

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC and
ECOBEE TECHNOLOGIES ULC,
Petitioner,

v.

ECOFACITOR, INC.,
Patent Owner.

IPR2022-00538¹
Patent 9,194,597 B2

Before SCOTT B. HOWARD, PAUL J. KORNICZKY, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

DOUGAL, *Administrative Patent Judge*.

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

¹ IPR2022-01461 (ecobee Technologies ULC) has been joined with this proceeding.

I. INTRODUCTION

A. *Background and Summary*

On a Petition (Paper 1 (“Pet.”)) from Google LLC, we instituted an *inter partes* review of claims 1–24 (the “challenged claims”) of U.S. Patent 9,194,597 B2 (Ex. 1001, “the ’597 patent”). Paper 7 (“Dec.”).

Patent Owner, EcoFactor, Inc., filed a Response (Paper 10, “PO Resp.”), Petitioner² filed a Reply (Paper 14, “Reply”), and Patent Owner filed a Sur-reply (Paper 15, “Sur-reply”). An oral hearing was held on May 11, 2023, and a copy of the transcript was entered into the record. Paper 25 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of the claims on which we instituted trial. Having reviewed the arguments of the parties and the supporting evidence, we determine that Petitioner has shown, by a preponderance of the evidence, that the challenged claims are unpatentable.

B. *Related Matters*

The parties identify the following related district court litigation: *Google, LLC v. EcoFactor, Inc.*, No. 4:21-cv-03220 (N.D. Cal.); and *EcoFactor, Inc. v. ecobee, Inc.*, No. 6:21-cv-00428 (W.D. Tex.). Pet. 5; Paper 4, 2 (Patent Owner’s Mandatory Notices); Paper 21 (Joint Notice Regarding Co-pending Litigation). Petitioner also notes that it “is in the process of filing petitions for inter partes review challenging all claims of

² Google LLC and ecobee Technologies ULC.

the other three patents [involved in the *Google v. EcoFactor* litigation referenced *supra*].” Pet. 72–73.

C. The ’597 Patent

The ’597 patent is entitled “System, Method and Apparatus for Identifying Manual Inputs to and Adaptive Programming of a Thermostat.” Ex. 1001, code (54). The ’597 patent explains that programmable thermostats can “enhance comfort as compared to manually changing setpoints using a non-programmable thermostat,” but “[i]f the temperatures programmed into a thermostat do not accurately reflect the preferences of the occupants, those occupants are likely to resort to manual overrides of the programmed settings.” *Id.* at 1:25–28, 1:60–2:8. Techniques disclosed in the ’597 patent detect manual changes to the setpoint for a thermostatic controller and then incorporate those manual changes into the long-term programming of the thermostatic controller. *Id.*, Abstr.

The ’597 patent explains that most thermostats do not record manual inputs locally, and also do not recognize or transmit the fact that a manual override has occurred. *Id.* at 5:45–48. Moreover, frequent changes in setpoints may be automatically initiated by thermostat algorithms, making it difficult to infer a manual override from the mere fact that a setpoint has changed. *Id.* at 5:47–53. Figure 7, reproduced below, illustrates a method for detecting the occurrence of a manual override. *Id.* at 5:54–55.

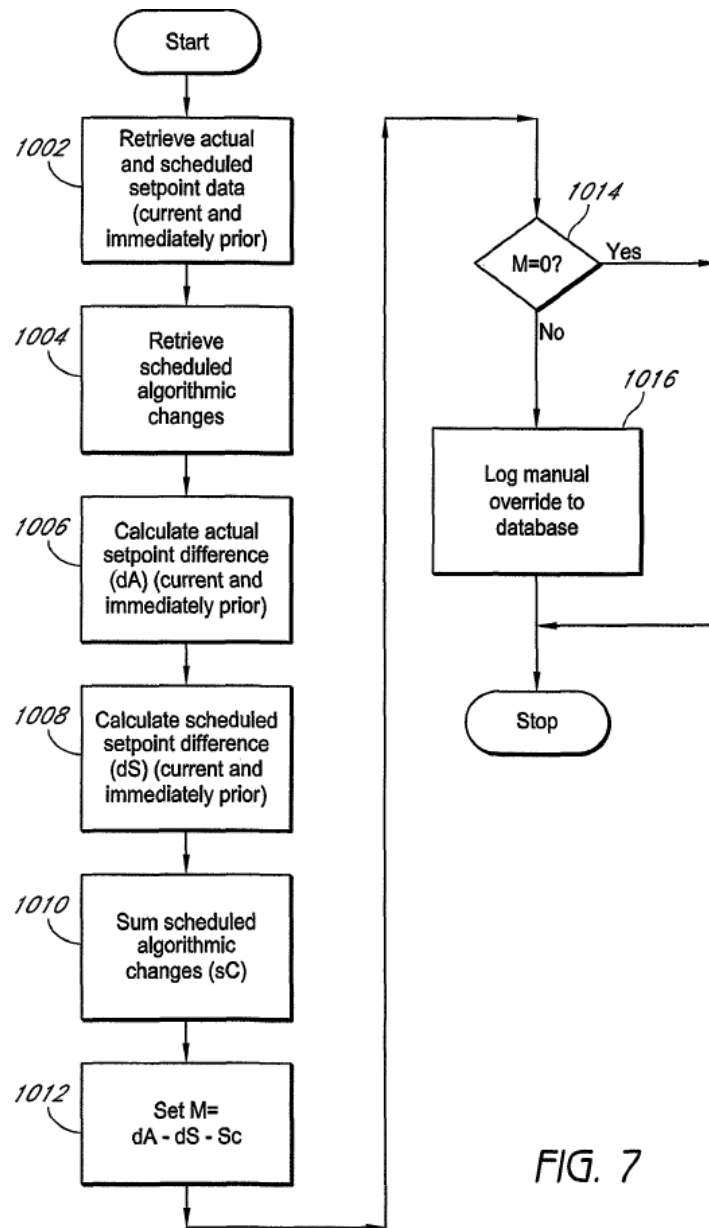


FIG. 7

At step 1002 illustrated in Figure 7, a server associated with the thermostat (e.g., a thermostat management server) retrieves setpoint data used to infer the occurrence of a manual override from one or more databases. *Id.* at 3:61–63, 5:55–6:19. At step 1004, the server retrieves any scheduled automated setpoint changes. *Id.* Such changes may include algorithmic changes intended to reduce energy consumption. *Id.*

At step 1006, the server calculates the setpoint difference. *Id.* At step 1008, the server calculates the scheduled setpoint difference. *Id.* At step 1010, the server evaluates and sums all active algorithms and other server-initiated strategies to determine their net effect on the setpoint. *Id.* For example, if one algorithm has increased setpoint by 2 degrees as a short-term energy savings measure, but another algorithm has decreased the setpoint by one degree to compensate for expected subjective reactions to weather conditions, the net algorithmic effect is +1 degree. *Id.*

At step 1012, the server calculates the value for M, where M is equal to the difference between actual setpoints dA, less the difference between scheduled setpoints dS, less the aggregate of algorithmic change sC. *Id.* at 6:20–30. At step 1014, the server evaluates the difference—if the difference equals zero, the server concludes that no manual override has occurred; however, if the difference is non-zero, the server concludes that a manual override has occurred, and at step 1016, the server logs the override to the database(s). *Id.*

After a manual override has been recognized, it can be used to either make short-term changes to the thermostat, or to alter long-term changes to interpretive rules and to setpoint scheduling for the thermostat. *Id.* at 2:37–42. Figure 8, reproduced below, illustrates a process of interpreting manual overrides and making short-term thermostat changes in response thereto. *Id.* at 2:37–42, 6:31–32.

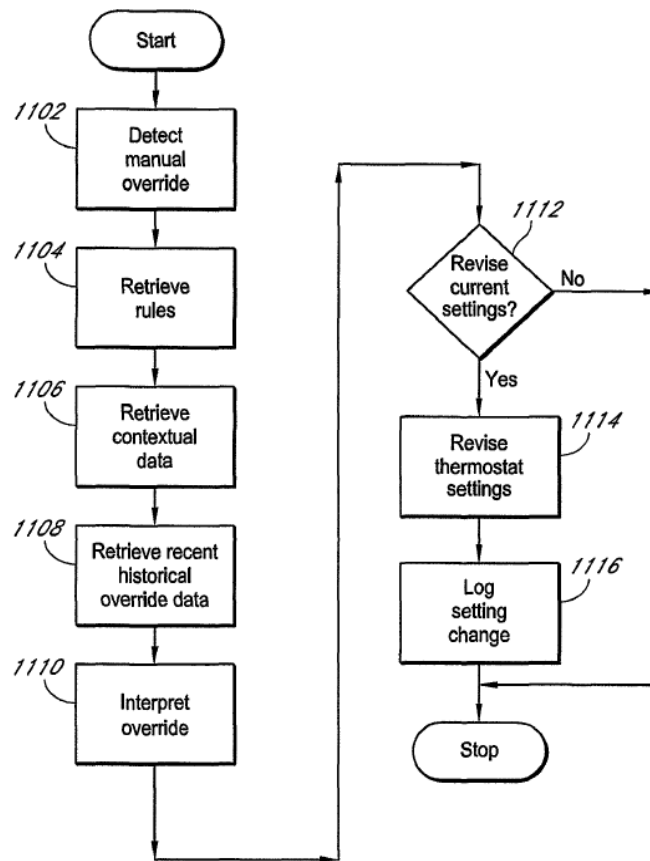


FIG. 8

After a manual override is detected (step 1102 in Figure 8), the server retrieves rules (step 1104³), contextual data (step 1106), and recent historical override data (step 1108). *Id.* at 6:31–60, Fig. 8. The retrieved rules include, for example, weather and time-related inferences such as: “if heating setpoint change is scheduled from ‘away’ to ‘home’ within . . . 2 hours after detected override, and override increases setpoint by at least 2 degrees, then change to ‘home’ setting.” *Id.* at 6:52–60. The “[contextual data] may

³ There appears to be typographical errors between Figure 8 and the descriptive text (Ex. 1001, 6:31–60) related to the labeling of steps 1104, 1106, and 1108. We refer here to the steps as labeled in Figure 8.

include current and recent weather conditions, current and recent inside temperatures, etc.” *Id.* at 6:34–36. The historical override data includes any “override data from the period preceding the specific override being evaluated that has not yet been evaluated by and incorporated into the long-term programming and rules engines.” *Id.* at 6:42–51.

At step 1110, the server applies the rules to the override and determines which rule, if any, should be applied as a result of the override, and in step 1112, the server determines whether to alter the current setpoint as a result of applying the rules in step 1110. *Id.* If a setpoint change is indicated, then the server transmits the setpoint change to the thermostat (step 1114), and records that change to database(s) (step 1116). *Id.*

The ’597 patent further explains that, in order to ensure that both the stored rules for interpreting manual thermostat overrides and the thermostat programming itself continue to most accurately reflect the intentions of the occupants, the server periodically reviews both the rules used to interpret overrides and the thermostat setpoint scheduling employed. *Id.* at 7:3–43.

D. Illustrative Claim

Of the challenged claims, claims 1, 9, and 17 are independent and claim 1 is illustrative:

1. A method for detecting manual changes to the setpoint for a thermostatic controller comprising:

providing a thermostatic controller operatively connected to a heating ventilation and air conditioning system, the temperature set point of the heating ventilation and air conditioning system being manually changeable;

accessing stored data comprising a plurality of internal temperature measurements taken within a structure and a plurality of outside temperature measurements;

using the stored data to predict changes in temperature inside the structure in response to at least changes in outside temperatures;

calculating with at least one computer, scheduled programming of the thermostatic controller for one or more times to control the heating ventilation and air conditioning system, the scheduled programming comprising at least a first automated setpoint at a first time;

recording, with the thermostatic controller, actual setpoints of the heating ventilation and air condition system;

communicating the actual setpoints from the one or more thermostatic controllers to the at least one computer;

generating with the at least one computer, a difference value based on comparing at least one of the an [sic] actual setpoints at the first time for the thermostatic controller to the first automated setpoint for the thermostatic controller;

detecting a manual change to the first automated setpoint by determining whether the at least one of the actual setpoints and the first automated setpoint are the same or different based on the difference value; and

logging the manual change to a database.

Ex. 1001, 8:8–38.

II. ANALYSIS

A. Grounds of Unpatentability

Petitioner asserts the following ground of unpatentability (Pet. 6), supported by the declaration of Rajendra Shah (Ex. 1002):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–24	103(a) ⁴	Ehlers, ⁵ Wruck ⁶

B. Legal Standards

Petitioner bears the burden to demonstrate unpatentability. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

A claim is unpatentable as obvious under 35 U.S.C. § 103(a) 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.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). We resolve the question of obviousness based on underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the prior art and the claims; (3) the level of skill in the art; and (4) when in evidence, objective indicia of obviousness or nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

We apply these principles to the Petition’s challenges.

⁴ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. § 103 effective March 16, 2013. We refer to the pre-AIA version of § 103.

⁵ U.S. Patent Pub. 2004/0117330 A1, pub. June 17, 2004 (Ex. 1004, “Ehlers”).

⁶ U.S. Patent Pub. 2005/0040250 A1, pub. Feb. 24, 2005 (Ex. 1005, “Wruck”).

C. Level of Ordinary Skill in the Art

Petitioner argues that the level of skill of a person of ordinary skill in the art (“POSA”):

encompassed a (1) Bachelor’s degree in engineering, computer science, or a comparable field of study, and (2) at least five years of (i) professional experience in building energy management and controls, or (ii) relevant industry experience. Additional relevant industry experience may compensate for lack of formal education or vice versa.

Pet. 21 (citing Ex. 1002 ¶ 27).

Patent Owner argues that a person having ordinary skill in the art would have “2–3 years’ experience in temperature controls, embedded control systems, electronic thermostats, or HVAC controls, or similarly relevant industry experience, with relevant experience substituting for education and vice versa.” PO Resp. 5 (citing Ex. 2008 ¶ 26). Patent Owner further argues that an Administrative Law Judge adopted that formulation in a proceeding involving a related patent. *Id.* at 5–6 (citing Ex. 2011).

The parties’ positions on the level of ordinary skill in the art are substantially similar and both parties agree that the level of skill is not determinative to the outcome of the case. Tr. 7:3–7 (Petitioner), 30:8–12 (Patent Owner).

The ’597 patent is directed to systems and methods involving thermostatic controllers. *See* Ex. 1001, 8:8–9 (claim 1), 9:40–41 (claim 17). The parties’ listed experience for one of skill in the art (“building energy management and controls” or “temperature controls, embedded control systems, electronic thermostats, or HVAC controls”) appear equally relevant and interchangeable when considering the ’597 patent. Further, the parties

do not identify any difference in skill sets between 2–3 years’ or at least 5 years’ experience.

For consistency’s sake, we adopt Patent Owner’s level of skill. *See* Ex. 2011 (*In re Certain Smart Thermostat Sys., Smart HVAC Sys., Smart HVAC Control Sys., and Components Thereof*, 337-TA-1258, Order No. 18, 8 (ITC Sept. 1, 2021) (noting with regard to a related patent that “Professional experience in a more specialized area, even if for a shorter time (as Complainant contends), seems more appropriate than a more general area of experience having no direct connection to the relevant technology Therefore, a person of ordinary skill in the art at the time of the invention would have had 2–3 years’ experience in temperature controls, embedded control systems, electronic thermostats, or HVAC controls, or similarly relevant industry experience”). However, as previously stated, the level of skill is not determinative to the outcome of the case.

D. Claim Construction

In *inter partes* review, we construe claims 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), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b) (2021).

Petitioner states that “[a] prior ITC investigation [(*see* Ex. 2011)],” for a related patent, addressed a phrase similar to a phrase in claim 1, which Petitioner describes as an “apparent construction.” Pet. 11–12 (citing Ex. 1017, 396–402). It is not clear what Petitioner means by an apparent construction. Petitioner does not lay out a construction for this phrase. *Id.*

Patent Owner argues that “[t]he claim terms of the ’597 patent should be given their plain and ordinary meaning.” PO Resp. 8 (citing Ex. 2008 ¶ 32).

We determine that no terms need to be construed. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

E. Relative Credibility of Experts

Petitioner argues that Mr. Shah has significantly more experience than Dr. Palmer and that we “should take the relative experience of the experts into account when assessing their credibility.” Reply 8–9 (quoting *Tr. of Columbia Univ. v. Illumina, Inc.*, 620 F. App’x 916, 922 (Fed. Cir. 2015)). Patent Owner argues that “Dr. Palmer’s experience, and his opinions in this matter, are equally valuable as those of Mr. Shah.” PO Sur-reply 2–3.

We decline to find Dr. Palmer less credible based solely on the relative experience of the witnesses. There is no dispute that both of the witnesses are at least as skilled as a person having ordinary skill in the art. *See* Ex. 1002 ¶ 28; Ex. 1003 (CV of Mr. Shah); Ex. 2008 ¶ 26; Ex. 2009 (CV of Dr. Palmer). Therefore, both Mr. Shah and Dr. Palmer may give expert testimony. *See Kyocera Senco Indus. Tools Inc. v. ITC*, 22 F.4th 1369, 1376–77 (Fed. Cir. 2022) (“To offer expert testimony from the perspective of a skilled artisan in a patent case—like for claim construction, validity, or infringement—a witness must at least have ordinary skill in the art.”).

We see nothing in Mr. Shah’s greater experience that would give him greater insight as to what a person having ordinary skill in the art—as opposed to someone with significantly more experience—would find obvious. Petitioner does not identify a single patent case in which a court has discounted the testimony of an expert based on the relative experience of the two experts. Although Petitioner directs us to *Illumina* (*see* Pet. 8), the issue in that non-precedential decision was whether the PTAB committed reversible error by not resolving the dispute as to the level of ordinary skill in the art, not the relative weight to be given to qualified experts. *See Illumina*, 620 F. App’x at 921–22.

Instead, in judging the credibility of experts, we focus on whether the witness offers corroboration for his opinions, provides opinions that are consistent with the prior art, and the witness’ cross-examination testimony.

F. 35 U.S.C. § 103(a) – Ehlers, Wruck

Petitioner argues that the combination of Ehlers and Wruck renders obvious claims 1–24. Pet. 13–72. Patent Owner disagrees. *See* PO Resp. 10–34. For the reasons expressed below, we determine that Petitioner has proven, by a preponderance of the evidence, that claims 1–24 are unpatentable.

1. Ehlers

Ehlers is titled “System and Method for Controlling Usage of a Commodity.” Ex. 1004, code (54). Ehlers describes “managing delivery of energy from a distribution network to one or more sites.” *Id.* at Abstr. Figure 1B of Ehlers, reproduced below, illustrates an energy management system. *Id.* ¶¶ 20, 72.

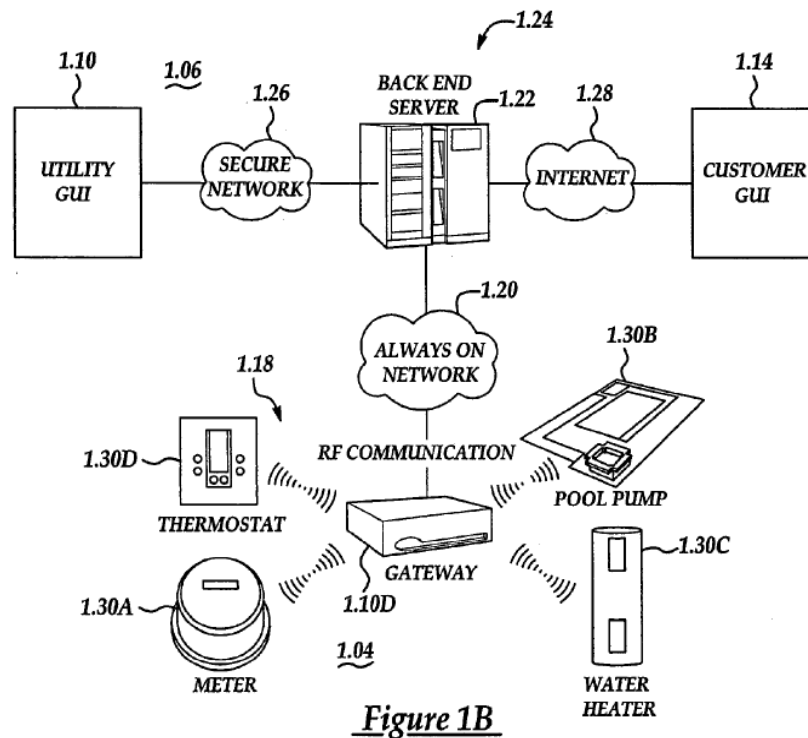


Figure 1B of Ehlers illustrates a customer site 1.04, and a utility 1.06 that generates and/or transmits electricity to the customer site. *Id.* ¶¶ 59–60. A gateway node 1.10D at the customer site communicates with a utility control system. *Id.* ¶ 72. The customer site 1.04 can include a number of systems that use electricity and communicate with the gateway, such as an electricity meter, a water heater, and an advanced thermostat device 1.30D. *Id.* ¶ 76.

The customer is able to monitor and control the devices through user interface 1.14 and the utility may also monitor the devices and control their usage of electricity. *Id.* ¶¶ 69, 77–78. In this way, the utility may implement a Power Supply Program designed to alleviate or reduce energy demand during peak periods. *Id.*

Figure 3B of Ehlers, reproduced below, is a block diagram of an advanced thermostat device. *Id.* ¶¶ 28, 229.

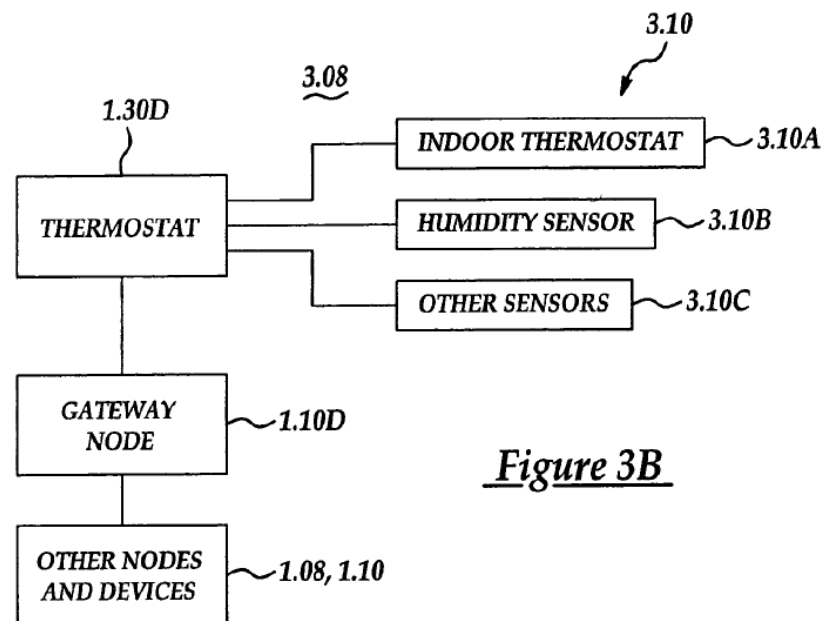


Figure 3B

Advanced thermostat device 1.30D in Figure 3B is part of a temperature and environmental sensing and control system 3.08, with thermostat 1.30D being a node having a node processor, a memory and a two-way communications channel. *Id.* ¶ 229. Thermostat 1.30D is coupled to sensors 3.10 adapted to sense one or more parameters related to indoor or outdoor air quality (temperature, humidity, etc.). *Id.* ¶ 237. Thermostat 1.30D may also receive external information through gateway node 1.10D, such as the local weather forecast. *Id.* Based on this data and information, thermostat 1.30D controls other devices 1.08 (such as a HVAC system) to manage air quality. *Id.*

Ehlers explains that system 3.08 learns from the user's inputs or adjustments to the system to change or modify indoor air temperature. *Id.* ¶ 242. The system can then monitor and control temperature and humidity levels. *Id.*

For example, if the customer initially sets the thermostat at 72° F, the system maintains a relationship between the temperature and humidity level sensed, and, as the humidity level of the home rises in summer, the effective

setpoint is automatically lowered to maintain a consistent level of comfort. *Id.* ¶ 243. “[T]he system 2.18 may have to lower the effective set point from that established by the customer by 3 degrees F. for every 10% of relative humidity that is sensed to retain the comfort level in the site.” *Id.*

2. Ehlers and “Thermal Gain Rate”

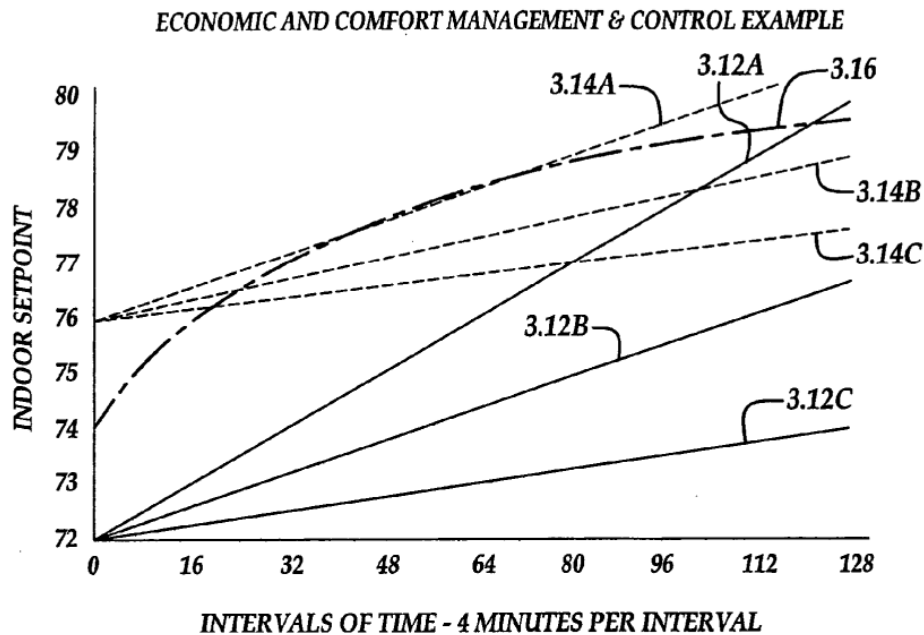
Underlying a large portion of the dispute between the parties is what does the phrase “thermal gain rate” in Ehlers refer to. *See* PO Resp. 10–19; Reply 8–14; Tr. 8:5–22:16 (Petitioner), 30:14–41:20 (Patent Owner).

Accordingly, we address this dispute before applying the prior art to the claim limitations.

Petitioner argues that “thermal gain rate” in Ehlers is a measure of the rate of change of inside temperature. *See* Pet. 34–38; Reply 9–15; Tr. 9:6–12. According to Petitioner, it is measured when the HVAC is off. *See* Reply 10 (“*Ehlers* ’330 teaches calculating the rate at which temperature inside a structure changes over time at different outside temperatures *when the HVAC system is ‘OFF,’* as illustrated in Figure 3D.” (emphases added)). For support of its understanding, Petitioner focuses on Ehlers Figures 3D, 3E, and 3G and their description in paragraphs 253 through 256.

Patent Owner argues that “thermal gain rate” in Ehlers does not refer to a measure of the rate of change of the inside temperature. *See* PO Resp. 10–19; PO Sur-reply 4–13; Tr. 30:14–15. Instead, Patent Owner argues that it is the rate that energy is absorbed. *See* PO Resp. 11 (citing Ex. 2008 ¶ 37); Tr. 30:16–17. Patent Owner relies on the same portions of Ehlers as Petitioner does.

We begin our analysis with Ehlers Figure 3D, reproduced below.



Ehlers Figure 3D is a graph illustrating “an exemplary economic and comfort management control strategy.” Ex. 1004 ¶ 29. Figure 3D shows a graph showing the indoor set point (temperature) versus time.

The first set point for which data is available is 72 degrees F. The three trends illustrated as lines 3.12A, 3.12B, and 3.12C plot the thermal rate of gain in the site 1.04 for different outside temperatures. On the day represented by line 3.12A the outside temperature was 99 degrees F. On the day represented by line 3.12B, the outside temperature was 90 degrees F. On the day represented by line 3.12C, the outside temperature was 77 degrees F. The next set point for which data is illustrated is the set point of 76 degrees F. The three trends shown as lines 3.14A, 3.14B, and 3.14C illustrate the thermal rate of gain in the home 2.18 for the same outside temperatures plotted in the 3.12A, 3.12B, 3.12C data points.

Ex. 1004 ¶ 253. Ehlers describes this graph as a “thermal gain table” and it “show[s] the impact the set point versus outside temperature differential has

over the thermal gain rate in the home.” Ex. 1004 ¶ 253. In the scenario illustrated in Figure 3D, the HVAC system is off. Ex. 1002 ¶ 92; Ex. 2008 ¶ 54.

There appears to be little dispute between the parties as to what is being shown in Figure 3D. Both experts testify that “[t]he lines appear to reflect temperatures rather than rates of energy increase.” Ex. 2008 ¶ 38; *see also* Ex. 1021 ¶ 7 (“The x axis of Figure 3D represents time in minutes and the y axis of Figure 3D represents temperature in degrees Fahrenheit.”); Ex. 1002 ¶ 93. And a person having ordinary skill in the art would recognize that “that the thermal gain rate is *related to* the slope of the line (which would be rate of change of temperature).” Ex. 2008 ¶ 38; *see also* Ex. 1021 ¶ 7 (“Each of the lines depicted in Figure 3D thus represents “rates” at which the temperature (y axis) in the structure changes over time (x axis).”); Ex. 1002 ¶ 93. “[T]he data in Fig 3D discloses the changes in inside temperature from a specific starting temperature and for a single, specific outside temperature when the HVAC system is OFF.” Ex. 2008 ¶ 59; *see also* Ex. 1002 ¶¶ 92–93; Ex. 1021 ¶¶ 6–7. Stated differently, Figure 3D graphs the change of temperature over time based on a given starting internal temperature (set point) and an external temperature. Because Ehlers states that these lines “plot the thermal rate of gain” and “illustrate the rate of thermal gain,” (Ex. 1004 ¶ 253) a person having ordinary skill in the art would recognize that the slope of the line—which Dr. Palmer admits is the rate of change of temperature over time (Ex. 2008 ¶ 38)—is the thermal gain rate. *See* Ex. 1002 ¶¶ 92–93. That is, the slope of the line, which represents the thermal gain rate, is the rate of change of the internal temperature over

time during periods in which the HVAC is turned off. Therefore, Petitioner's definition of thermal gain rate is consistent with Ehlers Figure 3D.

Petitioner's definition is also consistent with the description of "thermal gain rate" elsewhere. For example, Ehlers states that Figure 3F shows "the rate of thermal gain per hour would be set at 3 degrees F. per hour." Ex. 1004 ¶ 255. That is, Ehlers specifically states that thermal rate gain is a measure of the change of internal temperature over time. *See id.* ¶ 255; Ex. 1021 ¶ 7. And, because it is discussing an increase in the internal temperature, that means that the HVAC is cycled off at that time. *See* Ex. 1021 ¶ 16.

We cannot reconcile Patent Owner's definition of thermal rate gain with the description of Figure 3D or the example in paragraph 255. As discussed above, Ehlers states that Figure 3D "plot[s] the thermal rate of gain" and "illustrate[s] the rate of thermal gain." Ex. 1004 ¶ 253. As the lines plot temperature over time, the lines do not show the rate that energy is absorbed over time. Instead, as discussed above, it shows the rate of temperature change over time while the HVAC system is off. *See also* Ex. 1002 ¶ 93.

Moreover, Patent Owner's definition is inconsistent with the statement in paragraph 255 discussed above, which clearly equates the thermal gain rate with a measure of change of temperature over time. *See* Ex. 1004 ¶ 255 ("For the maximum savings setting, the dead band in this example would be raised to 3 degrees F. and the rate of thermal gain per hour would be set at 3 degrees F. per hour.").

Accordingly, we find that "thermal gain rate" means the rate of temperature change over time while the HVAC system is off.

Patent Owner makes a number of arguments disputing Petitioner's understanding of thermal gain rate. For the reasons set forth below, we disagree with those arguments.

Patent Owner argues that “the phrase ‘thermal gain rate’ is well understood by a [person having ordinary skill in the art] to be the rate at which energy is absorbed.” PO Resp. 11 (citing Ex. 2008 ¶ 37). But the only evidence Patent Owner cites is the conclusory statement of Dr. Palmer repeating the Response without any citation. *See* Ex. 2008 ¶ 37. Because Dr. Palmer's testimony does not provide any evidentiary support, we find it not credible and give it no weight. *See Xerox Corp. et al. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 (PTAB Aug. 24, 2022) (precedential) (holding that a conclusory declaration is entitled to little weight when it is a substantial restatement of the party's arguments without any additional supporting evidence or reasoning); 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, it is inconsistent with the use of “thermal gain rate” discussed in paragraph 255, which clearly uses the phrase to refer to the rate of temperature change over time.

Patent Owner also argues that its understanding of thermal gain rate in Ehlers is consistent with Ehlers Figures 3D, 3E, and 3G. *See* PO Resp. 11–18; PO Sur-reply 5–7. We agree that there is some support of Patent Owner's understanding in Figures 3E and 3G. However, we cannot look at Figures 3E and 3G in isolation. Instead, we must also consider whether Patent Owner's interpretation is consistent with Ehlers Figure 3D. And, for the reasons discussed above, it is not. Instead, as Petitioner and Mr. Shah

persuasively argue, Figure 3D clearly demonstrates that thermal gain rate in Figure 3D refers to the rate of change of the internal temperature.

Patent Owner also argues “if ‘thermal gain rate’ meant ‘rate of change of temperature,’ then the illustrations of Fig. 3E and Fig. 3G would indicate that the temperature was continuously increasing by 1 to 3 degrees per hour, for a total of nearly 42 degrees F. over the 24-hour period, regardless of the operation of the HVAC.” PO Resp. 18 (citing Ex. 2008 ¶ 43); *see also id.* at 14–15 (arguing thermal gain rate in Figure 3E cannot be a change of internal temperature because the temperature does not change); *id.* at 15–18 (making a similar argument with regard to Figure 3G); PO Sur-reply 6–10. According to Patent Owner, that is “directly contrary to Ehlers['] own usage.” PO Resp. 18.

Patent Owner’s argument does not account for how an HVAC system operates. During normal operation, an HVAC system cycles on and off. Ex. 1021 ¶ 16. The percentage of time the system is on “increases or decreases to balance the thermal gain rate of the structure—*e.g.*, to keep the *net* rate of change in indoor temperature over time at or close to zero.” *Id.* ¶ 16. That is, in the cooling context, although there is a gain in temperature when the HVAC is off, this is balanced by a negative gain (or decrease) in temperature when the HVAC is on. *Id.* A person having ordinary skill in the art would recognize that the positive and negative gain balance to keep the internal temperature at or near the set point. *Id.* ¶¶ 16–17. “In other words, the HVAC system cycles ON and OFF to effectively balance out the overall full cycle average rate of change of inside temperature at or near zero.” *Id.* ¶ 17; *see also id.* ¶¶ 16–21 (explaining how Figures 3E and 3F are consistent with Petitioner’s understanding of thermal gain rate). Thus, contrary to

Patent Owner's argument, applying Petitioner's understanding of thermal gain rate will not result in an internal temperature of 100 degrees F. *See* PO Sur-reply 6.

Patent Owner also argues that Petitioner ignores Mr. Shah's admission that "his interpretation of the phrase 'thermal gain' may not have the meaning that he attributes to it in applying the language of Ehlers, saying 'The thermal gain rate[] depends on how you interpret the language.'" ⁷ PO Sur-reply 5 (quoting Ex. 2013, 27:13–14) (alteration in original). According to Patent Owner, "[o]nly Dr. Palmer's opinion is supported by the consistent and repeated disclosures in Ehlers, all of which confirm that the 'thermal gain rate' is not, and cannot be, a 'predicted rate of change in temperature.'" *Id.*

We do not agree. First, as discussed above, Dr. Palmer's interpretation is not consistent with Ehlers. To the contrary, as discussed above, Dr. Palmer's interpretation of thermal rate gain is inconsistent with Ehlers' description of Figure 3D and ignores the clear disclosure of paragraph 255.

Second, Patent Owner takes Mr. Shah's testimony out of context. As the very next sentence—a sentence that Patent Owner chose not to include in its Sur-reply—makes clear, Mr. Shah is testifying as to how Ehlers uses the term:

Q. Okay. And you would agree that the thermal gain rate of a building is different when the HVAC system is on than when the HVAC system is off?

MS. LAUGHTON: Objection. Form.

⁷ Here and elsewhere, the parties refer to "Ehlers" as "Ehlers '330." We have modified all quotes to change "Ehlers '330" to "Ehlers."

THE WITNESS: The thermal gain rate as -- depends on how you interpret the language. *But the way Ehlers is looking at it, the thermal gain rate is the gain* -- thermal gain from the outside to the inside based on, as we say, the outside and the inside temperatures, the difference between them and the structure of the building and the materials and the -- you know, that can insulate or not. So that's the primary driver for the thermal gain rate.

Ex. 2013, 27:9–21 (emphasis added). Although thermal gain rate may have different meanings depending on the context, Mr. Shah's testimony is about how it is used in Ehlers.

Patent Owner also argues that "Petitioner's conclusions are clearly incorrect and are not supported by the testimony of Mr. Shah." PO Sur-reply 8. According to Patent Owner Mr. Shah testified during cross-examination that "thermal gain is not a rate of temperature change because Ehlers expressly states" that the system has a fixed set point. *Id.* (citing Ex. 1004 ¶ 254). Specifically, Patent Owner argues Mr. Shah testified as follows: "So whatever heat is being absorbed from the outside, the cooling of the HVAC system matches it in order to keep the inside temperature almost the same as the set point. That's what this graph is showing." *Id.* at 8–9 (quoting Ex. 2013, 28:7–11).

We do not agree with Patent Owner that there is anything inconsistent between the cited testimony and Petitioner's position. Mr. Shah testified as to what happens during an HVAC cycle as the HVAC cools the interior to counterbalance the heat being absorbed. Ex. 2013, 28:7–11. But at no time did Mr. Shah equate the heat being absorbed with the thermal gain rate. *See* Ex. 2013, 28:7–11. Instead, earlier in the same answer that Patent Owner

relies on, Mr. Shah clearly links thermal gain rate with the increase in the interior temperature due to heat outside:

But the way Ehlers is looking at it, the thermal gain rate is the gain -- thermal gain from the outside to the inside based on, as we say, the outside and the inside temperatures, the difference between them and the structure of the building and the materials and the --you know, that can insulate or not.

Ex. 2013, 27:14–20.

Accordingly, for the reasons set forth above, we find, consistent with Petitioner’s understanding, that Ehlers uses the term “thermal gain rate” to mean the rate of change of inside temperature when the HVAC system is off.

3. *Wruck*

Wruck is titled “Transfer of Controller Customizations,” and pertains to “configuring, setting and adjusting of programmable thermostats of air management systems, and the transfer of configuration information among the configuration tools.” Ex. 1005, code (54), ¶ 2. Wruck describes a personal digital assistant or computer that can be used to remotely configure, set or adjust the parameters and options of a control system. *Id.* at Abstr.

Figures 9G and 9I of Wruck, reproduced below, illustrate steps for reviewing the configuration of a thermostat and making possible changes. *Id.* ¶ 28.

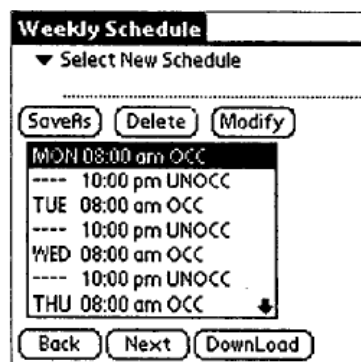


Figure 9G

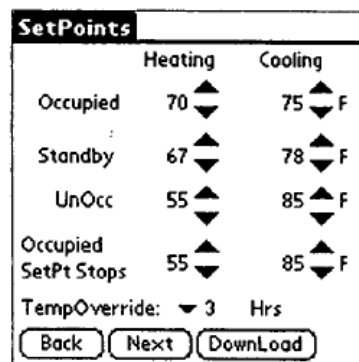


Figure 9I

Figure 9G illustrates an events schedule screen that enables modification of a schedule relative to unoccupied and occupied times of a user's space, for each day of the week, and Figure 9I illustrates a screen where a user may enter temperature set points for heating and cooling of a space that is occupied or unoccupied. *Id.* ¶¶ 28, 98.

Wruck provides that thermostat operating data may be monitored and displayed. *Id.* ¶ 110. For example, a temporary setpoint can be displayed: "Display actual temporary setpoint if Delta value < > 0." *Id.* at Table 28.

4. Claim 1

The Petition outlines how the combination of Ehlers and Wruck teaches the features of independent claim 1. Pet. 23–56. Generally, Petitioner relies on Ehlers for the majority of the features of claim 1 and on the combination of Ehlers and Wruck for the features involving "generating with the at least one computer, a difference value" and "detecting a manual change." Pet. 23–56.

Below, we consider the arguments and evidence relating to claim 1, of which, Patent Owner only contests the limitations listed under sections d, e, and h. *See* PO Resp. 19–30.

a) A method for detecting manual changes to the setpoint for a thermostatic controller comprising:

Petitioner argues that the preamble of claim 1 is suggested by Ehlers. Pet. 23–28. As identified by the Petition, Ehlers teaches managing a thermostatic controller. *Id.* at 23 (citing Ex. 1004, Abstr. ¶¶ 84, 90, 92, 190, 191). Petitioner argues that Ehlers teaches that “a user may set a desired **temperature set point** for the thermostat” and that the “user can also ‘override’ a scheduled setpoint.” *Id.* at 26 (citing, *e.g.*, Ex. 1004 ¶¶ 12, 116).

Concerning “detecting manual changes to the setpoint,” Petitioner argues that Ehlers teaches that the system learns from a user’s changes to the temperature setpoint so that over time, the system should better reflect the user’s preferences, decreasing the likelihood of the user needing to manually override the setpoint. *Id.* at 26–28 (citing, *e.g.*, Ex. 1004 ¶¶ 242–243, 308–309; Ex. 1002 ¶¶ 77–80).

Based on the cited evidence and arguments, we determine that Petitioner has proven, by a preponderance of the evidence, that Ehlers suggests the preamble⁸ of independent claim 1.

b) providing a thermostatic controller operatively connected to a heating ventilation and air conditioning system, the temperature set point of the heating ventilation and air conditioning system being manually changeable;

Petitioner argues that these elements of claim 1 are taught by Ehlers. Pet. 28–29. For example, Petitioner argues that Ehlers teaches controlling an HVAC system and that the temperature setpoints of the system are

⁸ Because it is not necessary, we make no determination of whether the preamble is a required aspect of the claim.

changeable by the user. *Id.* (citing, *e.g.*, Ex. 1004 ¶¶ 66, 81, 137–138, 153–160).

Based on the cited evidence and arguments, we determine that Petitioner has proven, by a preponderance of the evidence, that Ehlers teaches these elements of claim 1.

c) accessing stored data comprising a plurality of internal temperature measurements taken within a structure and a plurality of outside temperature measurements;

Petitioner argues that these elements of claim 1 are suggested by Ehlers. Pet. 29–34. For example, Petitioner points to Ehlers’ teaching that internal and external temperature measurements are stored by the system. *Id.* at 29, 31–32 (citing, *e.g.*, Ex. 1004 ¶¶ 268, 283, 293). Petitioner further argues that Ehlers’ system accesses the stored measurements, for example to generate historical reports and to calculate thermal gain rates. *Id.* at 31–33 (citing, *e.g.*, Ex. 1004 ¶¶ 123–125, 253, 256; Ex. 1002 ¶¶ 87, 90).

Based on the cited evidence and arguments, we determine that Petitioner has proven, by a preponderance of the evidence, that Ehlers teaches or suggests these elements of claim 1.

d) using the stored data to predict changes in temperature inside the structure in response to at least changes in outside temperatures;

Petitioner argues that these elements of claim 1 are suggested by Ehlers. Pet. 34–43. Petitioner argues that Ehlers teaches a system that “tracks and learns about the thermal gain characteristics of the home.” *Id.* at 34 (quoting Ex. 1004 ¶ 253). As discussed above, Ehlers does this by tracking the thermal gain rate—that is the rate of change of temperature over time while the HVAC is off—for different setpoints and outside

temperatures. Ex. 1004 ¶ 253; Section II.F.2; *see also* Ex. 1002 ¶¶ 92–96; Pet. 34–40. In other words, Ehlers teaches calculating thermal gain rates for different indoor set points and outside temperatures that represent a predicted rate of change of the temperature inside the structure at a first location. Ex. 1002 ¶¶ 96–97.

Petitioner argues that Ehlers uses the “computed thermal gain rate” to “compute[] the required effective set point offset needed to keep the HVAC cycle run time at [a] specified trigger level,” for example, at or below 33%. Pet. 39 (quoting Ex. 1004 ¶ 256). In that way, Ehlers predicts the thermal gain to predict the speed that the temperature inside the first location will change in response to changes in outside temperature at the current time or at a time in the future. Ex. 1002 ¶ 97. This thermal gain rate can be used to determine whether to pre-cool the structure prior to implementing a demand reduction request and/or reducing demand in response to a change in energy pricing. Ex. 1002 ¶ 96; *see also* Ex. 1004 ¶¶ 204, 247, 265 (all discussing pre-cooling).

Some of Patent Owner arguments focus on the Petition’s alleged misunderstanding of the meaning of thermal gain rate as used in Ehlers. *See* PO Resp. 19–25; PO Sur-reply 4–19. For the reasons discussed above in Section II.F.2, we do not agree with those arguments. We do not repeat the arguments or our findings here. However, we address Patent Owner’s other arguments below.

Patent Owner argues that Ehlers Figure 3D, and thus the thermal gain rate, only relates to when the HVAC is off. PO Resp. 19–21. Patent Owner further argues that Mr. Shah stated during cross-examination “that the

HVAC system being turned ON and functioning will alter the thermal gain rate of a building.” *Id.* at 20–21 (citing Ex. 2012, 29:3–23).⁹

We agree with Patent Owner’s factual description of what is shown in Ehlers’ Figure 3D and the effect of turning the HVAC system on; however, Patent Owner’s argument is inapposite. Claim 1 does not require that the predicted rate of change be based upon any particular status of the HVAC system.

Patent Owner also argues that “[t]here is no discussion in Ehlers, and neither Petitioner nor Mr. Shah identify one, of predicting changes in inside temperatures based on changes in outdoor temperatures.” PO Resp. 21 (citing Ex. 2008 ¶ 56). Specifically, Patent Owner first argues that “calculating a setpoint is not a prediction, it is developing an instruction for the control system.” *Id.* (citing Ex. 2008 ¶ 57). Similarly, Patent Owner argues that when Ehlers balances comfort with energy savings by setting a recovery time, it is merely operating the HVAC system based on a number of inputs. *Id.* at 22. Second, Patent Owner argues that, at best, Ehlers teaches “the changes in inside temperature from a specific starting temperature and for a single, specific outside temperature when the HVAC system is OFF.” *Id.* According to Patent Owner, Ehlers “does not provide an overall thermal gain rate for a building, nor does it involve considering changes to outside temperatures.” *Id.* at 22–23 (citing Ex. 2008 ¶ 59).

We do not agree with Patent Owner’s arguments. Ehlers calculates the thermal gain rate so that it can make predictions about future inside

⁹ The Response directs us to page 28. That appears to be a typographical error. However, our discussion of this argument applies to the testimony cited on either page.

temperatures, including predictions based on changes in outside temperatures. *See* Ex. 1002 ¶¶ 96–97; Ex. 1021 ¶ 26. For example, Ehlers describes how the system uses the thermal gain rate data to “manage costs and comfort.” Ex. 1004 ¶ 252. Ehlers further describes how the “computed thermal gain rate” is used to “compute[] the required effective set point offset needed to keep the HVAC cycle run time at [a] specified trigger level.” Ex. 1004 ¶ 256; *see also* Ex. 1021 ¶¶ 27–36 (providing a detailed explanation). Additionally, as discussed above, Ehlers uses the thermal gain rate to make predictions when determining whether to pre-cool before implementing a reduction in demand (Ex. 1002 ¶ 97; Ex. 1004 ¶ 256), when computing the recovery time (Ex. 1002 ¶ 98), and to balance comfort with savings (*id.* ¶ 99). These predictions are all based on the thermal gain rate, which varies based on the outside temperature. *See* Ex. 1004, Fig. 3D. Because the predicted rate of change of internal temperature—that is, the thermal gain rate—varies based on the outside temperature, the prediction is based on changes in outside temperature.

Based on the cited evidence and arguments, we determine that Petitioner has proven, by a preponderance of the evidence, that Ehlers teaches or suggests these elements of claim 1.

e) calculating with at least one computer, scheduled programming of the thermostatic controller for one or more times to control the heating ventilation and air conditioning system, the scheduled programming comprising at least a first automated setpoint at a first time;

Petitioner argues that these elements of claim 1 are suggested by Ehlers. Pet. 43–47. Petitioner argues that this is because “Ehlers . . . teaches that ‘the system 3.08’ computes various thermal gain rates and then uses

those thermal gain rates to perform various computations to manage the system.” *Id.* at 43 (citing Ex. 1004 ¶¶ 252–256; Ex. 1002 ¶ 101).

Petitioner further argues that “thermostat 1.30D (the **thermostatic controller**) is connected to a gateway node 1.10D” and that the gateway node reads on the claimed at least one computer. *Id.* at 45–46; *see also id.* at 45 (citing Ex. 1004 ¶ 268 (which states in part: “each node . . . includes a node processor **2.02** and memory **2.04**” and “any node . . . may assume the processing and/or the control of one or more devices and/or the storage of system data”)).

Concerning using the node to perform the claimed calculations, Petitioner implicitly acknowledges that this is not expressly taught by Ehlers. *Id.* at 46. Rather, Petitioner argues that one of skill in the art “would understand . . . that the gateway node . . . can be used to perform the claimed **calculations**” or, alternatively, that “[i]t would also be obvious to use the gateway node to perform the claimed calculations.” *Id.* (citing, *e.g.*, Ex. 1002 ¶ 106).

Petitioner argues that as “gateway nodes are typically a computer supplied by an energy company,” “[i]t would be obvious to configure a gateway node to perform the disclosed calculations because it would be more convenient for an energy company to do so.” *Id.* (citing Ex. 1002 ¶ 106). Petitioner also argues that “[i]t would further have been obvious under *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 416-21 (2007) to use any computer in communication with the thermostatic controller.” *Id.*

Patent Owner argues generally that “the various computations identified are not setpoints.” PO Resp. 25 (citing Ex. 2008 ¶ 65).

Concerning certain of these “computations,” Petitioner, argues that Ehlers teaches “programming [to] . . . provide for an **automated setpoint**—in this example, the setpoint calculated by the system which does not increase HVAC run time—which can be scheduled to occur **at a first time**.” Pet. 44. (citing Ex. 1004 ¶ 256; Ex. 1002 ¶ 102). In particular, Ehlers gives the example of a temperature setpoint at 72 degrees with a user selected variation of plus or minus 4 degrees. Ex. 1004 ¶ 256. The system can be programmed so as the day gets hotter and the HVAC runtime increases, the temperature setpoint can be adjusted, e.g., increased from 72 degrees by up to 4 degrees, so that the HVAC runtime stays at 33 percent or less for as long as possible. *Id.* If the runtime target is exceeded then other programming may further adjust the system based on other control parameters. *Id.*

Patent Owner argues that this example fails because the Petition is not sufficiently specific with which setpoint in Ehlers Petitioner is relying on for the claimed “first automated setpoint,” and that Petitioner has not identified the claimed “first time.” PO Resp. 26–27. We disagree. In this example, the calculated and therefore “first automated setpoint,” is the adjusted temperature setpoint, or the calculated setpoint up to 4 degrees above 72 degrees. Pet. 44; Reply 24–25. When this adjusted temperature setpoint is implemented by the system it occurs at a first time. Pet. 43–44; Reply 25. The claim does not require any more specifics than this.

Based on the cited evidence and arguments, we determine that Petitioner has proven, by a preponderance of the evidence, that Ehlers teaches or suggests these elements of claim 1.

f) recording, with the thermostatic controller, actual setpoints of the heating ventilation and air condition system;

g) communicating the actual setpoints from the one or more thermostatic controllers to the at least one computer;

Petitioner argues that these elements of claim 1 are suggested by Ehlers. Pet. 47–49. Petitioner argues that Ehlers’ teaches that the temperature set points are stored by the system, and in particular are recorded by the thermostat. *Id.* at 47–48 (citing, *e.g.*, Ex. 1004 ¶ 253). Then, concerning the step of communicating, Petitioner argues that:

Ehlers ’330 renders obvious this claim element. (Ex. 1002, ¶110). As set forth under claim element [1e] above, it is obvious to calculate scheduled programming of the thermostatic controller using Ehlers ’330’s gateway node, which is a **computer**. (Ex. 1002, ¶110). As set forth below under claim elements [1h] and [1i], it is obvious to use the **computer** to detect a manual change to the first automated setpoint. (Ex. 1002, ¶110). It would also be obvious to **communicate the actual setpoints** from Ehlers ’330’s thermostat 1.30D (the **thermostatic controller**) to the gateway node (a **computer**) in order to use them in the computations relating to calculating scheduled programming and detecting manual set point changes. (*See, e.g.*, Ex. 1004, ¶¶0150, 0153-0157, 0195)(Ex. 1002, ¶110)

Id. at 49.

Based on the cited evidence and arguments, we determine that Petitioner has proven, by a preponderance of the evidence, that Ehlers teaches or suggests these elements of claim 1.

h) generating with the at least one computer, a difference value based on comparing at least one of the an [sic] actual setpoints at the first time for the thermostatic controller to the first automated setpoint for the thermostatic controller; [and] detecting a manual

change to the first automated setpoint by determining whether the at least one of the actual setpoints and the first automated setpoint are the same or different based on the difference value; and

Petitioner argues that these elements of claim 1 are taught or suggested by the combination of Ehlers and Wruck. Pet. 50–54. Petitioner first points to the discussion of the preamble concerning “detecting manual changes to the setpoint,” (*id.* at 50) where Petitioner argues that Ehlers teaches that the system learns from a user’s changes to the temperature setpoint so that, over time, the system should better reflect the user’s preferences, decreasing the likelihood of the user needing to manually override the setpoint (*id.* at 26–28 (citing, *e.g.*, Ex. 1004 ¶¶ 242–243, 308–309; Ex. 1002 ¶¶ 77–80); *see also id.* at 19–20 discussing application to automated setpoints in Ehlers).

Petitioner states that though Ehlers’ system “**detect[s] a manual change** to a setpoint,” it does not disclose how. *Id.* at 50 (citing Ex. 1004 ¶¶ 242–243, 268, 308, 309; Ex. 1002 ¶¶ 113, 114). Accordingly, Petitioner argues that “[t]o determine whether two numbers are [the] same or different from each other . . . , the most obvious thing to do is to **compare** them,” as required by the claim. *Id.* (citing Ex. 1002 ¶ 114).

Similarly, Petitioner argues that “Wruck teaches determining whether a user’s manually entered setpoint differs from a scheduled setpoint by forming a difference value.” *Id.* at 51–52 (citing Ex. 1005, Table 28, ¶ 110; Ex. 1002 ¶ 116). Petitioner further argues that

It would thus be obvious . . . to form a difference value by **comparing** an **actual setpoint** at the first time for the thermostatic controller to a scheduled, **automated setpoint** for the thermostatic controller in order to **determine whether they**

are the same or different from each other, and thus detect a manual change.

Id. at 53 (citing Ex. 1002 ¶ 118).

Patent Owner first argues that the Petition is deficient because it does not analyze detecting manual changes to the setpoint where the setpoint is the calculated automated setpoint from the prior limitation. PO Resp. 28–29. Notably, Patent Owner does not contest that Ehlers teaches detecting manual changes to the setpoint. *See* PO Resp.

In response, Petitioner argues persuasively that “[t]he goal of Ehlers . . . is . . . to detect when a user has made a change to whatever setpoint is currently operative, which includes automated setpoints calculated by the system, and the Petition’s theory is that it would be obvious to do so. Reply 30 (citing Pet. 19–20; Ex. 1002 ¶¶ 64, 119). At pages 19–20 of the Petition, Petitioner does discuss application of Ehlers teaching of detecting a manual change of a setpoint to the automated setpoints in Ehlers and in view of the combination of Ehlers and Wruck. The Petition refers to the automated setpoints generally and does not refer to a particular example, however we see no need to discuss more than the general concept as applied to automated setpoints. Further, Patent Owner does not argue otherwise after Petitioner’s Reply. *See* PO Sur-reply 21–22 (provides no argument or response on this subject).

Patent Owner also argues that Ehlers teaches away from the claimed limitation “in favor of a different one that only tracks user changes to other user-programmed manual setpoints—not comparing any user setpoint to any computer-calculated setpoint.” PO Resp. 29 (citing Ex. 2008 ¶ 73). Though couched as a teaching away argument, this is more accurately described as

an argument against obviousness. *See In re Ethicon, Inc.*, 844 F.3d 1344, 1351 (Fed. Cir. 2017) (“Teaching away requires ‘clear discouragement’ from implementing a technical feature.”).

At the same time, Petitioner has the better argument as there is nothing in Ehlers that would suggest to one of skill in the art that the teachings should be so limited. *See* Reply 27–29. As identified by Petitioner, Ehlers teaches more generally “learning the user’s individual preferences” (*id.* (citing Ex. 1004 ¶¶ 242–243, 308–309)) and this would apply whether the user adjusts a temperature setpoint that was manually set or automatically set.

Based on the cited evidence and arguments, we determine that Petitioner has proven, by a preponderance of the evidence, that the combination of Ehlers and Wruck teaches or suggests this element of claim 1.

i) logging the manual change to a database.

Petitioner argues that this element of claim 1 is suggested by Ehlers. Pet. 54–56. As previously discussed, Petitioner cites to Ehlers’ teachings of learning from user changes to the set point and argues that it would have been obvious to log these changes to a database. *Id.* (citing, *e.g.*, Ex. 1002 ¶¶ 121–124).

Based on the cited evidence and arguments, we determine that, Petitioner has proven, by a preponderance of the evidence, that Ehlers teaches or suggests this element of claim 1.

j) Conclusion

After our review, we determine that Petitioner has proven, by a preponderance of the evidence, that the combination of Ehlers and Wruck suggests independent claim 1.

5. Claim 9

Claims 1 and 9 are very similar. Thus, the Petition primarily relies on the reasoning and discussion from independent claim 1 for related aspects of independent claim 9 with additional explanation and support for the differences. Pet. 60–67. Patent Owner argues that the Petition does not identify any automated setpoints with respect to the arguments surrounding the limitations of claim 1 discussed in sections d and e above. PO Resp. 31–33. However, the Petition only discusses setpoints with respect to the limitations of claim 1 discussed in section e and Patent Owner only relies on these arguments fully discussed above.

After our review, we determine that Petitioner has proven, by a preponderance of the evidence, that the combination of Ehlers and Wruck suggests independent claim 9.

6. Claims 2–8, 10–24

Claims 1 and 17 are very similar. Thus, the Petition primarily relies on the reasoning and discussion from independent claim 1 for related aspects of independent claim 17 with additional explanation and support for the differences. Pet. 67–71. The Petition further directs us to where Ehlers and Wruck teach or suggest each of the limitations recited in dependent claims 2–8, 10–16, and 18–24. *See id.* at 56–60, 67, 71–72.

Patent Owner relies on its arguments related to claims 1 and 9 for the patentability of these claims. PO Resp. 30, 33–34.

After our review, we determine that Petitioner has proven, by a preponderance of the evidence, that the combination of Ehlers and Wruck suggests claims 2–8, 10–16, and 18–24.

III. CONCLUSION¹⁰

For the reasons discussed above, we determine Petitioner has proven, by a preponderance of the evidence, that all of the challenged claims are unpatentable, as summarized in the following table:

Claims	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–24	103(a)	Ehlers, Wruck	1–24	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–24 of U.S. Patent 9,194,597 B2 have been shown to be unpatentable; and

¹⁰ 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. 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).

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

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