

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

CHARGE FUSION TECHNOLOGIES, LLC,
Patent Owner.

IPR2023-00063
Patent 10,819,135 B2

Before MEREDITH C. PETRAVICK, JEREMY M. PLENZLER, and
CARL M. DEFRANCO, *Administrative Patent Judges*.

PLENZLER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Tesla, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–5, 7–11, and 14–16 of U.S. Patent No. 10,819,135 B2 (Ex. 1001, “the ’135 patent”). Paper 2 (“Pet.”). Charge Fusion

Technologies, LLC (“Patent Owner”) filed a Preliminary Response. Paper 6. Pursuant to our authorization, Petitioner filed a Reply to Patent Owner’s Preliminary Response. Paper 7.

We instituted an *inter partes* review of claims 1–5, 7–11, and 14–16 of the ’135 patent on all grounds of unpatentability alleged in the Petition. Paper 9 (“Institution Decision” or “Inst. Dec.”). Patent Owner requested rehearing of our Institution Decision (Paper 13), which we denied (Paper 14).

After institution of trial, Patent Owner filed a Response (Paper 18, “PO Resp.”), Petitioner filed a Reply (Paper 21, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 22, “PO Sur-Reply”).

An oral hearing was held on February 13, 2024, and the record includes a transcript of the hearing. Paper 28 (“Transcript” or “Tr.”).

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 not shown by a preponderance of the evidence that any of claims 1–5, 7–11, and 14–16 of the ’135 patent are unpatentable.

B. Related Matters

The parties indicate that the ’135 patent is involved in *Charge Fusion Technologies, LLC v. Tesla, Inc.*, No. 1:22-cv-00488-LY (W.D. Tex. 2021) (“Texas Litigation”). Pet. 80–81; Paper 4, 1.

IPR2022-01217 (challenging U.S. Patent No. 10,998,753 B2 (“the ’753 patent”)) and IPR2023-00062 (challenging U.S. Pat. No. 9,853,488 B2 (“the ’488 patent”)) are related to this proceeding. The ’753 patent is a continuation filing of the ’135 patent, which is continuation of the ’488

patent. A final written decision has been entered in IPR2022-01217. Trial has been instituted for IPR2023-00062, which is pending.

C. The '135 Patent

The '135 patent relates to “[s]ystems and methods for charging electric vehicles and for quantitative and qualitative load balancing of electrical demand.” Ex. 1001, Abstract. The '135 patent states it would be advantageous to intelligently charge vehicles by creating a charging schedule. *Id.* at 2:5–15.

According to the '135 patent, a graphical user interface may be used to effectuate and facilitate operation of the systems. Ex. 1001, 14:19–21. Figure 7, reproduced below, illustrates an exemplary user interface. *Id.* at 1:53–54.

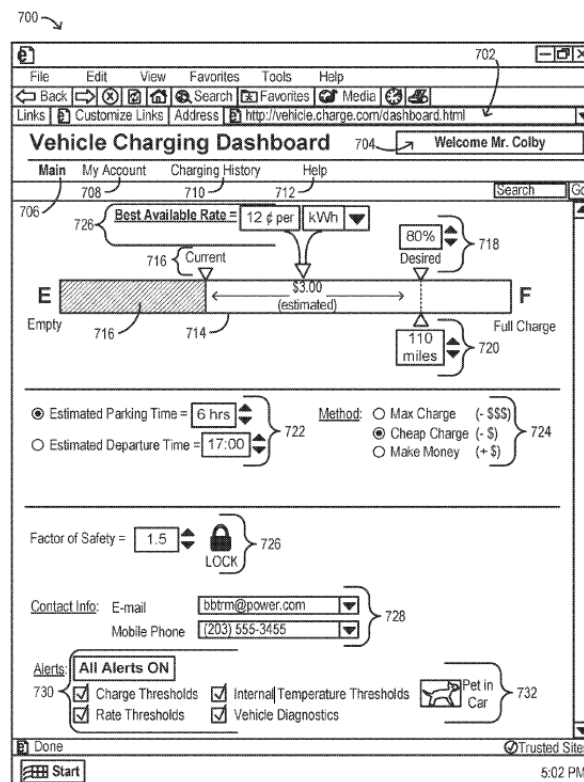


FIG. 7

Figure 7 illustrates a diagram of an exemplary interface 700. *Id.* at 14:16–18. Interface 700 may be utilized in conjunction with and/or to effectuate and/or facilitate operation of the systems. *Id.* at 14:18–21. The “main” menu item 706 may comprise a “dashboard” and/or primary screen via which vehicle charging parameters may be established, stored, viewed, and/or changed. *Id.* at 14:40–51. The “main” menu item 706 may comprise, for example, a vehicle charge indicator 714 that visually indicates a current charge level 716 of the vehicle. *Id.* Similarly, a desired charge percent level 718 may be both shown and alterable. *Id.* A user may select the desired charge percent level 718, for example, and may slide the marker on the vehicle charge indicator 714 to a new described location 50 and/or may utilize the exemplary up/down arrow controls to increase or decrease the desired charge percent level 718. *Id.* Also, a user may view and/or change the desired charge range level, and thus determine a desired distance to travel and accordingly set the desired charge range to match the desired distance. *Id.* at 14:53–62.

According to the ’135 patent, the “main” menu item 706 may comprise a “pet in car” button 732. Ex. 1001, 15:45–55. The “pet in car” button 732 may automatically set alerts and/or charge parameters to levels conducive to maintaining the comfort and safety of a pet left in a parked vehicle. *Id.* Thus, a user may safely leave a pet in a parked vehicle by establishing and/or setting charging parameters designed to keep the air conditioning on to maintain a cool vehicle and/or to keep the heat on to maintain a warm vehicle (e.g., depending upon the relevant season and/or external weather conditions). *Id.* The ’135 patent explains that “the operator [may] be notified if the current charge level of the vehicle 660 falls below a level that allows the Air Conditioning (A/C) to remain on for [a

time, such as] fifteen (15) minutes” or “the operator [may] be notified if the temperature inside the vehicle 660 climbs above [a temperature, such as] seventy (70) degrees.” *Id.* at 13:43–50.

*D. Illustrative Claim*¹

1. A non-transitory computer readable storage medium storing instructions that, when executed by a processor, cause the processor to:
 - 1[a] retrieve from a memory storage device one or more electric charge parameters describing one or more electric charge parameters of an electric vehicle;
 - 1[b] display via a user interface of a mobile device at least one of the one or more electric charge parameters
 - 1[c] wherein the user interface is adapted to display the one or more electric charge parameters as a vehicle charge indicator element comprising a first portion indicative of an amount of charge residing in a battery of the electric vehicle and a second portion indicative of an uncharged capacity of the battery of the electric vehicle and wherein the vehicle charge indicator element further comprises a slider by which an amount of charge may be specified;
 - 1[d] receive an amount of charge specified by the slider;
 - 1[e] commence charging of the electric vehicle in accordance with the received amount of charge;
 - 1[f] display via the user interface a visual indicia for selecting a mode of operation of the electric vehicle the selected mode of operation operating to determine and maintain an interior temperature of the electric vehicle suitable for a pet located within the electric vehicle;
 - 1[g] receive an indication of an activation of the selected mode of operation of the electric vehicle; and

¹ For ease of reference, we use Petitioner’s claim recitation numbering scheme as indicated by the bracketed numbers. *See* Pet. ii.

1[h] operate a climate control mechanism of the electric vehicle while the vehicle is in a parked state and in accordance with the selected mode of operation for a duration of time until the amount of charge residing in the battery reaches a predetermined level.

Ex. 1001, 29:16–47.

E. Evidence and Asserted Ground

Petitioner asserts that claims 1–5, 7–11, and 14–16 would have been unpatentable on the following ground:

Claim(s) Challenged	35 U.S.C. §²	Reference(s)/Basis
1–5, 7–11, 14–16	103	Eberhard ³ , Roadster Manual ⁴ , Hibi ⁵

Petitioner submits a declaration from Christopher Wilson. Ex. 1002 (“Wilson Declaration”). Patent Owner submits a declaration from Steven Goldberg, Ph.D. Ex. 2004 (“Goldberg Declaration”).

II. ANALYSIS

A. Legal Standards

Petitioner bears the burden of persuasion to prove unpatentability, by a preponderance of the evidence, of the claims challenged in the Petition. 35 U.S.C. § 316(e). This burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the application from which the ’488 patent issued was filed before this date, the pre-AIA version of § 103 applies.

³ U.S. Patent No. 7,671,567 B2, issued Mar. 2, 2010 (Ex. 1009).

⁴ 2008 Tesla Roadster Touch Screen User’s Manual (Ex. 1005).

⁵ Japanese Unexamined Patent Application Publication No. JP H10-55496, published February 24, 1998 (Ex. 1008).

Petitioner’s challenge is based on obviousness. A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious at the time of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in the record, objective evidence of non-obviousness. *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.*

Petitioner’s declarant, Mr. Wilson, testifies that one skilled in the art during the relevant time frame “would have had at least a bachelor’s degree in electrical engineering, mechanical engineering, or physics (or an equivalent field) and at least two years of work experience involving

automotive systems, including vehicle information systems, vehicle sensors, and vehicle controllers,” but “[m]ore education can supplement practical experience and vice versa.” Pet. 9–10 (citing Ex. 1002 ¶ 28). Patent Owner does not contest Petitioner’s articulation of the level of skill in the art. *See* PO Resp. 17 (“Patent Owner takes no position with respect to Petitioner’s proposed level of ordinary skill in the art, but submits that a POSITA would need to be able to actually perform without undue experimentation the software changes that Petitioner claims are obvious.”).

We analyze the asserted prior art with respect to the level of skill set forth by Petitioner because it is consistent with the prior art.

C. Claim Construction

In an *inter partes* review, we construe a patent claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b).” 37 C.F.R. § 42.100(b) (2021). Under this standard, the words of a claim generally are given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Claim 1 recites “instructions that . . . cause the processor to . . . *operate* a climate control mechanism of the electric vehicle while the vehicle is in a parked state and in accordance with the selected mode of operation for a duration of time *until* the amount of charge residing in the battery reaches a predetermined level.”⁶ Ex. 1001, 29:16–47 (emphases added).

⁶ Independent claim 8 includes a similar recitation, but in connection with a method. *See* Ex. 1001, 30:34–39 (“operating an A/C mechanism of the electric vehicle in accordance with the selected mode of operation for a

In the Institution Decision, “[w]e strongly encourage[d] the parties to address th[e] dispute about the meaning of this limitation, that is, whether the limitation requires the selected mode of operation to ‘cease operation’ or ‘change operation’ after the system reaches the predetermined battery level.” Inst. Dec. 28.

Patent Owner contends that “[a] POSITA would understand that the selected mode of operation stops or ceases once the amount of charge reaches a predetermined level.” PO Resp. 13–14 (citing Ex. 2004 ¶¶ 28–31). Patent Owner points to column 13, lines 30–50 and Figure 6 of the ’135 patent to support its position. *See id.* at 14–15.

The entirety of the disclosure in the Specification cited by Patent Owner is reproduced below.

In some embodiments, the system 600 may be utilized to setup, define, store, and/or update or change preference, option, and/or parameter data that is utilized by an ECS (not shown in FIG. 6) to determine how, when, and/or where to transfer electrical energy to and/or from the vehicle 660. An operator of the user device 680 may, for example, select the menu option 682 (and the user device 680 may receive an indication of such selection), which is depicted as being a menu option defining a situation of a pet being in the vehicle 660. The operator may then, for example, (i) determine whether it is desired that the vehicle 660 only be allowed to be charged in such a circumstance-as opposed to allowing the vehicle 660 to provide and/or sell stored and/or vehicle-generated power (e.g., the first preference option 684a), (ii) determine whether it is desired that the operator be notified if the current charge level of the vehicle 660 falls below a level that allows the Air Conditioning (A/C) to remain on for fifteen (15) minutes (e.g., the second preference option 684b), and/or (iii) determine whether it is

duration of time until it is determined that the selected mode of operation cannot be maintained by the amount of charge residing in the battery for more than a threshold amount of time”).

desired that the operator be notified if the temperature inside the vehicle 660 climbs above seventy (70) degrees (e.g., the third preference option 684c).

Ex. 1001, 13:30–50. That is, the support cited by Patent Owner for limitation 1[h] is a criterion for operator notification when the vehicle battery falls below a charge level allowing for air conditioner operation for a specified amount of time. This disclosure explains the action taken subsequent to limitation 1[h] (i.e., what happens after the “until” limitation). It does, however, shed light on how one skilled in the art would understand the ordinary and customary meaning of limitation 1[h] in a manner consistent with the Specification.

Patent Owner contends that “the patent states[] the purpose of the predetermined level is to notify a user that the battery of the vehicle is running out that would *preclude* the vehicle from being able to continue running the mode of operation—e.g., provide A/C to a car in a parked state.” PO Resp. 15 (citing Ex. 1001, 13:30–50). Patent Owner further contends that “[a] POSITA would understand that the purpose of the notification of the vehicle’s charge to a predetermined level in a parked state is to warn a user/driver that the battery of the electric vehicle will be unable to operate the selected mode of operation and the selected mode of operation will cease.” *Id.* In its Sur-Reply, Patent Owner contends: “The word ‘until’ indicates that a state is maintained or preserved up to a certain point and not after that point. *See* Merriam-Webster, *Until*, <https://www.merriam-webster.com/dictionary/until> (accessed Dec. 28, 2023) (defining the word ‘until’ as ‘to indicate continuance (as of an action or condition) to a specified time’).” PO Sur-Reply 8.

Petitioner responds that “the plain and ordinary meaning of limitation 1[h] does not require that the selected mode of operation either ‘cease’ or ‘change’ after the battery reaches the predetermined level.” Pet. Reply 1. Petitioner contends that “[t]he specification of the ’135 patent confirms that the mode of operation need not either stop or cease after the predetermined level is reached.” *Id.* at 2.

Patent Owner notes Petitioner’s contention that “[t]he claim is silent as to what happens after the predetermined level is reached, and does not require that the mode of operation change or cease” (Pet. Reply 2), but contends that such a construction would “render[] the term ‘until’ meaningless” (PO Sur-Reply 8).

We agree with Petitioner that the claim does not require that the selected mode of operation ceases after the battery reaches the predetermined level. We disagree with Patent Owner’s contention that this understanding would render the term “until” meaningless.

Contrary to the position taken in its briefing, at oral hearing, counsel for Patent Owner agreed that the claim does not require that operation of the climate control mechanism ceases. *See* Tr. 43:24–44:17 (counsel for Patent Owner explaining that a climate control system would not need to cease, but could continue to operate in the same manner, such as an auto mode, *both before and after* the battery reaches a predetermined level and be within the scope of the claim). This understanding is consistent with the Specification, which provides an example where the predetermined charge level is one allowing for 15 minutes of climate control operation. In that example, a notification is provided to the vehicle’s operator, but the climate control mechanism does not cease to operate.

Claim 1 does not specify the basis for the predetermined battery level. Claim 1 also fails to specify if anything changes with respect to the selected mode of the climate control mechanism after the predetermined battery level is reached, let alone what change would occur. The claim is silent as to what happens after the “until” limitation. But even if claim 1 does not recite a particular event that occurs *after* the predetermined battery level is reached, claim 1 at least requires that the instructions take into consideration the battery level in some manner when operating the climate control mechanism. In that sense, operation of the climate control mechanism does change in some manner.

Claim 1 requires “instructions . . . caus[ing] the processor to . . . operate a climate control mechanism.” Ex. 1001, 29:16–43. The fact that the claim requires *instructions* is key to this understanding. In order for limitation 1[h] to be met, “instructions that . . . operate a climate control mechanism” must take into account the predetermined battery level. The claim is broad as to how those instructions use that predetermined battery level to operate the climate control mechanism. As explained above, the instructions could continue operation of the selected mode of operation and simply provide some form of indication that the predetermined level has been met. Alternatively, the instructions could modify the operating mode or cease the operating mode altogether. In any event, those instructions that operate the climate control mechanism must be based in some manner on the predetermined battery level.

Based on the record before us, this understanding of the claim does not render the “until” limitation meaningless and is sufficient to reach our decision, while also being consistent with the ordinary and customary meaning and the Specification. We do not need to construe the “until”

limitation further or any other terms expressly to reach our decision. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Petitioner’s Challenge

Petitioner asserts that claims 1–5, 7–11, and 14–16 are unpatentable under 35 U.S.C. § 103 as obvious over various combinations of Eberhard, the Roadster Manual, and Hibi. Pet. 17–79. The dispositive issues in this proceeding focus on the combined teachings of Eberhard and Hibi.

1. Eberhard

Eberhard relates to “charging and cooling modes for the battery pack of an electric vehicle.” Ex. 1009, 1:17–18. More specifically, Eberhard relates to service life of rechargeable batteries. *See id.* at 1:22–45, 3:65–4:40, 7:32–8:49.

Eberhard describes a “system 400[, which] includes a power control subsystem 401, a battery pack 403, a battery cooling subsystem 405, a battery heating subsystem 407, and a user interface 409.” Ex. 1009, 4:46–49. Eberhard’s “[p]ower control subsystem 401 is comprised of a charging module 411 that controls and monitors cut-off voltage during charging.” *Id.* at 4:52–54. Eberhard explains that cut-off voltage affects battery life. *Id.* at 3:65–4:12.

Eberhard’s “[i]nterface 409 provides a means for the user to control the selection of the charging mode.” *Id.* at 5:59–61. Eberhard’s “system [also] allows the user to select the operational mode of a vehicle” including “aspects of the charging, battery and power control systems that affect the performance of an electric vehicle (i.e., all electric or hybrid) and the battery

pack, as well as the life expectancy of the battery pack.” *Id.* at 5:64–6:4. Eberhard’s various operating modes each have a specified cut-off voltage for charging. *See id.* at 6:6–7:3. Alternatively, Eberhard allows the user to select the cut-off voltage. *Id.* at 8:15–22.

In order for the user to select a particular mode or setting, Eberhard provides “a display system . . . either alone with a touch sensitive screen, or together with a plurality of switching means (e.g., toggle switches, push button switches, slide switches, etc.).” Ex. 1009, 8:52–56. According to Eberhard, “[t]his same user interface, through additional screens, can also be used to provide the user with AC/heat controls, audio entertainment controls, cell phone controls, navigation system controls, and other convenience functions.” *Id.* at 8:66–9:3.

2. *Hibi*

Hibi’s system is described in connection with a vehicle that is powered by a combination of a battery and engine, where the battery can separately power the vehicle and is able to be charged by operating the engine. *See* Ex. 1008 ¶¶ 38, 43. Accordingly, the vehicle can power items, such as climate control, when the engine is off. *See id.* ¶ 43.

Hibi addresses situations where “the driver is away from the automobile, such as while parked” (Ex. 1008 ¶ 4) and “there is . . . a possibility of some kind of accident occurring within the vehicle while the driver leaves a child or pet animal within the vehicle and is away from the car” (*id.* ¶ 6). These situations may include “an accident due to dehydration, lack of oxygen, or the like . . . within a closed vehicle” when “the appropriate measures . . . cannot be carried out by a child or animal.” *Id.* According to Hibi, “such accidents may be prevented, provided that there is means of being able to confirm the appearance of the inside of the vehicle

even while the driver is away from the automobile, or means of contacting the driver in the event of a dangerous situation.” *Id.*

Hibi’s objective “is to . . . enable[] the driver to quickly learn of an abnormality occurring inside or outside the automobile, and to also prevent serious incidents or accidents from occurring by implementing countermeasures automatically or by remote operation from the driver.” Ex.

1008 ¶ 7. Hibi’s system includes

an information processing device 2 equipped to an automobile 12, a sensor group 8 connected thereto for detecting a state inside and outside the automobile 12, an operation apparatus group 9 composed of various operation apparatus equipped to the automobile 12 and that is controllable from the information processing device 2, a cellular phone 6 as communication means with a driver 13 who is away from the automobile 12, an infrared interface 7 as another communication means, and a mobile communication terminal 10 and a cellular phone 11 held by the driver 1.

Ex. 1008 ¶ 18. “[T]he information processing device 2 is composed of the sensor group 8, an interface with the apparatus group 9, a microcomputer, and memory.” *Id.* ¶ 20.

Hibi provides examples of “the sensor group 8 includ[ing] an in-vehicle thermometer 81, a door lock opening and closing sensor 82, a battery voltmeter 83, a GPS receiver 84, a camera 85 . . . , a microphone 86, a suspension displacement sensor 87 . . . , and the like.” Ex. 1008 ¶ 24. Hibi also provides “[e]xamples of apparatus constituting the apparatus group 9 . . . includ[ing] an air conditioner 91, a door lock opening and closing device 92, a horn 93, a display device 94, a speaker 95, an engine starter 96, and the like.” *Id.* ¶ 26.

Hibi explains that “[w]hen the automobile stops and the driver starts the system, the system shifts to a system setting mode 21” where “the driver

may conduct various settings with respect to the system” (Ex. 1008 ¶ 30), such as “setting the environment within the automobile, such as room temperature, or the like” (*id.* ¶ 31). “[T]he system [then] shifts to an initialization mode 22, and data is collected in this mode from the sensor group 8 and the present state is recorded as an initial state.” *Id.* After “initialization is completed, the system shifts to a monitoring mode 23, and monitoring of the state inside and outside the automobile starts.” *Id.* When an abnormality is detected during Hibi’s monitoring mode, “the system shifts to an . . . abnormality processing mode” where “a countermeasure against the detected abnormality is automatically executed, and the driver is notified of the occurrence of the abnormality.” *Id.* ¶ 34. Figure 5(a) of Hibi provides example in-vehicle abnormalities and is reproduced below.

FIG. 5

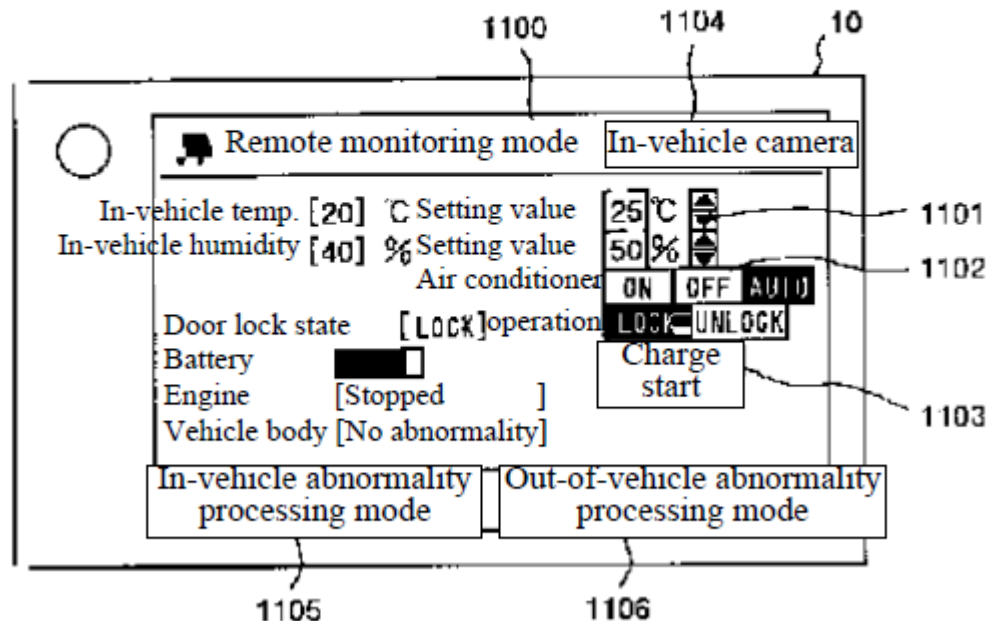
(a) In-vehicle abnormality

Type of Abnormality	Detection Sensor	Countermeasures	Apparatus Used
Increased temperature inside the vehicle	Thermometer Hygrometer	Cool the inside of the vehicle Open a window	Air conditioner Power windows
Decreased temperature inside the vehicle	Thermometer Hygrometer	Confirm that the gear is in neutral, start the engine, and turn on the heater	Heater Engine starter
Ventilation inside the vehicle	(Clock)	After a fixed time has passed, open the window slightly, and rotate a ventilator if necessary	Power windows Air conditioner
Fire inside the vehicle	Thermometer Smoke sensor	Report to driver and fire department Open the door lock if a person or animal is inside	Cellular phone Door lock opening and closing device
Low battery	Voltmeter	Confirm that the gear is in neutral, start the engine, and charge the battery	Engine starter

Figure 5(a) is a table listing types of abnormalities along with corresponding detection sensors, countermeasures, and the apparatus used for the given countermeasures.

Hibi conveys information to a user and accepts user input via a display screen, seen in Figure 11 and reproduced below.

FIG. 11



“F[igure] 11 illustrates a configuration example of a data display screen 1100 of the mobile communication terminal 10 of the driver 13 in the remote monitoring mode 24.” Ex. 1008 ¶ 38. Hibi provides the following description of Figure 11:

On the left side of the screen, the state of the automobile is displayed based on the data from the sensor group 8 installed in the automobile 12, such as the state of the temperature or humidity within the vehicle, door lock, or the like. On the right side of the screen, there is an operation screen of various apparatus groups 9 equipped to the automobile. In the present embodiment, . . . the setting value of the temperature and humidity within the vehicle may be changed by touching an up and down button 1101, and the operation of the air conditioner

91 or the door lock opening and closing device 92 may be operated by a radio button 1102.

Id. Hibi explains that “[w]hen a capacity of a battery is insufficient, charging may be conducted automatically by starting an engine; however, the driver 13 may also touch a charge start button 1103 to cause charging.”

Id. Hibi additionally explains that “[w]hen a heater is turned on or the capacity of the battery has been reduced by conducting cooling over a long period, after confirming that a gear is in neutral, the engine is started by the engine starter 96 and heating or charging of the battery is conducted.” *Id.* ¶ 43.

3. Claim 1

Petitioner relies on Eberhard’s teachings for many of the features recited in claim 1, but cites Hibi’s teachings for limitations 1[f]–[h].

The dispositive issue with respect to claim 1 involves Petitioner’s proposed combination of teachings from Hibi with those of Eberhard to meet the features recited in limitation 1[h]. Limitations 1[f] and 1[g] relate to limitation 1[h], as they recite the “selected mode of operation” applied in limitation 1[h]. Limitation 1[f] recites instructions that “display via the user interface a visual indicia for selecting a mode of operation of the electric vehicle the selected mode of operation operating to determine and maintain an interior temperature of the electric vehicle suitable for a pet located within the electric vehicle.” Ex. 1001, 29:36–40. Limitation 1[g] recites instructions that “receive an indication of an activation of the selected mode of operation of the electric vehicle.” *Id.* at 29:41–42.

As noted above, limitation 1[h] involves instructions that “operate a climate control mechanism of the electric vehicle while the vehicle is in a parked state and in accordance with the selected mode of operation for a

duration of time until the amount of charge residing in the battery reaches a predetermined level.” Ex. 1001, 29:43–47.

a) Limitation 1[f]

Petitioner explains that “Eberhard acknowledges that electric vehicles were known to include a climate control system” and “Hibi also acknowledges that vehicles include climate control mechanisms.” Pet. 32. Petitioner contends that Hibi describes the features recited in limitation 1[f], and “[s]pecifically, Hibi discloses a user interface that displays in-vehicle temperature and humidity” and “Figure 11 shows this interface.” *Id.* at 32–33 (citing Ex. 1008 ¶ 38).

Petitioner notes that “[t]he user interface includes the current temperature and humidity, as well as ‘ON,’ ‘OFF,’ or ‘AUTO’ modes to control the vehicle air conditioner” (Pet. 33) and “[t]he user interface also allows the user to decide whether or not to start the engine” (*id.* at 34). Petitioner includes a footnote stating that “[s]tarting the engine may affect both the battery life of the vehicle for air conditioning and whether the heater can be used.” *Id.* at 34 n.9 (citing Ex. 1008 ¶ 43). Petitioner indicates that Hibi’s “system will then automatically control an apparatus, such as a heater or air conditioner, to maintain the target temperature.” *Id.* (citing Ex. 1008 ¶¶ 29, 47, 61).

Petitioner additionally notes that “Hibi also discloses that, in the ‘monitoring mode’ or ‘remote monitoring mode,’ the system is capable of detecting and responding to ‘abnormalities’ within the vehicle.” Pet. 35 (citing Ex. 1008 ¶¶ 39–42). Petitioner identifies some of the abnormalities listed in Hibi, such as temperature conditions (e.g., increased or decreased temperatures) inside the vehicle, as well as the responses to those conditions discussed in Hibi (e.g., operation of air conditioner and or window opening

to address increased temperature and starting the engine and turning on the heater to address decreased temperature). *Id.* (citing Ex. 1008 ¶¶ 39–42, Fig. 5(a)). Petitioner notes Hibi’s explanation “that these abnormality responses are designed, in part, for situations ‘when the driver leaves a child 61 or a pet animal 62 within the vehicle and is away from the automobile.’” *Id.* (citing Ex. 1008 ¶ 47).

b) Limitation I[g]

Petitioner contends that “Hibi discloses a user interface that allows the user to select an ‘AUTO’ mode, and to set target values for the temperature and humidity by ‘touching an up and down button.’” *Id.* at 40 (citing Ex. 1008 ¶ 38, Fig. 11). Petitioner contends that “Hibi also discloses that the user interface allows the user to start the engine by touching the ‘charge start button’” and “[t]hese settings are received by the system as an ‘operation instruction’ from the driver.” *Id.* (citing Ex. 1008 ¶¶ 14, 38, Fig. 11). The settings referred to by Petitioner as “these settings” appear to be the combination of the “AUTO mode” selection and “charge start button” selection. According to Petitioner, “[w]hen this instruction is received, the system automatically controls the vehicle systems in accordance with the settings.” *Id.* (citing Ex. 1008 ¶¶ 14, 38, 47, 61, Fig. 11).

c) Limitation I[h]

Petitioner contends that “Hibi discloses a system to control an automobile ‘whose driver is absent while parked.’” Pet. 41 (citing Ex. 1008 ¶ 7). Petitioner contends that “Hibi discloses the operation of ‘a climate control mechanism of the electric vehicle while the vehicle is in a parked state and in accordance with the selected mode of operation’ as claimed” because its system is “configured to ‘automatically control[]’ heating and air conditioning systems, and the engine starter within the vehicle.” *Id.*

(alteration in original) (citing Ex. 1008 ¶ 47, Fig. 5(a)). Petitioner explains that “[t]he system may be set to use the heating and air conditioning systems to maintain a target temperature,” which “may be performed either with the engine on or off.” *Id.* (citing Ex. 1008 ¶¶ 30, 31, 43).

Petitioner further explains that “[t]he system is also configured to detect and respond when the battery runs to a predetermined level of charge.” Pet. 41–42. Petitioner contends that based on the “low battery” abnormality condition in Hibi’s Figure 5a, “there must be a predetermined level of charge below which the battery would be considered ‘low.’” *Id.* at 42 (citing Ex. 1002 ¶ 92). Petitioner explains that “[t]o respond to a low battery abnormality, the system enters the ‘in-vehicle abnormality processing mode.’” *Id.* (citing Ex. 1008 ¶ 34, Fig. 5(a)). That is, Petitioner considers the low battery level of Hibi’s low battery abnormality condition as corresponding to the recited “predetermined [battery] level.”

Petitioner contends that “[t]his [in-vehicle abnormality processing] mode may be different from the ‘selected mode.’” Pet. 42. As seen above, Petitioner identifies Hibi’s AUTO climate control mode as corresponding to the recited “selected mode.” Petitioner contends that Hibi’s AUTO climate control mode is “operate[d] . . . for a duration of time until the amount of charge residing in the battery reaches a predetermined level” as recited in claim 1 because Hibi enters the in-vehicle abnormality processing mode at the low battery abnormality condition (i.e., the predetermined battery level). *Id.* In this low battery mode, the system will decide on countermeasures, such as starting the car’s engine to recharge the battery. *Id.* (citing Ex. 1008 ¶ 41, Fig. 5(a)).

d) Analysis

We agree with Petitioner that Hibi teaches operating its climate control system in an AUTO mode for a duration of time. That time can be up to and beyond the low battery abnormality condition. As explained above, the claim language at least requires instructions that operate the climate control mechanism based on the predetermined battery level in some manner.

Patent Owner is correct that Hibi does not care about its battery level for operation of its climate control mechanism. *See* PO Resp. 42–44. Patent Owner is also correct that “in response to a low battery event, Hibi’s system simply turns on the engine and charges the battery.” *Id.* at 43 (citing Ex. 1008, Fig. 5). And as Patent Owner further notes, “if a user selects a climate control temperature in system setting mode of Hibi, that temperature is unchanged in response to a low battery event” and “[i]nstead, the temperature remains constant in response to the low battery, as Hibi’s vehicle simply turns the gas engine on and charges the battery.” *Id.* (citing Ex. 1008 ¶ 43, Fig. 5; Ex. 2004 ¶¶ 91–94; Ex. 2005, 53:13–54:14).

Because Hibi does not consider battery level for the operating instructions associated with its climate control system, Petitioner’s challenge to claim 1 fails. In its Reply Petitioner responds to Patent Owner’s contentions by addressing a scenario where limitation 1[h] requires ceasing the selected mode of operation. *See* Pet. Reply 19–20. As explained above, we do not read limitation 1[h] as requiring ceasing the selected mode of operation. And Petitioner’s explanation in its Reply does not address the issue with its challenge noted above. That is, even in its contentions regarding Hibi ceasing operation, Petitioner still relies on operation where Hibi’s climate control system is operated wholly independent of battery

level considerations. *See id.* at 19 (discussing ceasing operation in Hibi based on a change from climate control with battery on to climate control with engine on).

There does not appear to be any dispute that Hibi operates its climate control system independent of any consideration of battery level. And, as explained above, this makes sense because Hibi can simply run its engine when the battery level is below a certain level.

Accordingly, because limitation 1[h] requires instructions that operate the climate control mechanism based in some manner on the predetermined battery level, Petitioner's challenge to claim 1 is not supported by the preponderance of the evidence before us. And the challenge to claims 2–5, 7, and 15, which depend from claim 1, fail for the same reason.

4. Claims 8 and 14

Unlike claim 1, claims 8 and 14 recite a method. Claims 8 and 14 each recite operating a climate control mechanism (more specifically, an A/C mechanism in claim 8). Claim 8 recites:

operating an A/C mechanism of the electric vehicle in accordance with the selected mode of operation for a duration of time until it is determined that the selected mode of operation cannot be maintained by the amount of charge residing in the battery for more than a threshold amount of time.

Ex. 1001, 30:1–39 (“limitation 8[i]”). Claim 14 recites:

receiving, via the user interface, an indication of an activation of the selected mode of operation of the electronic vehicle and operating a climate control mechanism of the electric vehicle in accordance with the selected mode of operation, wherein the mode of operation defines (i) a stored temperature at which to maintain the interior of the electric vehicle and (ii) a minimum battery charge level required to

maintain the stored temperature for a threshold amount of time.

Id. at 31:12–20 (“limitation 14[h]”).

The “operating” recited in claims 8 and 14 requires a determination of an amount of battery level required to maintain a specified operation of the climate control mechanism for a particular amount of time. This is similar to the requirement from claim 1’s limitation 1[h] discussed above, but even more specific. That is, rather than simply requiring operating the climate control mechanism based in some manner on the predetermined battery level, claims 8 and 14 require knowing a specific relationship between the remaining level of charge in the battery and the amount of time the climate control mechanism can run on that remaining charge.

As explained below, Petitioner’s contentions regarding claims 8 and 14 fail for reasons similar to those discussed above relative to claim 1 because Hibi operates its climate control system independent of any consideration of battery level. This, itself, is dispositive as to the failure of the Petition’s challenges.

And the more specific recitations in claims 8 and 14 are even more problematic to Petitioner’s challenge to claims 8 and 14 than the recitations in claim 1’s limitation 1[h]. We address those features below to further illustrate why Petitioner’s challenges fail.

There is no dispute that Hibi has a threshold battery level that it uses to determine when to start the engine. But Petitioner stretches the teachings of Hibi too far, alleging that “Hibi’s function to detect when a capacity of a battery is insufficient *necessarily* defines a minimum battery charge level required to maintain the stored temperature for a threshold amount of time.”

Pet. 66 (emphasis added) (citing Ex. 1002 ¶ 144).⁷ Petitioner provides similar contentions in its discussion of claim 14. *See id.* at 75. Petitioner attempts to explain its position as follows:

Specifically, Hibi discloses a “battery voltmeter” used to determine the charge of the battery. EX1008, [0024]. To determine that charge is insufficient, a POSITA would understand that the system must define a level of charge, as measured by the battery voltmeter, that is considered insufficient. *Id.* Furthermore, this level of charge necessarily corresponds to an amount of time that the system can maintain the stored temperature, e.g., the available charge divided by the discharge rate provides a threshold time remaining for operation. This is consistent with Patent Owner’s interpretation of this limitation. *See* EX1014, 76 (claim 8: “The dog mode is automatically turned off if the charge level drops to 20%.”). The charge level together with the rate of discharge resulting from operating the climate control system will dictate the threshold amount of time. EX1002 ¶144. Measuring the charge level and the instant rate of discharge are both well known in the art as shown, for example, in the Roadster Manual. EX1005, p.2, 5; EX1002 ¶144.

Id.; *see also id.* at 75–76 (similar discussion relative to claim 14).

Patent Owner responds that Hibi provides no teaching relative to any duration of time for operation of its climate control system relative to a remaining charge level of its battery. *See* PO Resp. 45–47. We agree. As explained above, Hibi is silent as to *any* relationship between operating its climate control system and remaining battery charge level.

Contrary to Petitioner’s representations, the charge level in Hibi that results in starting the engine does not *necessarily* correspond to an amount of time that the system can maintain the stored temperature in the manner

⁷ Paragraph 144 of Mr. Wilson’s testimony is a *verbatim* reproduction of the paragraph on page 66 of the Petition.

required by the claims. Petitioner's characterization of limitations 8[i] and 14[h] renders much of those limitations meaningless.

According to Petitioner, limitations 8[i] and 14[h] are taught by Hibi because its climate control system requires a certain amount of battery power for operation and, therefore, when the battery reaches a specific level, there is a corresponding amount of time that battery level could power the climate control system. Missing from Hibi, however, is any determination of the amount of time that battery level could power the climate control system.

Claim 8 requires that "it is *determined* that the selected mode of operation cannot be maintained by the *amount of charge* residing in the battery for more than a *threshold amount of time*." Ex. 1001, 30:36–39 (emphases added). Claim 14 recites "*receiving*, via the user interface, an indication of an activation of the selected mode of operation" that "defines (i) a stored temperature at which to maintain the interior of the electric vehicle and (ii) a *minimum battery charge level required* to maintain the stored temperature *for a threshold amount of time*." *Id.* at 31:12–20 (emphases added).

Claims 8 and 14 require an actual determination of time available for climate control operation based on battery level as part of their recited operation of the climate control mechanism. Simply stated, this is missing in Hibi. And there is no proposed modification to fix this problem.

For these reasons, in addition to the reasons set forth above, Petitioner's challenge to claims 8 and 14 is not supported by the preponderance of the evidence before us. And the challenge to claims 9–11, and 16, which depend from claim 8, fail for the same reasons.

5. Summary

For the reasons explained above, we determine that the preponderance of the evidence before us does not support Petitioner’s challenge to claims 1–5, 7–11, and 14–16.

III. CONCLUSION

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 7–11, 14–16	103	Eberhard, Roadster Manual, Hibi		1–5, 7–11, 14–16

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–5, 7–11, and 14–16 of the ’135 patent are not proven unpatentable; and

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

IPR2023-00063
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