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**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION**

GOOGLE LLC,

Plaintiff,

v.

ECOFACOR, INC.,

Defendant.

Case No. 4:24-cv-00175-JST

**ECOFACOR, INC.'S OPPOSITION TO
GOOGLE LLC'S MOTION TO DISMISS**

DEMAND FOR JURY TRIAL

Date: May 30, 2024
Time: 2:00 pm
Courtroom: Courtroom 4 – 2nd Floor
Judge: Hon. Jon S. Tigar

Date Filed: January 9, 2024
Trial Date: TBD

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I. INTRODUCTION

Other courts have repeatedly rejected Google’s patent-eligibility arguments involving EcoFactor patents related to the ’394 patent. Google’s motion here (Dkt. 38) fails for the same reasons, at both steps of the patent-eligibility inquiry. At Step One, Google strips the 18 issued claims of any meaning. And at Step Two, Google fails to provide evidence—much less clear and convincing evidence—that the claimed inventions are conventional. These prior decisions include:

- Judge Gilliam (NDCA) denying Google’s motion for judgment on the pleadings under § 101, at Step One, as to all four asserted patents (including one directly related to the ’394 patent);
- Judge Albright (WDTX) denying Google’s motion for summary judgment under § 101 as to all three asserted patents (including two directly related to the ’394 patent) and sending the Step Two question to the jury for a factual finding on conventionality;
- That WDTX jury finding Google failed to prove conventionality at Step Two; and
- Judge Shaw (ITC) denying Google’s motion for summary determination under § 101 as to all four asserted patents and issuing a final determination that Google failed to prove ineligibility of any of the four asserted patents (including three directly related to the ’394 patent)—finding in both instances that Google failed at Step One and Step Two; and
- International Trade Commission upholding Judge Shaw’s § 101 determination.

This Court should reach the same result. As Judge Shaw explained, in addressing an identical patent specification and claims with similar elements to those at issue here, the claimed inventions reflect unconventional “improvements in energy efficient HVAC systems” and their control systems. *E.g.*, Ex. A (1185 Public Init. Det.) at 423-26. Judge Shaw held those claims were not abstract because they demonstrate a “**significant departure and improvement** over the existing electronic thermostat control systems.” *Id.*¹ And at Step Two, Judge Shaw determined those similar claims were inventive because they “use alleged new and **nonconventional techniques.**” *Id.*

Similarly, in addressing other EcoFactor claims with elements overlapping those here, Judge Gilliam found that those claims were “directed to the **non-abstract improvement** of using thermal mass calculations and predicted rate of change **in the technological process of directing**

¹ All emphasis in quoted material has been added unless otherwise noted.

1 *programmable HVAC thermostats*, not an abstract result that merely invokes generic processes
 2 or machinery.” *Google LLC v. EcoFactor, Inc.*, 602 F. Supp. 3d 1265 (N.D. Cal. 2022) (J. Gilliam).

3 The same logic and basic holdings apply to the related ’394 patent asserted here. The claims
 4 here are directed to technical improvements to then-existing climate control technology. They
 5 enhance climate control systems with new temperature profile calculations and dynamic HVAC
 6 efficiency calculations to diagnose when an HVAC system’s operational efficiency has degraded.
 7 Thus, they are eligible as a matter of law. *Alice Corp., v. CLS Bank Int’l*, 573 U.S. 208, 217 (2014)
 8 (claims are patent-eligible as a matter of law if “they improve an existing technological process”).
 9 And dependent claims, ignored by Google, are even less abstract, additionally requiring features
 10 such as diagnosis of specific problems, predictions, and climate control system adjustments.

11 Climate control devices in 2007 had no way to model the performance of a climate control
 12 device by (i) calculating an operating profile for the device that accounts for inside and outside
 13 temperature at different times, and (ii) comparing the operating profile to a calculated temperature
 14 profile from a different time to evaluate whether the device’s operational efficiency has decreased
 15 over time, thus indicating a problem (e.g., a refrigerant leak). Google’s assertion that this could be
 16 done by human beings mentally or with a pen and paper does not pass the straight-face test.

17 Google likewise fails to meet its burden at *Alice* Step Two because the claims recite non-
 18 generic, non-routine, and unconventional climate control systems. Google *isolates claim elements*
 19 and contends without support that each element may be performed by a conventional computer.
 20 But that runs contrary to the actual *claimed combinations*. Federal Circuit precedent requires
 21 considering the entire claim “as an ordered combination,” which Google fails to do. *See Alice*, 573
 22 U.S. at 217. Even worse, Google’s arguments are based on nothing more than conclusory attorney
 23 argument which is disproven by the ’394 patent itself. At minimum, the evidence precludes
 24 granting Google’s motion. Moreover, the Court has not yet construed the claims, which will only
 25 further confirm the eligibility of the claims. Google’s motion should be denied in its entirety.

26 **II. RELEVANT LEGAL STANDARDS**

27 To determine patent eligibility under § 101, courts conduct a two-step analysis as
 28 articulated by the Supreme Court in *Alice Corp. Pty. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014).

First, the court must determine “(1) whether the claim, as a whole, is ‘directed to’ patent-ineligible matter—here, an abstract idea—and (2) if so, whether the elements of the claim, considered individually or as an ordered combination ‘transform the nature of the claim’ into a patent-eligible application.” *Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343, 1347 (Fed. Cir. 2018).

The Federal Circuit has emphasized the importance of Step One of the § 101 analysis, explaining that *Alice* “plainly contemplates that the first step of the inquiry is a meaningful one.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016). To determine whether the “claim’s character as a whole is directed to excluded subject matter” courts must evaluate the claimed “advance” over the prior art. *Intellectual Ventures I LLC v. Erie Indem. Co.*, 850 F.3d 1315, 1325 (Fed. Cir. 2017) (quotation omitted). If the claims are not directed to an abstract idea, then the inquiry ends and the claims are eligible under § 101. *Ancora*, 908 F.3d at 1349.

But if the claims are directed to an abstract idea, then Step Two of the *Alice* analysis calls for the court to “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether [the claims contain] an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [abstract idea] itself.’” *Alice*, 573 U.S. at 217-18. Even where elements are conventional, the specific arrangement of conventional technologies can also form the inventive concept. *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1349 (Fed. Cir. 2016).

Dismissal under Rule 12 “is appropriate only where the complaint lacks a cognizable legal theory or sufficient facts to support a cognizable legal theory.” *Mendiondo v. Centinela Hosp. Med. Ctr.*, 521 F.3d 1097, 1104 (9th Cir. 2008). “[A]t the motion to dismiss stage a patent claim can be found directed towards patent ineligible subject matter if the *only* plausible reading of the patent must be that there is clear and convincing evidence of ineligibility.” *JSDQ Mesh Techs. LLC v. Fluidmesh Networks, LLC*, No. 16-CV-212-GMS, 2016 WL 4639140, at *1 (D. Del. Sept. 6, 2016). “[W]hether a claim recites patent eligible subject matter is a question of law which may contain underlying facts.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

III. GOOGLE’S MOTION FAILS AT ALICE STEP ONE AND STEP TWO

Consistent with the findings of numerous courts and a jury, the ’394 patent claims are

1 directed to improvements to conventional climate control devices. They are not abstract under
 2 *Alice* Step One, which ends the patent-eligibility inquiry. *Ancora*, 908 F.3d at 1347, 1349. The
 3 claims “solve a technological problem in ‘conventional industry practice’” and are patent-eligible.
 4 *Alice*, 573 U.S. at 223. For *Alice* Step Two, while §101 eligibility is an issue of law, the underlying
 5 issue of “whether a claim element or combination of elements is well-understood, routine and
 6 conventional to a skilled artisan in the relevant field is a question of fact” that “must be proven by
 7 clear and convincing evidence.” *Berkheimer*, 881 F.3d at 1368. Google fails to provide such proof.

8 **A. The Asserted Claims Are Not Directed to Abstract Ideas as a Matter of Law**

9 **1. The ’394 Patent Claims Are Directed to Technical Solutions to** 10 **Technical Problems Specific to Electronic HVAC Controls**

11 The ’394 patent claims are not directed to abstract ideas. They are directed to a novel
 12 climate control system that improves the functioning of existing systems, which could not account
 13 for thermal mass and differences in building insulation in detecting declines in the operational
 14 efficiency of a climate control system, by requiring new operating profile calculations that consider
 15 inside and outside temperature that account for thermal mass to diagnose when a climate control
 16 device’s operational efficiency has degraded. Claim 1 is directed to an environmental control
 17 system (a “control system for an environment inside a structure”) that: (i) “*calculates a current*
 18 *operating profile*” for a climate control device by comparing inside temperatures from inside the
 19 structure and outside temperatures from outside the structure over time, (ii) compares the current
 20 profile with a calculated “*stored temperature profile* that represents a previous operating profile
 21 for the climate control device calculated at a different time *to evaluate whether an operational*
 22 *efficiency of the climate control device has decreased over time*,” and (iii) “outputs a result of the
 23 evaluation.” ’394 patent at 14:10-34 (cl. 1). This does not merely recite a desired result. It claims
 24 a specific improvement to the functioning of climate control systems, which is non-abstract.
 25 *Kononklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d 1143, 1151 (Fed. Cir. 2019).

26 The intrinsic record explains the technological improvement of enhancing a climate control
 27 system to use thermal calculations of operating profiles that reflect impacts from thermal mass of
 28 the structure to calculate when an HVAC system’s operational efficiency has degraded.

Conventional systems lacked intelligence or calculations to automatically evaluate if the HVAC system's efficiency has degraded. So, the inventors designed an improved climate control system that does this using "thermal mass" calculations accounting for the "dynamic" factors that affect the "efficiency" of the HVAC system. '394 patent at 3:10-30 ("A conventional thermostat has no mechanism by which it might take the *thermal mass* of the structure into account, but *thermal mass* significantly affects many parameters relating to energy *efficiency*"), 3:62-4:40 ("It would be advantageous for *a thermostat system* to be able to *use that information to diagnose problems* and *make recommendations* based upon that data"). The claimed invention of the '394 patent improves conventional thermostats by using such "thermal mass" and "efficiency" calculations to solve technical shortcomings in diagnosing changes in HVAC efficiency. *Id.* 5:31-58 (inventions to "calculate the effective *thermal mass* of the structures conditioned by those thermostats...[and] evaluate the *efficiency* of a given system, as well as assist in the diagnosis of problems and malfunctions in such systems."). These calculations are shown in the specification text accompanying Figures 7, 8A/8B (9:1-10:20) and portions of the description accompanying Figure 12 (12:35-13:2). *Id.* at 9:35-10:20 (using "thermal mass" and "efficiency" calculations of inside and outside temperatures illustrated in Figure 8A/B to calculate a stored temperature profile for House A from an earlier time period, calculate a current operating profile for House A for a current time period, compare the current profile to the stored temperature profile to calculate the "*drop in efficiency*" and relate it to "possible causes" such as "50% drop in efficiency in one day may be correlated with a refrigerant leak" or "reduction by 10% over three months may be correlated with a clogged filter"), 12:35-13:2 ("*compare the historical and current data against patterns of changes known to indicate specific problems*[, such as clogged air filter or refrigerant leak]").

Thus, the claims of the '394 patent are directed to the non-abstract improvement of calculating operating profiles that account for thermal mass and calculating if operational efficiency has decreased in the technological process of thermostats diagnosing degradations in climate control systems. This is not an abstract idea or result. As Judge Gilliam found as to related EcoFactor patent U.S. 8,751,186 (Ex. C, which has the same specification as the '394 patent), EcoFactor patents that claim thermal mass calculations to improve thermostat technology are not

1 directed to abstract ideas—instead, they are non-abstract under Step One. *Google*, 602 F. Supp. at
 2 1270-72 (EcoFactor’s ’186 patent is “directed to the ***non-abstract improvement*** of using thermal
 3 mass calculations and predicted rate of change ***in the technological process of directing***
 4 ***programmable HVAC thermostats***, not an abstract result that merely invokes generic processes
 5 or machinery”). Judge Gilliam’s finding is one of several decisions in other courts supporting this.

6 Further, the claimed inventions improved existing HVAC control systems in the mid-to-
 7 late 2000s by solving technical problems that were *unique to that technology area*. For example,
 8 the specification describes how “conventional” thermostats and other HVAC controls could not
 9 account for the “thermal mass” of the structure, even though it “significantly affects many
 10 parameters relating to energy efficiency.” ’394 patent at 3:27-30. The specification also describes
 11 how, due to variations in thermal mass and the limitations of conventional programmable
 12 thermostats, the “significant theoretical savings” they may one day be able to achieve “are rarely
 13 realized.” *Id.* at Background, 1:66-2:26. The specification further recognizes that then-existing
 14 control systems lacked the ability to automatically identify potential problems with HVAC
 15 equipment that were indicated by performance declines that could not otherwise be explained by
 16 differences in inside and outside temperature conditions. *E.g., id.* at 3:62-4:2 (listing exemplary
 17 contributors to HVAC efficiency declines, “such as clogged filters, refrigerant leaks, duct leakage
 18 and ‘pop-offs,’ and the like”); *id.* at 4:19-21 (describing how “[i]t would be advantageous for a
 19 thermostat system” to be able to use collected information “to diagnose problems and make
 20 recommendations based upon that data”); *id.* at 5:51-58 (describing how embodiments that
 21 calculate “thermal mass of the structure” “can evaluate the efficiency of a given system, as well as
 22 assist in the diagnosis of problems and malfunctions in such systems”); *id.* at 8:62-67 (“By
 23 comparing outside temperature, inside temperature, thermostat settings, cycling behavior of the
 24 HVAC system, and other variables, the system will be capable of numerous diagnostic and
 25 controlling functions beyond those of a standard thermostat.”); *id.* at 12:35-39 (“In step 1214, the
 26 server compares the HVAC system’s efficiency, corrected for the relevant conditions, to its
 27 efficiency in the past. If the current efficiency is substantially the same as the historical efficiency,
 28 the server concludes, in step 1216, that there is no defect and the diagnostic routine ends. ***If the***

1 *efficiency has changed, the server proceeds to compare the historical and current data against*
 2 *patterns of changes known to indicate specific problems.* For example, in step 1218, the server
 3 compares the pattern of efficiency changes against the known pattern for a *clogged air filter*, which
 4 is likely to show a slow, *gradual degradation over a period of weeks or even months*....If the
 5 problem does not match the clogged filter paradigm, the system compares, in step 1222, the pattern
 6 to the known pattern for a *refrigerant leak*, which is likely to show a *degradation over a period*
 7 *of a few hours to a few days*...””). The inventors of the ’394 patent appreciated these
 8 shortcomings and saw that improving the system to calculate the thermal mass for each home
 9 would unlock its ability to evaluate declines in HVAC operational efficiency and provide
 10 optimized scheduling for the system. *Id.* at 1:66-3:30.

11 To address these technical problems in the HVAC control field, the inventors developed
 12 an unconventional control system comprising a climate control device, processor, and database
 13 configured with new calculations to improve the technical shortcomings of the day. These
 14 components receive outdoor temperatures, compare them to inside temperatures over time to
 15 calculate operating profiles for the climate control device, and compare profile data from different
 16 times to evaluate whether the climate control device’s operational efficiency has decreased over
 17 time. *Id.* at cls. 1, 10. All this and more is reflected in just independent claims 1 and 10. Dependent
 18 claims add other improvements that further show patent eligibility, such as claim 6’s requirements
 19 of using the operational efficiency evaluation to diagnose potential defects of the climate control
 20 device, or claims 7-9 using predictions and modifying operations. *Id.* at cls. 6-9, 15-18.

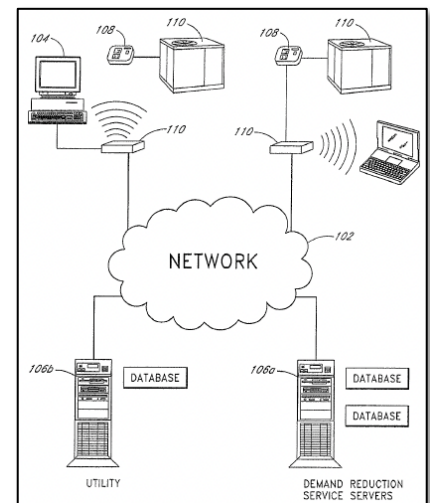
21 By comparing inside temperatures and outside temperatures over time, the claims recite a
 22 new way to analyze temperature data to account for the unique characteristics of the structure and
 23 its HVAC system, allowing the system to calculate new metrics showing that the “operational
 24 efficiency” of the climate control device has declined—which may indicate an HVAC equipment
 25 problem (e.g., a refrigerant leak). *Id.* at 4:41-5:12. For example, the patent discloses at 9:35-10:18:

26 Because server 106a logs the temperature readings from inside each house (whether
 27 once per minute or over some other interval), as well as the timing and duration of
 28 air conditioning cycles, *database 300 will contain a history of the thermal performance of each house*. That performance data will allow the server 106a to
 calculate an *effective thermal mass* for each such structure—that is, the speed with

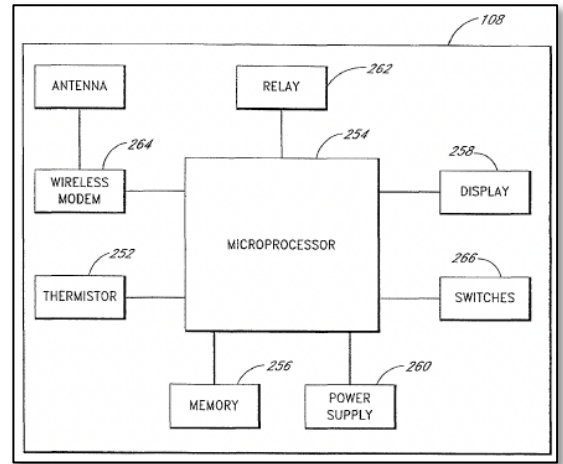
the temperature inside a given building will change in response to changes in outside temperature and differences between inside and outside temperatures. Because the server will also log these inputs against other inputs including time of day, humidity, etc., the server will be able to predict, at any given time on any given day, the rate at which inside temperature should change for given inside and outside temperatures.

The server will also *record the responses of each house to changes in outside conditions* and cycling behavior over time. That will *allow the server to diagnose problems as and when they develop*. For example, FIG. 8 a shows a graph of outside temperature 402, inside temperature 404 and HVAC cycle times 406 in House A for a specific 24-hour period on date X. Assume that, based upon comparison of the performance of House A on date X relative to House A's historical performance, and in comparison to the performance of House A relative to other nearby houses on date X, the HVAC system in House A is presumed to be operating at normal efficiency, and that House A is in the 86th percentile as compared to those other houses. FIG. 8 b shows a graph of outside temperature 408, inside temperature 410 and HVAC cycle times 412 in House A for the 24-hour period on date X+1. House A's HVAC system now requires significantly longer cycle times in order to try to maintain the same internal temperature. If those longer cycle times were due to higher outside temperatures, those cycle times would not indicate the existence of any problems. But *because server 106 is aware of the outside temperature, the system can eliminate that possibility as an explanation for the higher cycle times*. Because server 106 is aware of the cycle times in nearby houses, it can determine that, for example, on date X+1 the efficiency of House A is only in the 23rd percentile. The *server will be programmed with a series of heuristics, gathered from predictive models and past experience, correlating the drop in efficiency and the time interval over which it has occurred with different possible causes*. For example, a 50% drop in efficiency in one day may be correlated with a refrigerant leak, especially if followed by a further drop in efficiency on the following day. A reduction of 10% over three months may be correlated with a clogged filter. Based upon the historical data recorded by the server, the server 106 will be able to alert the homeowner that there is a problem and suggest a possible cause.

As exemplary figures in the patent show, the inventors designed a new networked, wireless communicating HVAC control system to obtain inside and outside temperatures, among other information, that are used to learn about the environment and account for the structure's thermal mass—thereby improving the climate control system. *Id.* at Figs. 1, 2, 4, 8. The exemplary system architecture shows how this system differed from conventional HVAC controls at the time:



Id. at Figs. 2, 4 (annotated). The claimed inventions undeniably provide technological solutions to technological problems with then-existing HVAC control systems—including their inability to evaluate inside and outside temperature data to profile the structure, recognize drops in operational efficiency, and thereby identify potential HVAC issues. That is not abstract.



2. Google's Framing of the Claimed Advance And Cited Cases Ignore Key Aspects of Claim 1 and All Other Claims of the '394 Patent

Google boils all 18 claims down to the following alleged claimed advance: “the claims are directed to the concept of using temperature comparisons to evaluate whether a climate control device’s operation has worsened.” Dkt. 38 at 2; *see also* Dkt. 38 at 8, 11 (similar). This is a legally flawed oversimplification of claim 1 (and an even worse oversimplification of its dependent claims). Claim 1 is not a “concept,” but is a “control system for an environment,” claiming:

1. A **control system** for an environment inside a structure, comprising:
 - a **climate control device** in the structure that **receives first temperatures from inside the structure**;
 - a **processor** that:
 - receives second temperatures from outside the structure from at least one source outside the structure**; and
 - compares the first temperatures and the second temperatures over time to calculate a current operating profile** for the climate control device; and
 - a **database** that **stores the current operating profile** for the climate control device,
 wherein the processor (a) **compares a portion of the current operating profile** for the climate control device **with** a stored temperature profile that represents a **previous operating profile** for the climate control device calculated at a different time **to evaluate whether an operational efficiency of the climate control device has decreased over time**, and (b) **outputs a result of the evaluation**, wherein: the portion of the current operating profile for the climate control device is limited to a specified first time interval, and the stored temperature profile is limited to a specified earlier second time interval.

’394 patent at cl. 1. Even in its most basic form, claim 1 requires the hardware limitations highlighted above in blue and configuring this hardware according to what is highlighted above in yellow, and the claim indicates that the claimed control system is a networked system that receives outside temperature data from remote sources (e.g., an Internet weather data provider that publishes weather information based on geographic areas—see ’394 patent at 5:41-44, cl. 4).

And while Google argues this improved climate control system is just “storing and comparing information,” the claims are directed to novel *thermal efficiency calculations* that allow the control system to calculate profiles that account for thermal mass, providing new analysis to improve how the system evaluates decreases in operational efficiency. ’394 patent at cl. 1. For example, claim 1 recites *calculation* of a current operating profile based on comparing a multitude of indoor and outdoor temperatures over time, *calculation* of a stored temperature profile based on indoor and outdoor temperatures from a different time period, using these calculated profiles to *evaluate whether operational efficiency of the climate control device has decreased over time*, and outputting a *result* of the evaluation. ’394 patent at cl. 1. The calculations and evaluations performed by the claimed environmental control system are not merely “storing and comparing information.” Rather, these are novel thermal calculations that conventional thermostats could not perform. That is why, in holding that the related ’186 patent is “directed to the non-abstract improvement of using *thermal mass calculations* and predicted rate of change in the technological process of directing programmable HVAC thermostats,” Judge Gilliam concluded that the ’186 claims were more analogous to the eligible claims in *Koninklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d 1143 (Fed. Cir. 2019) and *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358 (Fed. Cir. 2020), which were directed to implementations of improved devices and systems:

In both cases, the Federal Circuit held that the asserted claims were directed to specific implementations of improved devices and systems and not abstract ideas that used computers as tools. See *Koninklijke KPN N.V.*, 942 F.3d at 1150 (“[W]e conclude that appealed claims 2–4 of the ’662 patent are patent-eligible because they are directed to a non-abstract improvement in an existing technological process (i.e., error checking in data transmissions.)”; *CardioNet*, 955 F.3d at 1368 (“[W]e conclude that claim 1 of the ’207 patent is directed to an improved cardiac monitoring device and not to an abstract idea.”). Similarly, claim 1 of the ’186 patent is directed to the non-abstract improvement of using thermal mass calculations and predicted rate of change in the technological process of directing

programmable HVAC thermostats, not an abstract result that merely invokes generic processes or machinery.

Google, 602 F. Supp. 3d at 1271. As Judge Gilliam recognized with respect to the related '186 patent, such cases are analogous to the facts presented here with the '394 patent claims.

Further, the claimed “operational efficiency” calculations, as shown in Figures 8A-8B and as construed by numerous Courts, refers to “the energy or time required by the HVAC system to change inside temperatures by a given amount for a set of indoor and outdoor conditions.” *See Ex. H (Markman Order in ecobee, Inc. v. EcoFactor, Inc., No. 21-cv-323-MN (D. Del. Apr. 5, 2023)); Ex. I (Markman Order in EcoFactor, Inc. v. ecobee, Inc., 6:22-cv-00033-ADA (W.D. Tex. Dec. 8, 2022))*. This shows that the '394 patent claims are not limited to “using current and previously recorded indoor temperature information to assess a climate control device,” as Google claims. Dkt. 38 at 11. Instead, the claimed *operational efficiency* calculation combines indoor and outdoor temperatures to do efficiency calculations in a new way, especially compared to conventional climate control systems. '394 patent at 3:62-4:21, 9:35-10:20.

As such, Google’s cited cases (Dkt. 38 at 11-12) are inapposite. The '394 patent claims a control system that performs thermal calculations and dynamic HVAC efficiency calculations to improve how such systems evaluate declines in operational efficiency. This is nothing like claims held abstract for merely reciting steps of storing or comparing data. For example, Google cites *PerkinElmer, Inc.*, 496 F. App’x 65 (Fed. Cir. 2012), a non-precedential decision about a medical screening patent which claimed a “law of nature” and which was held to be abstract because “[n]o action beyond the comparison is required [by the claims].” *PerkinElmer, Inc.*, 496 F. App’x 65 at 74-75. As even that non-precedential case makes clear, claims that do not recite any action beyond comparing data are distinguishable from the '394 patent claims, which require several distinctive **calculations** as well as an **evaluation** and **output** step that rely on the calculations to evaluate whether the operational efficiency of a climate control device has degraded over time. The *PerkinElmer* panel also noted that the claims held abstract there did not specify any particular calculation that must be used. *Id.* By contrast, the claims of the '394 patent specify distinctive calculations that must be performed to output a specific result. Thus, Google’s cited cases that found claims merely reciting comparisons to be abstract are inapplicable here.

Google’s other cited cases address claims that took an idea practiced by humans and implemented it in a computer, which is not true of the ’394 patent. The claims in *Content Extraction* were “drawn to the basic concept of data recognition and storage” and only recited collecting data, recognizing relevant data (such as account numbers and amounts), and storing the data. *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat’l Ass’n*, 776 F.3d 1343, 1347 (Fed. Cir. 2014). The claims in *Personalized Media* were directed to the abstract idea of “checking to see if a copy [] is up to date and, if it is not, replacing it with a new one,” which would have “preempted all methods of [remotely] updating operating instructions.” *Personalized Media Commc’ns v. Amazon.com Inc.*, 161 F. Supp. 3d 325, 332 (D. Del. 2015). By contrast, the ’394 claims recite novel **operational efficiency calculations** by an environmental control system. The claimed operational efficiency calculations use indoor and outdoor temperatures to calculate profiles having specific temperature signatures and to evaluate declines in operational efficiency. This goes well beyond updating stored data. EcoFactor’s was the first climate control system to ever perform these calculations.

Similarly, *FairWarning* was about a claim for collecting and analyzing information relating to fraud detection, without identifying a particular tool or improvement to detecting fraud. *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1094-95 (Fed. Cir. 2016). The *FairWarning* panel explained that the claims there merely “implement an old practice in a new environment,” the old business method of fraud detection. *Id.* at 1095. The panel explained that the claims were “not directed to an improvement in the way computers operate,” because the focus of the claims was just taking the abstract idea of fraud detection and using a computer to do it. *Id.* By contrast, the ’394 patent identifies a particular tool—the claimed “control system” comprising a “climate control device,” a networked “processor” and a “database”—and an improvement to the calculations it requires to detect that an HVAC system is less efficient (using the claimed **calculations** of a **current operating profile** and **stored temperature profile** to compare current to previous changes in indoor temperatures in response to outdoor temperatures, to evaluate declines in the **operational efficiency** of the system). Unlike the “basic concept” in *Content Extraction* and the “old practice” in *FairWarning*, the ’394 patent claims “operational efficiency” calculations

1 never done in conventional climate control systems or human businesses.

2 The '394 patent is also not implementing a longstanding practice in a computer—instead,
3 it teaches a new improvement for how to enhance a climate control system to diagnose changes in
4 operational efficiency, which had not been done before. Google contends that the claims and
5 specification fail to identify, and that EcoFactor makes no claim to have invented or improved, the
6 diagnosis of changes in the operational efficiency of the climate control device with a smarter
7 control system. Dkt. 38 at 12-13. That is false. As shown above, the patent specification teaches
8 how conventional thermostats fell short and how the inventors alone recognized how to improve
9 climate control systems with novel and dynamic operational efficiency calculations. *See supra*
10 Section III.A.1 (citing '394 patent at 3:10-30, 3:62-4:21, 9:35-10:20, 12:35-13:2).

11 Dependent claims, such as dependent claim 6, add the requirement to use the claimed
12 efficiency evaluation to “identify potential defects identified by changes in the operational
13 efficiency of the climate control device over time.” '394 patent at cl. 6. And other dependent
14 claims, such as dependent claims 7, 8 and 9, require developing predictions using this approach
15 and modifying the operation of the climate control device based on these calculations. '394 patent
16 at cls. 7-9. These claim novel calculations and use them in new ways for climate control. None of
17 these actions was performed by conventional systems or conventional human businesses.

18 And while Google argues all this can be done with “pen and paper” (Dkt. 38 at 14), that is
19 wrong. A pen and paper **do not** receive inside temperatures, **do not** receive outside temperatures
20 from a remote source, **do not** compare large amounts of temperature data over time to calculate
21 and store profiles reflecting the thermal mass of a structure, and **do not** compare calculated profiles
22 over time to evaluate changes in operational efficiency—thus providing a new way to diagnose
23 problems with the HVAC system. It is absurd for Google to suggest that even a “generic” or
24 “conventional” HVAC control system today—much less one **in 2007**—could accomplish all this.
25 It is also unreasonable for Google to suggest with nothing more than attorney argument that a
26 human with a pen and paper could achieve the same results as the claimed inventions.

27 As such, cases like *PlanetID*, *RingCentral*, *Symantec*, and *In re TLI* are readily
28 distinguishable. *PlanetID* involved the abstract idea of sharing information between authorized

1 users during a defined time period (as any business would) and implementing it with a computer.
 2 *PlanetID, LLC v. Digify, Inc.*, 2021 WL 567371 at *5. *RingCentral* and *Symantec* both involved
 3 the abstract idea of routing messages to the right place, as in a “corporate mailroom.” *RingCentral*,
 4 372 F. Supp. 3d 988, 996-97 (N.D. Cal. Mar. 8, 2019); *Intellectual Ventures I LLC v. Symantec*
 5 *Corp.*, 838 F.3d 1307, 1317-18 (Fed. Cir. 2016). And *TLI* involved the abstract idea of “classifying
 6 and storing digital images in an organized manner.” *In re TLI Comm’ns LLC Patent Litig.*, 823
 7 F.3d 607, 611-12 (Fed. Cir. 2016). None recited *improvements* to existing technology like the ’394
 8 patent’s control system, upgraded with efficiency calculations not possible with other tools.

9 Google’s reliance on *Electric Power Grp. LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir.
 10 2016) is also misplaced. Those claims did not recite improvements to existing technology and did
 11 not require “new data” or “new techniques for analyzing it.” *Electric Power*, 830 F.3d at 1354-55.
 12 Instead, they focused on the “process of gathering and analyzing information of a specified content,
 13 then displaying the results, *and not any particular assertedly inventive technology for performing*
 14 *those functions.*” *Id.* By contrast, the ’394 patent recites an improvement to conventional control
 15 systems. It requires new data *and* new techniques for analyzing it, represented by the claimed
 16 profiles and operational efficiency calculations. This is an inventive technology providing a new
 17 way for climate control systems to analyze temperature data to diagnose efficiency degradations.
 18 *See supra* at III.A.1, citing ’394 patent, 3:10-30, 3:62-4:21, 9:35-10:20, 12:35-13:2.

19 Moreover, contrary to Google’s “pen and paper” argument, the Federal Circuit has made
 20 clear that patent eligibility problems arise with “computational methods which can be performed
 21 *entirely* in the human mind.” *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 &
 22 n.3 (Fed. Cir. 2011). That is clearly not the case here, as the ’394 patent claims do not recite the
 23 “types of methods that embody the ‘basic tools of scientific and technological work’ that are free
 24 to all men and reserved exclusively to none.” *Id.* at 1373. Put another way, “a human cannot always
 25 achieve the same results as a computer,” and claims do “not become conventional simply because
 26 humans can do math.” *California Inst. of Tech. v. Hughes Commc’ns Inc.*, 59 F. Supp. 3d 974,
 27 994-95 (C.D. Cal. 2014). It would not even be possible for a human with a pen and paper to perform
 28 the claimed functionality, and no human could receive high volumes of data from multiple sources

(including remote sources) and automatically analyze such data over time and under varied inside and outside temperature conditions to ascertain performance degradations in the HVAC that cannot be explained by differences in outdoor temperatures, as required by the '394 patent.

Controlling precedent further demonstrates that the '394 patent claims are patent-eligible, as they are directed to technical improvements to then-existing climate control technologies. *E.g.*, *Alice*, 573 U.S. at 217 (claims are patent-eligible as a matter of law if “they improve an existing technological process”). For example, the Supreme Court’s decision in *Diamond v. Diehr* is instructive. There, the Supreme Court confirmed the eligibility of a claim that used the “well-known Arrhenius equation to calculate the optimal cure time [of rubber] using, among other variables, the internal temperature of [a rubber] mold.” *Thales Visionix, Inc. v. United States*, 850 F.3d 1343, 1347 (Fed. Cir. 2017) (discussing *Diamond v. Diehr*, 450 U.S. 175 (1981)). As the court explained, the invention “improved upon prior art molding methods by constantly measuring the actual temperature inside the mold, recalculating the ideal cure time, and automatically opening the press when the ideal cure time equaled the actual time elapsed.” *Id.*; *see also Thales*, 850 F.3d at 1346-50 (claims “using sensors to more efficiently track an object on a moving platform” were not abstract despite requiring a “mathematical equation” to determine the orientation of the object).

The *Diehr* court contrasted its facts with those of *Parker v. Flook*, where claims using a specific equation were held unpatentable because they simply used a computer to provide a better “method for *calculating* alarm limit values,” itself an abstract idea, and were not directed to solving technical problems specific to any technology field. *See Diehr*, 450 U.S. at 186. As in *Diehr* and *Thales*—and unlike in *Flook*—the '394 patent claims provide technical solutions to shortcomings specific to electronic HVAC control systems and thus are not abstract. Google’s “pen and paper” argument is fundamentally flawed, and decades of controlling law demonstrate this—including the *Thales* and *Diehr* decisions involving known parts and known mathematical equations.

Google’s oversimplification of the claimed advance strips away the character of the claimed inventions. That approach is improper because “essentially every routinely patent-eligible claim involving physical products and actions *involves* a law of nature and/or natural phenomenon—after all, they take place in the physical world.” *McRO, Inc. v. Bandai Namco*

1 *Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016) (courts “must be *careful to avoid*
 2 *oversimplifying the claims* by looking at them generally and failing to account for the specific
 3 requirements” of the claims); *see also CardioNet*, 955 F.3d at 1373-74 (reversing district court’s
 4 oversimplification under Step One). Google fails because it oversimplifies the claimed advance
 5 and ignores the specification’s descriptions of the technical problems solved by the claims.

6 3. Prior § 101 Decisions Found Related EcoFactor Patents Non-Abstract

7 Numerous EcoFactor patents have been confirmed patent-eligible by multiple judges and
 8 a jury—including multiple patents related to the ’394 patent at issue here. Google largely ignores
 9 these prior findings and offers no credible reason that this Court should reach a different result.

10 For example, in ITC Investigation No. 337-TA-1185 (“1185 Investigation”),
 11 Administrative Law Judge (ALJ) Shaw rejected similar arguments made by Google and other
 12 respondents that the claims of U.S. Patent Nos. 8,131,497 (“’497 patent”) and 8,423,322 (“’322
 13 patent”) were directed to the abstract idea of using temperature measurements to calculate the
 14 efficiency of an HVAC system, and found that the claims are “directed to *technical improvements*
 15 in HVAC systems” and their respective control systems. Ex. A (1185 Public ID) at 420-23; *see*
 16 *also* Ex. B (1185 Commission Notice) at 2-3 (full Commission noting ALJ Shaw’s patent
 17 eligibility findings and declining to review them).² These patents are both related to the ’394 patent
 18 asserted here, not only because they share the same specification and claim priority to the same
 19 provisional application filed in 2007 (App. No. 60/994,011) but also because the ’394 patent
 20 explicitly claims priority to the ’322 patent. *See* ’394 patent at Related U.S. Application Data, 1:27;
 21 Ex. D (’322 patent). A comparison of their claims also shows that ’322 claim 1 (found patent-
 22 eligible) includes similar limitations to ’394 claim 1, further supporting eligibility here.

’322 Patent, Claim 1	’394 Patent, Claim 1
1. A system for evaluating changes in the operational efficiency of an HVAC system over time comprising: at least one HVAC control system associated with a first structure that receives temperature measurements from at least a first structure conditioned by at least one HVAC	1. A control system for an environment inside a structure, comprising: a climate control device in the structure that receives first temperatures from inside the structure; a processor that:

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 28 ² ALJ Shaw also found that the asserted claims of the third asserted patent, U.S. Patent No. 10,018,371, are likewise patent-eligible under § 101. Ex. A at 427-30.

1 system, and receives status of said HVAC
2 system;

3 one or more processors that receive
4 measurements of outside temperatures from at
5 least one source other than said HVAC system
6 and compare said temperature measurements
7 from said first structure, wherein said one or
8 more processors compares the inside
9 temperature of said first structure and the
10 outside temperature over time; and

11 one or more databases that store at least
12 said temperature measurements obtained from
13 said first structure over time,

14 wherein said one or more processors
15 compares an inside temperature recorded
16 inside the first structure with an inside
17 temperature of said first structure recorded at a
18 different time to determine whether the
19 operational efficiency of the HVAC system
20 has decreased over time.

receives second temperatures from
outside the structure from at least one source
outside the structure; and

compares the first temperatures and the
second temperatures over time to calculate a
current operating profile for the climate control
device; and

a database that stores the current operating
profile for the climate control device,

wherein the processor (a) compares a
portion of the current operating profile for the
climate control device with a stored
temperature profile that represents a previous
operating profile for the climate control device
calculated at a different time to evaluate
whether an operational efficiency of the
climate control device has decreased over
time, and (b) outputs a result of the evaluation,
wherein: the portion of the current operating
profile for the climate control device is limited
to a specified first time interval, and the stored
temperature profile is limited to a specified
earlier second time interval.

As another example, Judge Gilliam issued a detailed order denying Google's motion for judgment on the pleadings that four other EcoFactor patents are invalid under §101. *Google LLC v. EcoFactor, Inc.*, 602 F. Supp. 3d 1265 (N.D. Cal. 2022). This included U.S. Patent No. 8,751,186 (Ex. C, "'186 patent"), which shares the same specification as the '394 patent asserted here and claims priority to the same provisional application filed in 2007 (App. No. 60/994,011). Judge Gilliam separately analyzed each patent and held that all asserted claims are directed to specific improvements in HVAC system operation and thus patent-eligible under §101. *Id.*

Indeed, Judge Gilliam considered and rejected many arguments Google raises here. For example, Google relied upon the same *ChargePoint* case (Dkt. No. 38 at 13) in the parties' case before Judge Gilliam, and it is just as inapposite now as it was then. *E.g., Google*, 602 F. Supp. 3d at 1270-71 ("Google argues that claim 1 of the '186 patent is analogous to the patents found ineligible in *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 766 (Fed. Cir. 2019). The Court disagrees."). The *ChargePoint* case involved the abstract idea of "communication over a network for interacting with a device." *ChargePoint*, 920 F.3d at 768. As Judge Gilliam explained, the *ChargePoint* claims were held abstract because they covered the idea of "add[ing] networking

capabilities to existing charging stations to facilitate various business interactions.” *Google*, 602 F. Supp. 3d at 1271 (quoting *ChargePoint*, 920 F.3d at 770). The “specification never indicated that charging stations were improved from a technical perspective.” *Id.* “By contrast, claim 1 of the ’186 patent recites a device that receives and stores inside temperature measurements, calculates a predicted rate of change based on the stored temperature, status of the HVAC system, and outside temperature (the ’186 patent describes this analysis as calculating ‘thermal mass’), then determines whether to direct the HVAC to pre-cool the structure before the HVAC reduces electricity.” *Id.* Judge Gilliam thus concluded that the ’186 claims were more analogous to the eligible claims in *Koninklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d 1143 (Fed. Cir. 2019) and *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358 (Fed. Cir. 2020), which were directed to improvements to conventional technology. *Google*, 602 F. Supp. 3d at 1271.

Judge Gilliam’s reasoning applies here, too. The ’394 claims recite a non-abstract implementation of HVAC efficiency diagnostics that improves the operation of climate control systems. Like the ’186, the ’394 specification details limitations in existing thermostats and solutions showing these claims are not abstract. *See, e.g.*, ’394 patent at 3:21-4:54, 9:1-10:18.

There are even more examples of Google’s § 101 arguments being rejected. In the parties’ case in Texas, Judge Albright considered similar arguments made by Google in seeking summary judgment of ineligibility under § 101 as to three patents. Judge Albright rejected Google’s assertions, denying Google’s motion for summary judgment and submitting the Step Two question to the jury for a factual finding. *See EcoFactor, Inc. v. Google LLC*, No. 6:20-cv-00075, Dkt. 192 (W.D. Tex. Jan. 31, 2022) (sealed order); Ex. E (Jury Verdict) at 4.³

B. Google Also Cannot Meet Its Burden Under *Alice* Step Two

Because Google fails at Step One, this Court need not consider Step Two. But even if it did, Google also fails at Step Two because the claims recite an undoubtedly unconventional electronic HVAC control system. *See Diehr*, 450 U.S. at 188 (“In determining the eligibility of

³ While upholding the eligibility of some claims, another ALJ found (incorrectly) that certain claims in two other EcoFactor patents were patent-ineligible in ITC Investigation No. 337-TA-1258. That decision predates the detailed opinion issued by Judge Gilliam upholding the patent eligibility of all claims at issue there.

Defendants’ claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements”). While Google pays lip service to the “ordered combination” requirement, it fails to meaningfully apply that standard. *Cellspin Soft, Inc. v. Fitbit, Inc.*, 927 F.3d 1306-07 (Fed. Cir. 2019) (must consider “whether the claimed elements—individually and as an ordered combination—recite an inventive concept”).

1. Evidence Confirms the Claimed Inventions Were Unconventional

The ’394 patent proves that the claimed inventions were not conventional, routine, or well-understood. For example, the specification shows that “conventional” thermostats and HVAC controls had “*no mechanism* by which it might take the *thermal mass* of the structure into account, but *thermal mass* significantly affects many parameters relating to energy efficiency.” ’394 patent at 3:10-30, 9:28-10:22. The claims solved these shortcomings with an unconventional climate control system that was improved with new ways to analyze thermal mass and HVAC efficiency over time. *See supra* Section III.A.1 (citing ’394 patent at 3:62-4:21, 9:35-10:20 (calculating “effective thermal mass for each structure—that is, the speed with the temperature inside [] will change in response to changes in outside temperature and differences between inside and outside temperatures” and using it for new diagnostic and control functions), 12:35-13:2). The claimed system compares inside and outside temperatures (including data from remote sources) to calculate and store operating profiles that reflect the thermal mass of the structure and efficiency HVAC system and, when compared over time with a computer processor, indicate decreases in operational efficiency and that signal what caused the problem. ’394 patent at cl. 1. This contrast—between conventional thermostats that could not calculate thermal mass, and the claimed system for calculating operating profiles that reflect thermal mass and calculating operational efficiency—is direct evidence that this ordered combination of elements was unconventional.

Google offers essentially no analysis of the ordered combination of claim elements. Again, even just claim 1 requires a climate control device, processor, and database that work together to receive inside temperatures, receive outside temperatures from a remotely located source, compare large amounts of temperature data to calculate and store a profile reflecting the thermal mass of a structure, and compare calculated profiles over time to evaluate changes in a climate control

1 device's operational efficiency. That combination of features is not conventional today, much less
2 *in 2007*. Google fails to show otherwise and cannot meet its heavy burden under Step Two.

3 2. Prior Decisions on Related Patents Support Unconventionality

4 As with Step One, there are also multiple prior decisions rejecting Google's Step Two
5 arguments on related EcoFactor patents. These decisions demonstrate that the claimed inventions
6 at issue here are not routine or conventional but instead recite inventive concepts, and that so many
7 facts support their unconventionality that, at the very least, a trial would be needed on this issue.

8 For example, Judge Shaw found that Google failed to meet its "burden of showing that the
9 asserted claims of the '497 and '322 patents lack an inventive concept, insofar as the particular
10 arrangement of claimed elements purports to provide unconventional electronic HVAC control
11 systems." Ex. A (1185 Public ID) at 425-26. Judge Shaw further explained his Step Two reasoning,
12 stating that "the asserted claims of the '497 and '322 patents are directed toward improvements in
13 energy-efficient HVAC systems that may correct for the distortion caused by thermal mass." *Id.*
14 at 426 (citing *BASCOM*, 827 F.3d at 1350). The same is true of the '394 patent claims, which
15 consider inside and outside temperature in the recited operating profiles to account for thermal
16 mass in determining whether operational efficiency has decreased. Judge Shaw also explained that
17 "the claims are purportedly directed to a specific system and method designed to improve/*evaluate*
18 *the operational efficiency* of an HVAC system using an alleged new and non-conventional
19 technique, which *includes calculating the effective thermal mass* of the structure set forth by the
20 limitations set forth in elements 1[d] of each patent." *Id.* As shown above, the '394 patent claims
21 are directed to an improved way to evaluate the operational efficiency of an HVAC system using
22 a non-conventional technique which includes calculations that reflect thermal mass.

23 As another example, Google argued in the parties' prior case in Texas that the claimed
24 inventions of other EcoFactor patents were also conventional. That court denied Google's motion
25 for summary judgment and submitted the Step Two question to the jury, and the jury sided with
26 EcoFactor for each asserted claim:

QUESTION NO. 3:

Did Google prove by clear and convincing evidence that the elements of the Asserted Claims, when taken individually and when taken as an ordered combination, involve only activities or technology which a person of ordinary skill in the art would have considered to be well-understood, routine, and conventional as of the priority date of the invention?

“Yes” is in favor of Google, and “No” is in favor of EcoFactor.

Check “Yes” or “No” for each Asserted Claim for which you answered “Yes” in Question 1.

'327 Patent				
Claim 5	YES	☐	NO	☒
'382 Patent				
Claim 2	YES	☐	NO	☒
Claim 12	YES	☐	NO	☒

Ex. E (Jury Verdict) at 4. The '327 patent at issue in the Texas case is related to the '394 patent at issue here, claiming priority to the same provisional patent application filed in 2007—and is similarly unconventional for a climate control system. *See, e.g.*, Ex. F ('327 patent) at claim 1, from which asserted claim 5 depends (“receives temperature measurements from inside the structure,” “receive measurements of outside temperatures from at least one source other than the HVAC system,” “compares the inside temperatures of the structure and the outside temperatures over time to derive an estimation for the rate of change in inside temperature of the structure in response to outside temperature”). Results such as these demonstrate that Google’s motion is unfounded and that the facts support EcoFactor.⁴

Google relies primarily upon two cases to support its Step Two argument. Dkt. 38 at 16-17. Both are unavailing. In *Chamberlain*, the court found the claims to be conventional at Step

⁴ As discussed above, Judge Gilliam denied Google’s § 101 motion at Step One and did not make any finding with respect to Step Two. *E.g.*, *Google*, 602 F. Supp. 3d at 1272 (“Accordingly, the Court concludes that the '186 patent is not directed to an abstract idea at step one. Thus, the Court need not reach Alice step two.”).

Two because it found the abstract idea at Step One to be wireless communication of status information, and the claims recited nothing more as an inventive concept beyond that. *Chamberlain Grp. v. Techtronic Indus. Co.*, 935 F.3d 1341, 1349 (Fed. Cir. 2019). Those are far from the facts here because the '394 patent claims require much more, including the analysis of inside temperature data and outside temperature data over time (including data from remote sources) to determine whether a climate control system's operational efficiency has decreased, enabling useful diagnosis of equipment problems. Unlike in *Chamberlain*, that is unconventional. And even though some of the diagnostic and predictive control strategy advantages of this system are only *claimed* in dependent claims such as claims 6-9 and 15-18, they are equally relevant to show that claim 1 and other claims at issue are not abstract. *Uniloc USA, Inc. v. LG Elecs., USA, Inc.*, 957 F.3d 1303 (Fed. Cir. 2020) (“[c]laims need not articulate the advantages of the claimed combinations to be eligible.”).

Google's reliance upon the *Trinity* case is also misplaced because Google only uses it only to attack a straw man. Dkt. 38 at 16-17 (citing *Trinity Info Media, LLC v. Covalent, Inc.*, 72 F.4th 1355 (Fed. Cir. 2023)). EcoFactor's position is not that the claimed inventions merely “improv[e] the speed or efficiency” at which the claimed receiving, comparing, storing, and evaluating takes place. *Id.* at 17. As discussed above with respect to Step One, a human cannot perform the claims with a pen and paper for numerous reasons, so Google's point about *Trinity* is inapposite.

C. Even at This Early Stage, Extrinsic Evidence Further Supports Denial

Extrinsic evidence reinforces the unconventionality of EcoFactor's solution. Contemporaneous EcoFactor studies show EcoFactor's patented solution was the first to harness thermal mass calculations accounting for differences in building insulation. It did so by *unconventionally* collecting temperature information from numerous sources, including remote sources, to compute the claimed profiles reflecting thermal mass and perform evaluations that identify drops in operational efficiency that may indicate HVAC equipment problems. A team from the University of California at Berkeley that included Professor David Auslander worked with EcoFactor to validate the inventors' smart HVAC control technologies for widespread

commercial use. Dr. Auslander was so impressed with EcoFactor's technology at that time that he wrote the foreword to EcoFactor's paper detailing its 2007-2008 global field trial results, stating:

FORWARD

Thanks to support from EcoFactor to the University of California at Berkeley through the Center for the Built Environment, we, together with PhD candidates working under our supervision, conducted cooperative research and development into the feasibility and practicality of using data streams provided by EcoFactor's service to model the dynamic signatures of the houses in the study.

The concept of structures having dynamic signatures – that their thermal performance varies in predictable ways in response to inputs such as outside temperature, solar radiation, and the cycling of heating and cooling systems, etc.—is well accepted. EcoFactor's approach of collecting and centralizing high granularity data on many houses provides a unique resource for characterizing buildings, their mechanical systems, construction, and occupants, and comparing behaviors among them. Together with EcoFactor we have been able to use this data to successfully obtain dynamic signatures and use them to develop promising control strategies.

Access to EcoFactor's data has been of great benefit to our own work, as real-world data of this quality has generally been difficult and expensive to obtain. The data EcoFactor obtained from identically constructed homes in Australia is especially valuable in our ongoing efforts to understand the relationships between structures, HVAC systems and how people use them because it provides high quality experimental controls that are rarely available in this type of research.

We hope to maintain our relationship with EcoFactor and further explore HVAC optimization.

Signed:
Professor Ed Arens, PhD
Professor Dave Auslander

As another example, named inventor Scott Hublou testified in a prior EcoFactor-Google case that “in 2007” “[i]t was very much an anomaly to have any sort of internet-connected device inside of your home or inside of a building,” much less the claimed system that receives inside temperatures and outside temperatures from sources remote from the building—and performs inventive comparisons and evaluations using such data. *See* Ex. G (Hublou Depo Tr.) at 194:1-7.

Google's conventionality arguments also run contrary to Federal Circuit law because any claimed invention's compatibility with conventional systems does not render it ineligible. *Uniloc USA, Inc. v. LG Elecs. USA, Inc.*, 957 F.3d 1303, 1309 (Fed. Cir. 2020). Indeed, in nearly every case in which claims are held to be patent-eligible, the claims include known components, like the

internet or a computer server or processor. It is just that, as here, the *combination* of those elements proves unconventional or else those components are *configured* to work in an unconventional way.

D. Google Wrongly Asserts That Claim 1 Accurately Represents All Other Claims for Purposes of the Court’s § 101 Analysis

In a single sentence per claim, Google argues that the numerous dependent claims of the ’394 patent add nothing of significance to claim 1 (or independent method claim 10) for purposes of the § 101 analysis. Dkt. 38 at 18-19. That is wrong. Each dependent claim adds meaningful distinctions that only further demonstrate patent eligibility, and Google’s failure to account for these differences means that its motion should be denied as to the dependent claims even its arguments on claim 1 were accepted (which they should not be).

For example, claims 6 (system) and 15 (method) further specify that “the database stores a plurality of separate *diagnostic temperature profiles* associated with a plurality of *potential defects identified by changes in the operational efficiency* of the climate control device over time; and the *processor identifies one or more of the potential* defects based on the evaluation of the operational efficiency of the climate control device between the specified first time interval and the specified earlier second time interval.” ’394 patent at cl. 6. Tellingly, Google dismisses claims 6 and 15 with the mischaracterization that they “only add that the database will store additional (‘a plurality of’) temperatures.” Dkt. 38 at 18. Google altogether ignores that claims 6 and 15 recite storing diagnostic temperature profiles associated with potential defects and identifying a potential defect based on an operational efficiency evaluation over time. This is a glaring omission and shows that Google has offered no meaningful analysis with respect to claims 6 and 15, which clearly add numerous substantive limitations above and beyond those recited in claims 1 and 10.

Similar problems exist for Google’s treatment of the other dependent claims. For example, claims 2 and 11 specify a programmable thermostat and requires that it communicate with the climate control device. Claims 3 and 12 further restrict how the claimed operational efficiency evaluation (already an inventive concept) is performed. Claims 4 and 13 further specify that the second temperatures are outside air temperatures measured by a remotely located sensor. Claims 5 and 14 further require a programmable thermostat that displays results of operational efficiency

1 valuations. Claims 7 and 16 further require another temperature profile stored as a prediction of a
 2 coming change in outside temperature. Claims 8 and 17 further requires that modifying an
 3 operating interval for the climate control device based on a predicted change in outside temperature
 4 and in light of the recited operational efficiency evaluation. And claims 9 and 18 further require
 5 modifying on/off times or temperatures for the climate control device, in accordance with claim
 6 8/17. These are significant distinctions that Google brushes off, even though many of these
 7 dependent claims explicitly recite additional hardware and/or functionality beyond that of claim 1.
 8 While EcoFactor maintains that Google’s arguments on claim 1 should be rejected in any event, it
 9 is also clear that dependent claims 2-9 and 11-18 are even more specific and are patent-eligible.

10 **E. Though Google Cannot Meet Its Heavy Burden of Showing That Any Claim,**
 11 **Let Alone All Eighteen Claims, Are Ineligible, There Are at Least Significant**
 12 **Questions of Fact That Preclude Google’s Motion to Dismiss**

13 As discussed in detail above, the intrinsic record of the ’394 patent itself demonstrates that
 14 the challenged claims are inventive and directed to unconventional technological solutions to
 15 technological problems. At minimum, these facts—which must be accepted as true and contradict
 16 Google’s unsupported assertions that the claims are conventional—raise factual disputes
 17 precluding dismissal at the pleading stage. *See Aatrix Software, Inc. v. Green Shades Software,*
 18 *Inc.*, 882 F.3d 1121, 1126-28 (Fed. Cir. 2018). Moreover, as there are eighteen patent claims
 19 involved here, if this Court has any reservations about the scope of the claims, it deserves a full
 20 claim construction record to utilize when deciding those issues. *MyMail, Ltd. v. ooVoo, LLC*, 934
 21 F.3d 1373, 1380 (Fed. Cir. 2019) (“Nevertheless, the district court’s failure to address the parties’
 22 claim construction dispute is error under *Aatrix Software*, 882 F.3d at 1125.”).⁵

23 **IV. CONCLUSION**

24 For the reasons above, Google’s motion should be denied in its entirety.

25
 26
 27
 28 ⁵ And if the Court is inclined to grant any portion of Google’s motion, Federal Circuit law makes
 clear that it should do so without prejudice and give the patent owner a chance to amend its
 pleadings. *See, e.g., Aatrix*, 882 F.3d at 1126.

DATED: April 23, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that this document is being served upon counsel of record for Defendant on April 23, 2024 via CM/ECF.

/s/ Reza Mirzaie

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