

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

CHARGE FUSION TECHNOLOGIES, LLC,
Patent Owner.

IPR2025-00152
Patent 11,990,788 B2

Before BENJAMIN D. M. WOOD, CARL M. DeFRANCO, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

DeFRANCO, *Administrative Patent Judge*.

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

Charge Fusion Technologies, LLC is the owner of U.S. Patent No. 11,990,788 B2 (Ex. 1001, “the ’788 patent”). Tesla, Inc. filed a Petition requesting an *inter partes* review of claims 1–17 of the ’788 patent. Paper 1 (“Pet.”). We instituted an *inter partes* review of all claims as challenged in the Petition. Paper 12 (“Inst. Dec.”). In due course, Charge Fusion filed a

Patent Owner Response. Paper 18 (“PO Resp.”). Tesla filed a Reply in support of the Petition (Paper 19, “Reply”). And Charge Fusion followed with a Sur-Reply. Paper 21 (“Sur-Reply”). We held an oral hearing, a transcript of which is in the record. Paper 23 (“Hrg. Tr.”).

We have authority to hear this *inter partes* review under 35 U.S.C. § 6(c). We enter this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. In short, we determine that Tesla proves by a preponderance of the evidence that claims 1–17 of the ’788 patent are unpatentable as obvious. *See* 35 U.S.C. § 316(e).

I. BACKGROUND

A. *Real Parties-in-Interest*

Tesla and Charge Fusion identify themselves as the only real parties in interest. *See* Pet. 67; Paper 3, at 2.

B. *Related Matters*

The parties identify the following co-pending district court action as related to this proceeding. *See* Pet. 67; Paper 6, at 2.

- *Charge Fusion Technologies, LLC v. Tesla, Inc.*, No. 1:22-cv-00488-DAE (W.D. Tex.).

Charge Fusion also identifies the following PTAB proceedings, which address claims in various patents within the priority chain of the ’788 patent challenged here. *See* Paper 3, at 2.

- *Unified Patents, LLC v. Charge Fusion Technologies, LLC*, IPR2022-00519 (PTAB);
- *Tesla, Inc. v. Charge Fusion Technologies, LLC*, IPR2022-01217 (PTAB);
- *Tesla, Inc. v. Charge Fusion Technologies, LLC*, IPR2023-00062 (PTAB);

- *Tesla, Inc. v. Charge Fusion Technologies, LLC*, IPR2023-00063 (PTAB);
- *Tesla, Inc. v. Charge Fusion Technologies, LLC*, IPR2025-00032 (PTAB); and
- *Tesla, Inc. v. Charge Fusion Technologies, LLC*, IPR2025-00153 (PTAB).

Finally, Charge Fusion identifies the following pending appeals before the United States Court of Appeal for the Federal Circuit. Paper 3, at 2.

- *Tesla, Inc. v. Charge Fusion Technologies, LLC*, Appeal No. 24-2015 (Fed. Cir.); and
- *Tesla, Inc. v. Charge Fusion Technologies, LLC*, Appeal No. 24-1584 (Fed. Cir.).

C. Overview of the '788 Patent

The '788 patent describes “[s]ystems and methods for charging electric vehicles utilizing Graphical User Interface (GUI) elements.” Ex. 1001, Abstract. The charging system determines a charging schedule based on the operator’s charging preferences, including a desired charge level. *Id.* at 10:31–39, 11:3–11. The operator enters the charging preferences via an interface, as depicted in Figure 7 of the '788 patent and reproduced below. *Id.* at 14:40–15:18.

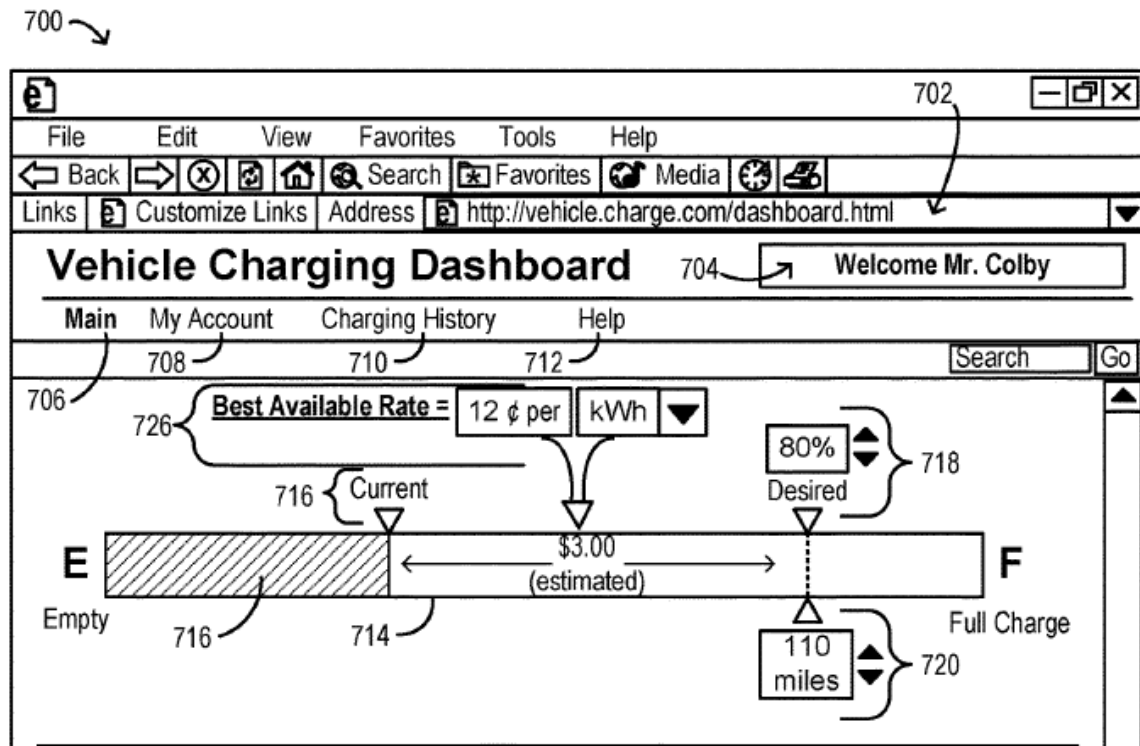


Figure 7 illustrates a charging “dashboard” that allows an operator of the vehicle to discern the current state of charge 716 on charge indicator 714 and select a desired level of charge by sliding a marker to a “desired charge percent level 718” or as a “desired charge range level 720.” *Id.* at 14:63–15:9.

D. Illustrative Claims

Claims 1, 6, and 11 are the independent claims among those challenged. Claim 1 is illustrative and recites (with bracketed nomenclature added for clarity):

- 1[Pre]. An electrical charging system, comprising:
- [a] one or more processing devices; and
 - [b] a non-transitory memory device in communication with the one or more processing devices, the non-transitory memory storing instructions that when executed by the one or more processing devices, result in:

- [i] receiving information indicative of a desired charge level of a battery of an electric vehicle wherein the desired charge level is defined by a user of the electric vehicle
- [ii] via a Graphical User Interface (GUI) forming a part of the electric vehicle and
- [iii] adapted to display a unitary vehicle charge indicator comprising a combination of input and output GUI elements the GUI elements comprising: (i) a first portion indicative of an amount of charge residing in a battery of the electric vehicle; (ii) a second portion indicative of an uncharged capacity of the battery of the electric vehicle; and (iii) a third portion comprising a slider by which an amount of charge may be specified;
- [iv] displaying a charging status of the electric vehicle via the GUI; and
- [v] increasing, in accordance with the desired charge level, a level of charge of the battery of the electric vehicle;
- [vi] wherein the desired charge level of the battery represents a specific amount of charge desired to reside in the battery after increasing the level of charge.

Ex. 1001, 29:35–62.

E. Asserted Challenges

Tesla challenges the patentability of the claims as follows:

Claims Challenged	35 U.S.C. §	Basis
1–4, 6–9, 11–14	103	Sutardja, ¹ Donnelly, ² Letendre, ³
5, 10, 15	103	Sutardja, Donnelly, Letendre, Seelig ⁴
16, 17	103	Sutardja, Donnelly, Letendre, Knockeart ⁵

In further support of these challenges, Tesla relies on the declaration testimony of Mr. Scott Andrews. *See* Ex. 1003. Charge Fusion, in turn, relies on the declaration testimony of Dr. Steven Goldberg. *See* Ex. 2008. The parties also submit cross-examination testimony from each of these expert witnesses. *See* Exs. 1096, 1097 (cross of Dr. Goldberg); Ex. 2011 (cross of Mr. Andrews).

II. ANALYSIS

A. Level of Ordinary Skill

We review the asserted grounds of unpatentability in light of the understanding of one of ordinary skill in the art at the time of the invention. Tesla submits that one of ordinary skill in the art would have had

at least a bachelor’s degree in electrical or mechanical engineering (or an equivalent field) and at least two years of work experience involving automotive systems, including electric vehicle power management. . . . Additional industry experience or technical training may offset less formal education,

¹ US 2008/0136371 A1, pub. Jun. 12, 2008 (Ex. 1011, “Sutardja”).

² US 7,124,691 B2, iss. Oct. 24, 2006 (Ex. 1006, “Donnelly”).

³ Steven E. Letendre, *The V2G Concept: A New Model for Power?* PUBLIC UTILITIES FORTNIGHTLY, Feb. 15, 2002, at 16 (Ex. 1007, “Letendre”).

⁴ US 5,654,621, iss. Aug. 5, 1997 (Ex. 1078, “Seelig”).

⁵ US 6,622,083 B1, iss. Sep. 16, 2003 (Ex. 1010, “Knockeart”).

while advanced degrees or additional formal education may offset lesser levels of industry experience.

Pet. 2–3 (citing Ex. 1003 ¶ 29). Charge Fusion “takes no position with respect to Petitioner’s proposed level of ordinary skill in the art.” PO Resp. 9. For purposes of our analysis, we apply Tesla’s proposed level of ordinary skill, which we find to be consistent with the problems addressed in the ’788 patent and the prior art.

B. Claim Interpretation

We interpret claims in the same manner as a district court in a civil action under 35 U.S.C. § 282(b), “including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). When applying that standard, we interpret the claim language as it would be understood by one of ordinary skill in the art in light of the specification. *Wasica Fin. GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1279–80 (Fed. Cir. 2017). Thus, we give claim terms their ordinary and customary meaning as understood by an ordinarily skilled artisan. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Here, Tesla proposes a construction for several claim terms common to the independent claims—namely, “unitary vehicle charge indicator” and “first portion” and “second portion” of that indicator. *See* Pet. 3–7. Tesla also proposes a construction of “determining . . . a charging schedule for the

electric vehicle,” as recited in dependent claims 2, 7, and 12. *See id.* at 7–8. Charge Fusion responds to Tesla’s proposed constructions, while offering its own construction of yet another term—“amount of charge.” *See* PO Resp. 9–20. We address each of these claim terms in turn.

1. “unitary vehicle charge indicator”

Limitation 1[b][iii] recites a “unitary vehicle charge indicator element” comprising three sub-elements, “a first portion indicative of an amount of charge residing in battery of the electric vehicle,” “a second portion indicative of an uncharged capacity of the battery,” and “a third portion comprising a slider by which an amount of charge may be specified.” This limitation is also recited in independent claims 6 and 11.

Tesla notes that this limitation “at least includes a bar graph” as shown in Figure 7 of the ’788 patent. Pet. 4–5. Charge Fusion responds that Tesla’s proposed construction should be rejected because it “wrongly import[s] embodiments from the specification.” PO Resp. 14–16. We discern no dispute over the meaning of “unitary vehicle charge indicator” because, contrary to what Charge Fusion argues, Tesla does not contend that this limitation is “required to be limited to” the bar graph embodiment of Figure 7, only that it “at least includes” that embodiment. *Compare* Pet. 5, *with* PO Resp. 14–16.

Tesla also argues that the “first” and “second” portions of the unitary vehicle charge indicator—which indicate the charged and uncharged capacities of the battery—recite merely “communicative content,” and thus, are “not entitled to any patentable weight” because they are directed to non-functional printed matter. Pet. 5–7 (citing various case law). At the same time, however, Tesla maintains that “[r]egardless, Donnelly teaches a bar

graph indicating the amount of charge and uncharged capacity.” Pet. Reply 11–12 (citing Pet. 33–34); *see also* Hrg. Tr. 74:22–25, 75:9–11. For reasons expressed below, we agree that Tesla persuasively demonstrates that the asserted combination teaches the “unitary vehicle charge indicator element” as claimed and construed by Charge Fusion. Accordingly, we need not decide the printed matter issue.

2. “*amount of charge*”

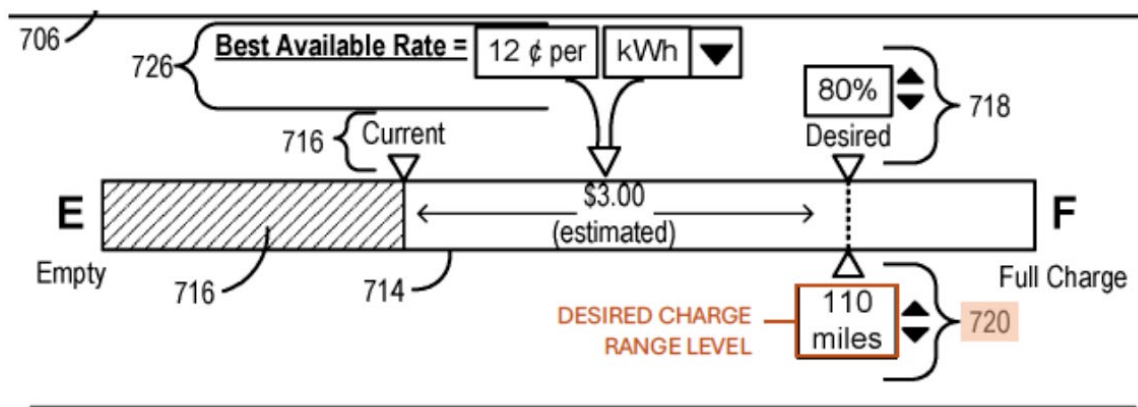
Central to this proceeding is the meaning of “amount of charge” as recited in limitation 1[b][iii], as well as identical limitations in independent claims 6 and 11. In particular, limitation 1[b][iii] recites that the “first portion” of the unitary vehicle charge indicator is “indicative of an *amount of charge* residing in a battery of the electric vehicle” and the “third portion” is “a slider by which an *amount of charge* may be specified.” Ex. 1001, 29:50–55 (emphases added).

Charge Fusion argues that “an ‘amount of charge’ cannot encompass the selection of a desired mileage,” such as a desired distance or range, but instead “must be a *percentage* of charge of the battery.” PO Resp. 9–10 (emphasis added); *see also id.* at 11–12 (“The limitation ‘amount of charge’ . . . should be construed . . . according to its plain ordinary meaning such as a quantity (including in percentage) of electrical charge residing in the battery that is measurable by the electric vehicle – not as a user selected travel distance or range of miles.”). We disagree.

Initially, we note that, as claimed, there is no express restriction on the manner in which the “amount” or “charge” is specified or otherwise expressed. Indeed, the Specification uses both “desired charge *percent* level” and “desired charge *range* level” as alternative ways for a user to

specify an “amount of charge.” Ex. 1001, 14:63–15:18 (emphases added). In particular, the Specification defines “desired charge range level” as meaning “a desired distance to travel.” *Id.* at 15:8–18. Elsewhere, the Specification describes that a user may specify the amount of charge as follows: “the user may indicate a desired charging level (and/or a desired charging level may be automatically calculated) based on a desired *distance of travel.*” *Id.* at 19:59–67 (emphasis added).

More specifically, annotated Figure 7 of the '788 patent, reproduced below, demonstrates how a user may select “amount of charge” in terms of a desired mileage range 720 or a percentage level 718. *See* Pet. Reply 2.



As shown in red, annotated Figure 7 illustrates that a user selects “desired charge level 720” on “vehicle charge indicator 714” by moving a slider to a value specified in “miles” (e.g., 110 miles). The Specification, after discussing selecting a desired charge percent level 718, explains:

The user may also or alternatively view and/or change the desired charge range level 720. An estimate of how far the vehicle can travel on a given charge amount (which may be a general average and/or may be computed based on a specific itinerary and/or past driving habits) can be determined, for example, and utilized to express the desired charge level in terms of distance capable of being traveled. In such a manner, for example, a user may determine a desired distance to travel (e.g.,

how far it is from home to work or vice versa) and may set the desired charge range level 720 to match the desired distance.

Ex. 1001, 15:8–18. Thus, the Specification confirms that “amount of charge” may be expressed in terms of a desired mileage as well as a desired percentage level.

Charge Fusion alleges the Specification “makes clear *charge amount* (i.e., the claimed ‘amount of charge’) is *different* from *charge level* (which broadly includes distance of travel and percentage of charge).” PO Resp. 10 (citing Ex. 1001, 15:9–15). According to Charge Fusion, the Specification uses only “desired charge percent level 718” as referring to an “amount of charge” and that the reference to “desired charge range level 720” reflects an estimated “amount.” *Id.* at 10–11 (again citing Ex. 1001, 15:10–15).

However, we read the cited passage as favoring Tesla’s position that “range” is an alternative way of specifying the “amount of charge” as claimed. *See* Pet. Reply 2–6. Indeed, the sentence immediately preceding the portion of the Specification cited by Charge Fusion equates selecting the desired charge percent level 718 with the desired charge range level 720 by stating: “The user may *also or alternatively* view and/or *change* the desired charge range level 720.” Ex. 1001, 15:8–9 (emphases added). Thus, the intrinsic record unequivocally supports that “amount of charge” can refer to a range as well as a percentage.

3. “*determining . . . a charging schedule for the electric vehicle*”

Dependent claims 2, 7, and 12 each recite “determining, based at least on the desired charge level, a charging schedule for the electric vehicle.” Tesla submits that this limitation should *not* be construed as a means-plus-function limitation under 35 U.S.C. § 112(6). *See* Pet. 7. Charge Fusion

agrees that “nothing in the claim invokes [§] 112(6).” PO Resp. 19. As such, we discern no dispute regarding the meaning of this claim limitation.

C. Ground 1—Obviousness in View of Sutardja, Donnelly, and Letendre

Tesla challenges claims 1–4, 6–9, and 11–14 as obvious over the combined teachings of Sutardja, Donnelly, and Letendre. *See* Pet. 15–54. This challenge covers all three independent claims—claims 1, 6, and 11—with Tesla referencing its showing for claim 1 as support for claims 6 and 11 likewise being unpatentable. *See id.* at 51–52 (claim 6), 53–54 (claim 11). To begin, Tesla relies on Sutardja as disclosing most of the limitations recited by the independent claims and points to various features of Donnelly and Letendre as teaching the remaining limitations. *See* Pet. 15–48. In other words, Tesla relies on Donnelly and Letendre as teaching enhancements or modifications to Sutardja’s system. For example, Tesla relies on Donnelly as teaching the claimed “Graphical User Interface (GUI)” that allows a user to define a desired charge level of the battery. *See id.* at 27–28. Tesla relies on both Donnelly and Letendre as teaching the claimed “GUI elements,” including “a slider by which an amount of charge may be specified.” *See id.* at 30–34, 37–40. For the following reasons, we find that Tesla demonstrates by a preponderance of evidence that the challenged claims of Ground 1 are unpatentable as obvious over the combined teachings of these references.

1. Summary of the Asserted Prior Art

Sutardja describes a system for charging an electric vehicle according to user-defined charging parameters. *See* Ex. 1011 ¶¶ 4, 8. As disclosed, “[a] user of the vehicle 102-1 may use the user interface module 108 to set

charging parameters for charging the battery 14.” *Id.* ¶ 243. Charging parameters include a desired charge level (e.g., a full charge) and a requested charge completion time. *Id.* ¶ 119.

Donnelly and Letendre, in turn, relate to battery-powered vehicles incorporating various features of a GUI. *See* Ex. 1006, 1:36–38, 6:64–7:1, 8:22–27, 21:47–58, 26:6–8; Ex. 1007, 18–20,⁶ Fig. 1.

2. Independent Claim 1

We begin with claim 1. Tesla argues that the combined teachings of Sutardja, Donnelly, and Letendre render claim 1 obvious. *See* Pet. 15–48. For clarity, Tesla subdivides claim 1 into a preamble (labeled “1[Pre]”) and eight other limitations (labeled 1[a], 1[b], and 1[b][i]–[vi]). Charge Fusion does not contest Tesla’s showing that the asserted combination describes or suggests limitations 1[Pre], 1[a], 1[b], 1[b][i], 1[b][ii], and 1[b][iv]–[vi]. *See* PO Resp. 21–55 (disputing only the asserted combination’s disclosure of limitation 1[b][iii]⁷). Based on our review of Tesla’s showing and the evidence of record, we find that Tesla demonstrates that the asserted combination teaches the subject matter of the *undisputed* limitations. *See* Pet. 15–30, 43–48.

⁶ Tesla’s citations to Letendre refer to internal page numbers rather than exhibit page numbers affixed by Tesla. Unless otherwise noted, we likewise refers to Letendre’s internal page numbers.

⁷ Although Charge Fusion did not expressly oppose or criticize Tesla’s nomenclature for claim 1, Charge Fusion chose not to adopt it in its Patent Owner Response and, instead, uses labels “1[c]–1[f]” to reference the various parts of limitation 1[b][iii]. For clarity, we maintain the nomenclature used by Tesla.

As for *disputed* limitation 1[b][iii], it recites the various elements of the claimed “GUI,” which allows the user to input and display the “desired charge level” of the vehicle. In particular, limitation 1[b][iii] recites that the GUI is:

adapted to display a unitary vehicle charge indicator comprising a combination of input and output GUI elements[,] the GUI elements comprising: (i) a first portion indicative of an amount of charge residing in a battery of the electric vehicle; (ii) a second portion indicative of an uncharged capacity of the battery of the electric vehicle; and (iii) a third portion comprising a slider by which an amount of charge may be specified.

Ex. 1001, 29:45–55. As claimed by this limitation, the GUI includes a “unitary vehicle charge indicator” that has two portions for providing information to the user about the charged and uncharged capacities of the vehicle’s battery and a third portion that comprises “a slider” for the user to specify “an amount of charge.”

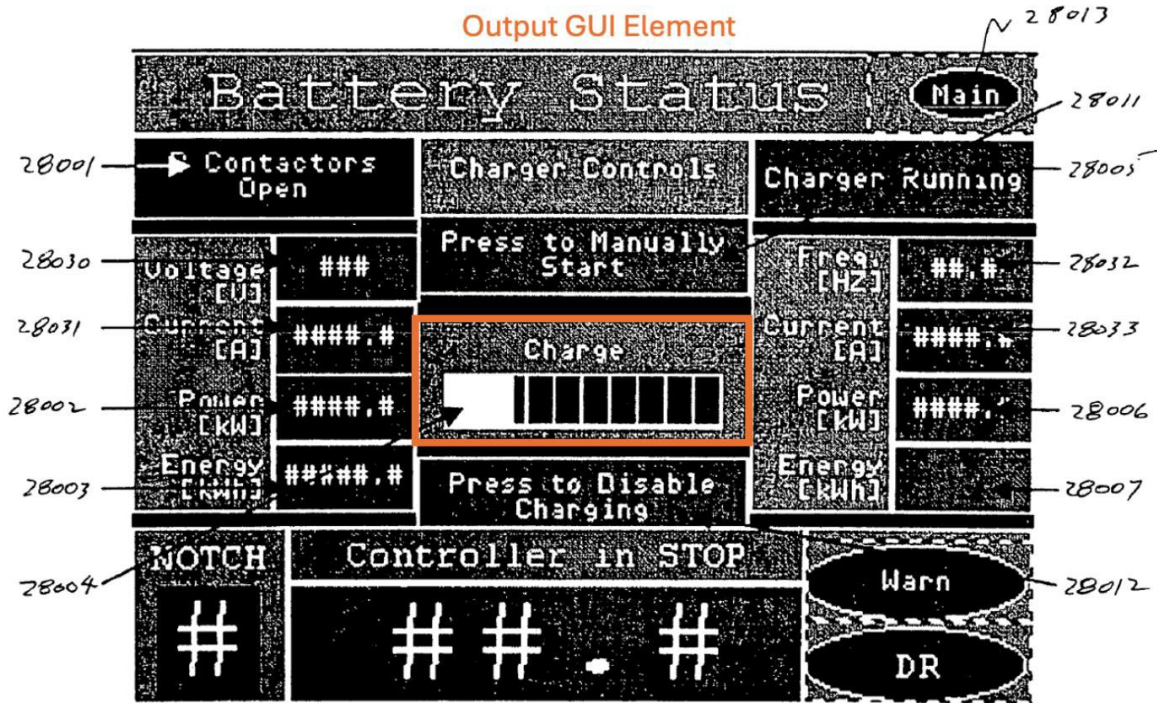
Tesla relies on Sutardja as disclosing an interface module 108 that allows a user to enter charging parameters via “a keypad, a display, a microphone, and/or a speaker” (Pet. 27) and points to Donnelly and Letendre as teaching the use of a GUI for altering charging parameters (*id.* at 30–34, 37–40). Charge Fusion counters with three arguments, namely, (1) Tesla’s asserted combination fails to teach or suggest a GUI that allows a user to specify “an amount of charge” as claimed (PO Resp. 21–28); (2) Tesla “fails to explain how Letendre’s distance based slider would be combined with [the modified Sutardja/Donnelly] interface module” (*id.* at 28–31); and (3) Tesla fails to demonstrate how Sutardja, Donnelly, and Letendre would be successfully combined “to arrive at a *unitary* vehicle charge indicator without hindsight from the ’788 patent” (*id.* at 31–35).

We do not find Charge Fusion’s arguments persuasive for the following reasons.

- a. “unitary vehicle charge indicator” comprising “GUI elements” for selecting and displaying “amount of charge”*

Limitation 1[b][iii] defines a “unitary vehicle charge indicator” that includes a “combination of input and output GUI elements.” Among the GUI elements are “first,” “second,” and “third” portions, the first two indicative of an “amount of charge” in the vehicle’s battery and the third the “amount of charge may be specified” by the user.

To begin, Tesla contends that the combined teachings of Sutardja and Donnelly suggest a combination of GUI elements that include *first* and *second* portions for specifying and displaying an amount of charge in the battery of an electric vehicle. *See* Pet. 32–36; *see also* Ex. 1003 ¶¶ 135–145, 148–161, 163. More specifically, Tesla relies on Sutardja’s disclosure of user interface module 108, such as “a keypad [and/or] a display,” that “[a] user of the vehicle 102-1 may use . . . to set charging parameters for charging the battery 14” of an electrical vehicle. Pet. 24–25, 27 (citing Ex. 1011 ¶¶ 242–243). Next, Tesla points to Donnelly’s teaching of a touchscreen GUI for displaying the charged and uncharged capacity of an electric vehicle’s battery. *Id.* at 32–34 (citing Ex. 1006, 21:47–58, 23:16–33, 26:6–8, Fig. 28; Ex. 1003 ¶¶ 149–153). In particular, Tesla annotates Donnelly’s Figure 28, reproduced below, to illustrate how Donnelly’s touchscreen GUI indicates the amount of charge.



As shown above, Donnelly’s touchscreen GUI is labeled “Battery Status” and Tesla highlights in orange the GUI element labeled “Battery State of Charge 28004,” which depicts a bar graph indicating “the state of charge” of the vehicle battery. Ex. 1006, 23:16–33; Fig. 28. Relying on the testimony of its expert, Tesla contends that one of ordinary skill in the art would have understood that the black bars in Donnelly’s bar graph 28004 represent the “amount of charge residing in the battery” and the white space represents the uncharged capacity of the battery. Pet. 33–34 (citing Ex. 1003 ¶¶ 151–155).

In addition, Tesla explains that one of ordinary skill in the art would have found it obvious to incorporate Donnelly’s touchscreen GUI— which depicts the state of charge of the vehicle’s battery— into Sutardja’s user interface module 108 in order to more easily and conveniently communicate Sutardja’s charging parameters *in a graphical format*. *Id.* at 35 (citing Ex. 1011 ¶ 242; Ex. 1003 ¶¶ 157–159). Modifying Sutardja in this way, Tesla

contends, would have required simply combining known elements (i.e., Donnelly’s output GUI in the form of a bar graph depicting the amount of charge in a battery) to yield the predictable result of allowing Sutardja’s user to easily set and view the charging parameters for charging the battery. *Id.* at 36 (citing Ex. 1003 ¶ 160). And, according to Tesla, an ordinarily skilled artisan would have reasonably expected success in doing so given that Sutardja already processes information about the battery’s state of charge and already includes a display for showing the charging parameters set by the user. *Id.* (citing Ex. 1011 ¶¶ 242–243, Ex. 1003 ¶ 161).

Charge Fusion responds that Sutardja only allows a user to select a “full charge” for the battery, and thus, Tesla fails to explain how the combination of Sutardja with Donnelly’s battery bar graph image “would allow a user to select a specific amount of charge or how this would result in a *unitary vehicle charge indicator*,” as claimed. PO Resp. 30. According to Charge Fusion, “[l]imiting the single option of ‘full charge’ as described in Sutardja would defeat the purpose of implementing a slider” as taught by Donnelly. *Id.* (citing Ex. 2008 ¶ 72). We disagree.

Charge Fusion’s argument rests on the mistaken premise that Sutardja only contemplates selecting a full amount of charge for the battery and not an amount below a full charge, i.e., a partial charge. But that is not what Sutardja says. More accurately, Sutardja teaches that the user specifies the amount of charge—“The user interface module 108 may comprise a key pad, a display, a microphone, and/or a speaker (all not shown). A user of the vehicle 102-1 may use the user interface module 108 to set charging parameters for charging the battery 14.” Ex. 1011 ¶ 243. Elsewhere, Sutardja teaches that the user may set a “predetermined level” of charge—

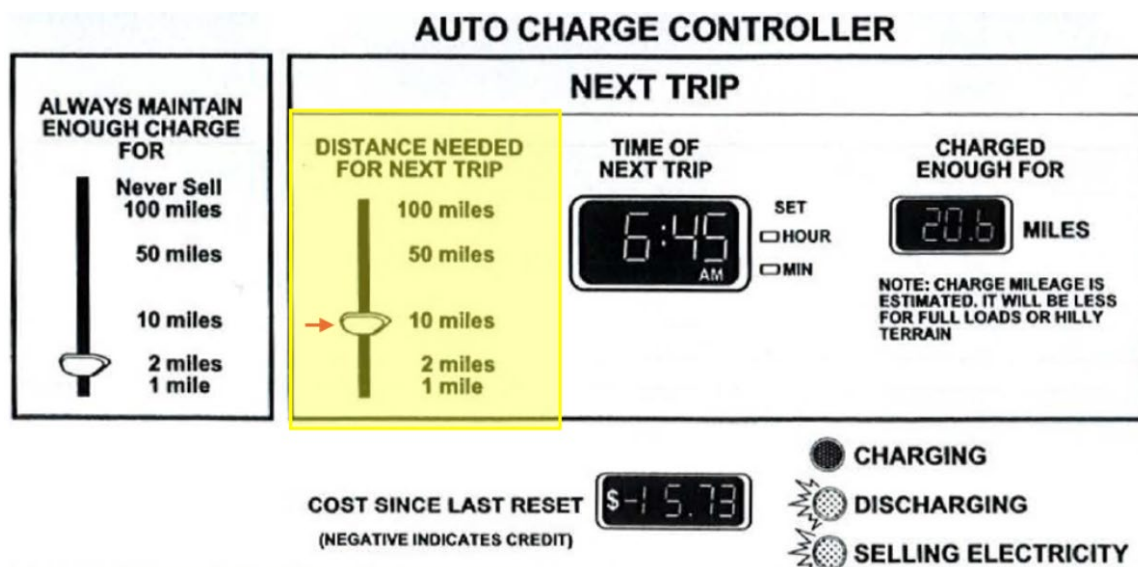
The charge monitoring module 150 may inform the control module 112 when the battery 14 is charged to a *predetermined level (e.g., full charge)* that may be indicated in the charging parameters. Subsequently, the charge monitoring module 150 may *stop charging the battery 14* by deactivating the converter 156 and the charging module 152. The power meter 24 may measure the amount of power received from the utility company 23 during the charging operation.

Id. ¶ 270 (emphases added). Although that passage indicates that a “full charge” is *an example* of a “predetermined level” of charge, nowhere does it exclude the selection of a lesser amount. Indeed, the passage contemplates the ability to “stop charging the battery,” which indicates that selection of the predetermined level may be less than a full charge. *Id.* Thus, we are not persuaded by Charge Fusion’s argument to the contrary. Rather, in our view, Tesla demonstrates by a preponderance of the evidence that the Sutardja-Donnelly combination teaches a “unitary vehicle charge indicator” that includes at least “first” and “second” portions and that one of ordinary skill in the art would have had reason to successfully combine their respective teachings in a manner that allows a user to predetermine, i.e., specify, an amount of charge.

b. GUI element comprising a “slider”

Limitation 1[b][iii] also requires that the combination of GUI elements include “a third portion comprising a slider by which an amount of charge may be specified.” As discussed above, Sutardja already describes a user interface module by which the user sets the charging parameters for the vehicle’s battery and, as modified by Donnelly, is a touchscreen GUI. *See* Ex. 1011 ¶ 243; *see also* Ex. 1003 ¶¶ 135, 163 (Tesla’s expert confirming as much). With that in mind, Tesla relies on Letendre as teaching the use of a slider to set the charging parameters of the vehicle’s battery and argues that

one of ordinary skill in the art would have found it obvious to incorporate Letendre's slider interface into Sutardja's interface module as modified by Donnelly's touchscreen GUI. *See* Pet. 37–43. More specifically, Tesla submits an annotated version of Letendre's Figure 1, reproduced below, to highlight its use of a slider to set charging parameters. *See id.* at 38–39 (citing Ex. 1007, 18–20⁸).



Letendre's Figure 1 depicts a control panel, labeled "Auto Charge Controller," that has a slider (highlighted in yellow) for a user to set a desired amount of charge expressed in miles of range. Ex. 1007, 18, Fig. 1. As shown, the desired amount of charge is set to "10 miles." *Id.* at 18, Fig. 1. Letendre refers to the control panel for setting the desired amount of charge as "a control that the driver sets according to driving needs" and identifies the source of Figure 1 as "Kempton and Letendre, 1997." Ex. 1007, 18, 19; Ex. 1003 ¶ 166 (citing Ex. 1073, 162). Importantly,

⁸ As noted earlier (*supra* n.7), the page citations refer to Letendre's internal page numbering rather than exhibit page numbering affixed by Tesla.

Letendre explains that the control panel illustrated in its Figure 1 may be “physical, on the dash, *or on a Webpage.*” *Id.* at 19–20 (emphasis added). According to Tesla, one of ordinary skill in the art would have understood the webpage version of Letendre’s selectable control to be an element of a GUI. *See* Pet. 39 (citing Ex. 1003 ¶ 168). And, because Letendre states “it is essential that the driver be able to limit any draw down so travel is not affected,” Tesla contends that Letendre expressly motivates one of ordinary skill in the art to use its GUI slider element with Sutardja/Donnelly’s interface module, which already includes a touchscreen GUI for setting and managing charging parameters. *Id.* at 40–41 (citing Ex. 1007, 19; Ex. 1003 ¶¶ 171–172).

Charge Fusion responds that Letendre’s disclosure of setting an amount of charge in miles of range is “insufficient” because Letendre teaches “parameters measured in units [i.e., miles] that cannot inform a user as to the *amount of charge.*” PO Resp. 24–25 (citing Ex. 2008 ¶¶ 61–62). According to Charge Fusion, Letendre’s user does not specify an amount of charge because “Letendre receives a user-specified mileage condition and then *estimates* a corresponding charge amount that will likely meet the condition.” *Id.* at 24. As such, Charge Fusion contends that Letendre’s user cannot specify an amount of charge because, for example, the user “would be unable to specify a 70% charge amount.” *Id.* (emphasis added). Essentially, Charge Fusion construes the “amount of charge” recited by limitation 1[b][iii] as requiring that the user specify the amount of charge in terms of *percentage*. But, consistent with the intrinsic record (as discussed above), we construe “amount of charge” as also encompassing a desired mileage or distance of travel. *See supra* Section II.B.1 (citing Ex. 1001,

19:59–62, 14:63–15:18, Fig. 7). Thus, Charge Fusion’s argument faulting the terms by which Letendre expresses the desired charge level fails because it is premised on an improper construction of “amount of charge.” *See* Pet. Reply 13–14.

Charge Fusion does not otherwise contest Tesla’s showing that Letendre teaches setting an “amount of charge” using a slider moved to a desired mileage, and we find Tesla’s showing on this aspect of limitation 1[b][iii] to be sufficiently persuasive.

c. Motive to combine Letendre’s slider with Sutardja-Donnelly’s touchscreen GUI

Tesla argues that one of ordinary skill in the art “would have been motivated and found it obvious to modify Sutardja-Donnelly to include Letendre’s graphical slider on the charge level bar graph of the GUI, where the user moves the slider to specify a desired charge.” Pet. 40 (citing Ex. 1003 ¶ 171); *see also* Pet. Reply 14–17. We agree.

As discussed above, Sutardja as modified by Donnelly already reflects a system with a touchscreen GUI for depicting and setting charging parameters. *See supra* Section II.C.1.b.(i) and (iii). Modifying that touchscreen GUI to add a slider for specifying the amount of charge is expressly motivated by (1) Letendre’s instruction that “it is essential that the driver be able to limit any draw down so travel is not affected” and (2) its use of a slider as “a control that the driver sets according to driving needs.” Ex. 1007, 19. Thus, Sutardja’s express description of a user interface module for managing charging parameters and Letendre’s express description of a GUI slider for setting charging parameters suggest using Letendre’s GUI slider with the Sutardja-Donnelly system. *See* Ex. 1003 ¶ 172. Indeed, such a modification constitutes nothing more than applying a

known technique (using Letendre’s slider to adjust a charge setting) to a known device ready for improvement (the Sutardja/Donnelly touchscreen GUI) to yield predictable results (easily allowing a user to choose a desired level of charge). *See id.* ¶ 176. And one of ordinary skill in the art would have reasonably expected success in undertaking such a modification given that the touchscreen GUI of the Sutardja-Donnelly system already allows the setting of charging parameters, including a desired charge level. *See id.* ¶ 178; Ex. 1011 ¶¶ 243, 262, 270.

Charge Fusion responds that Tesla’s reason for combining Letendre’s slider with Sutardja-Donnelly’s touchscreen GUI fails because Letendre’s slider, which specifies charge in terms of mileage, is “incompatible” with Sutardja/Donnelly’s bar graph, which specifies percentage of charge. PO Resp. 28–31 (citing Ex. 2008 ¶¶ 70–76); *see also* PO Sur-Reply 12–14 (arguing “Donnelly’s bar graph is in percentage and Letendre’s charge is in miles – entirely different scales”). In support, Charge Fusion focuses on “scale differences” between Letendre’s logarithmic, or non-linear, slider and Donnelly’s linear graph. *See* PO Resp. 30–31 (citing Ex. 2008 ¶¶ 73–76). But, in doing so, Charge Fusion ignores its own Specification, which allows a user to specify an amount of charge using either percentage or miles as if they are interchangeable. *See* Ex. 1001, Fig. 7 (showing “80%” charge and “110 miles” as equivalent levels of charge). Thus, we reject Charge Fusion’s argument that Letendre’s method of specifying an amount of charge is incompatible with the methods taught by Sutardja/Donnelly.

Moreover, Charge Fusion and its expert fail to account for the level of skill and creativity of an ordinarily skilled artisan, who would have had a bachelor’s degree in engineering and easily accounted for the differences in

scale depicted by Letendre’s GUI slider and Sutardja/Donnelly’s touchscreen GUI. *See* Ex. 1003 ¶¶ 235–237; *see also* *MCM Portfolio LLC v. Hewlett-Packard Co.*, 812 F.3d 1284, 1294 (Fed. Cir. 2015) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”). Accordingly, we find that Tesla’s showing regarding its reason for combining the teachings of Sutardja, Donnelly, and Letendre to arrive at limitation 1[b][iii] is persuasive and fully supported by the evidence.

d. Motive to combine Sutardja, Donnelly, and Letendre to arrive at “a unitary vehicle charge indicator”

Charge Fusion also argues that Tesla fails to establish how and why Letendre’s slider would have been combined with Sutardja and Donnelly “to arrive at a *unitary* vehicle charge indicator without hindsight from the ’788 patent.” PO Resp. 31–35 (citing Ex. 2008 ¶¶ 78–88); *see also* PO Sur-Reply 14–16 (“Petitioner relies on a patchwork of references—Sutardja, Donnelly, and Letendre, and others—without explaining how a POSITA would integrate these disparate systems into a coherent architecture, reconcile incompatible inputs and scales, or redesign the user interface to achieve the claimed functionality.”).

We disagree. Tesla explains in detail *how* those references would have been combined to arrive at first and second portions indicating charged and uncharged capacities of the battery and a third portion comprising a slider, all unified into a single GUI. *See* Pet. 39–40 (citing Ex. 1003 ¶ 170). With respect to the first and second portions, Tesla explains that Sutardja’s user interface module as modified by Donnelly’s touchscreen GUI (depicted

in Donnelly’s Figure 28) includes a bar graph with black-filled rectangles (first portion) indicating the charged amount of the battery and white-filled rectangles (second portion) indicating the uncharged capacity of the battery. *See id.* at 39 (referring back to Pet. 32–34, Ex. 1003 ¶¶ 149–155). As for the third portion, Tesla explains that the combination of Letendre’s slider GUI for specifying an amount of charge with Sutardja-Donnelly’s bar graph GUI indicating the battery’s state of charge results in Sutardja’s user interface 108 comprising charged, uncharged, and slider portions, as claimed. *See id.* at 40 (citing Ex. 1003 ¶ 170 (“A POSITA would have understood that Sutardja, modified with Donnelly’s bar graph on a GUI, further modified to include Letendre’s slider, yields a unitary vehicle charge indicator.”)).

Tesla also explains in detail *why* one of ordinary skill in the art would have combined the teachings of Sutardja, Donnelly, and Letendre to arrive at such a “unitary vehicle charge indicator.” *See* Pet. 34–36, 40–43 (citing Ex. 1003 ¶¶ 156–161, 171–178). In doing so, Tesla cites credible testimony from its expert, who has experience developing GUIs with sliders, as well as designing GUIs for electrical vehicles, before the critical date of the ’788 patent (*see* Ex. 2009, 17:13–21, 21:6–22:3) and corroborates his testimony with ample citations to persuasive evidence (*see, e.g.*, Ex. 1003 ¶¶ 139–145, 156–161, 171–178).

Charge Fusion, on the other hand, does not meaningfully explain how Tesla’s reasoning amounts to “hindsight,” nor does Charge Fusion’s expert sufficiently rebut the factual underpinnings of Tesla’s reasoning. *See* P.O. Resp. 31–35; PO Sur-Reply 14–16. Instead, Charge Fusion simply contends that Tesla should not be allowed to rely on a combination of multiple references for the “unitary vehicle charge indicator” limitation because “the

'788 Patent is the *only* document of record that shows a slider displayed *on* a bar graph” (and thus *unitary*).” PO Resp. 32. Notably, however, Charge Fusion does not identify any supporting authority for this conclusory assertion. *See, e.g., Bot M8 LLC v. Sony Interactive Ent. LLC*, 66 F.4th 1380, 1386 (Fed. Cir. 2023) (affirming obviousness finding based on the combined teachings of multiple references despite no single reference disclosing the execution of a program on two different CPUs, as required by the claim); *REC Solar Pte. Ltd. v. Hanwha Sols. Corp.*, No. 2023-1508, 2025 WL 251574, at *2 (Fed. Cir. Jan. 21, 2025) (affirming obviousness despite no single reference disclosing the claimed central cross-connector as a single assembly).

Moreover, in disputing Tesla’s reason for combining the teachings of Sutardja, Donnelly, and Letendre, Charge Fusion and its expert attack the references individually without fully comprehending the combination of their teachings as proposed by Tesla. *See* PO Resp. 32–33 (arguing “Sutardja does not show its display Donnelly shows, at best only a bar graph of a battery Letendre’s slider is isolated from any other display element and is not a component of a *unitary vehicle charge indicator* as claimed.”). That miscomprehension is reflected in Charge Fusion’s argument that adding Letendre’s slider to Donnelly’s bar graph “would put Letendre’s slider *in a different position on the Donnelly display* similar to how the slider is in a different position in the Letendre display.” PO Resp. 33 (emphasis added). In making that argument, Charge Fusion ignores the reasoning behind Tesla’s incorporation of Letendre’s slider into the Sutardja-Donnelly touchscreen GUI. As Tesla persuasively explains, one of ordinary skill in the art would have been motivated and found it obvious “to

include Letendre’s graphical slider on the charge level bar graph of the GUI” because “Sutardja already teaches a user inputting charging preferences (including a desired charge level) via a user interface module 108” and “applying a slider graphic on a GUI to allow a user to adjust a parameter was well-known.” *See* Pet. 42–43 (citing Ex. 1011 ¶ 262; Ex. 1003 ¶ 178); *see also id.* at 41 (“Given Sutardja teaches vehicle battery charging and a user interface module on-board the vehicle to manage charging preferences, a POSITA would have been expressly motivated to include an on-board GUI with a slider by which the user indicates a desired charge level, as such is ‘essential . . . so travel is not affected.’ *Letendre*, 19; *Sutardja*, [0262]; *Dec.*, ¶172.”); Ex. 1003 ¶ 174 (“A POSITA would have recognized that, for Letendre’s slider to be useful on Donnelly’s bar graph, the slider would be overlaid or superimposed with the bar graph to select the desired charge level, such that the combination of the bar graph and the slider is *unitary*; otherwise, the slider would not function as taught by Letendre, i.e., to set a desired charge/mileage level.”).

Nowhere do we discern that Charge Fusion’s directly addresses that reasoning, as extensively explained by Tesla, to satisfy the “unitary vehicle charge indicator” limitation. Instead, Charge Fusion focuses on differences between Letendre and Donnelly when, in fact, Tesla relies more heavily on Sutardja as providing the requisite motivation for the “unitary” aspect of the GUI elements. And to the extent Charge Fusion faults Tesla’s mention of the ’788 patent as “hindsight *gleaned solely from the present patent*,” we reject it. Tesla was simply showing that the manner in which Letendre’s expresses an “amount of charge”—i.e., in term of mileage—is no different than the Specification’s use of that term. *See* Pet. 39 (“Letendre thus

discloses a slider similar to that described in the '788 Patent, namely a selectable control to indicate a desired level of charge based on the miles needed for travel.”). As such, Tesla’s brief reference to the ‘788 patent does not amount to improper hindsight.

e. Conclusion

For all the reasons set forth above, we find that Tesla successfully demonstrates by a preponderance of the evidence that the combined teachings of Sutardja, Donnelly, and Letendre render claim 1 unpatentable as obvious.

3. Claims 2–4, 6–9 and 11–14

As to the other claims challenged under Ground 1, Tesla cross-references its showing for independent claim 1 as demonstrating that independent claims 6 and 11 are likewise unpatentable as obvious over the combined teachings of Sutardja, Donnelly, and Letendre. *See* Pet. 51–52 (claim 6); 53–54 (claim 11). Tesla also identifies specific disclosures from the asserted combination that teach the limitations introduced by challenged dependent claims 2–4, 7–9, and 12–14 and that render those dependent claims unpatentable as obvious. *See* Pet. 48–51 (claims 2–4), 52–52 (claims 7–9), 54–55 (claims 12–14).

Charge Fusion responds to Tesla’s showing for claims 2–4, 6–9 and 11–14 by arguing that they “should be upheld for the same reasons” as it argued for claim 1. PO Resp. 35–36. As such, Charge Fusion does not contest Tesla’s showing for any aspect of these claims that differ from Tesla’s showing for claim 1. And, to the extent Tesla’s showing for these claims might differ from its showing for claim 1, we agree with and adopt as our own Tesla’s showing as supported by the cited evidence. On that basis,

we find that Tesla demonstrates by a preponderance of evidence that the combined teachings of Sutardja, Donnelly, and Letendre render claims 2–4, 6–9, and 11–14 unpatentable as obvious.

D. Ground 2—Obviousness in View of Sutardja, Donnelly, Letendre, and Seelig

Claims 5, 10, and 15 depend from independent claims 1, 6, and 11, respectively, and add the limitation of “transmitting a control signal to a parking space charge device that starts a charging, in accordance with the charging schedule, of the electric vehicle.” Ex. 1001, 30:9–14 (claim 5), 30:53–58 (claim 10), 32:11–16 (claim 15).

For this limitation, Tesla argues that one of ordinary skill in the art “would have found it obvious and been motivated to configure Sutardja’s charge management system (CMS) 100 as a wireless charging system, as taught by Seelig.” Pet. 60 (citing Ex. 1003 ¶¶ 229. Indisputably, Seelig teaches that wireless charging stations allowing users to charge an electric vehicle without physically plugging it into a power supply “have been known since at least the early 1990s” and “were known to be ‘simple and convenient for the user with high operating reliability and safety in use.’” *Id.* 60, Ex. 1078, 1:11–13, 1:53–56); *see also* Ex. 1003 ¶ 232. With that in mind, Tesla contends that one of ordinary skill in the art “would have appreciated that because the wireless charging system only requires the user to park the vehicle in a parking space that includes a charging device, there would have been no need for the user to plug the vehicle into the power supply” and “there would be less opportunity for human error preventing charging due to the user forgetting to plug the vehicle in,” thereby motivating such ordinarily skilled artisan to apply Seelig’s known wireless

charging technique to Sutardja's charge management system so as "to improve similar electric vehicle charging systems in the same way." *Id.* at 60–61 (citing Ex. 1003 ¶¶ 229–231).

Charge Fusion responds that Tesla's reason for combining Seelig with Sutardja "is flawed as it is based on a fundamentally incorrect premise," namely, that Seelig's wireless charging system "only requires the user to park the vehicle in a parking space that includes a charging device." PO Resp. 37–38 (citing Pet. 60).⁹ According to Charge Fusion, "[i]ncorporating Seelig into Sutardja's system requires more than simply parking the vehicle in a parking space," when "[i]nstead, the user would still have to manually activate the Seelig charging system (even if combined with Sutardja) . . . , for example by the deposit of a coin." *Id.* at 37 (citing Ex. 1078, 4:55–57). "This coin," Charge Fusion argues, "starts a coupling process between the 'charging element 1' and 'transmission element 2' where the elements are iteratively moved towards one another until a 'coupling achieved KER' signal is generated." *Id.* at 37 (citing Ex. 1078, 4:67–5:3). As such, Charge Fusion surmises that "[i]ncorporating Seelig into Sutardja does not provide an advantage because the resulting combination would require manual intervention every time the charging was to be initiated (e.g., any time the charging schedule was operated, a coin would need to be inserted)," and, thus, "the Petition has not shown a reason or motivation to combine Sutardja (Donnelly/Letendre) with Seelig." *Id.* at 38–39.

⁹ In several parts of the Patent Owner Response, Charge Fusion mistakenly includes "Ferro" as part of Tesla's grounds. *See* PO Resp. 36, 39, 40, 41. Just to be clear, nowhere does Tesla rely on Ferro in challenging the claims of the '788 patent.

At the outset, we note that Charge Fusion does not dispute Tesla's showing that Seelig teaches the transmission of a "charging initiation signal" to a parking space charge device. *Compare* Pet. 58–59, with PO Resp. 37–39. As for Seelig's example that the control signal's transmission is initiated via insertion of a coin, Charge Fusion's argument ignores that dependent claims 5, 10, and 15 do not recite any details regarding a cause or trigger of the control signal's transmission and simply require that the transmitted control signal "starts a charging" of the electric vehicle. *See* Ex. 1001, 30:12–14 (claim 5).

Moreover, Charge Fusion's argument that combining Seelig's charge initiation signal with Sutardja's charge management system would require manual intervention (i.e., insertion of a coin) ignores that Tesla relies on Seelig solely for its teaching of transmitting a control signal that starts vehicle charging. *See* Pet. 55–59. The portions of Seelig's charging process that involve deposit of a coin are irrelevant to the combination with Sutardja. In other words, the *coin-operation* of Seelig's wireless charging process is not bodily incorporated into Sutardja, as Charge Fusion incorrectly assumes. Rather, as Tesla correctly notes, Sutardja already teaches a charge control signaling protocol and already teaches that Sutardja's vehicle is charged in accordance with a charging schedule. *See* Pet. 56–57, 61 (citing Ex. 1011 ¶¶ 8, 45, 223, 244, 253, 256, 262, 267, Ex. 1003 ¶¶ 221–224, 229, 231); Pet. Sur-Reply 18–19 (same argument). Thus, in the asserted combination, Seelig's wireless charge initiation signal would be incorporated into Sutardja's charge control signaling protocol such that the charge control signal initiated by Sutardja's control module 112 is wirelessly transmitted to the parking space charge device, as taught by Seelig, for starting charging

according to Sutardja’s charging schedule, without the need to insert a coin. As such, Charge Fusion’s arguments are based on a misunderstanding of Tesla’s reason for combining the teachings of Sutardja and Seelig.

In the end, after considering the parties’ arguments, we find that Tesla demonstrates by a preponderance of the evidence that the combined teachings of Sutardja, Donnelly, Letendre, and Seelig render claims 5, 10, and 15 unpatentable as obvious.

E. Ground 3—Obviousness in View of Sutardja, Donnelly, Letendre, and Knockeart

Claims 16 and 17 depend from independent claim 11 and add the limitation that the GUI “forms a part of a mobile display device” (claim 16), in particular, “a smartphone” (claim 17). Ex. 1001, 32:17–20.

Tesla identifies Knockeart as teaching “a removable device, such as a PDA,¹⁰ cellphone, or similar device,” that “provides a touchscreen display.” See Pet. 63–65 (citing Ex. 1010, Abstract, 2:46–50, 4:32–67, 6:39–47, 7:49–58, 12:38–41, Figs. 1, 3–6); see also Ex. 1003 ¶ 236 (confirming a cellular telephone is a smartphone). Tesla contends that one of ordinary skill in the art would have been motivated to adapt Sutardja/Donnelly’s touchscreen GUI to be displayed on a removable smartphone, as suggested by Knockeart, so as to allow the user to view and enter charging preferences while away from the vehicle. See Pet. 63–64 (citing Ex. 1011 ¶¶ 247, 249, 258; Ex. 1003 ¶¶ 237–240).

Charge Fusion does not contest Tesla’s showing except to rely on “the same reasons” for patentability that it argued against Tesla’s Ground 1, which we find unpersuasive as discussed above. See *supra* Section II.C.

¹⁰ Just as a reminder, “PDA” is short for Personal Digital Assistant.

Thus, Tesla demonstrates by a preponderance of evidence that the combined teachings of Sutardja, Donnelly, Letendre, and Knockeart render claims 16 and 17 unpatentable as obvious.

III. CONCLUSION¹¹

Claims Challenged	35 U.S.C. §	Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 6–9, 11–14	103	Sutardja, Donnelly, Letendre	1–4, 6–9, 11–14	
5, 10, 15	103	Sutardja, Donnelly, Letendre, Seelig	5, 10, 15	
16, 17	103	Sutardja, Donnelly, Letendre, Knockeart	16, 17	
Overall Outcome			1–17	

IV. ORDER

Accordingly, it is:

ORDERED that claims 1–17 of U.S. Patent 11,990,788 B2 are *unpatentable* as obvious under 35 U.S.C. § 103; and

¹¹ Should Charge Fusion wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw its attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). And should Charge Fusion choose to file a reissue application or a request for reexamination of the challenged patent, we remind it of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

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

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