UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner

v.

POLARIS POWERLED TECHNOLOGIES, LLC,
Patent Owner

Case IPR2023-00479
U.S. Patent No. 8,740,456

PATENT OWNER PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107(a)

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TABLE OF CONTENTS

I. INTRODUCTION 1
II. THE '456 PATENT 3
A. Summary 3
B. Prosecution History 4
C. Person of Ordinary Skill in the Art (POSITA) 5
D. Claim Construction 5
III. SUMMARY OF REFERENCES 6
A. Rabu (EX1005) 6
B. Katayama (EX1007) 12
C. Shoji (EX1006) 13
D. Karam (EX1008) 14
IV. PETITIONER FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF PREVAILING ON ANY CHALLENGED CLAIM. 14
A. Every Ground of the Petition is fatally flawed. 14
1. Independent Claims 1 and 9 14
2. Dependent claims 5-8, 12, and 13 17
B. Ground 1: Claims 1, 5-9, 12, 13 – Rabu in view of Katayama 18
1. Petitioner's proposed combination of Rabu and Katayama does not disclose or suggest at least elements 1[A] and 1[C] of claim 1. 18
(a) 1[A] – determining a change temperature at a first device wherein said temperature is measured at a first port of the first device that is configured to receive a connection to a second device 18
(i) Petitioner's mashup of Rabu's Figures is not an accurate representation of its disclosure. 19
(ii) Rabu does not teach two temperature sensors, much less one at a port of both the first and second device. 22

(iii) Dr. Hatalis's Declaration fails to support Petitioner's arguments for element 1[A]. 27

(b) 1[C] – determining the greater of the changes in temperature measured at the first device and the second device, wherein said determining is performed while the first device provides current to the second device over the connection 29

2. Petitioner's proposed combination of Rabu and Katayama does not disclose or suggest at least elements 9[C], 9[D], and 9[G] of claim 9..... 31

(a) 9[C] – first logic of the first device coupled to the first port, wherein the first logic is configured to determine a temperature of the connection at the first connector 31

(b) 9[D] – second logic of the first device, wherein the second logic is configured to provide current to the second device over the connection 33

(c) 9[G] – wherein, in response to the greater of the change in temperature determined by the first logic and the change in temperature determined by the third logic being above a threshold, the second logic is configured to reduce the current being provided from the first device to the second device 35

C. Ground 2: Claims 1, 5-9, 12, 13 – Rabu, Katayama, and Shoji (for 1[A], 1[C], 9[C], 9[D], and 9[G])..... 36

1. Petitioner's proposed combination of Rabu, Katayama, and Shoji does not render obvious independent claim 1 or 9..... 36

(a) 1[A] – determining a change temperature at a first device wherein said temperature is measured at a first port of the first device that is configured to receive a connection to a second device 37

(b) 1[C] – determining the greater of the changes in temperature measured at the first device and the second device, wherein said determining is

performed while the first device provides current to the second device over the connection 39

2. Petitioner's proposed combination of Rabu, Katayama, and Shoji does not disclose or suggest claim elements 9[C] and 9[G] of claim 9. 40

(a) 9[C] – first logic of the first device coupled to the first port, wherein the first logic is configured to determine a temperature of the connection at the first connector 40

(b) 9[G] – wherein, in response to the greater of the change in temperature determined by the first logic and the change in temperature determined by the third logic being above a threshold, the second logic is configured to reduce the current being provided from the first device to the second device 41

D. Ground 3: Claims 1-13 – Rabu, Katayama, and Karam.....42

1. Petitioner's proposed combination of Rabu, Katayama, and Karam does not render obvious independent claim 1 or 9. 42

2. 1[A] – determining a change temperature at a first device wherein said temperature is measured at a first port of the first device that is configured to receive a connection to a second device..... 44

V. CONCLUSION 45

I. INTRODUCTION

The Board should deny institution of *inter partes* review of claims 1-13 of U.S. Patent No. 8,740,456 (the "'456 patent") because the Petition fails to demonstrate a reasonable likelihood of prevailing on any claim or any ground. None of Petitioner's combinations teach or suggest all elements of the claimed inventions.

Claim 1 recites measuring the temperature at the ports of first and second connected devices. During prosecution, the Office agreed that this feature—measuring the temperature changes at the ports at *both* ends of the electrical connection—was absent from the prior art. It remains absent from the combinations of art in the Petition.

In Ground 1, Petitioner cites a hodgepodge of disclosures from Rabu—referencing multiple, distinct embodiments without explaining how or why a POSITA would have combined them—to ultimately allege that "a POSITA would have understood from Rabu's teachings to use a temperature sensor to measure temperature at any of many locations." Pet., 26. In analyzing Rabu, Petitioner devises its own version of Rabu's devices by combining figures from different embodiments, rearranging parts, and selectively quoting from the disclosure. However, no embodiment of Rabu contains two temperature sensors to measure the temperature at the ports at both sides of a connection. Petitioner's expert, Dr.

Hatalis, admits this: "*there is no explicit description of an embodiment that depicts the use of two temperature sensors* for measuring the temperature *in each of the two devices*." EX1002, ¶168 (emphasis added). Petitioner's argument is thus doomed from the start.

Independent claim 9 recites *logic* to measure temperature and provide power from the first to the second device. Petitioner largely relies on its analysis for claim 1, failing to identify any portion of the first device that would implement such logic and inconsistently identifying portions of the applied art that allegedly teach claim elements.

Compounding these deficiencies, Petitioner's expert, Dr. Hatalis, advances opinions that repeat the Petition's arguments, often *verbatim*, and thus are not entitled to weight under Federal Circuit and Board precedent.

Petitioner's Ground 2 attempts to rectify the transparent inadequacies of Ground 1 by adding Shoji, which discloses a temperature sensor in each of two devices. However, Shoji does not disclose or suggest temperature sensors at or near the ports at both sides of a connection as recited in claim 1, nor does it disclose the logic as recited in claim 9. Accordingly, Ground 2 similarly fails.

Finally, Petitioner's Ground 3 seeks to fill yet another deficiency, by adding the temperature comparison means of Karam to the Rabu-Katayama combination of Ground 1. Karam does not disclose or suggest multiple temperature sensors at

all, much less temperature sensors at or near the ports as recited in claim 1, or the claimed logic as recited in claim 9. So Ground 3 fails as well.

II. THE '456 PATENT

A. Summary

The '456 patent was filed on May 17, 2011, issued June 3, 2014, and is titled "Adjusting Delivery Of Current In A Connection Based On Temperature." The '456 patent claims a device and method that adjusts current when devices charge each other over a connection. In doing so, the '456 patent enables a safer charging experience by limiting current when temperature gets too high. EX1001, 1:17-45.

The '456 patent describes a first and a second device coupled together over a connection, where the first device provides current to the second device. EX1001, 1:37-40. A connector is coupled to a port on each device. EX1001, 1:40-44. While current is provided from the first device to the second device, the temperature of the connection is measured. EX1001, 1:45-47. In several embodiments, the temperature of the connection is measured at both devices. EX1001, 1:64-67. The '456 patent discloses measuring these temperatures with analog temperature sensors, thermistors, thermocouples, or RTDs (resistance temperature detectors). EX1001, 6:5-42, 7:3-14, 7:2-32, 7:63-67. In certain embodiments, the temperatures at both ends of the connection are measured near the power pins of a connector,

EX1001, 7:35-36, near the ports of the devices, EX1001, 7:7:37-40, or in the general area of a connector, EX1001, 7:42-45.

Both independent claims 1 and 9 recite measuring the temperature at both ends of a connection. Specifically, claim 1 recites "determining a change [in] temperature at a first device…" and "determining a change [in] temperature at a second device…," where the temperatures are measured at the devices' respective connection ports. Similarly, independent claim 9 recites "first logic of the first device…configured to determine a temperature of the connection at the first connector" and "third logic of the second device…configured to determine a temperature of the connection at the second connector."

None of the prior art in the prosecution history or Petitioner's references discloses measuring the temperature at both ends of a connection.

B. Prosecution History

On August 19, 2013, the Office issued an Action in the application that became the '456 patent. The Action rejected the pending claims under §§ 102(b), 102(e), 103(a), and 112(b), citing Baker 1 (US 2009/0139972), Baker 2 (US 2006/0238169), Gase (US 2013/0100982), Reusche (US 2007/006603), and Williams (US 6,905,362). EX1004, 70-80. Applicant filed an amendment on December 2, 2013, distinguishing the art largely on the basis that none of the art measured the temperature of the connection at both ends. "The amended Claims

recite the measurement of temperature changes at both ends of the electrical connection between the first device and the second device. *See e.g.* ¶ 0041." EX1004, 100-110. Applicant argued that this feature—measuring the temperature changes at *both* ends of the electrical connection—was not disclosed by any of the applied references. EX1004, 107-109. The Office agreed this feature was absent from the prior art, finding these arguments persuasive and allowing the amended claims. EX1004, 114-118.

As discussed further below, the Petition's references suffer from the same flaws as the references applied in prosecution—none measures temperature at *both* ends of a connection, nor would their combination have rendered this feature obvious.

C. Person of Ordinary Skill in the Art (POSITA)

Patent Owner applies Petitioner's definition of a POSITA and level of ordinary skill for purposes of this Preliminary Response. *See* Pet., 8. However, Patent Owner does not concede that Petitioner's definition is correct.

D. Claim Construction

Patent Owner does not believe that any term requires explicit construction for the purpose of this Preliminary Response. For purposes of this Preliminary Response, Patent Owner construes the claims according to their plain and ordinary

meaning in light of the specification, consistent with the standard established in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) ("*Phillips*").

III. SUMMARY OF REFERENCES

A. Rabu (EX1005)

Rabu discloses a "thermal protection circuit" for a 30-pin iPod USB charger. Rabu is primarily concerned with "dendritic shorts," which are electrical shorts caused by excessive moisture. EX1005, ¶6. Rabu discloses that its thermal protection circuit is composed of (1) a temperature sensor and (2) a cutoff switch. EX1005, ¶¶7-8, 46.

In one embodiment, Rabu discloses a cable with two connectors, where the temperature sensor and cutoff switch of the thermal protection circuit are located in a single connector. EX1005, ¶7. In a different embodiment, Rabu discloses that the temperature sensor is in one connector and the cutoff switch is located in the second connector. EX1005, ¶8. Rabu also discloses that the temperature sensor may be on a device itself, and the cutoff switch located in the second device. EX1005, ¶10.

Referring to Figure 7, Rabu discloses that thermal protection circuitry 710 uses a temperature sensor to sense elevated temperatures. "In general, thermal protection circuitry such as circuitry 710 may include any suitable temperature-sensitive device for determining when the power cutoff switch cuts off power to

connector 38. For example, circuitry 710 may include a temperature-sensitive fuse or other suitable device…" EX1005, ¶46. Rabu further discloses a cutoff switch that cuts power in response to such an increase in temperature. "In response to increasing temperatures in connector 38, circuitry 710 (e.g., a switch in circuitry 710) may be configured to cut off a power supply in connector 38 by electrically isolating contact 714 from contact 716." *Id.*

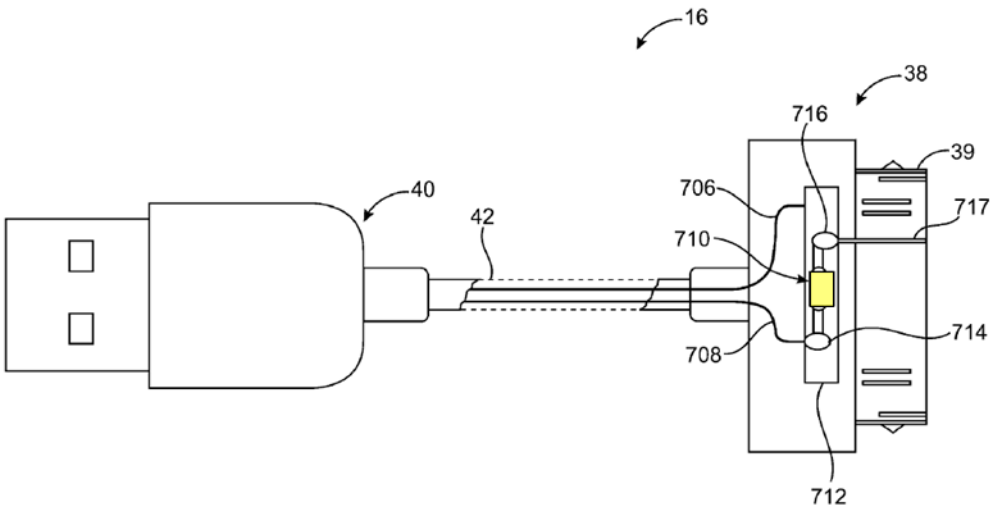


FIG. 7

EX1005, FIG. 7 (annotated).

Rabu's description of a thermal protection circuit containing one sensor and one cutoff switch is consistent throughout its examples. However, Rabu does disclose that the sensor and switch may be either together or separated. For example, regarding Figure 8, the power cutoff switch 800 and temperature sensor 802 may be a single unit *or* separate. EX1005, ¶47.

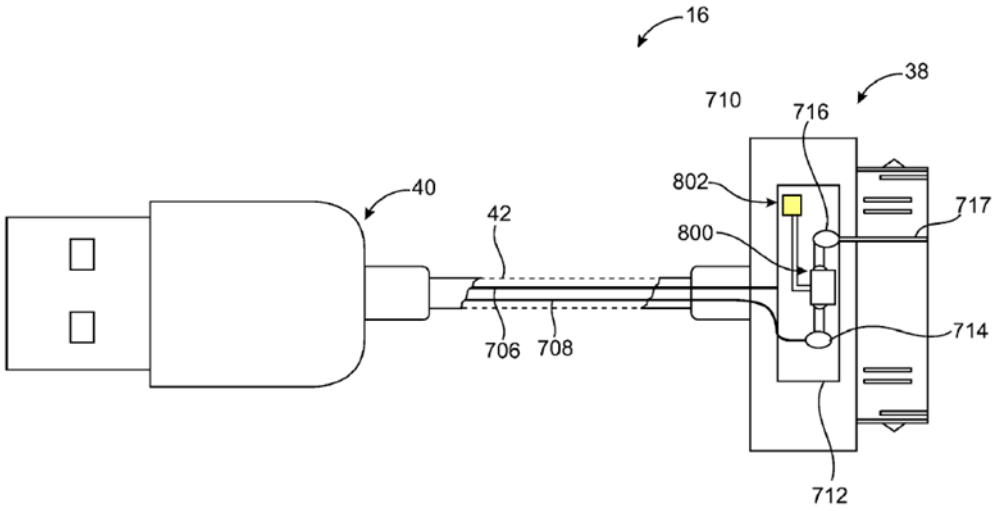


FIG. 8

EX1005, FIG. 8 (annotated).

Regarding Figures 9 and 10, Rabu re-numbers the temperature sensor as 902, the cutoff switch as 900, and shows them separated. EX1005, ¶¶51-52, 54. So, in this embodiment, while parts of the thermal protection circuit may be located in different devices, a temperature sensor is located in one of them and the cutoff switch is located in another. There is not a temperature sensor in both devices.

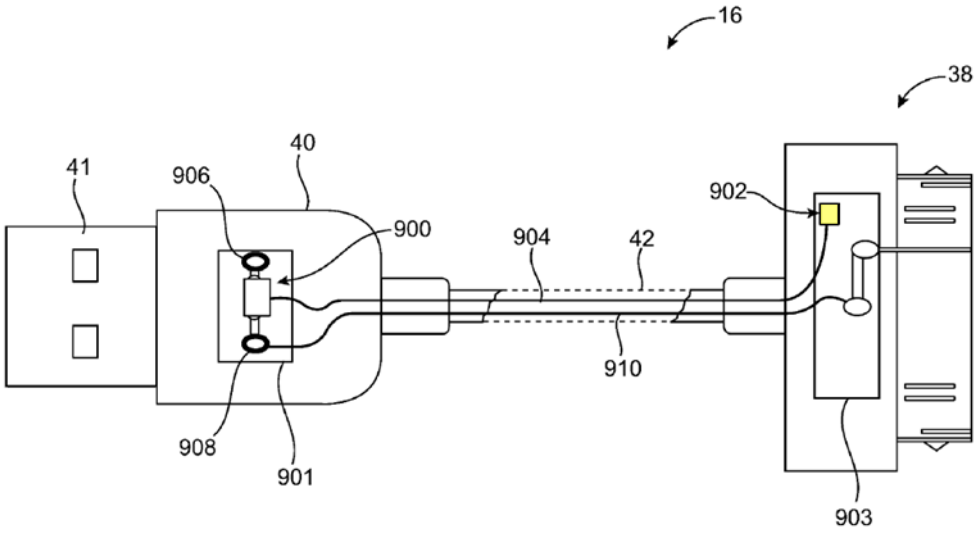


FIG. 9

EX1005, FIG. 9 (annotated).

Rabu discloses the combined temperature sensor and cutoff switch in Figure 11 as integrated circuit 1100 inside connector 38. EX1005, ¶60.

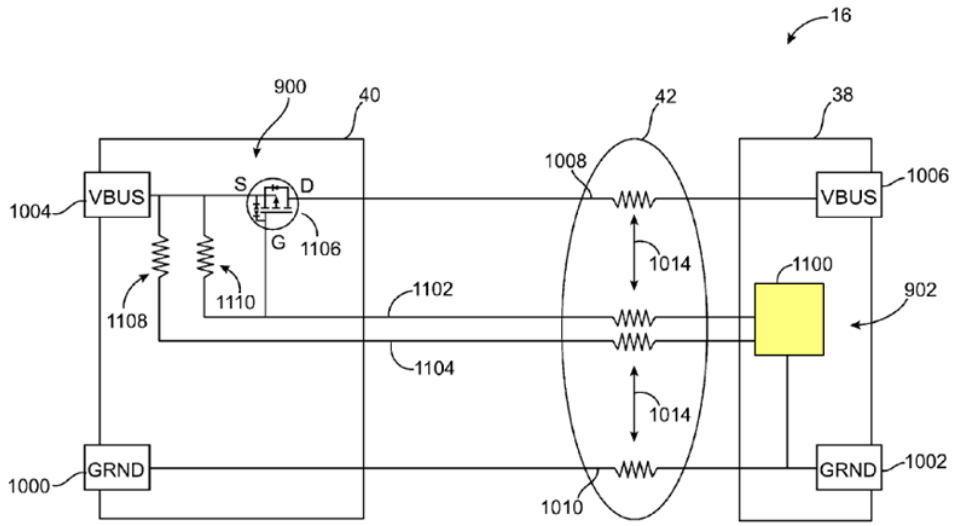


FIG. 11

EX1005, FIG. 11 (annotated).

With respect to Figure 14, the thermal protection circuitry 710 is in the connector 38 and also contains the combined temperature sensor and cutoff switch. EX1005, ¶¶75-76.

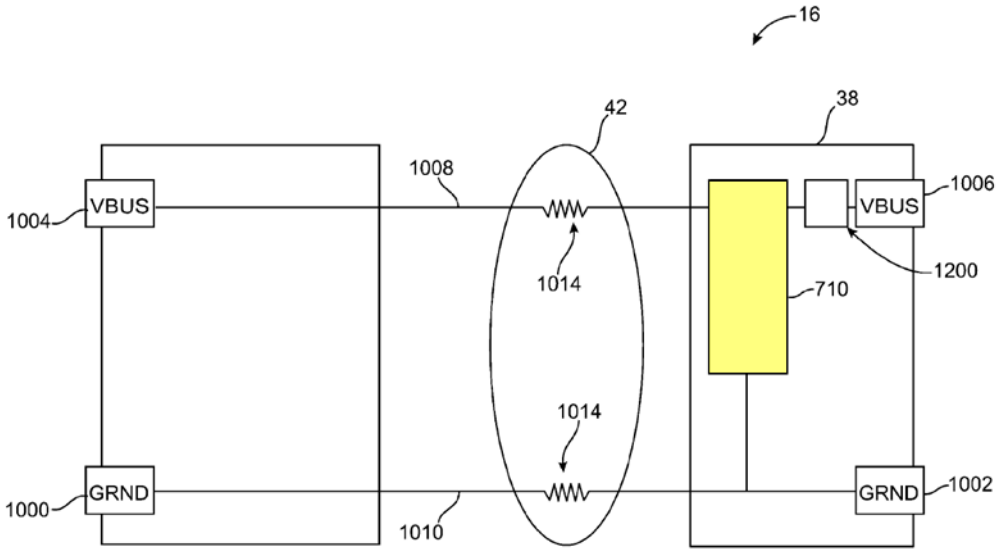


FIG. 14

EX1005, FIG. 14 (annotated).

With respect to Figure 15, the temperature sensor 1500 is in either device 12 or the connector 28 of device 12, and the power cutoff switch 1502 is separate, in connector 40. EX1005, ¶77. Thus, again, while parts of the thermal protection circuit may be located in different devices, in this embodiment, a temperature sensor is located in one of them and the cutoff switch is located in another. There is not a temperature sensor in both devices.

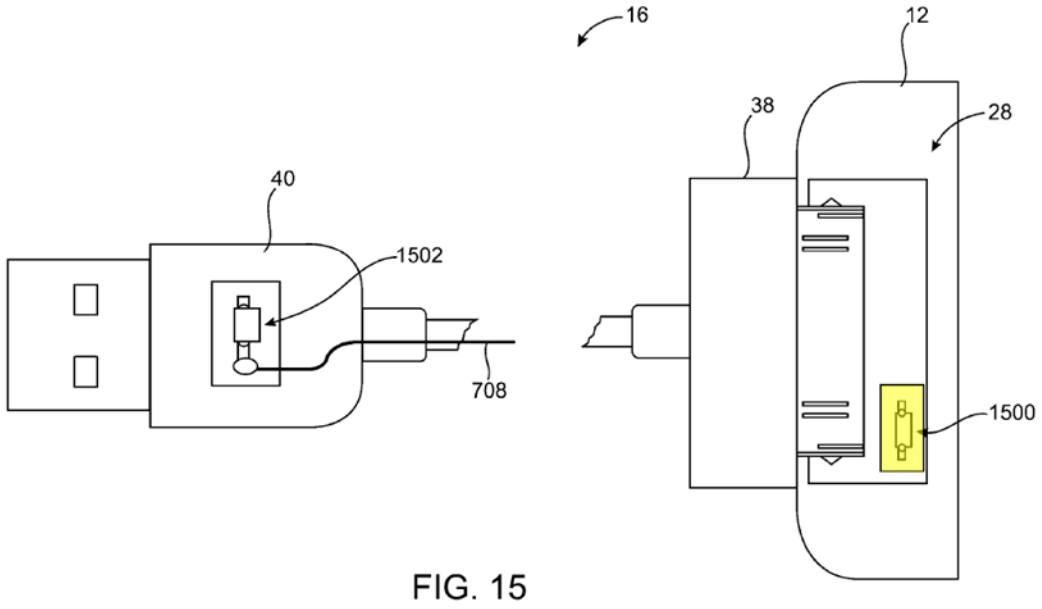


FIG. 15

EX1005, FIG. 15 (annotated).

With respect to Figure 16, Rabu similarly shows the temperature sensor 1500 in device 12 and cutoff switch 1600 in device 14. EX1005, ¶78.

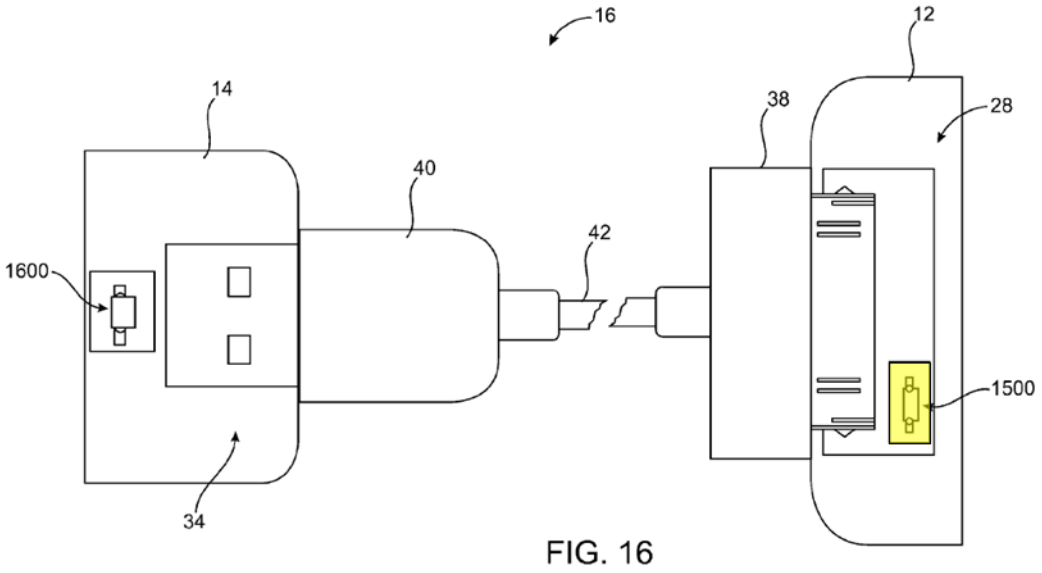


FIG. 16

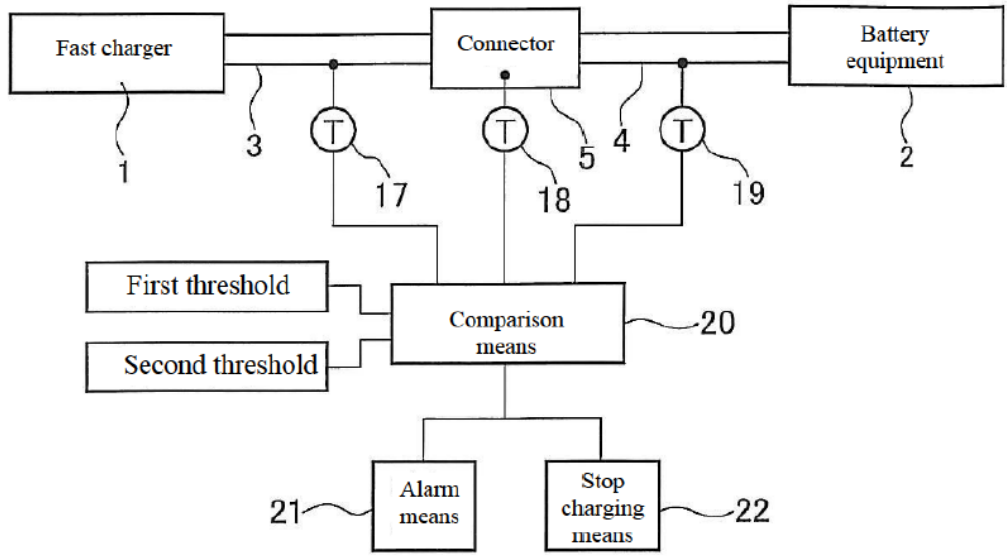
EX1005, FIG. 16 (annotated).

As shown above, in no embodiment of Rabu is there any disclosure of two temperature sensors at all, much less one at each end of the connection. Specifically, no embodiment of Rabu shows temperature sensor 710, 802, 1100, or 1500 in two locations. Rabu does not disclose or suggest using temperature sensors at both ends of a connection between two devices.

B. Katayama (EX1007)

Katayama describes a charger for an electric car. Figure 3 is instructive:

FIG. 3



EX1007, FIG. 3.

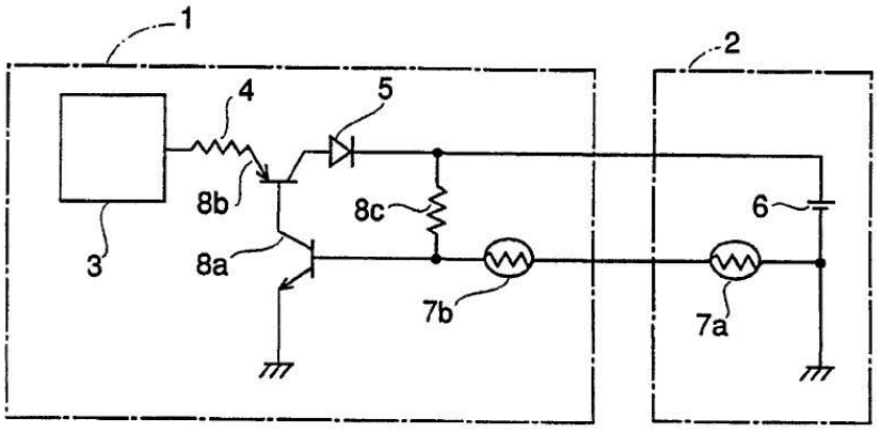
Regarding Figure 3, Katayama describes a system with two charging cables 3, 4, a charger 1, a battery 2, and a connector 5 that connects the two charging cables together. EX1007, ¶18. Katayama discloses using multiple temperature sensors at 17, 18, and 19, which are connected to charging cable 3, connector 18,

and charging cable 4, respectively. *Id.* Katayama does not disclose or suggest measuring temperature on any device, any port of any device, or at two connectors that form the ends of a connection between device 1 and device 2. The "connector" in Katayama connects disparate cables together—it is not the same as the connectors of the '456 patent, which form the ends of the connection and connect to ports in the respective devices. *Id.*; EX1001, 1:37-44.

C. Shoji (EX1006)

Shoji describes a battery charger. Shoji discloses a temperature sensor within a battery, shown as element 7a in Figure 3. EX1006, (57). Shoji also discloses a temperature sensor within the charger, shown as element 7b in Figure 3. EX1006, (57), page 13.

Fig.3



EX1006, FIG. 3.

Shoji is silent as to the location of the temperature sensors 7a and 7b and does not disclose measuring temperature at a port of a device or at two connectors forming the ends of a connection.

D. Karam (EX1008)

Karam discloses a technique for limiting power delivery over ethernet. EX1008, 1:8-21. Karam discloses measuring the temperature of a cable connecting "power-sourcing equipment" (PSE) to a "powered device" (PD) based on the resistance of the cable. EX1008, 2:29-35. Karam discloses a method for storing this resistance value at various points in time to calculate the change in temperature of a cable. EX1008, 7:57-61. Karam does not disclose any discrete temperature sensors at all, much less a sensor at a port of a PSE or PD, or measuring temperature at both ends of a connection.

IV. PETITIONER FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF PREVAILING ON ANY CHALLENGED CLAIM.

A. Every Ground of the Petition is fatally flawed.

1. Independent Claims 1 and 9

As discussed above, Claim 1 recites measuring the temperature at the ports of first and second connected devices. The Office agreed that measuring the temperature changes at the ports at *both* ends of the electrical connection was absent from the prior art. It remains absent from the combinations of art in the Petition.

In Ground 1, Petitioner cites multiple, distinct embodiments of Rabu without explaining how or why a POSITA would have combined them, arguing that "a POSITA would have understood from Rabu's teachings to use a temperature sensor to measure temperature at any of many locations." Pet., 26. In analyzing Rabu, Petitioner devises its own version of Rabu's devices by combining figures from different embodiments, rearranging parts, and selectively quoting from Rabu's disclosure. However, no embodiment of Rabu contains two temperature sensors to measure the temperature at the ports at both sides of a connection. Petitioner's expert, Dr. Hatalis, admits this: "*there is no explicit description of an embodiment that depicts the use of two temperature sensors for measuring the temperature in each of the two devices*." EX1002, ¶168 (emphasis added). Petitioner's argument thus fails. And although Ground 1 combines Rabu and Katayama, Petitioner only identifies Rabu for claim elements 1[A] and 1[B], which require measuring the temperature at the ports at both ends of the connection.

Independent claim 9 recites logic to measure temperature and provide power from the first to the second device. Specifically, claim 9 recites first and third logic that measure the temperature of the connectors of the first and second devices. Additionally, claim 9 recites second logic on the first device that is configured to provide power to the second device. Petitioner largely relies on its analysis from claim 1, failing to identify any portion of the first device that would implement

such logic in Rabu or Katayama and inconsistently identifying portions of the applied art that allegedly teach claim elements.

Attempting to rectify the inadequacy of the Ground 1 combination, Petitioner adds Shoji in Ground 2. Shoji discloses a temperature sensor in two devices. However, Shoji still does not disclose or suggest temperature sensors at or near the ports of the connection as recited in claim 1. Nor does it disclose the logic as recited in claim 9. Accordingly, Ground 2 similarly fails.

In Ground 3, Petitioner tries to fill yet another deficiency, by adding the temperature comparison means of Karam to the Rabu-Katayama combination of Ground 1. Karam does not disclose or suggest multiple temperature sensors at all, much less temperature sensors at or near the connection as recited in claim 1 or the claimed logic as recited in claim 9. So Ground 3 fails as well.

Moreover, compounding the technical flaws of the references in each Ground, Petitioner's analysis is frequently conclusory. But "[t]o satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Likewise, "conclusory expert testimony is inadequate to support an obviousness determination . . . ." *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019); *see also Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, 15-16 (P.T.A.B. Aug. 24, 2022) (precedential) (declining to credit to expert

testimony that "merely repeats, verbatim, the conclusory assertion for which it is offered to support."); 37 C.F.R. § 42.65(a).

Petitioner's expert, Dr. Hatalis, often repeats the Petition *verbatim*. *See*, *e.g.*, element 9[G] of Ground 1 (Pet., 45-46, EX1002, ¶150); element 9[C] of Ground 2 (Pet., 55-56; EX1002, ¶¶176-179); element 9[G] of Ground 2 (Pet., 58-59; EX1002, ¶184); element 1[A] of Ground 3 (Pet., 61-63, EX1002, ¶¶189-195). In other sections, Dr. Hatalis repeats the vast majority of the Petition's arguments, without any significant additional analysis. *See*, *e.g.*, element 1[A] of Ground 1 (Pet., 22-24; EX1002 at ¶¶83-86); element 1[C] of Ground 1 (Pet., 29-33; EX1002, ¶¶101-108, 111-112); element 1[A] of Ground 2 (Pet., 52-54; EX1002, ¶¶164-167); element 1[C] of Ground 2 (Pet., 54-55; EX1002, ¶¶170-173). Because Dr. Hatalis adds either no or little analysis to the attorney argument in the Petition, his corresponding testimony should be afforded little or no weight.

In sum, all three of Petitioner's Grounds are deficient. Accordingly, the Board should deny institution.

2. Dependent claims 5-8, 12, and 13

Because the combination in each of Grounds 1-3 does not render obvious independent claim 1 or 9, for at least the same reasons, each combination cannot render obvious dependent claims 5-8, 12, and 13.

B. Ground 1: Claims 1, 5-9, 12, 13 – Rabu in view of Katayama

1. Petitioner's proposed combination of Rabu and Katayama does not disclose or suggest at least elements 1[A] and 1[C] of claim 1.

(a) 1[A] – determining a change temperature at a first device wherein said temperature is measured at a first port of the first device that is configured to receive a connection to a second device

The proposed combination of Rabu and Katayama does not disclose or suggest claim element 1[A], "determining a change temperature at a first device wherein said temperature is measured at a first port…" because it does not determine a temperature at the claimed first device (i.e., the current providing device), much less at a port of the first device.

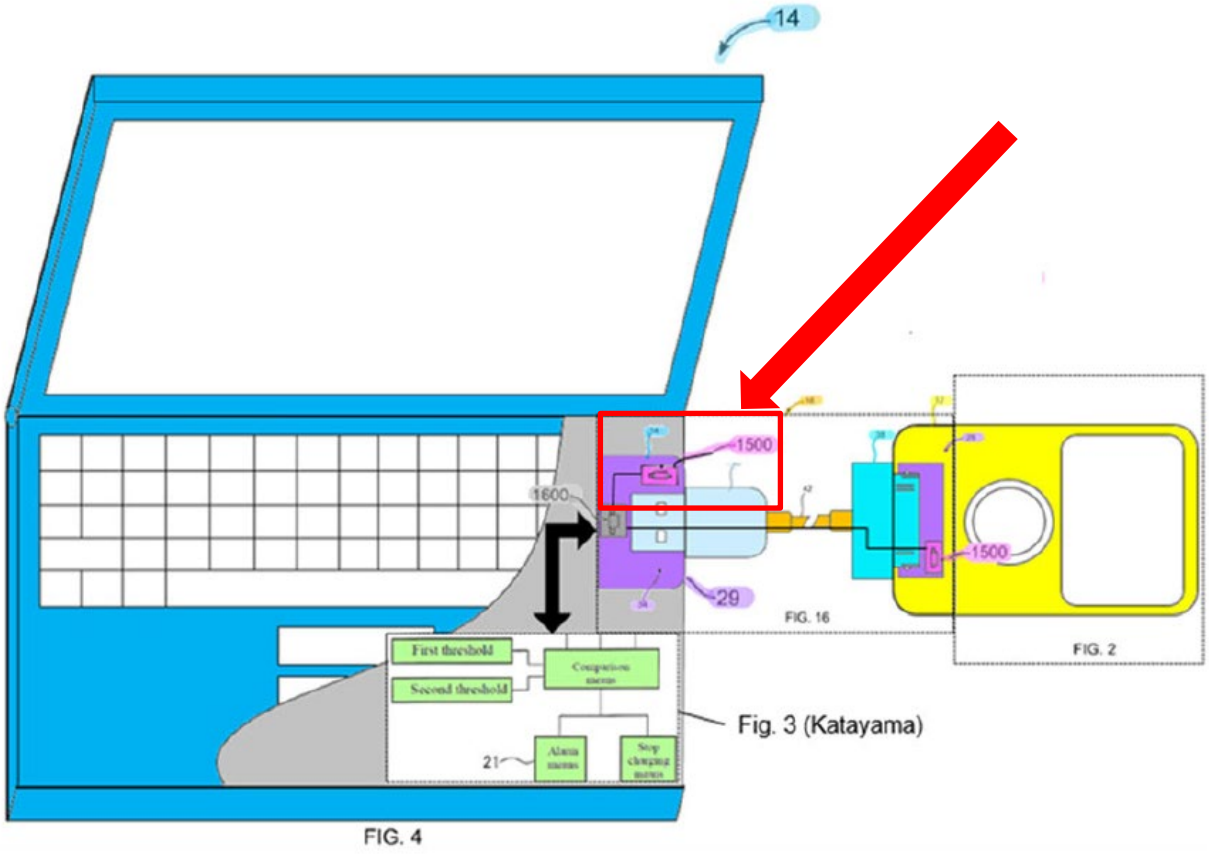
For element 1[A], the Petition relies on Rabu alone, without any combination with Katayama. Pet., 22. But Rabu does not disclose element 1[A]. First, Petitioner assembles an inaccurate combination of several different figures of Rabu. Although Rabu discloses a temperature sensor on the second device, Rabu does not disclose or suggest a temperature sensor on the first device, as Petitioner's creation purports.

Second, Petitioner relies on Rabu's disclosure of a "thermal protection circuit" that can span multiple locations, but this also fails to satisfy element 1[A]. The thermal protection circuits disclosed in Rabu do not include a *temperature sensor* in multiple locations.

Third, Petitioner's arguments are contradicted by its own expert, Dr. Hatalis, who admits that "there is no explicit description of an embodiment that depicts the use of two temperature sensors for measuring the temperature in each of the two devices." EX1002, ¶168. Instead, Dr. Hatalis selectively quotes portions of Rabu to suggest the presence of multiple sensors. But Dr. Hatalis's citations to Rabu only disclose sensors on a *second* device.

(i) Petitioner's mashup of Rabu's Figures is not an accurate representation of its disclosure.

Petitioner depicts an inaccurate, self-created "combined system" that includes a combination of Figures 2, 4, and 16 of Rabu and Figure 3 of Katayama. Pet., 20. In this "combination," however, Petitioner *adds a second temperature sensor 1500* to Figure 16 of Rabu—shown below inside the red box indicated by the red arrow—that does not exist in that figure.



Pet., 20 (combination of figures, added elements, and color coding by Petitioner; red box and arrow pointing out added temperature not in Rabu by Patent Owner).

The actual, un-doctored version of Figure 16 is shown in the following figure, which does not include Petitioner's added sensor 1500 on the left side of the connection. Indeed, at discussed above, Rabu does not teach a second temperature sensor in any embodiment or figure. Section III.A.

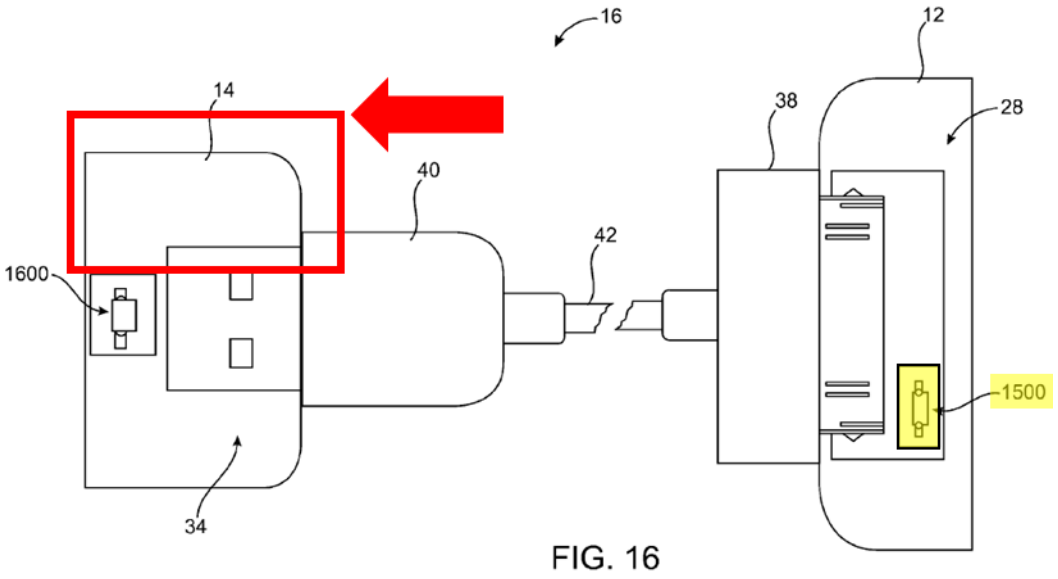


FIG. 16

EX1005, FIG. 16 (annotated, highlighting location of single temperature sensor 1500 in yellow (right), and absence of temperature sensor in red box (left).

Petitioner argues, "as explained in Rabu's Figure 16, thermal sensor 1500 (pink) is located in port 28 of device 12, where it measures the temperature of port 28. [EX1005] ¶¶77, 78." Pet., 21. Petitioner continues, "[a] *comparable temperature sensor would have been included in portable computer 14 as well*, as taught by Rabu. [EX1005] ¶¶43, 46, 47, 78." *Id.* (emphasis added). Petitioner is flatly wrong here. Indeed, as shown by the original Figure 16, the temperature sensor 1500 is *only* on the right-side connector that connects to device 12 (i.e., the second—not first—device). Petitioner's "combined" system makes it seem as if the *second* pink thermal sensor 1500 in the laptop (on the left side) is in the original drawing. It is not. And as discussed below, contrary to Petitioner's assertion, no other disclosure in Rabu teaches including a "comparable temperature sensor…in portable computer 14 as well."

(ii) Rabu does not teach two temperature sensors, much less one at a port of both the first and second device.

Besides its own "combination" of Rabu's Figures, Petitioner provides no evidence from Rabu that discloses or suggests using two temperature sensors. Indeed, Petitioner's expert, Dr. Hatalis, admits there is no express teaching of a sensor in the first device: "*there is no explicit description of an embodiment that depicts the use of two temperature sensors* for measuring the temperature *in each of the two devices*." EX1002, ¶168 (emphasis added). And as discussed below, Dr. Hatalis is wrong that "Rabu's teaching in regards to placing a thermal protection circuit that would include a temperature sensor in both the first and the second device." *Id.*

Petitioner cites Rabu at ¶¶43, 46, 47, and 78 for its assertion that Rabu teaches including a "comparable temperature sensor…in portable computer 14 as well." Pet., 21. Not only are these paragraphs related to different embodiments of Rabu, but each of the embodiments teaches a *single* temperature sensor. Rabu at ¶43 and ¶46 describes an embodiment shown in Figure 7, which discloses a temperature sensor within "Thermal protection circuitry 710" on only one side of the connection.

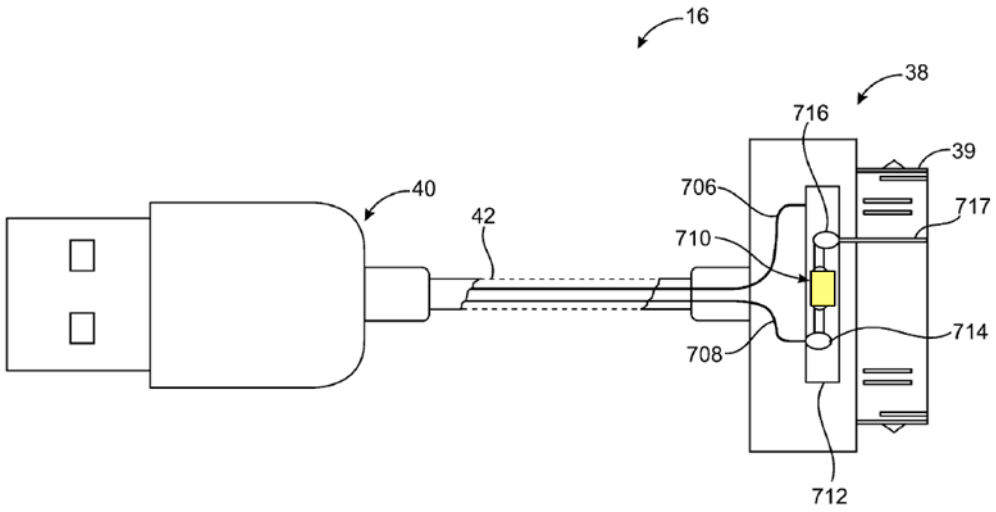


FIG. 7

EX1005, FIG. 7 (annotated).

Similarly, Rabu at ¶47 describes a different embodiment, shown in Figure 8, which also discloses a single temperature sensor 802.

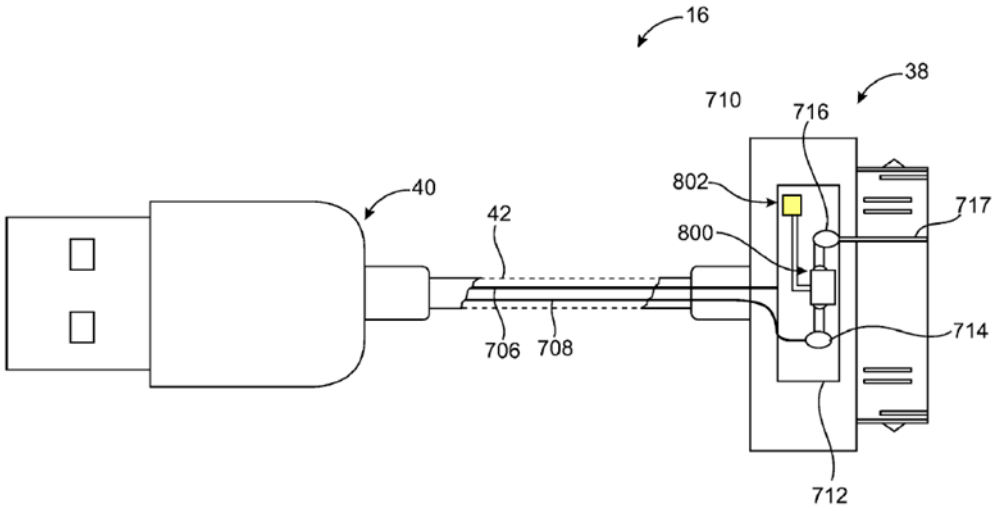


FIG. 8

EX1005, FIG. 8 (annotated).

Likewise, Rabu at ¶78, related to yet another embodiment shown in Figure 16, describes a single temperature sensor with a separate cutoff switch.

Petitioner mischaracterizes Rabu's "thermal protection circuitry," implying that the first device contains a temperature sensor. Petitioner cites the first sentence of Rabu at ¶78, "[w]ith another suitable arrangement, *thermal protection circuitry* may be provided in electronic device 12 and in electronic device 14," but conflates Rabu's "thermal protection circuitry" with a temperature sensor. Pet., 24 (quoting EX1005, ¶78) (emphasis added). But the very next sentence clarifies that "[a]s shown in the example of FIG. 16, thermal protection circuitry in system 10 may include *temperature sensor 1500 in electronic device 12* (e.g., sensor 1500 in connector 28) and a *cutoff switch 1600 in electronic device 14*." EX1005, ¶78 (emphasis added). Petitioner uses Rabu's disclosure of a temperature protection circuit to argue that there are multiple temperature sensors, rather than the correct reading that when Rabu discloses a temperature protection circuit in two devices, there may be a sensor (1500) in one device and a cutoff switch (1600) in a second, as shown in Figure 16 below.

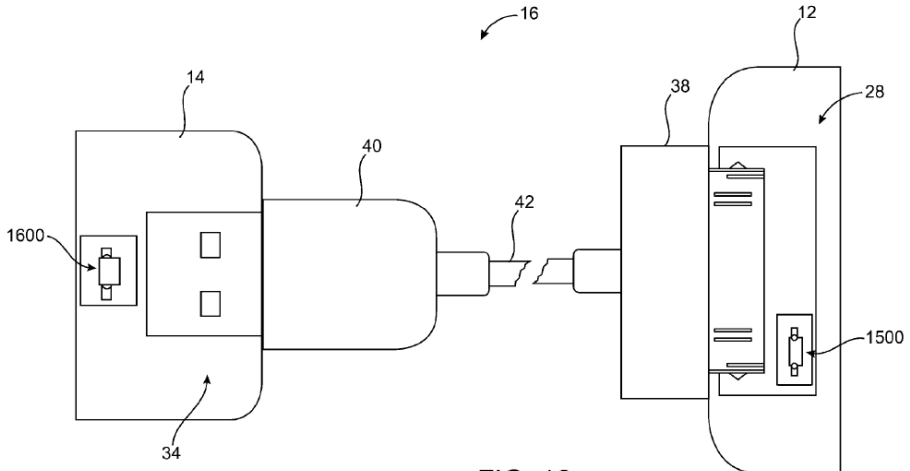


FIG. 16

EX1005, FIG. 16.

This is consistent with Rabu's summary, which explicitly describes its thermal protection circuit as providing a cutoff switch either in the same device or a different device than the actual sensor. *See, e.g.*, EX1005, ¶¶7-8 ("With one suitable arrangement, a cable may include thermal protection circuitry such as a temperature sensor and a power cutoff switch…. If desired, the temperature sensor and the power cutoff switch may be located in a single connector…. With another arrangement, the temperature sensor may be located in a first connector and the power cutoff switch may be located in a second connector.").

Petitioner's addition of a temperature sensor is not an insignificant misreading of Rabu. As described in the Prosecution History section above, sensing temperature at both ends of the connection distinguished the prior art. Section II.B. Rabu's teachings of temperature sensors are all on the second device or the connector to the second device (the iPod). Sensor 710 is in connector 38 on

the second device (¶46); sensor 902 is in connector 38 on the second device (¶50); sensor 1500 is on the second device itself, or, alternatively, in connector 28 on the second device (¶77); and sensor 1500 is in connector 38 on the second device (¶78). In sum, none of Petitioner's cited paragraphs in Rabu disclose an additional "comparable temperature sensor" that would be in device 14, as Petitioner alleges. Instead, Petitioner attempts to add an additional sensor that does not exist in Rabu (or in Katayama). In essence, Petitioner improperly attempts to insert a stand-alone obviousness argument for Rabu, which is not a Ground of the Petition, into its combination of Rabu and Katayama. *See Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1337 (Fed. Cir. 2020) (finding the Board erred in instituting an IPR where challenger did not advance the combination of references); *see also Apple Inc. v. MPH Techs. Oy*, No. 2021-1355, 2022 WL 4103286, at *7 (Fed. Cir. Sept. 8, 2022) (nonprecedential) (finding same).

Moreover, Petitioner and Dr. Hatalis effectively concede that Rabu, itself, does not teach element 1[A]. *See, e.g.*, Pet., 26 ("*a POSITA would have understood* from Rabu's teachings to use a temperature sensor…in the port of the device providing power (14) (first device)." (emphasis added); EX1002, ¶86 ("it would be *obvious to a POSITA to include a temperature sensor*, i.e. 'temperature sensor 1500,' in the thermal protection circuitry of device 14 (first device)") (emphasis added). And Petitioner contradicts its express teaching argument again, later

alleging that the combined system "[takes] temperature change measurements in multiple locations (as *suggested* by Rabu and disclosed by Katayama)." Pet., 31 (emphasis added). These arguments show that even Petitioner does not believe that Rabu discloses using multiple temperature sensors. *See also* EX1002, ¶168 ("no explicit description of... two temperature sensors).

(iii) Dr. Hatalis's Declaration fails to support Petitioner's arguments for element 1[A].

Petitioner relies on Dr. Hatalis's Declaration at ¶¶83-95 for element 1[A]. *See generally* Pet., 22-27. But Dr. Hatalis's opinions and description of Rabu fail to paint the full picture. For example, he quotes Rabu stating that "the power measuring circuitry may be used in place of or in addition to the temperature sensors" EX1002, ¶91 (emphasis omitted), yet leaves off the next words, "…used in any of the examples described herein," EX1005, ¶86. By omitting the final words of the sentence, Dr. Hatalis implies that Rabu discloses multiple temperature sensors in a particular embodiment. Yet the full quotation shows that Rabu's reference to "temperature sensors" means that Rabu is referring to the sensors present in each of its embodiments—with each example containing *only one* temperature sensor.

Dr. Hatalis argues that Rabu teaches measuring temperature at various places and incorporating temperature sensors in those locations. EX1002, ¶88 (citing EX1005, ¶¶31, 46, 48, 50, 77, 78, 83, 86). But in each embodiment Rabu

only discloses measuring temperature in a single place using a single temperature sensor in either the connector or the device itself. Dr. Hatalis's citations do not disclose or suggest temperature sensors *at both ends of the connection*, as recited by the claims. For example, Rabu at ¶31 simply says that a thermal protection circuit (as detailed above, meaning circuitry that may be in several locations but with a single temperature sensor) may be put in either a cable or device. Rabu at ¶¶46, 48, 50, notes that the thermal protection circuitry may be in connector 38, the connector to device 12 (the second device in Petitioner's combined system). Rabu at ¶¶77-78 notes that thermal protection circuitry in the example may include a temperature sensor in device 12. At ¶83, Rabu discloses a "dendritic-growth-promotion structure 1200" in connector 38 and is silent on either a thermal protection circuit or a temperature sensor. And at ¶86, Rabu discloses "power measuring circuitry," which is *not temperature* measuring circuitry, and is described in Rabu as an alternative: "power measuring circuitry may be used *in place of* or in addition to the temperature sensors used in any of the examples described herein." EX1005, ¶86 (emphasis added). Even used "in addition to" a temperature sensor, *power* measuring circuitry does not measure *temperature*. Dr. Hatalis concludes that "a POSITA would have understood…to use a temperature sensor…at any of many locations," EX1002, ¶94, but in each embodiment, Rabu

discloses only the need for a *single* temperature sensor at either device 12 (the second device) or the connector to device 12.

In sum, Petitioner does not show that element 1[A] is met because Rabu, the only reference relied upon for this element, does not disclose or suggest a temperature sensor at the first device. No embodiment of Rabu describes two temperature sensors, as the claim recites, and Petitioner's attempts to stretch Rabu's disclosures are contradicted and unsupported by Dr. Hatalis's Declaration.

(b) 1[C] – determining the greater of the changes in temperature measured at the first device and the second device, wherein said determining is performed while the first device provides current to the second device over the connection

Petitioner's proposed combination also does not disclose or suggest element 1[C], "determining the greater of the changes in temperature measured at the first device and the second device…" because the proposed combination does not teach measuring the temperature at the first device. Rabu does not disclose or suggest this element for the reasons discussed above for element 1[A]. But additionally, Petitioner does not meet its burden of proof for element 1[C] because it does not argue that either Rabu or Katayama individually teaches element 1[C].

Instead, Petitioner only argues that element 1[C] would have been obvious in view of Petitioner's combined Rabu-Katayama system. Pet., 29-30 (citing EX1002, ¶¶101-113). Indeed, Petitioner merely alleges that "it would have been

obvious to a POSITA to determine the worst case temperature change," Pet., 29, and that "it was well known in the prior art that the greater change in temperature poses the greater risk of damage to the system," Pet., 30.

Petitioner generally argues that Katayama teaches measuring temperature changes at multiple locations, mischaracterizing the reference as disclosing "wires (3) of fast charger 1" and "wires (4) of battery-operated equipment 2." Pet., 30 (citing EX1007, ¶18, FIG. 3). But Katayama at ¶18 describes that elements 3 and 4 are disparate "charging cable[s]," not wires of devices 1 and 2. EX1007, ¶18. Suggesting that wires 3 and 4 are part of devices 1 and 2 mischaracterizes Katayama. Indeed, Katayama's Figure 3 shows that the temperature sensors 17 and 19 are on distinct "charging cables" *outside* and between the boxes of the devices 1 and 2. EX1007, FIG. 3. While Katayama does have multiple temperature sensors, these sensors measure the temperature at distinct charging cables and at the sole connector that connects the distinct charging cables together—not "at each end of a charging connection" as Petitioner argues. Pet., 30.

Thus, even a combination of Rabu and Katayama would not teach a temperature sensor at a first device or "determining the greater of the changes…" recited in element 1[C].

2. Petitioner's proposed combination of Rabu and Katayama does not disclose or suggest at least elements 9[C], 9[D], and 9[G] of claim 9.

(a) 9[C] – first logic of the first device coupled to the first port, wherein the first logic is configured to determine a temperature of the connection at the first connector

Petitioner's proposed combination does not teach element 9[C], "first logic of the first device … configured to determine a temperature of the connection at the first connector."

Petitioner relies on its argument for element 1[A] in element 9[C], Pet., 41, yet Petitioner does not identify any logic in Rabu in element 1[A] (which does not recite logic). *See* Pet., 22-27. Regardless, Rabu does not disclose any logic in the first device (Rabu's device 14) related to determining a temperature of the connection.

Beyond Petitioner's reference back to element 1[A], Petitioner's few additional cites—Rabu at ¶46 and ¶78 and Dr. Hatalis's Declaration at ¶¶139-140—do not provide any further support for logic in Rabu's first device (14) for determining a temperature of the connection. Rabu at ¶46 discusses thermal protection circuitry 710; and ¶78 discusses temperature sensor 1500. First, Petitioner does not explain how these elements constitute the recited "logic" in element 9[C]. And second, in each of their respective embodiments of Rabu, these elements are on the connector to the second device, *not the first device* as recited in

9[C] (which recites "first logic *of the first device*"). EX1002, ¶¶46, 78, FIGS. 7, 16. Therefore, they do not disclose "first logic of the first device…configured to determine a temperature of the connection at the first connector."

Dr. Hatalis repeats his claim that a POSITA would find it obvious to use a thermistor in device 14, yet he does not cite anything from Rabu that supports his argument, citing only Rabu's disclosures of thermistors generally. EX1002, ¶139. Nor does he explain how or why this would constitute the "first logic" recited in element 9[C]. Dr. Hatalis at ¶140 continues by identifying "[a] portion of a circuit…in the port 28 or 29…for formulating the temperature readings, or Rabu's integrated circuit…1100" in Figure 11 as the first logic. *See* EX1005, FIG. 11. Dr. Hatalis is wrong for two reasons. First, Figure 11 shows only a circuit view of the connector of Figure 9 (which itself does not even show first device 14), not any part of first device 14. So Figure 11 does not show logic of the first device. EX1005, ¶22 ("FIG. 11 is a circuit diagram of the illustrative cable of FIG. 9…"). Second, Rabu describes that "temperature sensor 902 may be provided as an integrated circuit 1100….for controlling switch 900." EX1005, ¶60. Temperature sensor 902 is shown on the right side in Figure 9 below, within connector 38, which is the side of the connector to device 12 (the first device), not anywhere near port 28 or 29, *see* EX1005, FIG. 4, of device 14 (the second device), as Dr. Hatalis claims.

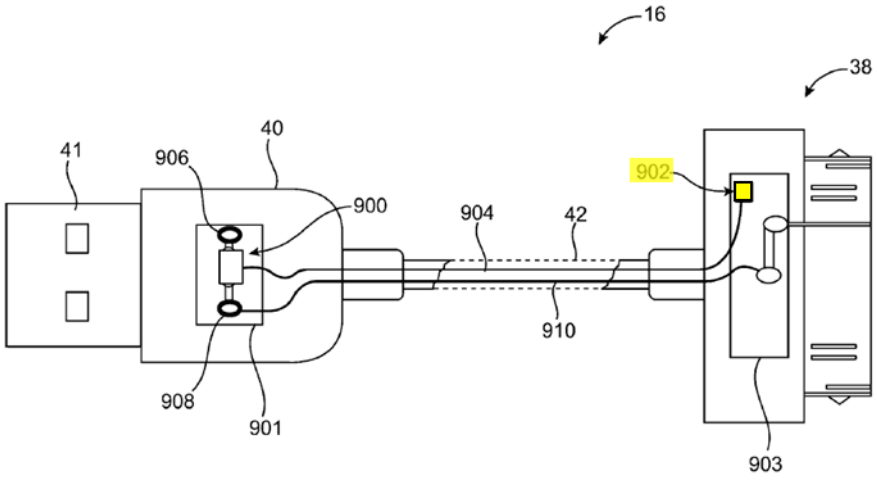


FIG. 9

EX1005, FIG. 9 (annotated).

The only elements of Figure 9 shown on the left side (the connector to the first device) are contacts and connectors, which are not "logic [] configured to determine a temperature" (and they are not on the first device). EX1005, FIG. 9, ¶¶50-53. In sum, Petitioner has not shown any "first logic of the first device…configured to determine a temperature" because all evidence that Petitioner and Dr. Hatalis rely on describes only features on the second device, not the first device. And Petitioner does not even explain how the identified features constitute logic.

(b) 9[D] – second logic of the first device, wherein the second logic is configured to provide current to the second device over the connection

Petitioner's proposed combination of Rabu and Katayama does not teach element 9[D], "second logic of the first device … configured to provide current to

the second device….” Petitioner identifies several components in Rabu for element 9[D] that are either not logic or do not provide current, and thus cannot satisfy second logic configured to provide current to the second device. Pet., 42-43.

First, Petitioner identifies conductors in the cable (not the first device), relying on EX1005, ¶51, FIG. 9, and EX1002, ¶144. Pet., 42-43. But conductors are not logic, nor does Dr. Hatalis contend they are. *See* EX1002, ¶¶141-144. Additionally, Petitioner’s highlighting of the cable itself in Figure 9, Pet., 43, shows that the identified conductors are part of the cable, not “second logic of the first device.” Thus, the conductors do not satisfy element 9[D].

Second, Petitioner identifies a power cutoff switch as an alleged “logic circuit.” Pet., 42. Petitioner’s rationale is that the power cutoff switch is a component that may *block* power delivery. But, as Petitioner acknowledges, a power cutoff switch *cuts off* power (i.e., “block[s] power delivery,” Pet., 42) instead of *providing* current, as recited in element 9[D]. *See, e.g.*, EX1005, ¶78 (“When the temperature of connector 38 exceeds a threshold level, cutoff switch 1600 may cut off power to cable 16.”) Thus, element 9[D] is not satisfied.

(c) 9[G] – wherein, in response to the greater of the change in temperature determined by the first logic and the change in temperature determined by the third logic being above a threshold, the second logic is configured to reduce the current being provided from the first device to the second device

Petitioner's proposed combination of Rabu and Katayama also does not teach element 9[G], "…in response to the … temperature determined by the first logic … the second logic is configured to reduce the current …." As discussed for element 9[C], Rabu does not teach the recited first logic. Section IV.B.2.a. Moreover, Petitioner's identification of second logic in element 9[G] is inconsistent with its identification of the second logic in element 9[D], highlighting that the second logic is not disclosed by the applied art.

For element 9[G], Petitioner argues that the recited second logic "corresponds to Rabu's power supply *and* 'cutoff switch 1600' (gray), *combined with* Katayama's comparison means 20 *and* stop charging means (green)." Pet., 45 (emphasis added). This is inconsistent with what Petitioner identified in element 9[D] as the second logic—*only* cutoff switch 1600 and/or the cable itself. Pet., 42. Additionally, Petitioner's identification of "Rabu's power supply" here is not clear. Petitioner does not identify what part of Rabu discloses a power supply nor explain how it would disclose the second logic of element 9[G]. Elsewhere, Petitioner identifies the entirety of device 14 as Rabu's power supply, Pet., 31, 56, but that

would be nonsensical here and overlap with other elements Petitioner identifies for the first and second logic.

Both the Petition and Dr. Hatalis's Declaration are conclusory on this issue, with fatal flaws in consistency, and fail to identify with particularly how the references disclose the claim elements. 35 U.S.C. § 312(a)(3); *TQ Delta*, 942 F.3d at 1359 ("conclusory expert testimony is inadequate to support an obviousness determination"). Finally, Dr. Hatalis's Declaration at ¶150 is a *verbatim* recitation of the Petition and, as such, should be afforded no weight. *Xerox*, IPR2022-00624, Paper 9, 15-16; 37 C.F.R. § 42.65(a).

C. Ground 2: Claims 1, 5-9, 12, 13 – Rabu, Katayama, and Shoji (for 1[A], 1[C], 9[C], 9[D], and 9[G])

1. Petitioner's proposed combination of Rabu, Katayama, and Shoji does not render obvious independent claim 1 or 9.

Ground 2 adds Shoji to the proposed combination of Rabu and Katayama of Ground 1, but still fails to disclose or suggest claim elements 1[A], 1[C], 9[C], 9[D], and 9[G] for the same reasons as Ground 1.

Neither Rabu nor Katayama disclose a temperature sensor on each device. As Dr. Hatalis acknowledges, "there is no explicit description of an embodiment that depicts the use of two temperature sensors for measuring the temperature in each of the two devices" of Rabu; so Petitioner adds Shoji in an attempt to address "the use of two distinct temperature sensors for measuring temperature at both

devices." EX1002, ¶168. But Shoji does not rectify the deficiencies in Ground 1. Although Shoji includes a temperature sensor on each device, Shoji does not disclose temperature sensors at a first or second device where the temperatures are measured at a first and second port, as respectively recited in claim elements 1[A] and 1[B]. Shoji also does not disclose any type of logic (nor does Petitioner contend Shoji discloses logic) as recited in claim 9.

In the arguments below, Patent Owner addresses only new arguments regarding the addition of Shoji—i.e., elements for which the Petition adds Shoji. For each element of the Petition that relies on the same arguments in Ground 1, Patent Owner's arguments above also apply to those elements. And because the combination of Rabu, Katayama, and Shoji does not render obvious independent claim 1 or 9, for at least the same reasons, it cannot render obvious dependent claims 5-8, 12, and 13.

(a) 1[A] – determining a change temperature at a first device wherein said temperature is measured at a first port of the first device that is configured to receive a connection to a second device

Petitioner relies on its analysis of Rabu from Section XII.A.2.b of the Petition regarding element 1[A]. Rabu does not teach this element for the same reasons as discussed above in Section IV.B.1.a.

Petitioner argues that Shoji teaches including a temperature sensor in device 1 and device 2, shown as elements 7a and 7b (thermistors) in Shoji's Figure 3. Pet.,

52-53. Although Shoji includes two temperature sensors—one in each device—Petitioner does not contend, and Shoji does not disclose, having a temperature sensor at the *port* of the first device as recited in element 1[A] (or at the port of the second device for that matter). Indeed, Shoji does not even use the word "port" or any analogous term in its entire disclosure. *See generally* EX1006. And Shoji's schematic circuit diagrams (e.g., Figure 3) shed no light as to where Shoji's thermistors 7a and 7b would be located in their respective devices.

Petitioner cites Dr. Hatalis's declaration at ¶¶164-169 for element 1[A], yet Dr. Hatalis's declaration is a *verbatim* recitation of the Petition at ¶¶164-167 and, as such, should be afforded no weight. *TQ Delta*, 942 F.3d at 1359 ("conclusory expert testimony is inadequate to support an obviousness determination"); *Xerox*, IPR2022-00624, Paper 9, 15-16; 37 C.F.R. § 42.65(a). Further, Dr. Hatalis's ¶¶168-169 address motivation to combine and expectation of success, but do not explain how or why the combination would teach to include a temperature sensor at the *port* of the first (or second) device. So those paragraphs do nothing to remedy this deficiency.

Additionally, Dr. Hatalis acknowledges "there is no explicit description" in Rabu of each device having a temperature sensor, but alleges that a POSITA would have looked to Shoji's disclosure of having a temperature sensor in each *device*. EX1002, ¶168. Tellingly, Dr. Hatalis does not allege that the temperature sensors

in Shoji would measure the temperature "at a first port of the first device" to overcome the deficiencies present in element 1[A] of Petitioner's Ground 1. Indeed, Shoji does not remedy these deficiencies. Shoji is concerned with measuring *battery* temperatures (*see, e.g.* EX1006, 3), not with measuring the temperature of the connectors or ports themselves. Thus, even if a POSITA were to consider Shoji, the combination of Rabu (and Katayama) with Shoji would not disclose or suggest measuring temperature "at a first port of the first device that is configured to receive a connection to a second device." Thus, Ground 2 fails.

(b) 1[C] – determining the greater of the changes in temperature measured at the first device and the second device, wherein said determining is performed while the first device provides current to the second device over the connection

Petitioner relies on Rabu and Katayama from Section XII.A.2.d of the Petition, regarding element 1[C]. Rabu and Katayama do not teach this element for the same reasons as discussed above in Section IV.B.1.b.

For element 1[C], Petitioner and Dr. Hatalis endorse combining Rabu and Katayama with Shoji based on a faulty argument. In particular, Petitioner argues that Shoji "teaches that a temperature change greater than a fixed value may cause damage to the system." Pet., 54 (citing EX1006, 11 and EX1002, ¶172 (citing the same page of Shoji)). But Shoji does not describe any type of "damage" that may

occur to the system. *See* EX1006, 11. Thus, Petitioner's premise for including Shoji for element 1[C] is flawed.

2. Petitioner's proposed combination of Rabu, Katayama, and Shoji does not disclose or suggest claim elements 9[C] and 9[G] of claim 9.

(a) 9[C] – first logic of the first device coupled to the first port, wherein the first logic is configured to determine a temperature of the connection at the first connector

As discussed above in Section IV.B.2.a, in Ground 1, Petitioner does not identify where the proposed combination of Rabu and Katayama discloses the first logic of the first device. Shoji does not rescue Petitioner's earlier failures. Indeed, Petitioner does not rely on Shoji for the logic features of element 9[C]. *See* Pet., 55-56. Instead, as in element 1[A], Petitioner relies on Shoji as disclosing temperature sensors in both devices. *Id.* But as similarly discussed in element 1[A] of Ground 2, Shoji does not disclose or suggest determining a temperature of the connection at the claimed first connector (*i.e.,* the connector at the transmitting device). Again, Dr. Hatalis's Declaration merely repeats the Petition nearly *verbatim* and, as such, should be afforded no weight. *See* EX1002, ¶¶176-179; *Xerox*, IPR2022-00624, Paper 9, 15-16; 37 C.F.R. § 42.65(a).

(b) 9[G] – wherein, in response to the greater of the change in temperature determined by the first logic and the change in temperature determined by the third logic being above a threshold, the second logic is configured to reduce the current being provided from the first device to the second device

For element 9[G] in Ground 2, Petitioner relies on Petition Sections XII.A.3.h for element 9[G] in Ground 1 and XII.B.2.b for element 1[C] in Ground 2. Pet., 54. Petitioner's arguments fail for the same reasons discussed in Sections IV.B.2.c and IV.B.1.b above.

Petitioner fails entirely to show how Shoji adds anything to those sections, either by explaining what elements Shoji teaches or how Shoji would be combined with Rabu and Katayama. Most notably, there is no explanation of how Shoji would teach how the first and third logic would interact with the second logic to reduce current. Petitioner provides no portion of Shoji that would cure this deficiency of element 9[G] as discussed in Ground 1. Petitioner also shows no portion of Shoji that would rectify Petitioner's inconsistent identification of "second logic," as Petitioner merely repeats its flawed analysis, as detailed above in element 9[G] of Ground 1. Section IV.B.2.c.

Here too, Dr. Hatalis's Declaration merely recites the Petition *verbatim* and, as such, should be afforded no weight. *See* EX1002, ¶184; *Xerox*, IPR2022-00624, Paper 9, 15-16; 37 C.F.R. § 42.65(a).

D. Ground 3: Claims 1-13 – Rabu, Katayama, and Karam

1. Petitioner's proposed combination of Rabu, Katayama, and Karam does not render obvious independent claim 1 or 9.

In Ground 3, Petitioner adds Karam to the combination of Rabu and Katayama in Ground 1 for its disclosure of calculating a change in temperature. Pet., 60-63. While Karam discloses temperature change calculations, it does nothing to cure the deficiencies of Ground 1 discussed above. Section IV.B. Accordingly, Ground 3 fails for the same reasons as Ground 1. Indeed, the proposed combination *still* does not disclose or suggest measuring temperature "at a first port of the first device" as recited in element 1[A]—nor does Petitioner apply Karam for this purpose. Instead, Petitioner adds Karam for its purported disclosure related to measuring the resistance value of an entire wire, EX1008, 2:40-42, 3:24-28, and comparing that resistance value to itself over time, EX1008, 7:57-61, rather than comparing two different temperature sensors (or even two different resistance measurements). *See* Pet., 59-63.

Because element 1[A] is not met, the elements that rely on measuring temperature at a first port of the first device are also not met, such as elements 1[C]-1[E]. Similarly, Petitioner has not pointed to first or second logic in Karam to remedy Ground 1's failure to teach first or second logic as recited in elements 9[C] or 9[D]; and Petitioner has not shown multiple temperature sensors in Karam to

remedy Ground 1's failure to teach first or third logic that determine temperature as required for elements 9[C] or 9[G].

A POSITA also would not have sought to combine the resistance sensing system of Karam with Rabu's temperature sensor. For example, Rabu discloses a single temperature sensor, EX1005, ¶7, whereas Karam's resistance-based temperature measurement would measure the temperature of the *entire* cable connection without distinguishing any point of the connection. EX1008, 3:24-27. And Karam disparages the use of multiple sensors such as Katayama's cable-embedded sensors: "[m]oreover, other means such as embedding temperature sensors within a bundle of cables along an entire run (e.g., across a building) would require the proper embedding of such sensors, taking apart the infrastructure, and cost money and network downtime and would still fail to predict the temperature of the metal inside the cable." EX1008, 2:22-27.

Because the Petition does not demonstrate that the combination of Rabu, Katayama, and Karam discloses or suggests all of the elements of the claims, the proposed combination does not render obvious independent claim 1 or 9. *See* Sections IV.B.1.a through IV.B.2.c above. For the same reasons, it cannot render obvious dependent claims 2-8 or 10-13.

2. 1[A] – determining a change temperature at a first device wherein said temperature is measured at a first port of the first device that is configured to receive a connection to a second device

Petitioner relies on section XII.A.2.b (Ground 1) in the Petition for element 1[A], but Petitioner is wrong for the same reasons discussed in Section IV.C.1.a. Karam does not cure the deficiencies of Rabu from section XIII.A.2.b of the Petition, such as not measuring temperature "at a first port of the first device." Petitioner argues that Karam "expressly discloses a calculation for a change in temperature." Pet., 61. But the Petition is silent as to where Karam's purported temperature sensor is located. In fact, Karam does not mention ports or connectors at all. Karam instead measures the resistance of the entire copper wire, not resistance at a specific part of the connection—much less at the ports at both ends of a connection. "The method involves obtaining an initial resistance value representing an initial resistance of the *communications pathway*…." EX1008, 2:40-42 (emphasis added); *see also* EX1008, 3:24-28 ("Improved techniques control delivery of power…based on generating temperature change results which are determined from resistance measurements (e.g. using the temperature coefficient of the *cable conductor material*)." (emphasis added). The resistance of the communications pathway or conductor material is not a measurement of the temperature at a first port of a first device.

Yet again, Dr. Hatalis's Declaration at ¶¶189-195 is a near *verbatim* recitation of the Petition and, as such, should be afforded no weight. *Xerox*, IPR2022-00624, Paper 9, 15-16; 37 C.F.R. § 42.65(a).

V. CONCLUSION

The Board should deny institution because the Petition fails to demonstrate a reasonable likelihood of prevailing with respect to any challenged claim of the '456 patent under any of the three Grounds. Like the art applied in prosecution, Rabu, Katayama, Shoji, and Karam all fail, alone or in combination, to disclose or render obvious at least having a temperature sensor at the first port of the first device and first and second logic as recited by the claims. Throughout, Petitioner's expert, Dr. Hatalis, adds little support, as his declaration often repeats the Petition *verbatim*. Accordingly, the Board should deny institution.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107(a)** was served electronically via e-mail on May 23, 2023, in its entirety on the following counsel of record for Petitioner:

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