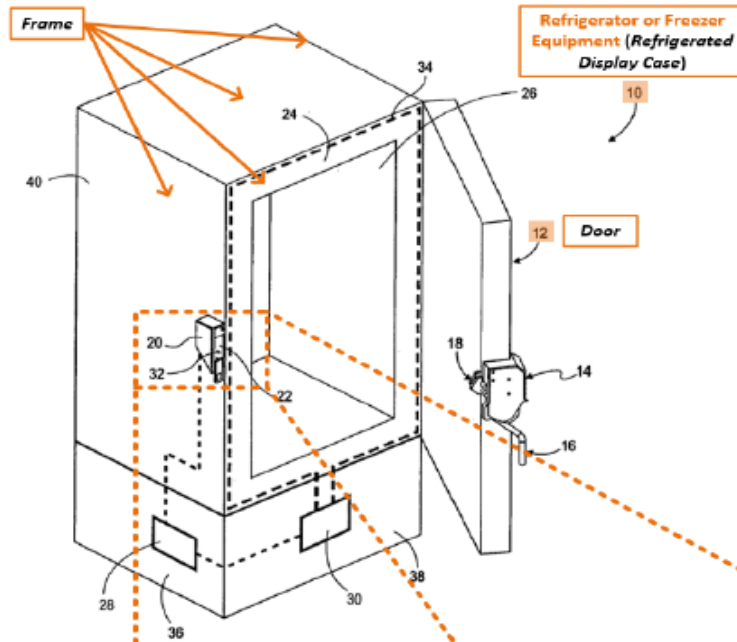
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Patent 7,421,847 B2

automatically controlled to provide heating to a sealing area to prevent condensation from forming.” *Id.* at code (57).

See below for annotated versions of Figures 1 and 2

Figures 1 and 2 of Carter, annotated by Petitioner (*see* Pet. 21), are reproduced below.



Carter's Figure 1, reproduced above, "is a perspective view illustrating supplemental heat system components incorporated into a refrigerator or freezer." Ex. 1004, 3:30–33. Carter's Figure 2, reproduced above, illustrates an enlarged view of the sensor assembly unit 32. *Id.* at 5:1–2. As shown in Carter's Figure 1, sensor assembly unit 32 is composed of surface temperature sensor 42, ambient temperature sensor 44, and ambient relative humidity sensor 46. *Id.* at 5:2–4. The combined readings of these sensors "will determine whether it is necessary to supply supplemental heat to the sealing surface 24 of the refrigerator or freezer." *Id.* at 5:15–20.

Refrigerator/freezer 10 includes door 12 having sealing surface 24, which, in a closed position, retains and maintains an operating temperature within compartment chamber 26 of the refrigerator/freezer, and prevents ambient temperatures from breaching into compartment chamber 26. *Id.* at 3:55–4:2. Carter explains that condensation is most likely to develop along sealing surface 24, and desires to prevent or eliminate the formation of condensation in this area. *Id.* at 4:13–17.

2. *Petitioner's Contentions*

Petitioner asserts that Carter discloses using a temperature sensor to monitor the surface temperature of a refrigerator or freezer. Pet. 10–11 (citing Ex. 1003 ¶¶ 68–69; Ex. 1004, 3:42–46, 4:17–22, 4:36–43, 5:1–20, 5:31–40, Figs. 2–3).

Petitioner asserts that Carter discloses using readings from an ambient air temperature sensor and an ambient relative humidity sensor to calculate the dew point. Pet. 11–12 (citing Ex. 1003 ¶¶ 70–71 Ex. 1004, 1:5–11, 1:15–28, 2:22–32, 2:44–67, 4:36–43, 5:1–20, 5:31–40, 6:30–40, 7:1–9, Fig. 3).

Petitioner asserts “[i]t would have been apparent or obvious to a POSITA¹⁴ that Carter’s teaching to identify a ‘set condition . . . that would promote surface condensation’ connotes anticipat[ing] formation of condensation at the display case.” Pet. 13 (emphasis omitted) (citing Ex. 1003 ¶¶ 73–80; Ex. 1004, 4:36–55).

Petitioner also asserts that a “POSITA would have recognized that Carter’s heater deactivation technique accounts for dew point by employing a floating offset responsive to ambient conditions.” Pet. 15 (citing Ex. 1003 ¶¶ 84–85).

Petitioner further asserts a “POSITA looking to improve Carter would have been motivated to employ a preselected set point for the purpose of achieving a more flexible control system, e.g., one more adaptable to different climates and conditions.” Pet. 17 (citing Ex. 1003 ¶¶ 92–94).

Patent Owner has not directed us any persuasive evidence contrary to the disclosure of Carter and supporting evidence on which Petitioner relies, as discussed above.

3. *Control Logic*

Concerning Ground 1A and claims 8–12, Patent Owner’s asserts only that “Carter lacks the claimed control logic.” PO Resp. 21. According to Patent Owner, “Carter’s heater control scheme does not teach or suggest the ’847 Patent’s “claimed algorithm.” *Id.* Patent Owner argues that “Carter triggers heat at dew point + constant but deactivates heat when the ambient and surface temperatures are equal. Carter makes no use of the dew point reference at shut-off.” *Id.* (citing Ex. 1004, 5:34–63). We disagree.

¹⁴ “POSITA” is a common patent law acronym for “a person having ordinary skill in the art.”

Carter evaluates thermal conditions using sensors monitoring external surface temperature of the freezer/refrigeration equipment and other variables such as ambient temperature, and the ambient relative humidity. *Id.* at 4:18–22. Carter discloses collecting and evaluating sensor data so that the surface heat is automatically activated when a set condition is approached or reached. *Id.* at 4:22–25. The components that perform these functions include control unit 28, switching unit 30, sensor assembly unit 32, and heating unit 34, which are mounted “along the refrigerator or freezer equipment at a lower side surface 36, a lower front surface 38, a side surface [of] cabinet surface 40 and along the sealing surface 24, respectively.” *Id.* at 4:41–43.

Carter’s Figure 3, reproduced below and annotated to highlight the activating and deactivating steps, clearly includes both “activation” and “deactivation.”

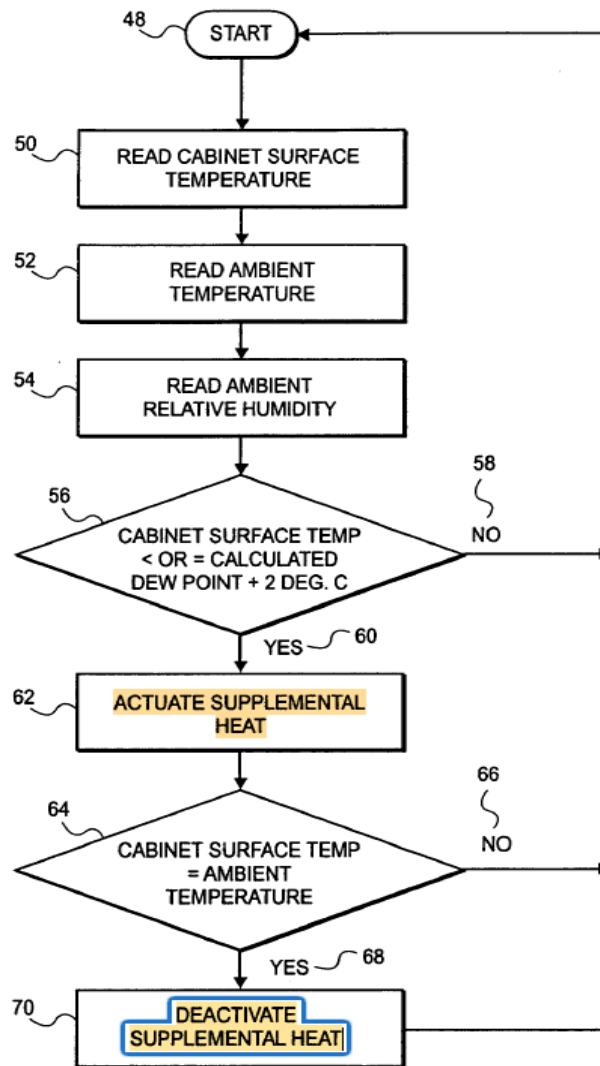


FIG. 3

Carter's Figure 3, annotated to highlight steps 62 and 70, is a flowchart of a process for testing and supplying supplemental heat to the refrigerator or freezer. Ex. 1004, 3:36–38.

As disclosed in Carter's Figure 3,

In operation, the sensor assembly unit 32 begins a process 48 of ascertaining whether a set condition exists to approach or reach a state which would promote surface condensation. A plurality of measurements are made in order to determine whether a

condition exists conclusive to promoting condensation along the sealing surface 24.

One of the readings 50 performed by the sensor assembly unit 32 includes a cabinet surface temperature of the refrigerator or freezer equipment 10. The sensor assembly unit also performs a measurement 52 of the ambient temperature and a measurement of the ambient relative humidity 54. Another measurement 56 includes a determination of the cabinet surface and temperature with respect to the dew point plus a 2 degree C.[°] constant. The cabinet surface temperature is evaluated to determine if it is less than or equal to the dew point plus 2 degrees C[.]

Ex. 1004, 5:24–40.

As also shown in Carter's Figure 3, if the cabinet surface temperature is not less than or equal to the dew point plus 2 degrees C, control unit 28 does *not* activate switching unit 30 to supply supplemental heat to sealing surface 29 of refrigerator or freezer 10. *Id.* at 5:41–45. Additional readings to monitor the cabinet surface temperature with respect to the dew point may start (reference number 48) after a negative determination (reference numerals 58, 66) is made. *Id.* at 5:45–47. Carter also discloses,

If the cabinet surface temperature is less than or equal to the dew point plus 2 degrees C.[°], a positive determination 60 is made. Based upon the positive determination, the control unit 28 enacts the switching unit 30 to activate supplemental heat 62 to the sealing surface 24 of the refrigerator or freezer equipment 10 via the heating unit 34.

After the supplemental heat is supplied to the sealing surface 24, a measurement is performed 64 to compare the cabinet surface temperature with respect to the ambient temperature. If the cabinet surface temperature is equal to the ambient temperature 38 the control unit 28 will deactivate the supplemental heat 70 by deactivating the switching unit 30. If the cabinet surface temperature is not equal to the ambient temperature 66, supplemental heat will continue to be supplied to the sealing surface 24 via the heating unit 34.

Carter further discloses that sensor assembly unit 32 will make continual measurements 48 to reevaluate a set condition to determine a state which would promote surface condensation. *Id.* at 5:64–66. This process may include making additional updated measures of cabinet surface temperature 50, ambient temperature 52, ambient relative humidity 54, and cabinet surface temperature with respect to the dew point plus 2 degrees C. *Id.* at 5:66–6:3. According to Carter’s disclosure, this constant evaluation of these measurements will facilitate the determination of whether to *activate* the system and supply supplemental heat 60, 62 and when to *deactivate* the supplemental heat supply 68, 70. *Id.* at 6:4–7; Fig. 3, steps 62, 70.

Patent Owner also argues that the “Petition does not address or make obvious deactivating the control means in anticipation of the formation of condensation.” PO Resp. 26–33. Based on our analysis above, we disagree. We understand Patent Owner to assert that Carter does not deactivate when there is no longer a threat or concern that condensation will occur. However, Carter clearly deactivates its system when the system determines condensation is no longer a risk.

4. *Conclusion for Ground 1A – Claims 8–12*

Based on our analysis above, our findings and conclusions in this proceeding, and including our analysis of objective evidence of nonobviousness in Section III, we determine Petitioner has established by a preponderance of evidence that claims 8–12 would have been obvious based on Carter.

*E. Ground 1B – Claims 1–20
Obvious Based on Carter and Bunch*

Petitioner asserts claims 1–20 would have been obvious based on Carter and Bunch. Petitioner provides a claim-by-claim, clause-by-clause analysis mapping the references to the claims and explaining how the references would be combined and why a person of ordinary skill would have been motivated to combine Carter and Bunch with a reasonable expectation of success. Pet. 26–51.

1. Bunch (Ex. 1006)

We make the following findings of fact concerning Bunch.

Bunch is titled “System for Preventing Condensation on Refrigerator Doors and Frames.” Ex. 1006, code (54).

There can be no reasonable dispute that Bunch clearly discloses a device for “*preventing* condensation” on refrigerator doors and frames (i.e., anticipating and stopping condensation before it forms, and reducing energy consumption by heaters on refrigerator doors and frames. Ex. 1006, 1:7–10 (“This invention relates particularly to devices for reducing energy consumption by refrigerator door and frame heaters while maintaining protection against condensation.”).

Bunch also discloses glass display case refrigerators with glass doors. *Id.* at 1:14–16 (“Shopkeepers display refrigerated or frozen products in temperature-controlled display cases, such as refrigerators with glass display doors or open-air, ‘coffin,’ coolers.”). Bunch refers to these “display cases” as “refrigerators.” *Id.* at 1:16–18. In one disclosed example, Bunch’s disclosed system is used on “supermarket refrigerator doors.” *Id.* at 4:30.

“To combat condensation and frost, heaters are installed in refrigerator doors and frames, which raise the temperature of the door or

frame sufficiently to eliminate condensation.” Ex. 1006, 1:24–26. A control unit is set so that the heater is on prior to the formation of condensation.

Id. at 2:22–25 (“The present invention is a device for reducing energy consumption by heaters on refrigerator doors and frames. A control unit is set so that the heater is on prior to the formation of condensation.”).

A preferred embodiment provides for preset heater stop and start times entered by a system user. *Id.* at 2:25–27. Alternatively, the heater may also be turned on when condensation is sensed by a sensor, and the sensor reading may be used to override the preset times. *Id.* at 2:27–29. For use with “multiple refrigerators” (*id.* at 1:65), a programmer provides individual identification of each connected control unit and is used to read, measure and adjust one or more control units’ settings. *Id.* at 2:29–32. A communications host is used to enable remote monitoring and control. *Id.* at 2:32–33.

Bunch also discloses that its “invention includes one or more condensation sensors 114 that are attached to refrigerator, preferably positioned uniquely for each refrigerator where condensation forms the soonest, such as on the door jams, headers, or mullions.” *Id.* at 3:15–18. Each sensor is connected to the control unit 110 which detects when condensation starts to form and, in response, applies power to the heater. The system continuously monitors the sensor so that when conditions change such that condensation is no longer present, power to the heaters is turned off. *Id.* at 3:21–26.

2. Analysis

Patent Owner asserts that “Carter and Bunch cannot supply the ’847 Patent’s ambient-control limitations.” PO Resp. 37–41. We disagree.

Patent Owner asserts:

Bunch's core paradigm is time-based scheduling with a local surface-wetness override; the '847 Patent requires continuous control responsive to ambient conditions rather than fixed duty cycles. Replacing Bunch's time schedules with Carter's ambient algorithm is not a routine substitution—it is a wholesale change in Bunch's principle of operation.

PO Resp. 37. Again, we disagree. Patent Owner misconstrues Bunch's disclosure.

Bunch's "core paradigm" is *not* limited to "time-based scheduling with a local surface override." Bunch states that the "preferred embodiment" provides for preset heater stop and start times entered the by a system user. Ex. 1006, 2:25–27. A second, distinct embodiment, however, is that the heater may also be turned on when condensation is sensed by a sensor, and the sensor reading may be used to override the pre-set times.

Id. at 2: 27–29. As explained in Bunch:

programmer 120 also adjusts values, such as lowering the set point of the sensor and thereby decreasing sensitivity. For example, if the set point of the sensor is set high, such that the heater is instructed to turn on when very little current is measured between the conductive lines of the sensor, the heater will turn on as the lightest condensation occurs. However, if the sensitivity is set lower, such that the heater turns on only when significantly more current is measured between the conductive lines, the heater will turn on when more condensation is present. *Ideally the sensitivity is adjusted to maintain an optimum balance between condensation and the amount of time the heater is on.* Of course, the less the heater is on, the less energy is consumed by the system and the lower the energy costs.

Ex. 1006, 3:48–61. Thus, Bunch discloses the basic objective of using sensors to determine the optimum balance between minimizing or eliminating condensation and energy efficiency. Bunch states that one objective of the disclosed system is "to provide door heating where

condensation has not yet been detected but is *anticipated*.” *Id.* at 2:8–10 (emphasis added); *See also* Pet. 28–31 (discussing motivations to combine Bunch and Carter): Ex. 1003 ¶¶ 38–41, 111–118 (summarizing technology developments in automated condensation control systems, such as how to operate them more effectively and efficiently, and explaining the motivation to combine Carter and Bunch).

Bunch states the preferred sensor is a “resistivity sensor,” but Bunch is not limited to this specific sensor. According to Bunch, “it will be understood by those skilled in the art that various changes and modifications may be made and equivalents may be substituted for elements” of the disclosed preferred embodiments in Bunch. As Dr. Henze testifies, “[i]nstead of relying on user-selected duty cycles or detection of actual condensation, Carter teaches a more accurate, adaptable, and energy efficient condensation-control technique that predicts the onset of condensation by comparing the surface temperature of the display case to ambient dewpoint.” Ex. 1003 ¶ 116.

3. *Conclusion for Ground 1B – Claims 1–20*

Based on our analysis above, our findings and conclusions in this proceeding, and including our analysis of objective evidence of nonobviousness in Section III, we determine Petitioner has established by a preponderance of evidence that claims 1–20 would have been obvious based on Carter and Bunch.

F. Ground 1C – Claims 3, 9, 10, and 19 Obvious Based on Carter, Bunch, King

Petitioner asserts claims 3, 9, 10, and 19 would have been obvious based on Carter, Bunch, and King. Petitioner provides a claim-by-claim, clause-by-clause analysis mapping the references to the claims and

explaining how the references would be combined and why a person of ordinary skill would have been motivated to combine Carter and Bunch with a reasonable expectation of success. Pet. 51–63 (citing Ex. 1003 ¶¶ 158–184). We adopt these findings and conclusions.

Petitioner relies on King for “complementary teachings on an integrated sensor package suitable for implementing the Carter-Bunch condensation control scheme.” *Id.* at 53–54 (citing Ex. 1003 ¶ 167). Petitioner states the “fundamental aspects of Bunch’s disclosure would remain intact, bolstered by the beneficial teachings of Carter and King in a way that the POSITA would reasonably expect to succeed.” *Id.* at 54 (citing Ex. 1003 ¶ 167).

1. King (Ex. 1006)

We make the following findings of fact concerning King.

King is titled, “Integrated Glass Fog Sensor Unit.” Ex. 1005, code (54). King “relates to an automotive windshield fog sensor. More particularly, this invention relates to an integrated glass fog sensor unit terminated on a flex circuit.” *Id.* at 1:5–6. King uses centralized “sensors necessary to predict fogging conditions.” *Id.* at 2:10–11. The specific context of a preferred embodiment of the disclosed glass fog sensor unit is a vehicle windshield. *Id.* at 1:50–54. The *claimed* invention in King, however, is *not* limited to a vehicle or a windshield.

Figure 2 of King is reproduced below.

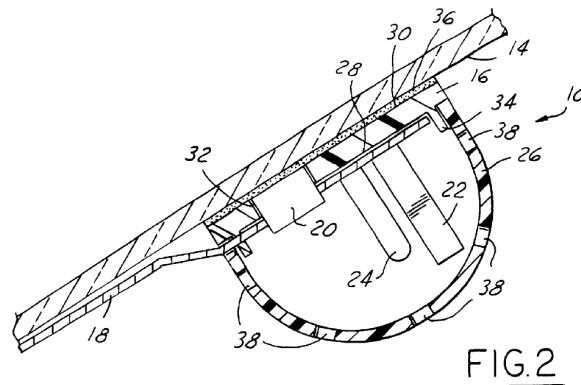


Figure 2, reproduced above, is “a cross-sectional view of the integrated glass fog sensor unit.” *Id.* at 2:25–26. Integrated glass fog sensor unit 10 has thermal barrier tray 16, multi-conductor member 18 embodied as a flex circuit, glass temperature sensor 20, ambient air temperature sensor 22, relative humidity sensor 24, each within protective dome 26, and wherein “glass temperature sensor 20 is in thermal contact with the glass surface 14 in order to measure the temperature at surface 14.” *Id.* at 2:40–50.

2. Analogous Art

The parties disagree as to whether King is analogous art. This is the only area of dispute not addressed in our analysis in Grounds 1A and 1B.

A reference qualifies as prior art for an obviousness determination only when it is analogous to the claimed invention. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004) (“References within the statutory terms of 35 U.S.C. § 102 qualify as prior art for an obviousness determination only when analogous to the claimed invention.” (citing *In re Clay*, 966 F.2d 656, 658 (Fed. Cir. 1992))).

The Federal Circuit has laid out two separate tests to determine whether a reference is analogous art to the claimed invention, i.e., whether

one of ordinary skill in the art would even look to the teachings of that reference. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). These two tests are: “(1) whether the art is from the same field of [the inventor’s] endeavor” and “(2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.” *Id.*; *see also Netflix, Inc. v. DivX, LLC*, 80 F.4th 1352, 1359 (Fed. Cir. 2023) (“Importantly, ‘the scope of any field of endeavor will vary with the factual description of each invention.’ Unlike the reasonable-pertinence test, the field-of-endeavor test does not look to the problem that the patent purports to address. It is enough that the prior art reference falls within the relevant field of endeavor of the patent-in-suit.”) (citations omitted); *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001 (Fed. Cir. 2016) (“To determine if art is analogous, we look to ‘the purposes of both the invention and the prior art.’ If a reference disclosure and the claimed invention have a same purpose, the reference relates to the same problem, which supports an obviousness rejection.” (citations omitted)); *see also Nielsen Co. (US), LLC v. TVision Insights, Inc.*, 186 F.4th 1363, 1369–1370 (Fed. Cir. 2026) (providing a comprehensive summary and analysis of the applicable law concerning analogous art)

(1) *Field of Endeavor*

Regarding the field of endeavor, Petitioner asserts “[b]roadly stated, the ’847 patent pertains to the field of “remediat[ing] condensation build up.” Pet. 52 (citing Ex. 1001, 1:14–18, 1:48–54 (explaining that “condensation control” is “utilized in a variety of applications”); Ex. 1003, ¶¶ 162–163 (citing Ex. 1029 referred to in the ’847 patent); *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (courts “construe the scope of analogous art broadly”).

Exhibit 1029, cited in the '847 patent and referred to in Dr. Henze's Declaration testimony (Ex. 1003 ¶ 163), is particularly relevant to the analogous art issue. Exhibit 1029 is a published U.S. patent application, Pub. No.: US 2004/0050072 A1 (the "'072 Pub. Appl." or the "'072 Published Application"). This published application is titled "Devices and Methods for Sensing Condensation Conditions and for Preventing and Removing Condensation from Surfaces." Ex. 1029, code (54). The title suggests it applies to all "surfaces" where it is desirable to sense, prevent, and remove condensation. As stated in the Abstract of the '072 Published Application, a device and method are provided "for sensing or *predicting* when condensation having a given physical state is present or imminent and for suppressing such condensation from a surface, such as a *vehicle windscreen*, eyewear, goggles, helmet visor, computer monitor screen, window, electronic equipment, etc, by preventing or removing it." *Id.* code (57) (emphases added). Thus, the '072 Published Application, cited by the inventors in the '847 patent, used a "vehicle windscreen" as an example of the type of "surfaces" using condensation control.

The '847 patent referred to the '072 Published Application as one of five documents in the technological field of "condensation control utilizing dew point calculations." Ex. 1001, 1:48–54. The technological field is further described as "[m]onitoring air temperature, relative humidity and surface temperature to initiate condensation control" of surfaces. "Refrigeration" is also mentioned as one of a "variety of applications."

Patent Owner asserts that King is not analogous art because it is an "automotive windshield fog sensor" and "does not teach heater control for refrigeration cases, does not disclose or suggest replacing Bunch's time-based control with ambient dew-point logic, and offers no algorithmic

control beyond providing data for predictive fog detection in a vehicle cabin.” PO Resp. 42. These arguments do not address the two separate tests to determine whether a reference is analogous art to the claimed invention as discussed above.

King, like the ’072 Published Application, also discloses condensation control in the context of a vehicle windscreen.

Petitioner asserts that a person of ordinary skill “would have understood that King’s disclosure of an integrated sensor package for use in a system that prevents “fog”— condensation—falls within the ’847 patent’s field.” Pet. 53 (citing Ex. 1003 ¶ 164). We agree.

Dr. Henze testifies “a POSITA would have understood that King’s disclosure of an integrated sensor package for use in a system that prevents ‘fog’— a manifestation of the condensation phenomenon—falls within the ’847 patent’s broad technical field.” Ex. 1003 ¶ 164.

(2) *Reasonable Pertinence*

Regarding the reasonable pertinence of King, Petitioner asserts that the ’847 patent and King each “address the design problem of provisioning a housing for a sensor package including a surface temperature sensor, an ambient air temperature sensor, and a relative humidity temperature sensor.” Pet. 53. Petitioner also asserts in both King and the ’847 patent, “the design problem involves mechanically supporting, electrically connecting, and thermally isolating the sensors. *Id.*

Dr. Henze also testifies:

King is reasonably pertinent to the problem(s) addressed by the ’847 patent. King and the ’847 patent similarly address the design problem of provisioning a housing for a sensor package including a surface temperature sensor, an ambient air temperature sensor, and a relative humidity temperature sensor.

In both King and the '847 patent, the design problem involves mechanically supporting, electrically connecting, and thermally isolating the sensors. King is therefore reasonably pertinent to at least one of the problems that the '847 patent's inventors were trying to solve.

Ex. 1003 ¶ 165 (citations omitted).

Petitioner concludes based on this evidence that King is reasonably pertinent to at least one of the problems that the '847 patent's inventors were trying to solve. Pet. 53 (citing *Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359–61 (Fed. Cir. 2020) (“The problems to which the claimed invention and reference at issue relate must be identified and compared from the perspective of a person having ordinary skill in the art”); *see also Sci. Plastic Prods., Inc. v. Biotage AB*, 766 F.3d 1355, 1360 (Fed. Cir. 2014) (“The analogous art inquiry is a factual one, requiring inquiry into the similarities of the problems and the closeness of the subject matter as viewed by a person of ordinary skill. Importantly, this analysis must be carried out from the vantage point of a PHOSITA who is considering turning to the teachings of references outside her field of endeavor.”). Moreover, “[t]he problems confronting an inventor are not limited to those expressly identified in a patent, and a patent may be directed to multiple problems.” *Nielsen Co. (US)*, 186 F.4th 1363, 1369–1370 (citing *KSR*, 550 U.S. at 420 (“[T]he problem motivating the patentee may be only one of many addressed by the patent's subject matter.”)).

Patent Owner's sole argument specific to Ground 1C and the King reference asserted in this Ground is “King is non-analogous art and irrelevant to refrigeration control.” PO Resp. 42–45.

Patent Owner acknowledges, however, that “King is an automotive windshield fog sensor that packages three sensors—glass surface

temperature, ambient air temperature, and ambient humidity—within a single housing adhered to a windshield, with a flex circuit and a protective dome.” *Id.* at 42. This is the technological field of endeavor and element for which Petitioner relies on King.

Patent Owner also argues King “does not teach heater control for refrigeration cases, does not disclose or suggest replacing Bunch’s time-based control with ambient dew-point logic, and offers no algorithmic control beyond providing data for predictive fog detection in a vehicle cabin.” *Id.* Petitioner does not rely on King for these disclosures.

Patent Owner concludes:

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

PO Resp. 45. We disagree.

We recognize that King’s application of the preferred embodiment is from a different field than display cases. That alone does not make it a non-analogous reference. As stated in *KSR*, “[w]hen a work is available in one field, design incentives and other market forces can prompt variations of it, *either in the same field or in another.*” *KSR*, 550 U.S. at 401 (emphasis added).

KSR also does not require that a combination only unite old elements without changing their respective functions. *KSR*, 550 U.S. at 416. Instead, *KSR* teaches that “[a] person of ordinary skill is also a person of ordinary

creativity, not an automaton.” *Id.* at 421. As explained in *KSR*, the ordinary artisan recognizes “that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* at 420. *KSR* does not support a theory that a person of ordinary skill can only perform combinations of a puzzle element A with a perfectly fitting puzzle element B. *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1219 (Fed. Cir. 2016).

As discussed above, Dr. Henze testifies “a POSITA would have understood that King’s disclosure of an integrated sensor package for use in a system that prevents ‘fog’—a manifestation of the condensation phenomenon—falls within the ’847 patent’s broad technical field” and “is reasonably pertinent to the problem(s) addressed by the ’847 patent. Ex. 1003 ¶¶ 164, 165.

Patent Owner’s statements may describe King’s preferred embodiment, but that does not detract from King’s broad field, which is condensation control. As Patent Owner acknowledges, King broadly discloses a “fog sensor that packages three sensors—glass surface temperature, ambient air temperature, and ambient humidity—within a single housing adhered to a windshield, with a flex circuit and a protective dome.” PO Resp. 42.

Patent Owner does not address the two-part test in *Bigio*.

3. Conclusion for Ground 1C – Claims 3, 9, 10, and 19

Based on the evidence and the analysis above, and our findings and conclusions in this proceeding, we determine King and the ’847 patent have the same field of endeavor, reasonable pertinence, and address the same problem, which is controlling condensation. *Unwired Planet*, 841 F.3d

at 1001; *Nielsen Co. (US)*, 186 F.4th 1363, 1369–1370. Accordingly, we determine King is analogous art and supports an obviousness rejection.

Also, based on our analysis above, and our findings and conclusions in this proceeding, and including our analysis of objective evidence of nonobviousness in Section III, we determine Petitioner has established by a preponderance of evidence that claims 3, 9, 10, and 19 would have been obvious based on Carter and Bunch.

*G. Grounds 1D – Claims 2, 11–13, and 17
Obvious Based on Carter, Bunch, Gatling*

Petitioner asserts claims 2, 11–13, and 17 would have been obvious based on Carter, Bunch, and Gatling. Petitioner provides a claim-by-claim, clause-by-clause analysis mapping the references to the claims and explaining how the references would be combined and why a person of ordinary skill would have been motivated to combine the references with a reasonable expectation of success. Pet. 63–68 (citing Ex. 1003 ¶¶ 183–192).

Petitioner relies on Gatling for “a system for ‘monitoring and controlling temperature’ in an array of refrigerated display cases” by “placing a “product-simulating probe” in each refrigerated case to measure the temperature within each case. Pet. 140.

1. 1. Gatling (Ex. 1007)

We make the following findings of fact concerning Gatling.

Gatling is titled “Wireless Method and Apparatus for Monitoring and Controlling Food Temperature.” Ex. 1007, code (54). Gatling discloses a “system and method for controlling refrigeration including a simulated product temperature sensor operable to measure a simulated product temperature from a refrigeration case and a transceiver in communication with said simulated product temperature sensor and operable to wirelessly

transmit data.” *Id.* code (57) (Abstract). A transceiver connected to the temperature-sensing element wirelessly transmits the measured temperature data to the receiver. *Id.* at 2:15–19. The transceiver may be disposed within the housing, or positioned external to the housing. *Id.* Main controller 30 logs and analyzes the temperature data and controls the temperature of the display cases 22 based on the monitored temperature data. *Id.* at 6:20–24.

2. *Analysis*

Patent Owner asserts that Gatling concerns wireless product-temperature monitoring and case refrigeration control, not ambient-condition-based anti-sweat heater control. PO Resp. 45. According to Patent Owner, the data Gatling logs and uses to control the system “are case-and product-related temperatures for refrigeration setpoint control, not the ambient humidity, ambient temperature, and door/frame surface temperature outputs that the ’847 Patent uses for dew-point based anti-sweat heater control.” *Id.* at 45-46.

Petitioner relies on Gatling for a specific purpose, the “notion of wirelessly communicating in the refrigeration context for the beneficial purpose of avoiding ‘expensive and extremely cumbersome’ wired communications.” Pet. 64. Petitioner relies on Gatling simply for wireless communications among a plurality of refrigerated display cases. *Id.* at 64–65 (“A POSITA would have been motivated to employ Gatling’s teachings to employ *wireless communications* as a predictable improvement to the wired configurations disclosed throughout Bunch.”). Dr. Henze’s declaration testimony also makes clear that Gatling’s role in the proposed combination is simply “to employ *wireless communications*.” Ex. 1003 ¶ 187.

Petitioner asserts that Patent Owner improperly focuses “on product/internal case temperatures rather than data derived by an anti-sweat control system like that of the Carter-Bunch Combination.” Pet. Reply 15. Petitioner asserts that obviousness “cannot be overcome by attacking references individually where the [asserted ground] is based upon the teachings of a combination of references.” *Id.* (citing *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1050 (Fed. Cir. 2019)). *See also, Palo Alto Networks, Inc. v. Centripetal Networks, LLC*, 122 F.4th 1378, 1386 (Fed. Cir. 2024) (stating “The question in an obviousness inquiry is whether it would have been obvious to a person of ordinary skill in the art to combine the relevant disclosures of the two references, not whether each individual reference discloses all of the necessary elements.” “Where, as here, the grounds for obviousness are based on a specific combination of references, arguments that ‘attack the disclosures of the two references individually’ lack merit.” (internal citations omitted)).

3. Conclusion for Ground 1D – Claims 2, 11–13, and 17

Based on our analysis above, our findings and conclusions in this proceeding, and including our analysis of objective evidence of nonobviousness in Section III, we determine Petitioner has established by a preponderance of evidence that claims 2, 11–13, and 19 would have been obvious based on Carter, Bunch, and Gatling.

III. OBJECTIVE EVIDENCE

Patent Owner asserts objective indicia corroborate non-obviousness. PO Resp. 60–73. Although we include our written analysis of this issue at the end of this Decision, as we have indicated in each asserted Ground, we have considered our analysis and conclusion for the objective evidence as

part of each asserted Ground before making any conclusions regarding that Ground.

We are well-aware that “the strength of *each* of the *Graham* factors must be weighed in every case and must be weighted en route to the final determination of obviousness or non-obviousness.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016). We have done so in this proceeding.

Although secondary considerations must be considered, they do not alone control the obviousness conclusion. *See Asyst Techs., Inc. v. Emtrak, Inc.*, 544 F.3d 1310, 1316 (Fed. Cir. 2008) (citing *Newell Cos. Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988)). “A determination of whether a patent claim is invalid as obvious under § 103 requires consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered.” *WBIP*, 829 F.3d at 1328.

A. General Background

Patent Owner asserts “[t]he objective indicia here strongly corroborate non-obviousness.” PO Resp. 60. According to Patent Owner, “[t]he record shows sustained industry adoption of controllers implementing the claimed dual set-points and co-located, insulated-pocket housings, indications of copying by Anthony to compete on the same architecture, and marketplace recognition that the invention solved a persistent problem that prior approaches—continuous heating and crude duty cycles—had not.” *Id.* at 60–61 (citing Ex..2037 ¶ 65; Ex. 2004 ¶¶ 3–6).

According to Patent Owner, “ControlTec [Patent Owner] and Anthony [Petitioner] have coexisted in the refrigeration controls marketplace for almost 30 years. They have, at times, collaborated, but most often

competed in this space, as the two major providers of anti-sweat systems in the United States. *Id.* at 61 (citing Ex. .2004 ¶ 5). There also has been litigation between the parties. *Id.* at 63.

In an extensive discussion of the “Background” between the parties (PO Resp. 61–68), Patent Owner also states that 20 years ago there was a “co-development agreement” between ControlTec and Anthony for a “a new anti-sweat controller system.” *Id.* at 62–63 (citing Ex. 2026). Patent Owner believes that the agreement from 20 years ago is “dispositive” and precludes Petitioner from credibly asserting that the technology claimed in the ’847 patent “lacks commercial value.” PO Sur-Reply 29. In its Sur-Reply, Patent Owner refers to a:

dispositive fact: more than twenty years ago, Patent Owner and Petitioner agreed to jointly develop the very technology embodied in the ’847 Patent as a condition of a settlement agreement between the parties. . . . Having accepted and exploited the benefits of that collaboration during that agreement, Petitioner cannot credibly now contend that the technology lacks commercial value.

Sur-Reply 29 (citing Ex. 2026, a “Co-Development Agreement,” bearing the notation “KS Draft 3/17/04,” but signed). Patent Owner cites no persuasive evidence to support the argument that this Agreement is a dispositive “fact” on the issue of objective evidence supporting patentability of the invention claimed in the ’847 patent. Patent Owner cites no persuasive evidence that ties the Co-Development Agreement to the ’847 patent.

In another “Background” assertion, Patent Owner states Anthony was found to be non-compliant with Department of Energy rules regarding anti-sweat heat controls. *Id.* at 64–65. Patent Owner asserts that Anthony then adopted a system that ControlTec asserts infringes the ’847 patent. *Id.* at 65.

Patent Owner provides no persuasive argument or evidence that ties this asserted fact to the '847 patent.

To establish its objective evidence concerning the '847 patent, Patent Owner asserts (1) commercial success (PO Resp. 69–70), (2) copying by Petitioner (*id.* at 70–71), (3) industry praise and adoption (*id.* at 71–72), and (4) a long-felt need for the technology disclosed and claimed in the '847 patent (*id.* at 72–73).

Petitioner takes a different view of the facts and evidence and concludes “[o]bjective indicia do not ‘corroborate non-obviousness.’” Pet. Reply 19. According to Petitioner, Patent Owner has not established the required nexus between the asserted facts and the invention claimed in the '847 patent. Petitioner also asserts that Patent Owner “lacks credible evidence” concerning its claims of success, long-felt need, praise, and copying. Pet. Reply 22–25. We agree with Petitioner.

B. Objective Evidence – Controlling Principles

Objective evidence of nonobviousness includes: (1) commercial success, (2) copying, (3) industry praise, (4) skepticism, (5) long-felt but unsolved need, and (6) failure of others. *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202, 1212–13 (Fed. Cir. 2023 citing *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling U.S., Inc.*, 699 F.3d 1340, 1349–56 (Fed. Cir. 2012). The weight to be given to evidence of secondary considerations involves factual determinations. *Id.* (citing *In re Couvaras*, 70 F.4th 1374, 1380 (Fed. Cir. 2023).

“[T]o be accorded substantial weight in the obviousness analysis, the evidence of secondary considerations *must have a ‘nexus’ to the claims, i.e.,* there must be a legally and factually sufficient connection between the evidence and the patented invention.” *Ancora Technologies, Inc. v. Roku*,

Inc., 140 F.4th 1351, 1361 (Fed. Cir. 2025) (emphasis added) (citing *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019) (citations and quotations omitted)); *see also Volvo Penta*, 81 F.4th at 1210 (citing *In re GPAC*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (holding that “[f]or objective evidence of secondary considerations to be relevant, *there must be a nexus between the merits of the claimed invention and the objective evidence.*”).

The burden is on the patent owner to establish a nexus. *Henny Penny*, 938 F.3d at 1332 (“Ultimately, ‘[t]he patentee bears the burden of showing that a nexus exists’” (quoting *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999))

A showing of nexus can be made in two ways: (1) via a presumption of nexus, or (2) via a showing that the evidence is a direct result of the unique characteristics of the *claimed invention*. *Volvo Penta*, 81 F.4th at 1210 (emphasis added).

“A patent owner is entitled to a presumption of nexus when it shows that the asserted objective evidence is tied to a *specific product that ‘embodies the claimed features and is coextensive with them.’*” *Id.* (citation omitted).

Absent a presumption of nexus, “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the *claimed invention.*’” *Id.* (citing *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373–74 (Fed. Cir. 2019) (quoting *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996)).

As is clear from the above summary, the objective evidence must be compared to the claimed invention or the patented invention to establish the required nexus.

1. Nexus

Here, Patent Owner has *not* established the required nexus. Patent Owner also has not made any argument, nor cited any evidence, to prove the required nexus between the *claimed invention* and the asserted evidence of objective indicia.

Throughout the PO Response asserting “Objective Indicia” (PO Resp. 60–73), Patent Owner cites the Declaration testimony of its expert witness, Mr. Pollock in Exhibit 2037 ¶¶ 65–66. *See, e.g.*, PO Resp. 60–61 (discussing “objective indicia” in general), 69–70 (discussing asserted “commercial success), 72–73 (discussing asserted “long-felt need and failure of prior approaches). In his cited Declaration testimony, Mr. Pollock testifies:

[t]o the extent evidence is presented of commercial success, industry adoption, or long-felt but unresolved need for stable, energy-efficient condensation control at refrigerated display cases using dew-point-referenced dual set points and compact, thermally isolating housing structures, those considerations would further support nonobviousness.

Ex. 2065 ¶ 65 (emphasis added). However, Mr. Pollock *does not* cite or otherwise refer to any evidence of (1) commercial success, (2) industry adoption, or (3) long-felt but unresolved need. Also, in this statement, Mr. Pollock *does not* refer to, or compare, any evidence to the *claimed invention*. As such, Mr. Pollock’s testimony on the issue of “nexus” has *no* probative weight. 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which

the opinion is based is entitled to little or no weight.”). Moreover, Mr. Pollock is neither qualified nor permitted to testify about “patent law.” *Id.* (“Testimony on . . . patent law . . . will not be admitted.”).

In Paragraph 66 of his declaration testimony, also relied on by Patent Owner, Mr. Pollock compares the claims of the ’847 patent to Patent No. 11,160,393, assigned to “Hill Phoenix.” Mr. Pollock asserts Hill Phoenix is “Anthony’s [Petitioner] affiliate.” Ex. 2037 ¶ 66. Mr. Pollock does not cite any evidence that Anthony is an “affiliate” of Hill Phoenix. We have not otherwise been directed to any persuasive evidence of such an affiliation.¹⁵ Moreover, comparing the ’847 patent to the Hill Phoenix patent has no probative value in establishing objective evidence that any product tied to the objective indicia evidence is coextensive with the invention claimed in the ’847 patent, which is a *method* for condensation control.

We review Patent Owner’s specific arguments below.

2. *Commercial Success*

To establish commercial success, Patent Owner relies on the Declaration testimony of John Bunch (Ex. 2004 ¶¶ 4–6) and the Declaration testimony by Mr. Pollock (Ex. 2037 ¶¶ 65–66). PO Resp. 69–70.

In paragraph 4, Mr. Bunch testifies that he is “very familiar with the market for refrigerated display cases.” He also testifies that these “anti-condensation technologies are often referred to in the industry as anti-sweat systems.” In paragraph 5, Mr. Bunch testifies there are “two major

¹⁵ Petitioner states in its Mandatory Notice of a Real Party-in-Interest, that: “Additional parties that may constitute real parties-in-interest, though Petitioner does not concede as much, are Dover Corporation and Hillphoenix, Inc.” We do not consider this to be a concession or admission that “Hillphoenix” is an “affiliate of Petitioner.”

providers of anti-sweat systems in the United States, namely ControlTec, LLC and Anthony, Inc.(including Anthony's affiliated companies such as Hill Phoenix, Inc.). Neither of his substantive statements in paragraphs 4 and 5 are probative evidence of the commercial success of the invention claimed in the '847 patent. Mr. Bunch neither cites nor provides any evidence that Anthony and Hill Phoenix are affiliated companies. In paragraph 6, Mr. Bunch testifies that the statements in this Declaration are true. This exhibit fails to establish a nexus with the claims of the '847 patent.

Mr. Pollock's cited Declaration testimony in paragraphs 65 and 66 are quoted and characterized in our discussion of "nexus" in the previous section of this Decision. We give this testimony no probative weight concerning the commercial success of the invention claimed in the '847 patent.

The cited exhibits fail to establish a nexus with the claims of the '847 patent.

3. *Copying By Petitioner*

To establish copying by Petitioner, Patent Owner compares the '847 patent to "Ex. 2035." PO Resp. 20. Exhibit 2035 is a copy of U.S. Patent 11,160,393, assigned to Hill Phoenix, Inc. *See* Ex. 2035. As discussed above, we have not been directed to any persuasive evidence of a relationship between petitioner and Hill Phoenix. We determine that this Hill Phoenix patent provides no probative weight that Petitioner, or anyone else, copied and commercialized the invention claimed in the '847 patent.

Patent owner also asserts that "Anthony modified its energy controller to copy the functionality of ControlTec's AS-20 controller." PO Resp. 70 (citing Ex. 2028).

Ex. 2028 is titled “Anthony Energy Controller (60-2271 5-0002) Installation instructions.” This is a 12 page document stating and illustrating installation instructions for an Energy Controller. The Energy Controller includes a dew point sensor cable and sensor head, an “Anthony Energy Controller (60-2271 5-0002,” and a temperature sensor cable and sensor probe. Ex. 2008, 3. We have not been directed to any persuasive evidence that this document establishes a “dual set-point condensation-anticipation strategy,” as asserted by Patent Owner. PO Resp. 70–71 (citing Ex. 2028, 3–10). Indeed, the evidence is to the contrary. Page 10 of the instructions states:

The Controller should not require any adjustments to the factory Setting. Factory setting for sensitivity adjustment is pre-set to 4.5°F above the dew point temperature. With this Setting, the heat will be turned on when the frame temperature (as measured using Temperature sensor) is 4.5°F above the Dew point temperature (Measured using Dew point sensor).

Ex. 2028, 10. There is no persuasive evidence that this single set-point for anticipating condensation is a “*dual* set-point condensation-anticipation,” as asserted by Patent Owner.

Also, there is no persuasive evidence comparing the function of the device illustrated and described in this document to the specific method steps recited in the claims of the ’847 patent.

Patent Owner also cites Ex. 2026, which is the Co-Development Agreement discussed in the Background section above. The Co-Development Agreement does not mention the ’847 patent specifically. Thus, this Agreement is *unlike* the license Agreement in *Ancora Technologies*. In *Ancora Technologies*, the patent at issue was identified specifically in the license agreement by its patent number. *Ancora*

Technologies, 140 F.4th at 1362. The Federal Circuit held that licenses to a specific patent, identified specifically [such as by its patent number] “unlike products or other forms of objective evidence of nonobviousness, do not require a nexus with respect to the specific claims at issue.” *Id.* The Federal Circuit also stated: “when it comes to licenses, clear evidence that substantial license fees were paid for licenses to a specific patent late in a litigation should be given the significance that their magnitude deserves.” *Id.* at 1363; *see also id.* at 1361 (footnote 5 stating “the licensees are very substantial companies and the royalties they paid were also very substantial”). The cited Co-Development Agreement was *not* a license agreement that met any of the license requirements stated in *Ancora Technologies* to exempt Patent Owner from establishing a nexus with respect to the specific claims at issue.

Patent owner also cited Ex. 2034, which is an email between the parties. This email also fails to establish a nexus with the claims of the ’847 patent.

4. *Industry Praise*

Patent Owner cites Exhibits 2029 and 2030 in support of its “industry praise” argument.

Ex. 2029 is a 33-page presentation at a conference concerning “Anti-Sweat Heater Controls – What Works, and What Works Best? *See* Ex. 2029. It is a generic presentation about anti-sweat heaters. It does *not* mention the ’847 patent. Patent Owner fails to establish a nexus between this Exhibit and the claims of the ’847 patent.

Exhibit 2030 is a 10-page Technical Study Report titled “Product Testing Anti-Sweat Heater Control.” *See* Ex. 2030. The report states that its intent is “to provide preliminary estimates of energy savings associated with

installing anti-sweat heater controls on a glass door refrigerated display case.” Ex. 2030, 3 (citing the added page numbering by Patent Owner, which includes the cover as page 1). In the Executive Summary, the report states that it evaluated “the potential energy savings from installing ControlTec’s AS-20 anti-sweat heater controls on refrigerated food cases and to determine if the anti-sweat heaters are controlled based on ambient conditions in the store.” Ex. 2030, 5. This Report does *not* mention the ’847 patent. Patent Owner fails to establish a nexus between this Exhibit and the claims of the ’847 patent.

5. *Long-Felt Need*

Patent Owner cites exhibits 2037 and 2004 in support of its long felt need argument. These same two exhibits were cited in our analysis of “Commercial Success.” As we held there, these exhibits fail to establish a nexus with the claims of the ’847 patent.

6. *Conclusion for Objective Evidence*

Based on the analysis above and the evidence before us, Patent Owner fails to establish a nexus between the claimed invention and any objective evidence of patentability. Accordingly, we give this objective evidence no probative weight.

IV. CONCLUSION¹⁶

We have determined that all challenged claims are unpatentable under each asserted ground.

¹⁶ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–20 are not patentable;

FURTHER ORDERED that, because this is a Final Written Decision, the parties to this proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

VI. SUMMARY

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
8–12	103	Carter	8–12	
1–20	103	Carter, Bunch	1–20	
3, 9, 10, 19	103	Carter, Bunch, King	3, 9, 10, 19	
2, 11–13, 17	103	Carter, Bunch, Gatling	2, 11–13, 17	
Overall Outcome			1–20	

16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

IPR2025-00636
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