NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

ECOFACTOR, INC.,
Appellant

v.

GOOGLE LLC,
Appellee

2024-1027, 2024-1032, 2024-1033

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2022-00473, IPR2022-00475, IPR2022-00538, IPR2022-01460, IPR2022-01461.

Decided: July 8, 2025

MATTHEW AICHELE, Russ August & Kabat, Washington, DC, argued for appellant. Also represented by KRISTOPHER DAVIS, REZA MIRZAIE, JAMES PICKENS, PHILIP WANG, Los Angeles, CA.

ELIZABETH LAUGHTON, Smith Baluch LLP, Washington, DC, argued for appellee. Also represented by MATTHEW A. SMITH.

Before TARANTO, STOLL, and STARK, *Circuit Judges*.

TARANTO, *Circuit Judge*.

EcoFactor, Inc. owns U.S. Patent Nos. 8,740,100, 8,751,186, and 9,194,597, which relate to heating, ventilation, and air conditioning (HVAC) systems. On inter partes review, the Patent Trial and Appeal Board of the Patent and Trademark Office determined that the challenged claims of the patents are unpatentable for obviousness under 35 U.S.C. § 103. *Google LLC v. EcoFactor, LLC*, IPR2022-00475, 2023 WL 5167492 (P.T.A.B. Aug. 7, 2023) (*'100 Patent Decision*); *Google LLC v. EcoFactor, LLC*, IPR2022-00473, 2023 WL 5153642 (P.T.A.B. Aug. 1, 2023) (*'186 Patent Decision*); *Google LLC v. EcoFactor, Inc.*, IPR2022-00538, 2023 WL 5166414 (P.T.A.B. Aug. 1, 2023) (*'597 Patent Decision*). EcoFactor appeals, and we now affirm.

I

A

The '100 patent is titled "System, Method and Apparatus for Dynamically Variable Compressor Delay in Thermostat to Reduce Energy Consumption." The specification explains that HVAC systems generally are used to maintain the temperature of the areas they serve within a "dead zone" around the desired "setpoint." '100 patent, col. 1, lines 60–62; *id.*, col. 2, lines 48–53. For example, if the setpoint is 70°F, the dead zone might range from 68 to 72°F. When the measured area temperature reaches an outer limit of the dead zone, the HVAC system cycles on to either heat or cool the structure until the temperature returns to the dead zone, at which point the system cycles off. *Id.*, col. 1, lines 62–67.

HVAC systems typically use a "compressor delay" in order to prevent damage to the system caused by users rapidly changing the setpoint. *Id.*, col. 2, lines 22–29. The compressor delay prevents the compressor (and, by extension, the system), once it is switched off, from being switched back on for a specified interval of time. *Id.*, col. 2, lines 25–29. The ’100 patent describes varying the compressor delay based on the predicted rate of change in area temperature in order to optimize user comfort and energy efficiency. *Id.*, col. 5, lines 1–6, 27–45.

The independent claims of the ’100 patent recite as follows:

> 1. A system for reducing the usage of a ventilation system comprising:
>
> a thermostatic controller having at least two settings for a delay enforced by said thermostatic controller after said thermostatic controller turns said ventilation system off prior to allowing said thermostatic controller to signal said ventilation system to turn on again, one setting being for a first interval, and at least a second setting for a second interval that is longer than said first interval; and
>
> a computer processor in communication with said thermostatic controller, the processor configured to:
>
>> access stored data comprising a plurality of internal temperature measurements taken within a structure and a plurality of outside temperature measurements relating to temperatures outside the structure;
>>
>> **use the stored data to predict a rate of change of temperatures inside the structure in response to at least changes in outside temperatures; and**
>>
>> evaluate one or more parameters including at least the outside temperature measurements and the predicted rate of change,

> and to determine whether to adopt said first interval or said second interval based upon the values of said parameters.

Id., col. 9, line 61, through col. 10, line 17 (emphasis added).

> 9. A process for optimizing the delay enforced by a thermostatic controller after said thermostatic controller turns a ventilation system off prior to allowing said thermostatic controller to signal said ventilation system to turn on again comprising:
>
> evaluating, with at least one computer processor, one or more parameters relating to the operation of the said ventilation system, wherein the computer processor:
>
>> accesses stored data comprising a plurality of internal temperature measurements taken within a structure and a plurality of outside temperature measurements relating to temperatures outside the structure;
>>
>> **uses the stored data to predict a rate of change of temperatures inside the structure in response to at least changes in outside temperatures; and**
>>
>> wherein evaluating the one or more parameters comprises evaluating at least the outside temperature measurements and the predicted rate of change;
>
> determining which of at least a first interval and a second interval is to be enforced as a delay by said thermostatic controller in light of at least the outside temperature measurements and the predicted rate of change, wherein said second interval is longer than said first interval;
>
> communicating said delay from said computer processor to said thermostatic controller; and

> adopting said delay by said thermostatic controller.

Id., col. 10, lines 36–61 (emphasis added).

B

The ’186 patent is titled “System and Method for Calculating the Thermal Mass of a Building.” “Thermal mass,” as the term is used within the patent, refers to the degree to which a given structure (*e.g.*, a house) responds to changes in external temperature. ’186 patent, col. 2, line 54, through col. 3, line 2. The specification describes an HVAC system that calculates the effective thermal mass of a building using outside and inside temperature measurements. *Id.*, col. 3, line 64, through col. 4, line 15.

The independent claims recite as follows:

> 1. A system for controlling a heating, ventilation and air conditioning (HVAC) system comprising:
>
> one or more server computers comprising computer hardware, the one or more server computers configured to receive inside temperature measurements from at least **a first location conditioned by at least one HVAC system**;
>
> **one or more databases that store the inside temperature measurements over time**, the one or more databases accesses by the one or more server computers;
>
> wherein the one or more server computers are located remotely from the first location, the one or more server computers configured to receive outside temperature measurements from at least one source other than the HVAC system,
>
> **wherein the one or more server computers are configured to calculate one or more predicted rates of change in temperature at the first location based on status of the HVAC**

> **system**, and based on the outside temperature measurements, wherein the one or more predicted rates of change predict a speed a temperature inside the first location will change in response to changes in outside temperature; and
>
> wherein the one or more server computers are further configured to determine whether to direct the HVAC control system to pre-cool the first structure based on the one or more predicted rates of change prior to directing the HVAC control system to reduce electricity demand.

Id., col. 13, lines 31–57 (emphases added).

> 8. A method for controlling a heating, ventilation and air conditioning (HVAC) system that comprises:
>
> receiving inside temperature measurements from at least **a first location conditioned by at least one HVAC system**;
>
> **storing in one or more databases the inside temperature measurements over time**;
>
> receiving outside temperature measurements from at least one source other than the HVAC system;
>
> **calculating with one or more server computers comprising computer hardware, one or more predicted rates of change in temperature at the first location based on the status of the HVAC system**, and based on outside temperature measurements, wherein the one or more predicted rates of change predicts a speed a temperature inside the first location will change in response to changes in outside temperature; and
>
> determining with the one or more server computers whether to direct the HVAC control system to pre-cool the first structure based on the one or more

> predicted rates of change prior to directing the HVAC control system to reduce electricity demand.

Id., col. 14, lines 19–39 (emphases added).

C

The ’597 patent is titled “System, Method and Apparatus for Identifying Manual Inputs to and Adaptive Programming of a Thermostat.” The specification explains that, with typical programmable thermostats, a mismatch between scheduled settings and the actual preferences of the occupants can prompt occupants to manually override the programmed settings. ’597 patent, col. 1, line 45, through col. 2, line 8. It would be desirable, the patent states, for a system to adapt its programming in response to such manual changes and “take into account both outside weather conditions and the thermal characteristics of individual homes in order to . . . achieve the best possible balance between comfort and energy savings.” *Id.*, col. 2, lines 9–17.

The patent states that manual overrides are generally not recorded by the thermostat (or communicated to the system), but must be detected by calculating the difference between the setpoint as recorded by the thermostat and the scheduled setpoint. *Id.*, col. 5, lines 44–47; *id.*, col. 5, line 54, through col. 6, line 19. The system can use manual override data to determine whether a change in baseline programming is warranted, *i.e.*, if the occupants’ preferences (as evidenced by the manual override) do not align with the scheduled programming. *Id.*, col. 7, lines 3–43.

The independent claims recite as follows:

> 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.

Id., col. 8, lines 8–38 (emphases added).

9. A method for incorporating manual changes to the setpoint for a thermostatic controller, the method 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 temperatures inside the structure in response to at least changes in outside temperatures;

calculating scheduled programming of setpoints in the thermostatic controller based on the predicted rate of change, the scheduled programming comprising at least a first automated setpoint at a first time and a second automated setpoint at a second time to control the heating ventilation and air conditioning system;

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

communicating the actual setpoints from the thermostatic controller to the at least one computer;

comparing at least one of the 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**; and
>
> changing the operation of the heating ventilation and air conditioning system by changing the second automated setpoint at the second time based on at least one rule for the interpretation of the manual change.

Id., col. 8, line 56, through col. 9, line 21 (emphases added).

> 17. An apparatus for detecting manual changes to one or more setpoints for a thermostatic controller, the apparatus comprising:
>
> a programmable communicating thermostat 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;
>
> at least an electronic storage medium comprising stored data of a plurality of internal temperature measurements taken within a structure and a plurality of outside temperature measurements;
>
> computer hardware configured to communicate with the electronic storage medium and with the programmable communicating thermostat, **the computer hardware configured to use the stored data to predict a rate of change of temperatures inside the structure in response to changes in outside temperatures;**
>
> the computer hardware further configured to calculate a scheduled setpoint programming of the programmable communicating thermostat for one or more times to control the heating ventilation and air conditioning system based on the predicted rate of change, the scheduled programming comprising one or more automated setpoints;

> wherein the programmable communicating thermostat records actual setpoints of the heating ventilation and air condition system;
>
> wherein the computer hardware is further configured to store in the electronic storage medium, the one or more automated setpoints associated with the scheduled programming for the programmable communicating thermostat;
>
> wherein the programmable communicating thermostat records actual setpoints of the heating ventilation and air condition system;
>
> wherein the computer hardware is further configured to obtain the actual setpoints from the programmable communicating thermostat and store the actual setpoints in the electronic storage medium;
>
> wherein the computer hardware is further configured to compare the one or more automated setpoints associated with the scheduled setpoint programming with at least one of the actual setpoints; and
>
> **wherein the computer hardware is further configured to detect a manual change to the one or more automated setpoints by determining whether the at least one of the actual setpoints and the one or more automated setpoints are the same or different based on the difference value**.

Id., col. 9, line 40, through col. 10, line 34 (emphases added).

D

Google petitioned for inter partes reviews of the ’100 and ’186 patents on February 2, 2022, and of the ’597 patent the next day. Google argued that claims 1–16 of the

’100 patent; claims 1–13 of the ’186 patent; and claims 1–24 of the ’597 patent were unpatentable for obviousness. *See* 35 U.S.C. § 103.

The primary reference cited by Google for the three patents was U.S. Patent Pub. No. 2004/0117330 (“Ehlers”). Ehlers discloses an energy management system that “learns from the user’s inputs or adjustments to the system to change or modify indoor air temperature” and modifies system settings accordingly. *’100 Patent Decision*, at *6 (citing J.A. 5098 ¶ 20; J.A. 5113 ¶¶ 242–43); *’597 Patent Decision*, at *6 (same); *see also ’186 Patent Decision*, at *5. For the ’100 patent, Google relied on the combination of Ehlers and another reference not relevant on appeal. For the ’186 patent, Google relied on the combination of Ehlers and U.S. Patent No. 6,868,293 (“Schurr”). Schurr describes a “load curtailment system” for managing energy use. *’186 Patent Decision*, at *5 (citing J.A. 5142, col. 3, lines 55–59; *id.*, col. 3, line 65, through col. 4, line 6). For the ’597 patent, Google argued that Ehlers “could be applied in a standalone § 103 challenge,” but that another reference, U.S. Patent Pub. No. 2005/0040250 (“Wruck”), “reinforce[s] the obviousness” of certain limitations. Wruck describes remote configuring of programmable thermostats. *’597 Patent Decision*, at *10 (citing J.A. 25134, Abstract).

The Board issued final written decisions for the ’186 and ’597 patents on August 1, 2023, and for the ’100 patent on August 7, 2023. *’100 Patent Decision*, at *1; *’186 Patent Decision*, at *1; *’597 Patent Decision*, at *1. The Board agreed with Google that all challenged claims of the three patents were unpatentable for obviousness. *’100 Patent Decision*, at *1; *’186 Patent Decision*, at *1; *’597 Patent Decision*, at *1. EcoFactor timely appealed to this court, and we have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II

We review the Board’s legal conclusions without deference and its factual determinations for substantial-evidence support. *In re Jolley*, 308 F.3d 1317, 1320 (Fed. Cir. 2002); *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009). Obviousness is an issue of law whose resolution depends on underlying findings of fact. *Corephotonics, Ltd. v. Apple Inc.*, 84 F.4th 990, 1003 (Fed. Cir. 2023); *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). The Board's ultimate obviousness conclusion is subject to de novo review, but "the subsidiary factual findings are reviewed for substantial evidence." *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1366 (Fed. Cir. 2016) (citing *In re Gartside*, 203 F.3d 1305, 1312, 1316 (Fed. Cir. 2000)). What the prior art discloses is a question of fact, so the Board's findings about such disclosures are reviewed for substantial-evidence support. *Corephotonics*, 84 F.4th at 1003. Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consolidated Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

EcoFactor challenges four aspects of the Board's decisions. First, EcoFactor argues that Ehlers does not disclose calculating "predicted rates of change in temperature," as recited in all independent claims of the three patents at issue here.[1] EcoFactor Opening Br. at 30–50. Second, EcoFactor argues that Ehlers does not disclose calculating the predicted rate of change "based on [the] status of the HVAC system," as recited in the independent claims of the '186 patent. *Id.* at 50–57. Third, EcoFactor argues that the Board erred in finding that the combination of Ehlers and Schurr teaches storing inside temperature measurements, as recited in the independent claims of the '186 patent. *Id.* at 57–61. Fourth, EcoFactor argues that Google's petition

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[1] Although there are slight variations in the phrasing of this limitation among the patents, the parties do not argue that such differences matter here. *See* EcoFactor Opening Br. at 31.

for an inter partes review of the ’597 patent did not disclose a sufficient obviousness theory for “detecting a manual change to the first automated setpoint” because Google relied on “general concepts” rather than a “particular example.” *Id.* at 62–73. We reject these arguments.

A

For the “predicted rates of change in temperature” limitation, the Board found that figure 3D in Ehlers (below) “graphs the change of temperature over time based on a given starting internal temperature (set point) and an external temperature.” *’100 Patent Decision*, at *7.[2] In particular, the Board found that “the slope of the line [in figure 3D], 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.” *Id.* For example, the Board found that lines 3.12A, 3.12B, and 3.12C show thermal gain (and the slopes the thermal gain rates) starting at an indoor temperature of 72°F (despite the “setpoint” label on the vertical axis) when outdoor temperatures are 99°F, 90°F, and 77°F, respectively. *Id.* (citing J.A. 5114 ¶ 253).

[2] The Board’s discussion of Ehlers is materially the same in the three decisions, so we cite primarily to the decision for the ’100 patent for this subsection. *See ’100 Patent Decision*, at *6–10; *’186 Patent Decision*, at *6–9; *’597 Patent Decision*, at *6–10.

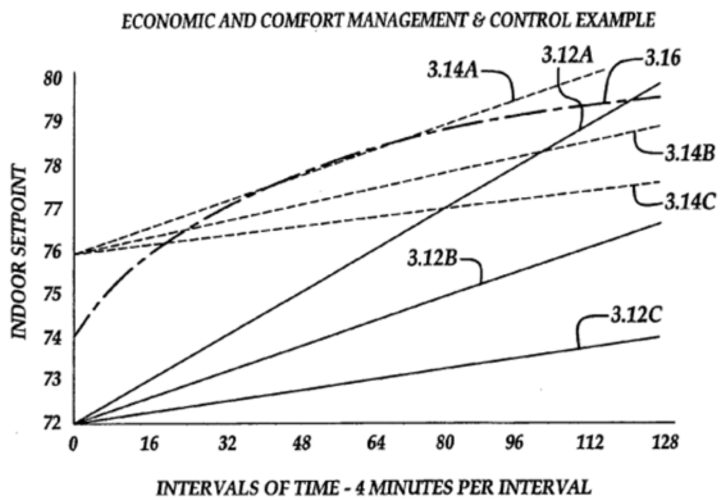

Figure 3D

J.A. 5085.

The Board explained that "Ehlers calculates the thermal gain rate so that it can make predictions about future inside temperatures, including predictions based on changes in outside temperatures." *'100 Patent Decision*, at *15 (citing J.A. 15062–64 ¶¶ 138–39; J.A. 16286 ¶ 26). The thermal gain rate is used to "manage costs and comfort" by, for example, increasing the indoor setpoint if the thermal gain rate is relatively high in order to maintain a desirable cycle run time (*i.e.*, a desirable ratio of off to on time for the HVAC system). *Id.* (discussing J.A. 5114–16 ¶¶ 252, 256). These findings are supported by substantial evidence, and EcoFactor's arguments to the contrary are not convincing.

EcoFactor argues that the thermal gain rates disclosed by Ehlers are not predictions of the rate of change in temperature, but rather the warming force acting upon the structure "given a fixed differential between indoor and outdoor temperature." EcoFactor Opening Br. at 35. The thermal gain rates are not predictions of the rate of change in temperature, EcoFactor argues, because the system in Ehlers "does not predict that the indoor temperature will *change* in accordance with the thermal gain rates." *Id.* at 5 (emphasis added). The basis for this argument is that figure 3E of Ehlers recites thermal gain rates ranging from 1–3°F/hour, while the Board found that the actual "rate of change of inside temperature [is] at or near zero." *Id.* at 30 (alteration in original) (citing *'100 Patent Decision*, at *9). Accordingly, in EcoFactor's view, it cannot be true that Ehlers discloses a positive predicted rate of change of the inside temperature if the inside temperature remains constant.

We are not convinced by EcoFactor's arguments. The Board's thermal gain rate finding is supported by the explicit statement in Ehlers that figure 3D depicts "a thermal gain table" and illustrates a "rate [o]f thermal gain change." J.A. 5114 ¶ 253. Ehlers also indicates that thermal gain rate is a measure of change of temperature over time, as it teaches that in one embodiment, "the rate of thermal gain per hour would be set at 3 degrees F. per hour." J.A. 5115 ¶ 255.

More broadly, we agree with the Board that EcoFactor's argument "does not account for how an HVAC system operates," *i.e.*, by cycling between on and off in order to keep the temperature close to the setpoint. *'100 Patent Decision*, at *9. The Board explained:

> 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." 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. 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. (internal citations omitted).

The Board also reasonably credited the testimony of Google's expert, Mr. Shah. *Id.* at *7 (citing J.A. 15058–60 ¶¶ 134–35); *id.* at *9 (citing J.A. 16280–84 ¶¶ 16–21). Mr. Shah explained that the relevant artisan would understand that the thermal gain rates of figure 3D show the rate of temperature change over time while the HVAC system is off, and that the thermal gain rates disclosed in figure 3E of 1–3°F/hour "*would* substantially increase the actual inside temperature itself over time," in the manner asserted by EcoFactor, "if it were not for the HVAC system delivering sufficient cooling during the periods of time in which it is [on]." J.A. 16282 ¶ 19; *see also* J.A. 15058–60 ¶¶ 134–35; J.A. 16280–84 ¶¶ 16–21. But because the HVAC system cycles on after the periods of positive thermal gain (*i.e.*, those in which the HVAC system is off), the temperature remains relatively constant around the indoor setpoint. Accordingly, in light of the express disclosures of Ehlers coupled with the expert testimony credited by the Board, we conclude that EcoFactor has not demonstrated reversible error in the determination that Ehlers renders obvious calculating predicted rates of change in temperature, as recited in all claims of the '100, '186, and '597 patents.

B

EcoFactor argues that the Board implicitly, and incorrectly, "construed claim 1 [of the '186 patent] in holding that the 'effect of turning the HVAC system' on does not need to be accounted for in the prediction, despite the language in claim 1 requiring that the prediction be for the 'first location' that is 'conditioned by at least one HVAC system.'" EcoFactor Opening Br. at 52 (citing *'186 Patent Decision*, at *14). Under the correct construction, EcoFactor asserts, the predicted rate of change should "account for the effects of conditioning by the HVAC system," *i.e.*, apply to periods during which the HVAC system is on. EcoFactor Opening Br. at 51.[3]

The Board found, with respect to the ’186 patent, that the predicted rates of change in temperature in Ehlers are “based on [the] status of the HVAC system,” as required by claims 1 and 8. The Board’s discussion is as follows:

> Claim 1 simply requires that the predicted rate of change be based upon that “status of the HVAC system.” As discussed in Section II.E.3, the thermal gain rate in Ehlers applies when the HVAC is off, which is a status of the HVAC system. Nothing in claim 1 requires it to calculate a predicted rate of change for all statuses of the HVAC system.

’186 Patent Decision, at *14.

On the merits, EcoFactor’s claim construction argument is not convincing. The requirement that the first location be “conditioned” does not demand that the predicted rate of change of temperature at the first location be calculated for when the HVAC system is on, as EcoFactor argues here. The specification of the ’186 patent states that the rate of change of temperature at the first location is calculated both for “periods during which the status of the HVAC system is ‘on’” and “periods during which the status of the HVAC system is ‘off.’” ’186 patent, col. 4, lines 32–35; *see also id.*, col. 4, lines 19–20 (stating that the first location is “conditioned by said HVAC system” in the same embodiment). Accordingly, the status of the first location being “conditioned” is separate from the “status of the HVAC system,” which can be on or off, and does not support requiring that the predicted rate of change in temperature

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[3] Because we affirm the Board’s treatment of this claim limitation on the merits, we do not address Google’s argument that EcoFactor forfeited this argument. *See* Google Response Br. at 47–49.

be calculated for periods in which the status of the HVAC system is on.

C

EcoFactor argues that the Board erred in finding that the combination of Schurr and Ehlers teaches "one or more databases that store the inside temperature measurements over time," as recited in the '186 patent. EcoFactor Opening Br. at 57–61; *see '186 Patent Decision*, at *10–12. In particular, EcoFactor asserts that Ehlers does not disclose storing individual temperature measurements, but rather taking average temperatures. *Id.* at 59–60. This argument is not convincing in light of the Board's findings, which are supported by substantial evidence.

The Board found that Schurr teaches a database but does not expressly disclose that the database is used to store inside temperature measurements. *'186 Patent Decision*, at *10 (citing J.A. 5141, col. 2, lines 25–27; J.A. 5142, col. 4, lines 4–6; J.A. 5040 ¶¶ 98, 99). The Board explained that the relevant artisan, "in order to have a reasonable expectation of success in using Ehlers' thermal gain rate computations," would have modified Schurr to store inside temperature measurements in the database. *Id.* (citing J.A. 5040–42 ¶¶ 99–101). Ehlers states that the system can generate "[d]aily temperature reports displaying temperature and setpoints in, *e.g.*, 15-minute intervals," J.A. 5103 ¶ 124, and the Board credited EcoFactor's expert's admission that the Ehlers system could not generate such a report if inside temperature measurements were not stored, *'186 Patent Decision*, at *11 (citing J.A. 5755, 30:20–31:1 ("[Ehlers] would not be able to display temperature measurements without storing those temperature measurements.").

D

EcoFactor argues that Google's petition for an inter partes review of the '597 patent did not provide an obviousness theory for "'detecting a manual change to the first automated setpoint' through a setpoint comparison and determination involving an actual setpoint and this same 'first automated setpoint.'" EcoFactor Opening Br. at 67–73 (emphasis omitted).[4]

The Board rejected that argument:

> [Google] 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.

'597 Patent Decision, at *15 (citing J.A. 20019–20). The Board's finding is supported by the petition itself, which explains why it would have been obvious based on either Ehlers alone, or Ehlers in combination with Wruck, to compare an actual setpoint to the automated setpoint in order to determine whether a manual change occurred. J.A. 20019–20. EcoFactor's related argument that the Board's discussion of "general concept[s]" was insufficient, EcoFactor Opening Br. at 69, is similarly unpersuasive, as

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[4] EcoFactor also argues that the Board's treatment of claim 9 of the '597 patent was "fundamentally flawed." EcoFactor Opening Br. at 62–67. Claims 9–16, however, were held to be invalid for indefiniteness in *EcoFactor, Inc. v. ecobee, Inc.*, No. 6:21-cv-00428 (W.D. Tex. Mar. 22, 2022). J.A. 20306–09. Google asserts, and EcoFactor does not contest, that EcoFactor is estopped from challenging the invalidity of those claims before this court. Google Response Br. at 56 n.26; Oral Arg. at 32:18–33:06, https://oralarguments.cafc.uscourts.gov/default.aspx?fl=24-1027_06042025.mp3.

EcoFactor does not point out any particular deficiency in the Board's conclusion that Ehlers and Wruck render this claim element obvious.

III

We have considered the remainder of EcoFactor's arguments and find them unpersuasive. For the foregoing reasons, we affirm the Board's unpatentability determinations for the '100, '186, and '597 patents.

AFFIRMED