

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner,

v.

LS CABLE & SYSTEM LTD.,

Patent Owner.

CASE: IPR2025-01141

U.S. PATENT NO. 8,013,568

PATENT OWNER PRELIMINARY RESPONSE

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TABLE OF PATENT OWNER EXHIBITS

Exhibit No.	Description
2001	LS Cable's Complaint in <i>LS Cable & System Ltd v. Apple Inc.</i> , 4:24-cv-09194 (N.D. Cal.) (Dkt. No. 1)
2002	Information Disclosure Statement dated April 14, 2019, in Application No. 16/258,464
2003	Information Disclosure Statement dated May 26, 2021, in Application No. 16/983,866
2004	Correspondence from Apple Counsel K. Grewal dated July 13, 2020
2005	Korean Patent No. KR950005819 to Hong Chung-Sik
2006	English translation of Korean Patent No. KR950005819 to Hong Chung-Sik
2007	Non-final Office Action dated June 30, 2021, rejecting claims as anticipated and obvious over <i>Chung-Sik</i>
2008	Final Office Action dated March 3, 2022, rejecting claims as anticipated and obvious over <i>Chung-Sik</i>
2009	Notice of Intent to Issue Reexamination Certificate
2010	Joint Claim Construction & Prehearing Statement in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.) (Dkt. No. 39)
2011	Joint Case Management Statement in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.) (Dkt. No. 31)
2012	Order setting case deadlines in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.) (Dkt. No. 32)
2013	Certificate of Service of Party Discovery in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)

Exhibit No.	Description
2014	Proof of Service of Party Discovery in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2015	Notice of Service of Party Discovery in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2016	Proof of Service of Party Discovery in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2017	Notice & Subpoena to Third Party Alticor in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2018	Notice & Subpoena to Third Party Epson America in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2019	Notice & Subpoena to Third Party Amway in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2020	Notice & Subpoena to Third Party Fulton Innovation in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2021	Notice & Subpoena to Third Party Gillete Co. in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2022	Notice & Subpoena to Third Party P&G in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2023	Notice & Subpoena to Third Party Phillips North America in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2024	Notice & Subpoena to Third Party Amway in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2025	Apple's Patent Local Rules 3-3 and 3-4 Disclosures in <i>LS Cable & System Ltd. v. Apple Inc.</i> , 3:24-cv-09194 (N.D. Cal.)
2026	Declaration of Dr. David S. Ricketts
2027	<i>Curriculum Vitae</i> of Dr. David S. Ricketts, Ph.D.

Patent Owner, LS Cable & System Ltd. (“Patent Owner”), submits this Patent Owner Preliminary Response (“Response”) pursuant to 37 C.F.R. § 42.107(a) to the *inter partes* review petition (“Petition”) filed by Apple Inc. (“Petitioner”) challenging the patentability of claims 1 and 3-58¹ (the “Challenged Claims”) of U.S. Patent No. 8,013,568 (the “’568 Patent”) (Ex. 1001), as amended in *ex parte* reexamination. *See* Ex. 1002.

I. INTRODUCTION

The ’568 Patent describes and claims a novel wireless charging system and charging control method, including a chargeable battery and charging device that need not be fixed in a certain restrictive position relative to one another during use. Ex. 1001, 9:35-44; Ex. 2026, ¶ [0050]. The ’568 Patent recognizes that applying a feedback control through an overvoltage to both ends of the constant voltage/constant current supplier solves an overvoltage state. Ex. 1001, 29-34; Ex. 2026, ¶¶ [0049]-[0050]. Mitigating the overvoltage state allows the intensity of a magnetic flux to be constantly linked to the secondary coil without being in a restrictive, fixed position. Ex. 1001, 9:35-38; Ex. 2026, ¶¶ [0050]-[0051].

¹ Claim 2 no longer exists post reexamination.

The Petition's prior art falls into one of three buckets: (1) wireless charging systems with pre-determined, load-type detection (*Baarman-878*² and *Baarman-267*³); (2) chip-level, self-contained, battery controllers that are agnostic to wireless charging that fail to describe any communication out of the self-contained chip (the NCP1800 Datasheet⁴ and *Veselic*); and (3) background disclosure regarding certain components of power supply circuits (Horowitz⁵).

In challenging the '568 Patent, the Petition does not identify a single reference that discloses inducing a change of intensity of a magnetic field by adjusting the power applied to a primary coil of the remote charging device based on relative positions of the chargeable battery to the remote device, a concept claimed in every challenged claim. As a result, the Petition fails.

In Ground 1, which challenges all independent claims of the '568 Patent, the Petition relies on the combination of *Baarman-878*, the NCP1800 Datasheet, and Horowitz. *See* Petition, 5. Ground 1 fails to establish that the combination renders obvious changing intensities of magnetic field based on the chargeable battery's

² U.S. Patent No. 7,522,878 to Baarman et al. ("*Baarman-878*") (Ex. 1007).

³ U.S. Patent No. 7,518,267 to Baarman et al. ("*Baarman-267*") (Ex. 1014).

⁴ Datasheet for NCP1800, Single-Cell Lithium Ion Battery Charge Controller, Rev. 4 (May 2003) (the "NCP1800 Datasheet") (Ex. 1012).

⁵ P. Horowitz and W. Hill, *The Art of Electronics* (Cambridge Univ. Press 2nd Ed. 1988) ("*Horowitz*") (Ex. 1019).

position relative to the charging device. In yet another shortcoming in Ground 1, the Petition fails to establish a motivation to combine *Baarman-878*, the NCP1800 Datasheet, and Horowitz, and indeed, one would not because there is no technical reason to combine *Baarman-878*'s wireless system with the NCP1800 Datasheet's self-contained chip that is agnostic to wireless technologies. Rather, only through the Petition's hindsight-driven interpretation of NCP1800 does the Petition arrive at the proposed combination, ignoring that nothing in either of the references nor Dr. Smith's declaration suggests, with rational underpinnings, why such a combination would have been made.

Ground 2, which simply adds *Veselic* to the proposed combination of Ground 1 and addresses certain dependent claims, fails to rectify the deficiencies of Ground 1 and fails for the same reasons as Ground 1.

Ground 3 relies on *Baarman-267* and *Veselic*. *See* Petition, 86. Like Ground 1, Ground 3 fails to establish that the combination renders obvious changing intensities of magnetic field based on the chargeable battery's position relative the charging device. Moreover, the Petition fails to establish a motivation to combine *Baarman-267* and *Veselic*. Similar deficiencies in the Petition's analysis exist. Contrary to the actual teachings of *Baarman-267* and *Veselic*, the Petition, through a hindsight-tinted lens, alleges the references would be combined, again without any rational basis for doing so. As supported by the expert declaration of Dr. Ricketts

(Ex. 2026; Ex. 2027), the Petition fails to carry its burden to warrant institution and the Petition should be denied.

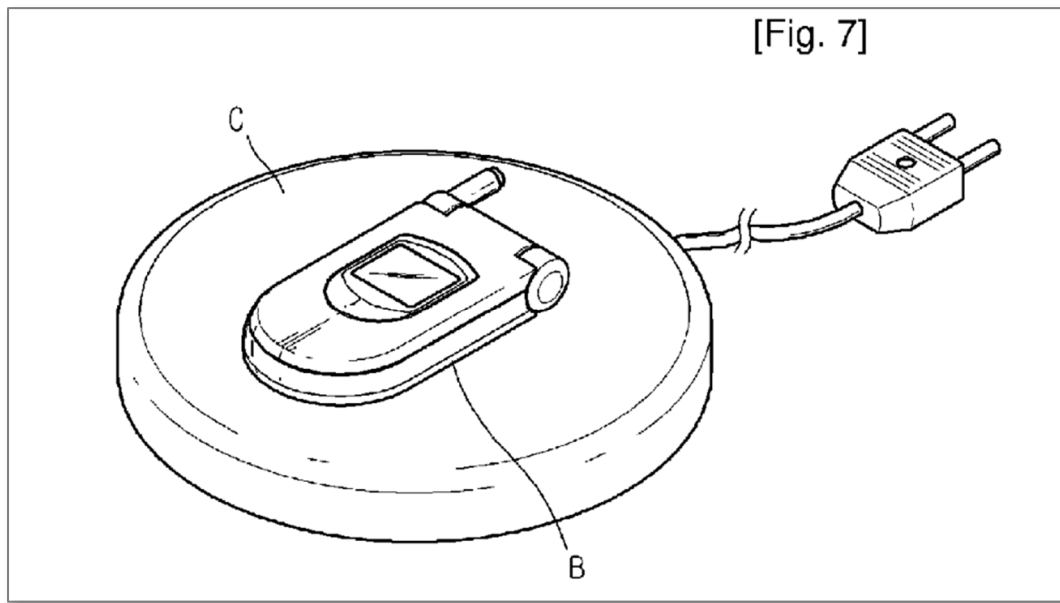
II. SUMMARY OF THE '568 PATENT

The '568 Patent relates to a wireless charging system for a mobile communication terminal utilizing electromagnetic wave generation and intercepting technology, and is “capable of solving an overvoltage state by means of a wireless feedback control.” Ex. 1001, Abstract; Ex. 2026, ¶ [0049]. This charging may be accomplished by way of a charger body that receives power from a power supply, converts it to wireless form for transmission, and then transmits that power to a receiver, as well as a receiver that can receive a wireless transmission of power and converts it back to AC current to provide a charge to a connected battery. Ex. 1001, 7:13-36; Ex. 2026, ¶ [0049].

The '568 Patent identifies certain problems with conventional charging systems, explaining that the conventional wired charging systems include “exposed” contact and charging terminals resulting in faster corrosion and contamination. Ex. 1001, 1:38-49; Ex. 2026, ¶ [0050]. The '568 Patent sought to address these problems by providing a contact-less (wireless) battery charging system in which a charger wirelessly transmits power to a battery, and the battery includes circuitry to regulate and monitor charging for safe, efficient, and convenient operation. Ex. 1001, 3:18-21; Ex. 2026, ¶ [0050]. Specifically, the battery incorporates voltage detectors and

a microprocessor to monitor voltages along the charging path and, through a microprocessor and wireless transmitting unit, communicate adjustment signals to the charger to prevent overvoltage. Ex. 1001, 7:42-61; Ex. 2026, ¶ [0050]. This arrangement allows the battery to receive safe, regulated charging without requiring physical coupling between the charger and battery. Ex. 2026, ¶¶ [0050]-[0051].

The '568 Patent further describes its wireless system as a “contact-less chargeable battery and charging device capable of preventing any damage of an internal battery circuit together with solving a restriction for relative positions between the chargeable battery and the charging device when charging the battery in a contact-less charging method.” Ex. 1001, 3:29-43; Ex. 2026, ¶ [0051]. Indeed, the '568 Patent provides a convenient “contact-less charging device and chargeable battery” that “need not be fixed to a certain relative position.”. Ex. 1001, 9:35-4, Fig. 7; Ex. 2026, ¶ [0051]. This configuration allows “a user [to] conveniently charge a battery just by placing a subject such as a cellular phone coupled with a battery B onto a predetermined position of the pad, thereby allowing to make a convenient charger and battery set.” Ex. 1001, 9:38-44, Fig. 7 (below); Ex. 2026, ¶ [0051].



Ex. 1001, Fig. 7. In response to position changes of the user device (e.g., the phone), an intensity of the transmitted electrical field may be changed. Ex. 1001, 11:32-45; Ex. 2026, ¶ [0051]. This ongoing “monitoring” and “transmitting” as claimed in the ’568 Patent, provides real-time wireless feedback from the receiver to the power transmitter to allow the power transmitter to perform similar real-time “adjusting” of the intensity of the transmitted power. *See e.g.*, Ex. 1001, Cl. 1.

III. PROSECUTION OF THE ’568 PATENT

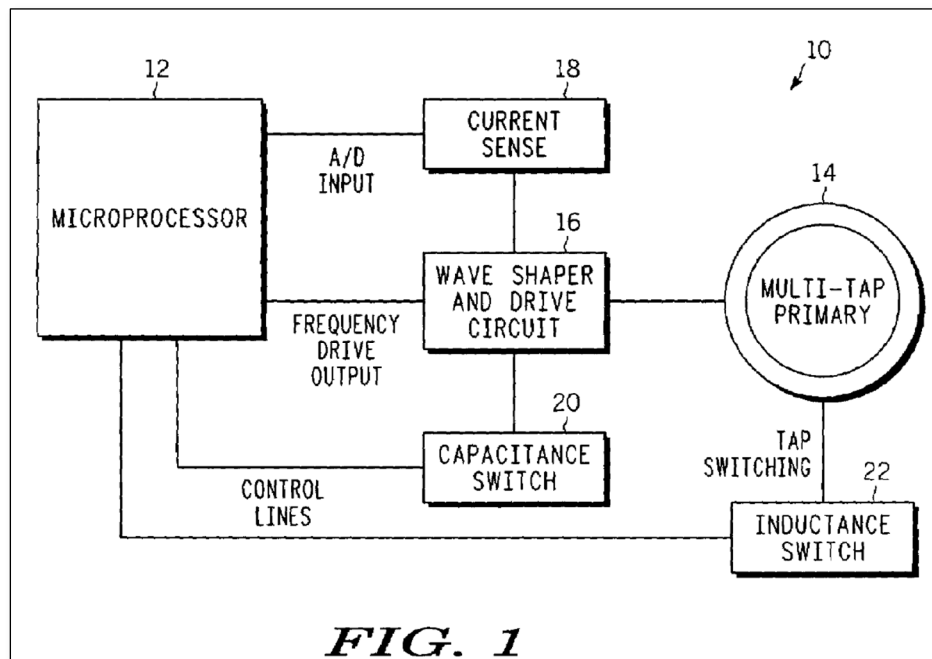
The ’568 Patent issued on September 6, 2011, and claims priority to Korean Patent Application No. 2005-0069871, with a priority date of July 29, 2005. Ex. 1001, Cover. On September 28, 2023, the USPTO issued a Reexamination Certificate for the ’568 Patent, confirming that claims 1, 3, 4, 7–13, 15–19, 21, and 23 were patentable, as amended, over the prior art. Ex. 1002. The certificate also

found that Claims 5, 6, 14, 20, 22, and 24, dependent on an amended claim, were patentable over the prior art. *Id.* Additionally, new claims 25–58 were added and determined to be patentable.

IV. OVERVIEW OF THE ART

A. Overview of *Baarman-878*

Baarman-878 generally describes contactless power supplies that communicate with and power remote devices. Ex. 1007, 1:33-36; Ex. 2026, ¶ [0053]. Specifically, *Baarman-878*’s disclosure focuses on “an adaptive inductive ballast.” Ex. 1007, 3:66-4:1; Ex. 2026, ¶ [0053]. *Baarman-878*’s adaptive inductive ballast includes microprocessor 12, multi-tap primary 14, wave shaper and drive circuit 16, current sense subcircuit 18, capacitance switch 20, and inductive switch 22. Ex. 1007, 4:1-10; Fig. 1; Ex. 2026, ¶ [0053].



Ex. 1007, Fig. 1. These components work together to allow the microprocessor “to monitor the input from the current sense circuit 18 while adjusting the capacitance and inductance values to determine which values provide optimum current to the primary 14.” Ex. 1007, 4:47-51; Ex. 2026, ¶ [0053]. Ultimately, the microprocessor “locks the adaptive ballast into the optimum setting.” Ex. 1007, 4:51-52; Ex. 2026, ¶ [0053]. *Baarman*-878 explains that “[b]y continually adapting to the addition or removal of loads to the contactless power supply, the contactless power supply remains highly efficient.” Ex. 1007, 3:25-28. Once a load is present, the transmitter adjusts the transmission parameters (capacitance and inductance) to achieve an optimum setting then fixes those setting, i.e., not continuous, or real time, adjustment is performed. Ex. 2026, ¶ [0053].

As opposed to, for example, a continuous closed-loop feedback system that continuously adjusts operating parameters in real-time, after the operation parameters are locked in *Baarman*-878, *Baarman*-878’s system does not continuously vary them; it keeps them fixed until a triggering event (i.e., load has “changed” or “checked-out”) causes it to “[re-]check loads via communications network and autorange,” then update and “lock” in the new set of parameters. Ex. 1007, Fig. 5; Ex. 2026, ¶ [0054]. This “locked in” and “as necessary” checking confirms that *Baarman*-878’s system is “open-loop,” meaning it occurs only as needed. Ex. 2026, ¶¶ [0053]-[0054].

Baarman-878 exclusively refers to its “load” on the receiver side: “Load 350 could be a rechargeable battery or any other kind of load.” Ex. 1007, 9:10-11; Ex. 2026, ¶ [0055]. Nowhere does *Baarman*-878 use the phrase “battery charger” nor does it describe any specific format, design, or configuration for a battery charger, let alone the claimed wireless battery charger. Ex. 2026, ¶ [0055].

B. Overview of NCP1800 Datasheet

The NCP1800 Datasheet describes the NCP1800 controller, which is a single-cell lithium ion battery charge controller. Ex. 1012, 1; Ex. 2026, ¶ [0056]. As disclosed in the NCP1800 Datasheet, “[t]he NCP1800 is a constant current, constant voltage (CCCV) lithium ion battery charge controller.” Ex. 1012, 1; Ex. 2026, ¶ [0058]. The NCP1800 is a standalone battery management integrated circuit, which means that it is intended to be used without any requirement of external control, communication, or input. Ex. 2026, ¶¶ [0056]-[0057]. Moreover, because the NCP1800 battery charge controller is standalone, it provides the necessary safety features for battery charging, such as: “Integrated Voltage and Programmable Current Regulation,” “Integrated Cell Conditioning,” “Voltage Regulation,” “Charge Interrupt,” “Safety Shutoff,” and “Input Over and Under Voltage Lockout” as supervisory functions. Ex. 2026, ¶ [0056]. The NCP1800 has one output, CFLG, which is a binary output to indicate its charge state, i.e., it is charging or not charging, to external circuitry. Ex. 1012, Figure 15; Ex. 2026, ¶ [0056]. This output cannot be

used to provide the feedback or communication to an external device or system. Ex. 2026, ¶ [0059].

The NCP1800 Datasheet's controller "provides the necessary control functions for charging Li-ion batteries precisely and safely." Ex. 1012, 10; Ex. 2026, ¶ [0058]. The NCP1800 Datasheet's controller implements threshold-based charging phases, including Pre-Charge, Full-Charge, and Trickle modes, to regulate battery charging according to these preset limits, or thresholds. Ex. 1012, 10; Ex. 2026, ¶ [0058]. Further, the controller operates using hardwired voltage and current sense pins (I_{SNS}) and COMP/DIS pin, which feed discrete thresholds into the internal control circuitry. Ex. 1012, 10; Ex. 2026, ¶ [0059]. Importantly, the NCP1800 Datasheet does not provide any monitoring information or any information about voltage or current parameter of the charger, the input voltage, or the output voltage. Ex. 2026, ¶¶ [0057], [0059]. This is because the NCP1800 is intended to be used standalone. Ex. 2026, ¶ [0057]. The NCP1800 is not designed to be used with external control or components, other than those identified in the datasheet. Ex. 2026, ¶ [0057].

Further, the NCP1800 Datasheet discloses that during the pre-charge phase, the NCP1800 controller "initiates a charging cycle upon toggling the COMP/DIS to LOW or application of the valid external power source (i.e. $V_{UVLO} < V_{CC} < V_{OVLO}$) with the Li-ion battery present or when the Li-ion battery is inserted." Ex. 1012, 10;

Ex. 2026, ¶ [0059]. Then, in Full Charge phase—after the “battery voltage reaches V_{PCTH} , the NCP1800 begins fast charging the battery with the full rate charging current I_{REG} ”—the controller “monitors the charging current at the I_{SNS} pin by the voltage drop across a current sense resistor” and the charging is maintained throughout the full charge phase. Ex. 1012, 10; Ex. 2026, ¶ [0059]. Thus, the controller monitors battery voltage and current through its internal, hardwired components, and uses this information to switch between discrete charging phases (i.e., pre-charge, full charge, and trickle). Ex. 2026, ¶ [0059]. This internal threshold-based feedback responds only when a voltage or current threshold is reached, and involves no wireless transmission. Ex. 1012, 10; Ex. 2026, ¶ [0059].

The NCP1800 controller disclosed in the NCP1800 Datasheet neither performs wireless communication nor adjusts transmitted power in response to system-level conditions; it also does not react to changes in coil coupling or other wireless-charging parameters. Ex. 2026, ¶¶ [0057]-[0059].

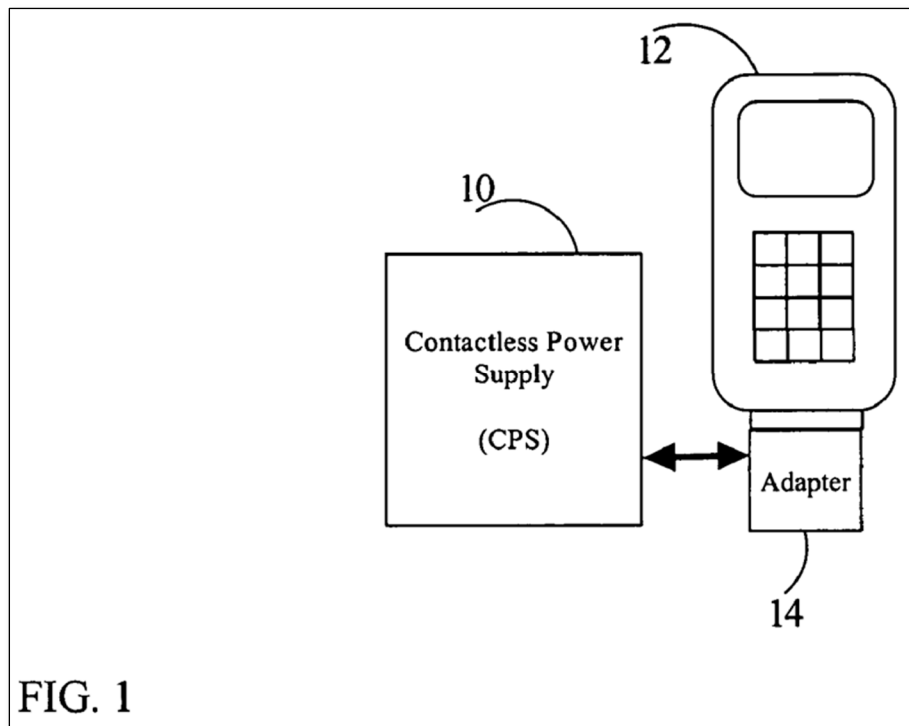
C. Overview of Horowitz

Relevant to this proceeding is an excerpt from Horowitz, an “electronic circuit design textbook,” that focuses on the “foundations of electronics.” Ex. 1019, 23, 28; Ex. 2026, ¶ [0060]. The cited excerpt of Horowitz focuses on “voltage, current, power, and the components that make up electronic circuits[,]” as well as “reactive circuits.” Ex. 1019, 27-28, Ch. 1.18; Ex. 2026, ¶ [0060]. The excerpt does not,

however, address active or system-level circuits, adaptive feedback, or wireless energy transfer. Ex. 2026, ¶ [0060].

D. Overview of *Baarman-267*

Similar to *Baarman-878*, *Baarman-267* generally describes a contactless power supply (“CPS”) that “provides power to a remote device without any physical connection.” Ex. 1007, 1:27-28; Ex. 2026, ¶ [0061]. As shown in Figure 1, *Baarman-267*’s “CPS 10 provides power to remote device 12 through adapter 14.” Ex. 2:54-60, Fig. 1.



Ex. 1014, Fig. 1.

Further, *Baarman-267* discloses that it may include an “adaptive power interface.” Ex. 1014, 2:19-20; Ex. 2026, ¶ [0062]. “When the adaptive power

interface has an adjustable component, then the contactless power supply is configured to *an optimal setting* corresponding to that component. For example, if the adjustable element is a variable inductor, the system determines and sets *the optimal inductance value* to achieve the desired power transfer performance.” Ex. 1014, 2:19-25; Ex. 2026, ¶ [0062]. Thus, like *Baarman-878*, *Baarman-267* likewise does not teach or suggest a continuous closed-loop feedback system that continuously adjusts operating parameters in real-time. Ex. 2026, ¶ [0062]. Rather, *Baarman-267* discloses that after “optimal” operation parameters are set, *Baarman-267*’s system does not continuously vary them; it keeps them fixed until “Adapter 14 then checks CPS 10 to determine if CPS has sufficient capacity to charge remote device 12” and “[i]f not, charging ceases,” and “[i]f so, then Adapter 14 determines from remote device 12 whether charging should continue,” and, again, “[i]f not, charging ceases.” Ex. 1013, 5:22-28; Ex. 2026, ¶ [0062].

E. Overview of Veselic

Veselic describes a wired charging system in which a DC power supply charges a rechargeable battery through a direct, physical connection. Ex. 1013, 2:20-34; 5:65-6:17; Ex. 2026, ¶ [0063]. *Veselic* teaches a using a voltage difference such that “total power dissipated by the battery charge controller is controlled.” Ex. 1013, Abstract, 4:20-21, 4:45-46, 4:58-59; Ex. 2026, ¶ [0063]. *Veselic* teaches the use of

the invention to be added to existing systems without any interruption or interaction with that system. Ex. 2026, ¶ [0063]. *Veselic* describes its system as follows:

There is therefore a need for a method and apparatus which allows standard computer data busses such as USB ports to simultaneously power portable devices 18 and their associated battery charge circuits 20 **without having to design new battery charge controllers with very specific applications**. This design must be provided with consideration for the tight operating parameters of battery charging circuits, the limited physical board area in portable devices, and the reliability and complexity of the design. Ex. 1013, 3:59-67 (emphasis added). . . . It is therefore an **object of the invention** to provide a novel method and apparatus which **allows standard battery charge controllers** to be supplied from **standard computer data ports** and other power sources, which obviates or mitigates at least one of the disadvantages of the prior art.

Ex. 1013, 4:3-7 (emphasis added); Ex. 2026, ¶ [0063].

Veselic's system relies on voltage sensing and a semiconductor switch to regulate current flow and manage power dissipation. Ex. 1013, 6:13-22; Ex. 2026, ¶ [0064]. The feedback in *Veselic* is internal and hardwired: the controller responds to voltage at specific pins and does not communicate wirelessly or coordinate with remote devices. Ex. 1013, 2:20-34; Ex. 2026, ¶ [0065].

Veselic specifically emphasizes the importance of not requiring any connection or interface with external systems. Ex. 2026, ¶ [0064]. *Veselic*'s system is a standalone solution and may be used with any standard battery charger system. Ex. 2026, ¶ [0064]. The disclosed system involves monitoring that consists of measuring a voltage difference across a standard battery charger and controlling a

series transistor. *See, e.g.*, Ex. 1013, Q1 Fig. 4 and Q3 Fig. 6; Ex. 2026, ¶ [0064]. No communication or other input or output is needed by *Veselic's* system. Ex. 2026, ¶ [0064].

Veselic's system is DC-based, supplied by sources such as USB ports, which provide low DC voltage often close to the battery voltage, which specifically avoids the need for a separate AC charger or complex conversion. Ex. 1013, 2:35-38; Ex. 2026, ¶ [0066].

V. THE PETITION FAILS TO ESTABLISH THAT THERE IS A REASONABLE LIKELIHOOD THAT THE PETITIONER WILL PREVAIL ON A SINGLE CLAIM

A. Ground 1 Fails to Render Obvious the Challenged Claims

Ground 1 relies on the combination of three disparate references, 1) a patent to a single inventor, David Baarman (*Baarman*-878), 2) a datasheet that purports to represent a hardware chip (NCP1800 Datasheet), and 3) an excerpt from a textbook (Horowitz). However, the combination of *Baarman*-878, the NCP1800 Datasheet, and Horowitz fails to render obvious the challenged claims of the '568 Patent. **First**, the Petition's proposed combination of *Baarman*-878, NCP1800 Datasheet, and Horowitz, even if made, does not teach the "wireless feedback control signal to induce the change of intensity of the magnetic field ... based on relative positions" as required by the Challenged Claims. **Second**, the Petition fails to establish a

motivation to combine *Baarman*-878, NCP1800 Datasheet, and Horowitz to arrive at the challenged claims, which is fatal to the entirety of Ground 1.

i. The Non-Obvious Combination of *Baarman*-878, NCP1800 Datasheet, and Horowitz Fails to Render the Challenged Claims Obvious

- a. Ground 1 fails to render obvious the “wireless feedback control signal to induce the change of intensity of the magnetic field ... based on relative positions” as required by claim 1[e]

Petitioner’s argument relies on the general principle (i.e., Faraday’s law) that moving a device closer to a charging coil increases magnetic flux and thus the induced current. Petition 35. However, this reasoning is legally insufficient and ignores the actual disclosure of *Baarman*-878. *Supra* V.A.i.a.i; Ex. 2026, ¶¶ [0075]-[0076]. First, the Petition improperly relies solely on how a POSITA would understand Faraday’s law to include changes of intensity based on relative positions of the battery and charger. Petition, 34-35. Second, the Petition’s discussion regarding *Baarman*-878 fall short of establishing that *Baarman*-878 teaches or suggests the claimed power adjustments based on relative positions, likely because *Baarman*-878 does not have such disclosure. Petition, 24-34; *supra* V.A.i.a.ii.

- i. The Petition fails to cite any reference disclosing changes of magnetic field intensity “based on relative positions” of the battery and charger

The Petition incorporates its discussion of claim limitation 1[d] as apparent support for its arguments regarding claim limitation 1[e]. Petition, 34-35. However,

the Petition's discussion of claim limitation 1[d] does not disclose or suggest the specific limitation of adjusting power *based on the relative positions* of the chargeable battery and the charging device system claimed by the '568 Patent. Petition, 24-34. With respect to claim limitation 1[d], the Petition relies on *Baarman*-878 for its disclosure that "received signals can be used by power supply controller 326 to induce a change in intensity of the magnetic field generated at the primary winding 334." Petition, 33 (citing Ex. 1007, 8:8-12, 10:4-64, Fig. 9). Petitioner's arguments stop short of identifying any disclosure that teaches or suggests a "wireless feedback control signal to induce the change of intensity of the magnetic field ... based on relative positions." Ex. 1001, Cl. 1. Petitioner is incorrect for two reasons.

First, the Petition provides only conclusory statements that the induced current becomes greater such that the claim limitation is met. Petition, 34-35. The Petition's conclusion relies entirely on hindsight reasoning. *Baarman*-878 itself does not support such conclusory statements. Ex. 2026, ¶¶ [0075]-[0076]. Instead, *Baarman*-878 describes tuning the inductance and capacitance for a specific load condition. Ex. 2026, ¶ [0075]. For example, the microprocessor "continues to monitor the input from the current sense circuit 18 while adjusting the capacitance and inductance values to determine which values provide optimum current to the primary 14. The microprocessor 12 then *locks* the adaptive ballast into the optimum

settings.” Ex. 1007, 4:50-52 (emphasis added); Ex. 2026, ¶ [0075]. Before the optimum settings are locked, the optimum settings are determined by the load and its distance from the charger. Ex. 2026, ¶ [0075]. Neither Petitioner, nor its expert, provide any analysis as to how the magnetic flux would increase for a ballast that has been locked “into the optimum settings.” Ex. 2026, ¶ [0075].

Once *Baarman*-878’s system is locked into those optimum settings, *Baarman*-878 provides no indication that magnetic flux or current would further increase absent re-optimization. Ex. 2026, ¶¶ [0075], [0077]-[0078]. Accordingly, Petitioner’s theory that *Baarman*-878’s system would continue to increase current requires adding functionality that is not disclosed or suggested in *Baarman*-878, which is an improper reconstruction of the reference to arrive at the claimed invention (i.e., hindsight). Ex. 2026, ¶¶ [0078]-[0083].

Second, for claim limitation 1[e], the Petition relies heavily on general principles, such as Faraday’s law and a textbook discussing Faraday’s law (Ex. 1017), and unspecified “typical implementations” to suggest a “POSITA would understand that . . . as the remote device 338 and the charging device 305 become closer, and the air gap accordingly becomes smaller, the magnetic flux of the secondary winding 353 increases, and the induced current in the secondary winding becomes greater (and vice versa), how to achieve this limitation.” Petition, 34-35. The Petition identifies no separate reference or disclosures that addresses the effects

of the *relative positions* as claimed in the '568 Patent nor does it explain why a POSITA would have been motivated to make any change to *Baarman-878* in view of Faraday's law, which was well-known long before *Baarman-878*. Rather, the Petition appears to posit that simply because Faraday's law was known, a POSITA would have modified *Baarman-878*. Notably, Faraday's law was known before *Baarman-878* was filed, and it failed to motivate Mr. Baarman to make the changes that allegedly were so obvious.

Faraday's law describes a general physical principle (i.e., a relationship between magnetic field changes and induced voltage/current), but does not teach or suggest the claimed configuration in which a wireless feedback control signal induces the “*change of intensity of the magnetic field ... based on relative positions*” of the battery and charger. Ex. 2026, ¶¶ [0075]-[0076]. As such, the Petition fails to identify any reference that discloses a wireless feedback control system that induces a change in magnetic field intensity *based on relative positions*. Ex. 2026, ¶ [0083].

- ii. *Baarman-878* does not teach monitoring or adjusting based on relative positions of charger and battery

In *Baarman-878*, the system queries the load to determine parameters such as power rating or voltage requirements and sets the charger output according to that discrete response. Ex. 2026, ¶ [0079]. Once this output is set, the system does not

continuously monitor or dynamically adjust power based on the load's position or changes in the electromagnetic coupling. Ex. 2026, ¶ [0079]. Indeed, *Baarman*-878 states that “the frequency of the ballast circuit is not permitted to vary once the appropriate inductance value has been determined.” Ex. 1007, 6:11-13; Ex. 2026, ¶ [0083]. Instead, feedback occurs only upon a new load event, which *Baarman*-878 defines as when a load disconnects or a different load type is detected. Ex. 2026, ¶¶ [0079]-[0080]. This is a threshold-based adjustment, not a continuous closed-loop system as claimed by the '568 Patent. Ex. 2026, ¶ [0079].

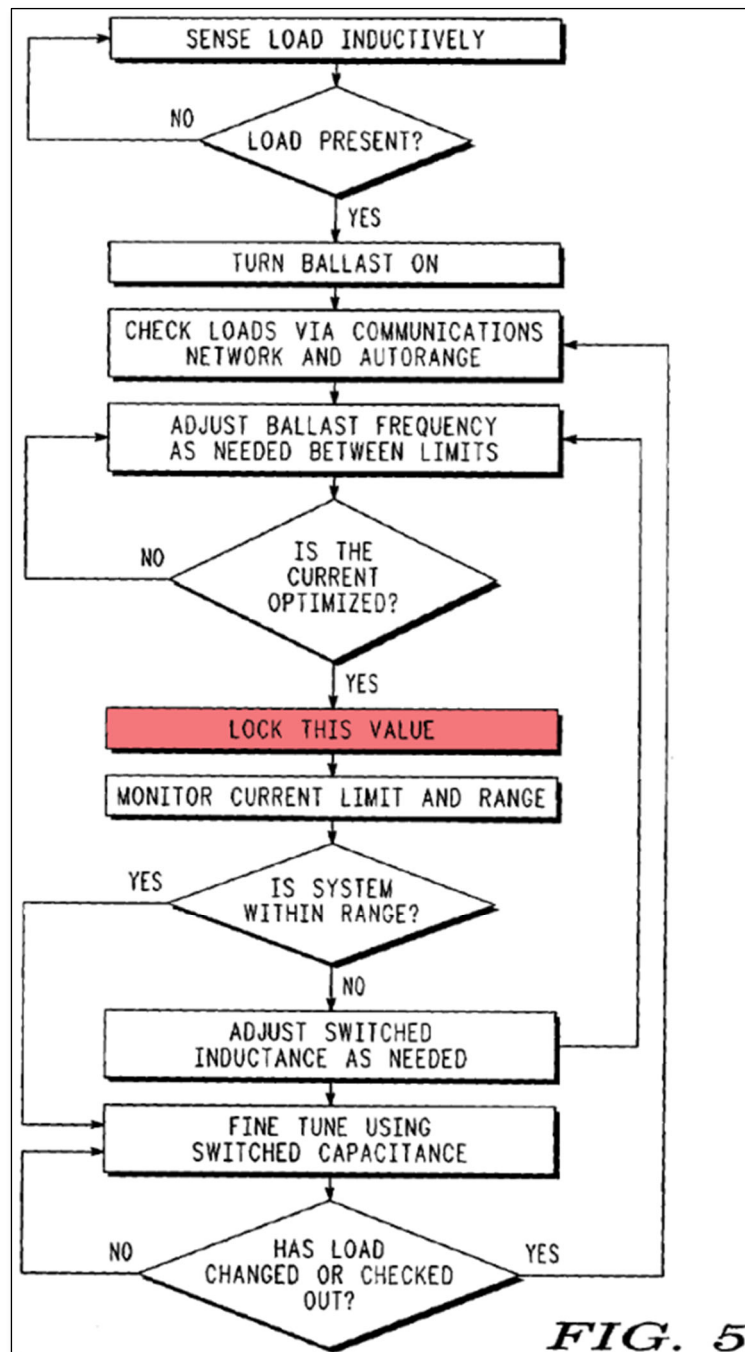
The '568 Patent expressly discloses “a wireless feedback control capable of solving an overvoltage state.” Ex. 1001, Abstract. Further, the '568 Patent describes a closed-loop system that continually measures, compares, and adjusts the charging conditions as the battery's position relative to the charger changes. Ex. 1001, 2:21-32; *see also* Ex. 1001, Cl. 1 (claiming detecting, monitoring, transmiting, adjusting).

In contrast, *Baarman*-878 describes “an adaptive inductive power supply” that queries the load to determine its type (e.g., whether it is a 5-watt or 10-watt load) and then selects appropriate operating parameters for the charging. Ex. 1007, 5:24-47, 7:1-6; Ex. 2026, ¶ [0080]. After it makes this determination, the system “locks” the chosen parameters until it detects a change in load type, at which point it may re-query and adjust. Ex. 1007, 5:35-63, 7:4-19, Fig. 5; Ex. 2026, ¶ [0080].

Baarman-878 therefore uses a load-type detection mechanism rather than a continuously responsive control loop. Ex. 1007, 7:1-6; Ex. 2026, ¶ [0080].

The load type is communicated through the wireless communication of *Baarman-878*. Ex. 1007, 9:35-48, Fig. 5; Ex. 2026, ¶ [0080]. A POSITA would understand a “change in load type” means a communication is received via the wireless communication that informs the charger of new load parameters. Ex. 2026, ¶ [0080]. Importantly, *Baarman-878* discloses no means to sense the load or changes in load, but rather relies on explicit communication of changes in parameters via the wireless communication. Ex. 2026, ¶ [0080]. *Baarman-878* cannot sense any change in relative position. Ex. 2026, ¶¶ [0080]-[0082]. Accordingly, *Baarman-878*’s wireless system does not dynamically adjust power in response to ongoing changes in coupling or relative position between the transmitter and receiver. Ex. 2026, ¶ [0081].

As shown at Figure 5, *Baarman-878*’s adaptive power supply queries the type of load connected and then sets fixed operating parameters such as ballast frequency or switched inductance. Ex. 1007, 7:1-19; Ex. 2026, ¶ [0080]. Once these parameter values are selected, the system “lock[s] this value” (“lock” step shown in red below) until a change in load type is detected or has checked out, at which point it may re-query and adjust. Ex. 1007, Figs. 3, 5; Ex. 2026, ¶¶ [0080]-[0081].



Ex. 1007, Fig. 5 (annotated); Ex. 2026, ¶ [0080]. In other words, after the operation parameters are locked in *Baarman-878*, *Baarman-878*'s system does not continuously vary them; it keeps them fixed until a triggering event (i.e., load has

“changed” or “checked-out”) causes it to “[re-]check loads via communications network and autorange,” then update and “lock” in the new set of parameters. Ex. 1007, Fig. 5; Ex. 2026, ¶¶ [0080]-[0083]. Unlike the ’568 Patent, *Baarman*-878 does not disclose or even contemplate a control system that continuously monitors the physical relationship between coils or dynamically modulates power to account for positional shifts between a battery and a charging device. Ex. 2026, ¶¶ [0081]-[0083].

Petitioner improperly conflates *Baarman*-878’s discrete load-type detection with the ’568 Patent’s continuous positional feedback (Petition, 35), without providing any explanation for why, and in doing so the Petition ignores the fact that these are two distinct concepts. Ex. 2026, ¶ [0082]. A change in load does not equate to a change in spatial alignment or relative position, and a system optimized for discrete load types (*Baarman*-878) cannot substitute for a closed-loop system that tracks and dynamically responds to physical positioning (’568 Patent). Ex. 2026, ¶¶ [0082]-[0083]. Without explicit disclosure or embodiments of *Baarman*-878’s adaptive ballast circuit that detect relative position and adjust transmitted power accordingly, *Baarman*-878 does not meet the claim limitations of the ’568 Patent. Ex. 2026, ¶¶ [0082]-[0083].

At base, the ’568 Patent and *Baarman*-878 take opposite approaches to wireless charging control. Ex. 2026, ¶ [0082]. The ’568 Patent’s closed-loop

feedback architecture continuously adjusts charging conditions based on relative position and wireless feedback, whereas *Baarman*-878 uses a discrete, open-loop load querying approach that does not address relative position at all. Ex. 2026, ¶¶ [0082]-[0083]. Accordingly, *Baarman*-878 does not teach or suggest “wireless feedback control signal to induce the change of intensity of the magnetic field ... *based on relative positions of the contact-less chargeable battery and the external contact-less charging device.*” Ex. 2026, ¶¶ [0082]-0083].

- iii. The secondary references, the NCP1800 Datasheet and Horowitz, do not teach monitoring or adjusting based on relative positions of charger and battery

The Petition fails to establish that the additional prior art references remedy *Baarman*-878’s deficiencies, and therefore Petitioner has not met its burden of showing that the challenged claims are obvious. Ex. 2026, ¶ [0084]. The Board should therefore deny institution on this ground.

The Petition points to its discussion for claim limitation 1[d], which further points to its discussion for claim limitation 1[c], as support for claim limitation 1[e]. Petition, 26, 34. In these discussions, however, Petitioner seemingly admits that neither *Baarman*-878 nor the NCP1800 Datasheet disclose transmitting to the remote power supply a monitoring result as claimed. Petition, 33 (citing Ex. 1005, ¶ 74); Ex. 2026, ¶ [0084]. Further, Petitioner does not allege, much less establish, that the cited excerpt of Horowitz discloses the appropriate transmission. Ex. 2026,

¶ [0085]. Neither the NCP1800 datasheet nor Horowitz contain any disclosure of transmitting any information. Ex. 2026, ¶ [0085]. The NCP1800 teaches standalone control and protection, and does not output any parameter information. Ex. 2026, ¶ [0085]. The NCP1800 datasheet describes certain functions that are specifically internal to the IC, including local monitoring and regulation functions. Ex. 2026, ¶ [0085]. The NCP1800 Datasheet does not teach communicating those monitored voltages to an external power supply. Ex. 2026, ¶ [0085].

Similarly, the cited portion of Horowitz simply discusses rectification and basic circuit definition adoption. Ex. 2026, ¶ [0085]. In particular, the cited Horowitz excerpt discusses “voltage, current, power, and the components that make up electronic circuits[,]” as well as “reactive circuits,” but does not address active or system-level circuits, adaptive feedback, or wireless energy transfer. Ex. 1019, 27-28, Ch. 1.18; Ex. 2026, ¶ [0085]. Accordingly, because *Baarman*-878 only discloses wireless transmission in the context of transmitting a load’s power rating or voltage requirements, not real-time, position-based monitoring results as recited and claimed in the ’568 Patent; the NCP1800 Datasheet and Horowitz do not remedy *Baarman*-878’s deficiencies. Ex. 2026, ¶¶ [0085]-[0088].

ii. The Petition Fails to Establish a Motivation to Combine *Baarman*-878, NCP1800 Datasheet, and Horowitz

The Petition provides no technical reason for combining the NCP1800 Datasheet with *Baarman*-878. Ex. 2026, ¶ [0089]. The NCP1800 Datasheet's controller is a standalone controller that does not provide external feedback or communication such that a POSITA would not have been motivated to look to, let alone incorporate, the features of NCP1800 Datasheet into *Baarman*-878's system. Ex. 2026, ¶ [0089]. Accordingly, Ground 1 fails because a POSITA would not have been motivated to combine the NCP1800 Datasheet with *Baarman*-878. Ex. 2026, ¶¶ [0089], [0092], [0098].

a. A POSITA would not be motivated to combine the NCP1800 Datasheet with *Baarman*-878

The Petition erroneously suggests that controller 352 in *Baarman*-878 **could** transmit a monitoring result (i.e., an instruction to lower the rail voltage, thereby reducing the AC current provided to the primary winding) to the power supply, and that NCP1800's teachings regarding the "first and second voltages (V_{CC} and V_{SNS}) **could** supply the necessary control logic to do so." Petition, 33-34; Ex. 2026, ¶¶ [0089]-[0090]. This reasoning is unsupported, speculative, and at odds with the legal requirements of obviousness. *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 886 (Fed. Cir. 2024) ("The mere fact that these possible arrangements existed in the prior art does not provide a reason that a skilled artisan

would have” arrived at the claimed configuration); *Nautilus Hyosung Inc. v. Diebold Selfservice Sys. Div. of Diebold*, IPR2016-00633, Paper 9 at 21 (P.T.A.B. Aug. 22, 2016) (“An assertion that something *could* be done does not articulate a reason why something *would* be done,” raising the issue of hindsight bias.).

The feedback disclosed in the NCP1800 Datasheet is internal; it does not communicate wirelessly nor is there any suggestion that the feedback could be communicated external to the chip itself. Ex. 2026, ¶ [0091]. The NCP1800 Datasheet discloses monitoring events, such as voltage or current thresholds. *See, e.g.*, Ex. 1012, 10; Ex. 2026, ¶ [0091]. The single output feedback disclosed in the NCP1800 Datasheet is *internal*, chip-level feedback that is entirely agnostic to wireless charging; there is simply nothing in *Baarman-878* that indicates such this type of data could be extracted from the chip to provide system-level feedback, let alone that such a modification would be made, would be effective, or would lead to the claimed configuration. Ex. 2026, ¶ [0091].

Baarman-878, in contrast, transmits power inductively and relies on wireless signaling for its control. Ex. 2026, ¶¶ [0093]-[0094]. Ultimately, the NCP1800 is designed for single-cell Li-ion batteries in a direct-contact system. Ex. 1012, 1, 10; Ex. 2026, ¶ [0093]. The NCP1800 Datasheet discloses a closed system, i.e., a universal safety and protection chip intended to independently manage battery charging and cutoff conditions. Ex. 2026, ¶¶ [0091]-[0093]. The NCP1800

Datasheet does not provide any external communication or feedback capability, nor any mechanism by which its internal monitoring data could be transmitted to an external device, including the external system disclosed in *Baarman-878*. Ex. 2026, ¶ [0093]. As a result, applying the NCP1800 battery controller would not provide feedback useful for controlling transmitted power in *Baarman-878* because the NCP1800 only provides local, internal signals and cannot communicate system-level load information to the transmitter. Ex. 2026, ¶ [0093].

Put simply, the NCP1800 Datasheet teaches that it itself solves all monitoring and safety concerns. Ex. 2026, ¶ [0091]. The NCP1800 is intended for systems that do not require any further monitoring, and thus does not involve providing any feedback external to the NCP1800. Ex. 2026, ¶¶ [0091]-[0093].

A POSITA would recognize that applying NCP1800's monitoring approach in *Baarman-878* would not achieve continuous wireless feedback or any position-sensitive power control. Ex. 2026, ¶¶ [0091]-[0094]. Further, a POSITA would not have been motivated to rely on a battery-focused controller (i.e., NCP1800 Datasheet) for the required feedback and integrate it into a system-level feedback loop (i.e., *Baarman-878*). Ex. 2026, ¶ [0092]. Accordingly, a POSITA would not have been motivated to combine *Baarman-878* and the NCP1800 Datasheet. Ex. 2026, ¶ [0092].

- b. The NCP1800 Datasheet's controller cannot provide external feedback to *Baarman-878*'s system

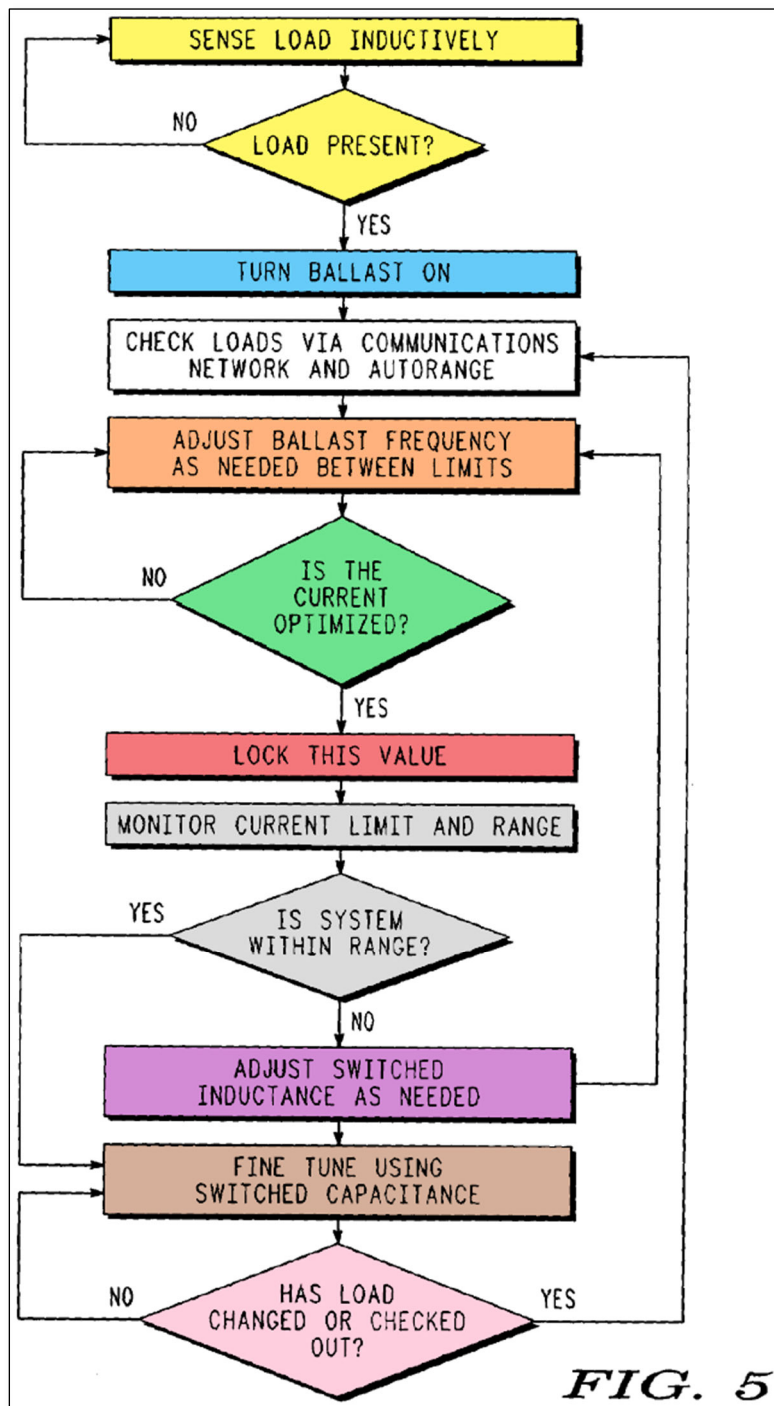
The NCP1800 Datasheet describes a linear Li-ion charge controller designed for wired, single-cell batteries, with internal, event-driven feedback based on discrete voltage and current thresholds. Ex. 1012, 1, 10; Ex. 2026, ¶ [0093]. The NCP1800 neither communicates wirelessly nor modulates transmitted power, and the NCP1800 does not respond to changes in coil coupling or other system-level wireless charging parameters. Ex. 2026, ¶ [0093]. Unlike the NCP1800 Datasheet's controller, *Baarman-878*'s wireless charging system transmits power inductively, relying on wireless signaling for system-level coordination. Ex. 1007, 9:17-29; Ex. 2026, ¶ [0093]. Specifically, *Baarman-878*'s system “waits until it determines that a load is present before applying power to the primary 14.” Ex. 1007, 5:20-21; Ex. 2026, ¶ [0094]. This initial step “may be done by providing each inductively powered device with a magnet that actuates a reed switch adjacent to the primary.” Ex. 1007, 5:22-24; Ex. 2026, ¶ [0093]. This initiation step is important to *Baarman-878* because it “will save power[,]” and “operat[ing] more efficiently by adjusting power output . . . is highly desirable.” Ex. 1007, 2:23-28; Ex. 2026, ¶ [0093].

Further, as shown in Figure 5 (reproduced and annotated below), in operation, *Baarman-878*'s “system waits until it determines that a load is present before applying power to the primary 14” (load presence determination step shown in

yellow). Ex. 1007, 5:20-21, Figs. 3, 5; Ex. 2026, ¶ [0094]. Once a load is detected, the power supply circuit activates (activation step shown in blue), and “the circuit adjusts its frequency to optimize the current applied to the primary” (frequency adjustment step shown in orange) until “*the appropriate operating frequency* has been determined at initial capacitance and inductance values” (current optimization determination step shown in green). Ex. 1007, 5:36 (emphasis added); Ex. 2026, ¶ [0094]. Then, the microprocessor “locks the ballast circuit into *the* operating frequency” (optimized value locking step shown in red). Ex. 1007, 5:36-39 (emphasis added); Ex. 2026, ¶ [0094]. While the appropriate operating frequency remains locked, the microprocessor “cycle[s] through the range of inductance values available through the multi-tap primary” (monitoring current limit and range step shown in gray). Ex. 1007, 5:36-39; Ex. 2026, ¶ [0094]. Thus, the cycle repeats: while the operating frequency is unlocked, “the microprocessor continues cycling through the available inductance values until it has determined which value provides optimal current to the primary.” Ex. 1007, 5:44-26; Ex. 2026, ¶ [0094].

“After the appropriate inductance value is determined, the microprocessor *locks the circuit* at the determined inductance value [(red step)] and begins to cycle through the capacitance values” (switched capacitance step shown in brown). Ex. 1007, 5:64-66, Fig. 5; Ex. 2026, ¶ [0094]. *Baarman*-878’s adaptive ballast circuit determines whether a load has “changed or checked out” (load status determination

step shown in pink) (*see, e.g.*, Ex. 1007, 10:21-24, 10:39-49; Ex. 2026, ¶ [0094]), and if so, repeats the cycle starting with “check[ing] loads via communications network and autorange.” Ex. 1007, Fig. 5; Ex. 2026, ¶ [0094].



Ex. 1007, Fig. 5 (annotated); Ex. 2026, ¶ [0094].

Notably, the NCP1800 Datasheet's disclosed hardwired components (e.g., voltage/current sense pins (I_{SNS}/R_{SNS}), the COMP/DIS pin, pass transistor, and fixed parameter charge phases (Pre-Charge, Full Charge, Trickle)) do not play any role in feedback or communication, even if incorporated into *Baarman-878*'s system, as they are *internal* feedback elements to the closed system of NCP1800. Ex. 2026, ¶ [0095].

Because the components disclosed in the NCP1800 Datasheet are designed for a standalone battery charge controller, i.e., the NCP1800, a POSITA would not have been motivated to integrate the NCP1800 into *Baarman-878*'s wireless architecture to result in the required feedback or communication because the NCP1800 Datasheet does not have any external feedback mechanisms. Ex. 2026, ¶¶ [0056], [0091], [0095], [0098]. The NCP1800 Datasheet's "control logic" cannot provide wireless feedback or system-level modulation required for inductive charging. Ex. 2026, ¶ [0098]. Consequently, a POSITA would not have been motivated to combine the NCP1800 Datasheet with *Baarman-878*, and any such combination would not improve performance or achieve the intended charging behavior of "control[ing] the battery precisely (e.g., within defined input voltage parameters) and safely (e.g., avoiding overvoltage conditions)." Petition, 33; Ex. 2026, ¶¶ [0090], [0098].

inductive power transfer, or control based on system-level device coordination. Ex. 2026, ¶ [0098]. The Petition has not established that the NCP1800 Datasheet’s “control logic” could provide wireless feedback or system-level modulation required for *Baarman-878*’s inductive charging. Ex. 2026, ¶ [0098]. Indeed, *Baarman-878* provides no disclosure suggesting such a modification. Ex. 2026, ¶ [0098]. For example, the NCP1800 Datasheet’s controller regulates by comparing sensed voltages to pre-determined thresholds *within its own circuitry* (see, e.g., Ex. 1012, 10 (emphasis added)), whereas *Baarman-878* relies on digital messages, or “communication sessions,” between remote devices and then locks the appropriate parameters until a subsequent triggering event occurs. See, e.g., Ex. 1008, 8:67-9:3, Fig. 5; Ex. 2026, ¶ [0098]. Importantly, these are not variations of the same control technique, but rather are distinct principles of regulation: localized analog IC control (NCP1800 Datasheet) versus discrete system-level signaling (*Baarman-878*). Ex. 2026, ¶ [0098].

While a POSITA could have theoretically imagined placing a device like the NCP1800 controller in some part of *Baarman-878*’s system, such as, for example, in *Baarman-878*’s remote device 338 shown in Figure 8 below, there is no teaching, suggestion, or guidance in *Baarman-878* that such a modification would result in the required feedback or communication because the NCP1800 Datasheet does not have any external feedback mechanisms. Ex. 2026, ¶ [0096]. That a POSITA could place

something like the NCP1800 controller in *Baarman*-878 alone does not suggest a reason to actually do so or why such an addition would result in the claimed arrangement. Ex. 2026, ¶ [0096]. It is only through impermissible hindsight reasoning that Petitioner makes the conclusion that the combination of the NCP1800 Datasheet and *Baarman*-878 would result in the required feedback claimed by the '568 Patent. Ex. 2026, ¶ [0096]. Accordingly, a POSITA would not be motivated to combine *Baarman*-878 with the NCP1800 Datasheet, given the lack of any teaching or suggestion that doing so would achieve any benefit. Ex. 2026, ¶¶ [0096], [0098].

B. Ground 2 Fails to Remedy The Deficiencies of Ground 1

Ground 2 simply challenges dependent Claims 3, 4, 6, 9, 10, 12, 20, 22, 24, 50, 51, and 53, using the base of Ground 1 and fail to provide any independent argument for the independent Claims addressed with respect to Ground 1. Ex. 2026, ¶¶ [0099]-[0100]. Moreover, Ground 2 adds yet another reference, *Veselic*. The Petition fails to even allege that *Veselic* addresses any of the above discussed deficiencies with regard to Ground 1. Ex. 2026, ¶ [0100]. The entirety of Ground 2 should be similarly rejected for the reasons outlined above with regard to Ground 1. Ex. 2026, ¶ [0100].

C. Ground 3 Similarly Fails to Render Obvious the Challenged Claims

Ground 3 is legally flawed because Petitioner’s proposed combination of *Baarman-267* and *Veselic* fails to teach or suggest the claimed “wireless feedback control signal to induce the change of intensity of the magnetic field . . . based on relative positions.” In this regard, the Petition improperly conflates the discrete load-type detection wireless systems (*Baarman-267* and *Veselic*) with the ’568 Patent’s contact-less, wireless battery charging via electromagnetic induction, using feedback to dynamically adjust power based on relative coupling and charging control methods. Ex. 1001, 1:19-28, 12:46-56; Ex. 2026, ¶ [0102]. In view of the actual teachings of *Baarman-267* and *Veselic*, it becomes clear that the references do not render obvious the ’568 Patent. Thus, Ground 3 is legally flawed and fails to render obvious the Challenged Claims.

i. The Non-Obvious Combination of *Baarman-267* and *Veselic* Fail to Render the Challenged Claims Obvious

The non-obvious combination of *Baarman-267* and *Veselic* cannot succeed because it fails to render obvious the “wireless feedback control signal to induce the change of intensity of the magnetic field . . . based on relative positions.” In an attempt to teach this element, the Petition improperly conflates a wireless charging system directed to discrete load-type detection with the ’568 Patent’s contact-less, wireless battery charging via electromagnetic induction, using feedback to

dynamically adjust power based on relative coupling and charging control methods. Ex. 1001, 1:19-28, 12:46-56; Ex. 2026, ¶¶ [0102]-[0103]. When the cited prior art references' scopes are properly analyzed, the Petition fails to establish a reasonable likelihood of success on Ground 3. Ex. 2026, ¶ [0103].

- a. Ground 3 fails to render obvious the “wireless feedback control signal to induce the change of intensity of the magnetic field ... based on relative positions” as required by claim 1[e]

As discussed above with reference to Ground 1, the '568 Patent requires a wireless charging system with continuous, closed-loop feedback between the device being charged and the external power supply, not merely localized control within a charging circuit. *See supra* Section V.A.i.a.ii; Ex. 2026, ¶ [0102]. Against this backdrop, Petitioner's reliance on *Baarman-267* and *Veselic* is likewise misplaced. Ex. 2026, ¶ [0102].

Baarman-267, at most, discloses a system that can operate with a closed-loop feedback path similar to *Baarman-878*, but only to the extent that the system initially collects charging requirements from the device (via an adapter), communicates these to the CPS, and allows for some adaptation of supply parameters. Ex. 2026, ¶ [0102]. *Baarman-267* does not disclose the kind of continuous feedback claimed in the '568 Patent. Ex. 2026, ¶ [0102].

ii. The Petition Fails to Establish a Motivation to Combine *Baarman-267* and *Veselic*

The Petition relies on a combination of *Baarman-267* and *Veselic* to disclose that the “monitoring result includes a wireless feedback control signal” as claimed by Claim limitation 1[e]. Petition, 99-100. Specifically, the Petition suggests that controller 38 in *Baarman-267* could “transmit a monitoring result—e.g., an instruction to lower the rail voltage, thereby reducing the AC current provided to the primary winding (and thus induced in the secondary winding),” based on, or in response to, *Veselic*’s “determination that power consumption is too high.” Petition, 99. This reasoning is unsupported, and at odds with the legal requirements of obviousness. *Virtek Vision*, 97 F.4th at 886 (“The mere fact that these possible arrangements existed in the prior art does not provide a reason that a skilled artisan **would** have” arrived at the claimed configuration); *Nautilus*, IPR2016-00633, Paper 9 at 21 (“An assertion that something **could** be done does not articulate a reason why something **would** be done,” raising the issue of hindsight bias.).

First, *Veselic*’s system is not a wireless system. Ex. 2026, ¶ [0104]. *Veselic* involves a direct, physical connection between its power supply, semiconductor switch, and battery, with voltage sensing to modulate current flow. Ex. 1013, 2:20-34; 5:65-6:17; Ex. 2026, ¶ [0104]. On the other hand, *Baarman-267*’s system incorporates a multi-coil structure for wireless energy transfer. Ex. 1013 5:53-67;

Ex. 2026, ¶ [0104]. In *Veselic*, the feedback is hardwired, and does not involve system-level wireless coordination or communication. Ex. 1013, 2:20-34; 4:1-7; Ex. 2026, ¶ [0104]. In contrast, *Baarman-267* discloses that its multi-coil topology transfers energy inductively between resonant structures over a distance. Ex. 1013, 6:1-16; Ex. 2026, ¶ [0104].

Second, *Veselic* utilizes a DC power supply to charge a rechargeable battery, and focuses on managing power dissipation and current regulation through a semiconductor and voltage sensing circuit. Ex. 1013, 2:20-34 (“USB ports would seem to be a very logical choice as a power supply for portable devices for a number of reasons. To begin with, USB ports supply a low DC voltage supply which is often very close to, or just above, the voltage of the battery.”), 5:65-6:17; Ex. 2026, ¶ [0105]. *Veselic* states that “it makes much more sense to use the USB port 12 to supply charging power to the portable device 18, rather than using a separate AC charger. For example: 1. a USB power supply will have less electrical noise than an AC charger, unless the AC charger incorporates large DC capacitors or inductors; 2. an AC charger requires either a heavy transformer or an expensive switching power supply, neither of which would be required if USB power is used[.]” Ex. 1013, 2:35-44; Ex. 2026, ¶ [0105]. For example, “an object of [*Veselic*’s invention is] to provide a novel method and apparatus which allows standard battery charge controllers to be supplied from standard computer data ports and other power sources.” Ex. 1013,

4:1-7; Ex. 2026, ¶ [0105]. This is unlike *Baarman-267*'s system, which is a wireless, AC inductive system that requires a much more complex feedback strategy. Ex. 2026, ¶ [0105]. Specifically, *Baarman-267* requires AC inductive coupling (which must be *AC* to enable wireless energy transfer) followed by rectifying the AC to DC for charging the battery. Ex. 1014, 6:1-16 (emphasis added); Ex. 2026, ¶ [0105].

Further, *Veselic*'s system is designed to operate as a standalone charging solution that preserves the standard configuration of existing systems (much like NCP1800). In other words, *Veselic*'s system is specifically meant to **not** modify any other system, but rather to keep those existing systems “standard” and to simply do its function. Ex. 1013, 3:59-67, 4:3-7; Ex. 2026, ¶ [0106]. Specifically, *Veselic*'s USB-based configuration would be understood by a POSITA to function as a standalone, self-contained charging and protection system similar in concept to the NCP1800 controller discussed above in Sections IV.B, V.A.ii.b. Ex. 1013, 2:20-44; 4:1-7; Ex. 2026, ¶ [0106]. *Veselic*'s design encompasses the full regulation and safety functions internally, without providing any external feedback or communication output. Ex. 2026, ¶ [0106]. In other words, there is no output from *Veselic*'s circuit that could transmit a monitoring result or communicate control information to an external power supply, such as the wireless controller in *Baarman-267*. Ex. 2026, ¶ [0106].

The Petition’s attempt to modify *Veselic* to include such external, wireless feedback capability contradicts *Veselic*’s specific purpose, which is to “allow[] standard battery charge controllers to be supplied from standard computer data ports” (Ex. 1013, 4:3-7), to maintain standard, unmodified charging configurations “without having to design new battery charge controllers with very specific applications.” Ex. 1013, 3:59-67; Ex. 2026, ¶¶ [0063], [0105]. Rather, Petitioner impermissibly reconstructs *Veselic* with the benefit of hindsight to supply functionality it does not disclose (wireless feedback control) simply to reach the claims of the ’568 Patent.

This is particularly obvious given that *Baarman-267*’s disclosure contrasts with the purpose of the system disclosed in *Veselic*, which is to specifically avoid modifying the underlying hardware or feedback architecture of any external system. Ex. 1013, 3:59-67, 4:3-7; Ex. 2026, ¶ [0107]. As a result, *Veselic* expressly teaches away from incorporating any additional feedback or control functionality, much less introducing a wireless monitoring loop or communication scheme of the type described in *Baarman-267*. Ex. 2026, ¶ [0107]. As such, a POSITA would understand that modifying *Veselic* to include such wireless functionality would contradict *Veselic*’s objective of maintaining simple compatibility with standard, unmodified external devices. A POSITA would not have been motivated to integrate *Veselic*’s system into *Baarman-267*’s wireless power architecture, nor had any

reason to expect that such a modification would function as intended. Ex. 2026, ¶¶ [0107]-[0108]. And a POSITA would recognize that applying *Veselic*'s power transfer approach in *Baarman*-267 would not achieve a monitoring result including a wireless feedback control signal as claimed by the '568 Patent. Ex. 2026, ¶ [0108]. Accordingly, a POSITA would not have been motivated to combine *Baarman*-267 and *Veselic*, and Ground 3 fails. Ex. 2026, ¶ [0108].

VI. CONCLUSION

As each of the Grounds fail, the Petition should be denied.

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Respectfully submitted,

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Certification of Word Count Under 37 C.F.R. § 42.24(d)

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CERTIFICATE OF SERVICE

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