UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ECOBEE TECHNOLOGIES ULC and GOOGLE LLC,
Petitioner,

v.

ECOFACTOR, INC.,
Patent Owner.

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IPR2022-00969[1]
Patent 8,596,550 B2

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

KORNICZKY, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Dismissing Motion For Collateral Estoppel
35 U.S.C. § 318(a)

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[1] IPR2022-00355 (Google LLC) has been joined with IPR2022-00969.
Paper 17.

I. INTRODUCTION

ecobee Technologies ULC and Google LLC ("Petitioner") filed a Petition for *inter partes* review of claims 17–23 of U.S. Patent No. 8,596,550 B2 (Ex. 1001, "the '550 patent"). Paper 2 ("Pet."). EcoFactor, Inc. ("Patent Owner") filed a Preliminary Response opposing institution. Paper 7.

We instituted an *inter partes* review of claims 17–23 of the '550 patent on all grounds of unpatentability alleged in the Petition. Paper 8 ("Institution Decision" or "Inst. Dec.").

After institution of trial, Patent Owner filed a Response (Paper 12, "PO Resp."), Petitioner filed a Reply (Paper 15, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 18, "PO Sur-reply").

An oral hearing was held on August 18, 2023, and the record contains a transcript of this hearing. Paper 28 ("Tr."). After the hearing, Petitioner and Patent Owner filed Supplemental Briefs Regarding Collateral Estoppel. Papers 25, 27.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 17–23 of the '550 patent are unpatentable. Petitioner's motion for collateral estoppel is dismissed as moot.

II. BACKGROUND

A. *Related Proceedings*

As required by 37 C.F.R. § 42.8(b)(2), Petitioner and Patent Owner identify the judicial or administrative matters that would affect or be affected

by a decision in this proceeding. Petitioner and Patent Owner state the '550 patent is the subject matter of:

(1) *Emerson Electric Co. v. EcoFactor, Inc.*, 1-21-cv-00317 (D. Del. March 1, 2021);

(2) *Google, LLC v. EcoFactor, Inc.*, 3-21-cv-01468 (N.D. Cal. March 1, 2021);

(3) *ecobee, Inc. v. EcoFactor, Inc.*, 1-21-cv-00323 (D. Del. March 2, 2021);

(4) *Carrier Global Corp. v. EcoFactor, Inc.*, 1-21-cv-00328 (D. Del. March 3, 2021);

(5) *EcoFactor, Inc. v. Google, LLC*, 6-22-cv-00350 (W.D. Tex. April 1, 2022);

(6) *Certain Smart Thermostat Systems, Smart HVAC Systems, Smart HVAC Control Systems, And Components Thereof*, Inv. No. 337-TA-1258 (April 4, 2022) ("*Certain Smart Thermostat Systems*"); and

(7) *ecobee Technologies ULC v. EcoFactor, Inc.*, IPR2022-00983. Pet. 76–77; Paper 5, 1.

B.   *Overview of the '550 Patent (Ex. 1001)*

The '550 patent is titled "System, Method and Apparatus for Identifying Manual Inputs to and Adaptive Programming of a Thermostat." Ex. 1001, code (54). The '550 patent describes a system and methods for controlling climate control systems such as heating, ventilation, and air conditioning (HVAC) systems. *Id.* at code (57).

According to the '550 patent, programmable thermostats, which control HVAC systems, offer two types of advantages over non-

programmable devices. Ex. 1001, 1:18–20. First, "programmable thermostats can save energy . . . because they automate the process of reducing conditioning during times when the space is unoccupied, or while occupants are sleeping, and thus reduce energy consumption." *Id*. at 1:21–25. Second, "programmable thermostats can also enhance comfort" and "allows homeowners to anticipate [a] desired result by programming a pre-conditioning of the home." *Id*. at 1:26–38. For example, "if the homeowner gets out of bed at 7 AM, setting the thermostat to change from the overnight setpoint of 64 degrees to 70 at 6 AM can make the house comfortable when the consumer gets up." *Id*. at 1:38–41.

The '550 patent, however, states "all of the advantages of a programmable thermostat depend on the match between the preferences of the occupant and the actual settings employed." Ex. 1001, 1:45–47. "If 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 1:64–67. "The need to correct the 'mistakes' of the thermostat is likely to annoy many users" and, "because people tend to overshoot the desired temperature when they make such manual changes, these overrides are likely to result in excessive heating and cooling, and thus unnecessary energy use." *Id*. at 1:67–2:5. "That is, if a person feels uncomfortable on a summer afternoon when the setting is 73 degrees, they are likely to change it to 68 or 69 rather than 71 or 72 degrees, even if 72 degrees might have made enough of a difference." *Id*. at 2:5–8.

Thus, the '550 patent explains that it would be desirable to have a system and method which may adapt to the occupants' manual temperature changes and incorporate the information contained in such gestures into

long-term programming and which accounts for both outside weather conditions and the thermal characteristics of individual homes in order to improve the ability to dynamically achieve the best possible balance between comfort and energy savings. Ex. 1001, 2:9–17. To achieve these goals, the '550 patent discloses systems and methods for incorporating manual changes to the setpoint for a thermostatic controller into long-term programming of the thermostatic controller. *Id*. at code (57). It discloses servers 106 which log the temperature readings from inside each house and the timing and duration of air conditioning cycles, and databases 300 which contain a history of the thermal performance of each house. *Id*. at 5:21–25. According to the '550 patent, this performance data allows "server 106 to calculate an effective thermal mass for each such structure — that is, the speed with the temperature inside a given building will change in response to changes in outside temperatures." *Id*. at 5:22–29. Because the server will also log these inputs against other inputs including time of day, humidity, etc., the '550 patent explains that "the server will be able to predict, at any given time on any given day, the rate at which inside temperature should change for given inside and outside temperatures." *Id*. at 5:30–34.

According to the '550 patent, this performance data also permits server 106 to calculate and automate setpoints and schedule future set point changes to reduce energy consumption, etc. Ex. 1001, 5:54–6:3; *see also, e.g., id*. at 5:63–6:1 (stating "for time0 the setpoint as scheduled by server 106 according to the standard setpoint programming (S0), and for time0 the setpoint as scheduled by server 106 according to the standard setpoint programming (S-1). In step 1004, the server retrieves any additional

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