

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

NUCURRENT, INC.,
Patent Owner.

IPR2019-00861
Patent 9,300,046 B2

Before KRISTINA M. KALAN, CHRISTOPHER M. KAISER, and
WESLEY B. DERRICK, *Administrative Patent Judges*.

DERRICK, Administrative Patent Judge.

DECISION

Granting Petitioner's Request for Rehearing
37 C.F.R. § 42.71

Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Samsung Electronics Co., Ltd.¹ (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–3, 5–8, 10, 12, 13, 15–21, and 23–29 of U.S. Patent No. 9,300,046 B2 (Ex. 1001, “the ’046 patent”). NuCurrent, Inc. (“Patent Owner”) filed a Preliminary Response to the Petition (Paper 8, “Prelim. Resp.”). Patent Owner does not substantively address the merits of Petitioner’s challenge, but contends review by the Board would be improper. *See generally* Prelim. Resp. We authorized additional briefing on the issues set forth in the Preliminary Response. Paper 9. Petitioner in turn filed a Reply to Patent Owner’s Response (Paper 10, “Reply”) and Patent Owner filed a Sur-Reply to Petitioner’s Reply (Paper 12, “Sur-Reply”).

We denied institution of an *inter partes* review. Paper 13 (“Decision Denying Institution” or “Dec.”). In the Decision Denying Institution, we noted that “Petitioner concurrently filed another petition in IPR2019-00859 challenging the same claims of the ’046 patent as challenged in this petition” (*id.* at 2), and exercised our statutory discretion to deny institution of this *inter partes* review (*id.*). We also authorized Petitioner to file a twenty-page request for rehearing. *Id.* at 5. Petitioner filed a Request for Rehearing (Paper 14, “Request” or “Req.”) of our Decision Denying Institution. Patent Owner, although authorized to do so (Dec. 5), did not file a response to the Request. For the reasons that follow, Petitioner’s Request for Rehearing is granted and *inter partes* review is instituted.

¹ Petitioner lists Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. as the real parties-in-interest. Pet. 1.

To institute an *inter partes* review, we must determine that the information presented in the Petition shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons discussed below, after considering the parties’ submissions and the evidence of record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the ’046 patent. Moreover, we decline to maintain our earlier exercise of discretion to deny institution. Thus, we institute an *inter partes* review.

A. Related Proceedings

Petitioner states that the ’046 patent is at issue in *NuCurrent, Inc. v. Samsung Electronics Co. Ltd.*, Case No. 1:19-cv-00798-DLC (S.D.N.Y.). Pet. 1. Petitioner concurrently filed another petition in IPR2019-00859 challenging the same claims of the ’046 patent as challenged in this Petition. Compare IPR2019-00859, Paper 1, 2, with Pet. 2. Petitioner also states that petitions have been filed for further U.S. patents, identifying these in the Petition (Pet. 1), as well as in the further petitions, as U.S. Patent No. 8,698,591 (IPR2019-00863, Paper 1), U.S. Patent No. 8,710,948 (IPR2019-00862, Paper 1), and U.S. Patent No. 8,680,960 (IPR2019-00858, Paper 1; IPR2019-00860, Paper 1).

B. The ’046 patent

The ’046 patent is titled, “Method for Manufacture of Multi-Layer-Multi-Turn High Efficiency Inductors” and is directed to the design, operation, and method of manufacture of an efficient inductor, as well as related systems. Ex. 1001, at [54], 1:37–40. The ’046 patent discloses that inductors experience energy loss due to their internal electrical resistance.

Id. at 2:1–10. According to the '046 patent, such internal losses are more pronounced at higher operating frequencies (e.g., radio frequencies and greater), mainly due to the “skin effect,” which is the tendency of an alternating electric current to distribute itself in a conductor so that a current density is predominant near the surface of the conductor, whereas the remaining body of the conductor is unused by the electrical current flow. *Id.* at 2:15–19, 2:37–45. This results in the effective resistance for an inductor wire being similar to that of a wire thinner than the actual diameter of the inductor wire, which increases the resistance of the inductor wire at higher operating frequencies. *Id.* at 2:64–3:3.

To address this issue, the '046 patent discloses a multi-layer wire concept to increase the area of conductance within an inductor structure and reduce resistance losses. *Id.* at 4:16–22. The '046 patent states that the multi-layer wire can be used in electrical circuits operating within and above the radio frequency range of at least 3 kHz. *Id.* at 4:23–26. Figure 1 of the '046 patent, shown below, illustrates a high-level diagram of such an inductor structure. *Id.* at 12:13–14.

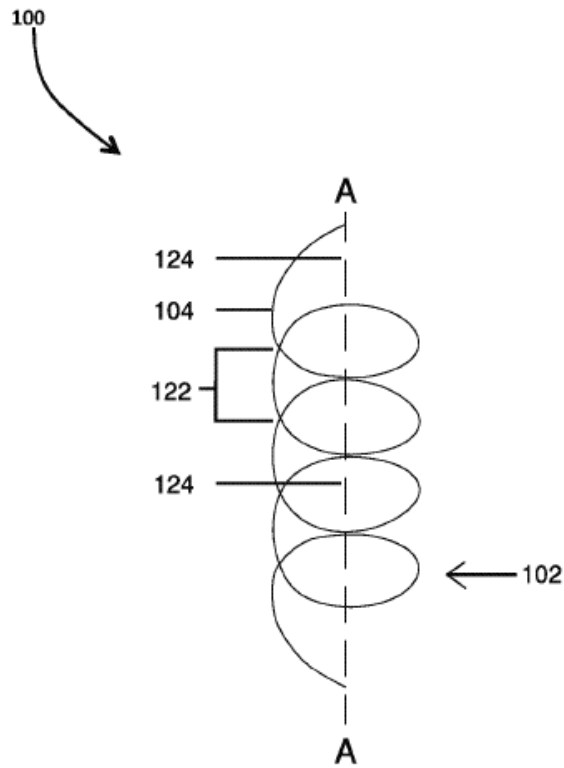


FIG. 1

Figure 1 depicts inductor 100 including coil 102 that may have a plurality of turns 122, which may be formed by a bend, fold, or arc in multi-layer wire 104 until multi-layer wire 104 completes a revolution around a central axis A-A of coil 102, such as around central axis point 124. *Id.* at 15:10–11, 16:31–35.

Figure 3A of the '046 patent, shown below, illustrates an example of a single turn circular coil with N layers. *Id.* at 12:32–33, 16:39–43.

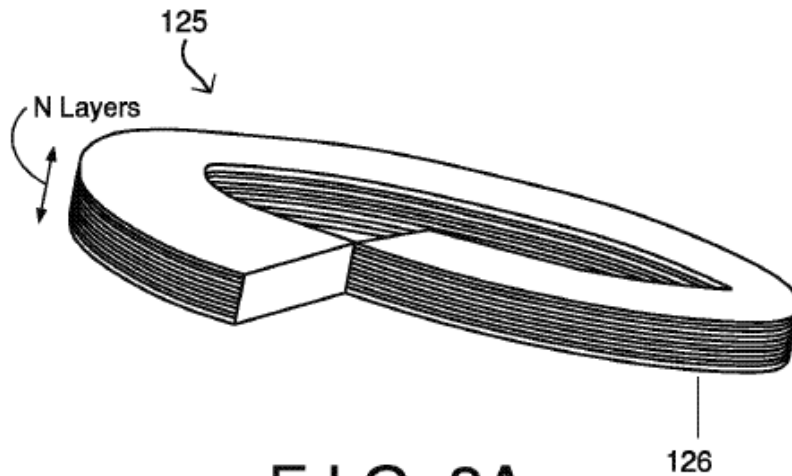


FIG. 3A

As shown in Figure 3A, inductor 125 can include a single turn circular coil having one or more layers 126. *Id.* at 16:39–43.

Figure 3B of the '046 patent, shown below, illustrates an example of a double turn circular spiral solenoidal coil. *Id.* at 12:34–36.

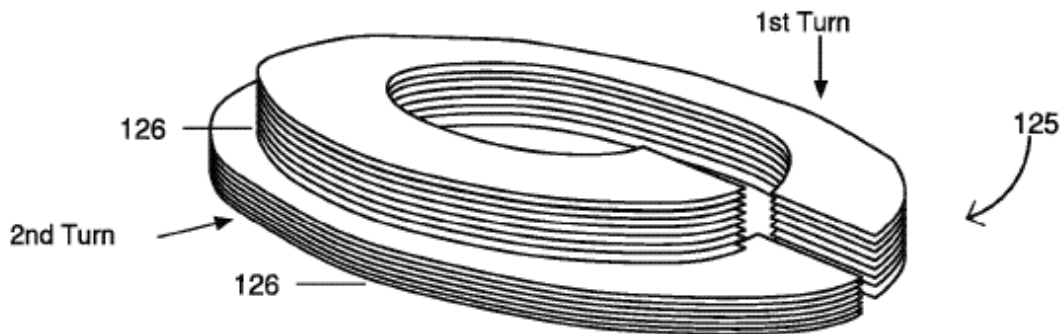


FIG. 3B

As depicted in Figure 3B, double turn inductor 125 may have two turns of a coil having one or more layers 126. *Id.* at 16:43–46.

Figure 4F of the '046 patent, shown below, depicts a rectangular cross-section of a multi-layer wire. *Id.* at 12:46–47.

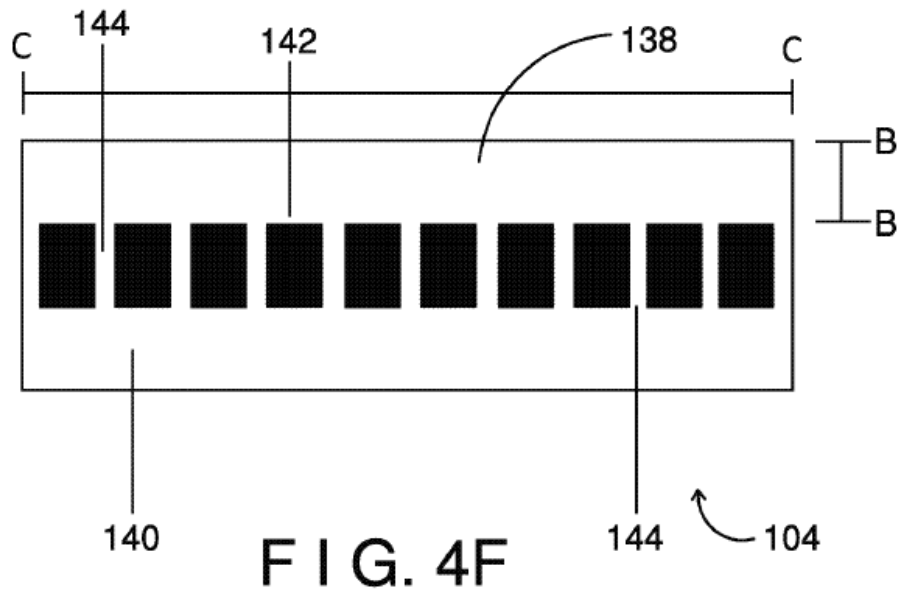


Figure 4F illustrates multi-layer wire 104 that can have first conductive layer 138 and second conductive layer 140 separated by insulating material 142. *Id.* at 17:7–14. Vias 144 traverse insulating material 142 to connect first conductive layer 138 and second conductive layer 140. *Id.* at 17:11–14.

C. Illustrative Claim

Petitioner challenges claims 1–3, 5–8, 10, 12, 13, 15–21, and 23–29 of the '046 patent. Independent claim 1 is illustrative of the challenged claims and is reproduced below:

1. A method of manufacturing an inductor structure, the method comprising the following steps:
 - providing a first conductor layer and a second conductor layer, the first conductor layer and the second conductor layer being electrically conductive;
 - positioning an insulator layer between the first conductor layer and the second conductor layer; and
 - connecting the first conductor layer and the second conductor layer in an electrically parallel connection with at least two connectors, each connector having an electrical impedance;

wherein, when an electrical current is propagated within at least the first conductor layer, a magnetic flux is generated within the inductor when a change occurs in at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current.

Ex. 1001, 33:15–30.

D. The Asserted Grounds of Unpatentability

Petitioner contends claims 1–8, 10, 12, 13, 15–21, and 23–29 of the '046 patent are unpatentable on the following grounds:

Reference(s)/Basis	35 U.S.C. § ²	Claims Challenged
Partovi ³ , Chiang ⁴	103(a)	1–3, 10, 15–21, 23–26, 28, 29
Partovi, Chiang, Tseng ⁵	103(a)	6, 7, 13
Partovi, Chiang, Phan ⁶	103(a)	8, 12, 26, 27
Partovi, Chiang, Hu ⁷	103(a)	5

In support of its unpatentability arguments, Petitioner relies on the declaration testimony of Dr. Steven Leeb. Ex. 1002.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the '960 patent was filed before March 16, 2013, the effective date of the relevant amendment, the pre-AIA version of § 103 applies.

³ US 2009/0096413 A1, published Apr. 16, 2009 (Ex. 1009).

⁴ US 7,248,138 B2, issued July 24, 2007 (Ex. 1023).

⁵ US 9,912,173 B2, issued Mar. 6, 2018 (Ex. 1022).

⁶ US 7,601,919 B2, issued Oct. 13, 2009 (Ex. 1029).

⁷ J. Hu & C.R. Sullivan, *AC Resistance of Planar Power Inductors and the Quasidistributed Gap Technique*, IEEE TRANSACTIONS ON POWER ELECTRONICS, 16:4 (July 2001), 558-67 (Ex. 1033).

II. ANALYSIS

A. *The Request for Rehearing*

In its pertinent part, 37 C.F.R. § 42.71(d) states:

The burden of showing a decision should be modified lies with the party challenging the decision. The request must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply.

Petitioner requests rehearing to address several issues with our Decision Denying Institution. Req. 1–13. First, Petitioner argues that “[t]he grounds of the instant Petition are not cumulative or redundant to the grounds in IPR2019-00859 (‘the ’859 proceeding’), which the Board instituted for the ’046 patent.” *Id.* at 2.

Second, Petitioner argues that “the instant Petition relies on the same primary reference (Partovi) and the same combinations of prior art references that are already of record and discussed in instituted proceedings IPR2019-00862 and -00863.” *Id.* at 10–11.

Third, Petitioner argues that “any burden on the Patent Owner can be further minimized by coordinating the depositions in these proceedings and holding a consolidated oral hearing.” *Id.* at 11.

Fourth, Petitioner argues that “the Administrative Procedure Act and due process weigh against denying institution under 35 U.S.C. § 314(a).” *Id.* at 12.

We have reviewed Petitioner’s Request and have carefully considered all the arguments presented. For the following reasons, we grant Petitioner’s Request for Rehearing and institute *inter partes* review.

By way of background, the Petition in this case was filed on March 22, 2019, and the Preliminary Response was filed on June 26, 2019.

Paper 1; Paper 8. Subsequently, a Trial Practice Guide Update was published in the Federal Register on July 16, 2019. Patent Trial Practice Guide, July 2019 Update, 84 Fed. Reg. 33,925 (July 16, 2019). The 2019 Trial Practice Guide Update provided, *inter alia*, that: “After the publication of this guide, it will be expected that petitioners will justify multiple petitions in the first instance in their petitions or in a separate paper with the petitions, and patent owners will respond in their preliminary responses or in a separate paper with their preliminary responses.” *Id.* at 27 n.4.⁸

On the same day the 2019 Trial Practice Guide Update issued, on July 16, 2019, we had a conference call with the parties to discuss their requests for additional briefing. Following this telephone conference, we issued an Order the following day, July 17, 2019, allowing the parties to brief issues raised during the call. Paper 9. The parties submitted a Reply and a Sur-Reply addressing, *inter alia*, the *General Plastic* factors and, briefly, the issue of whether the Board might find that only one petition should be instituted for the '046 patent. Reply 10, Sur-Reply 5–7; see *General Plastic Indus, Co. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 9–10 (PTAB Sept. 6, 2017) (precedential as to § II.B.4.i). The parties, however, spent the greater part of the Reply and Sur-Reply briefing the estoppel-related issues we discuss in the sections below. See generally Reply, Sur-Reply. Patent Owner indicated that it opposed further briefing by Petitioner on the issue of choosing between IPR petitions. Sur-Reply 6.

⁸ The same footnote provides that the Board “may continue to authorize such papers [i.e. an additional paper after the patent owner preliminary response to address the issues of identifying the similarities and differences between petitions] for petitions submitted before publication of this guide.” Trial Practice Guide Update, July 2019, 27 n.4 (cited in Reply 10).

Thus, in the Reply and Sur-Reply, the parties touched on the issue of choosing between IPR petitions, but not in an in-depth manner.

The Petition for IPR2019-00861 was, therefore, procedurally caught in an unusual place in time. As noted, the Petition was filed (March 22, 2019), and the Preliminary Response submitted (June 26, 2019), before promulgation of our 2019 Trial Practice Guide Update (July 16, 2019). At the time of filing, Petitioner could not have known of the guidance set forth in the 2019 Trial Practice Guide Update concerning multiple petitions. Although Petitioner “could, in theory, have filed a single petition including all of its grounds within the page limits,” Petitioner, acting on the guidance available to it at the time of filing, “determined that filing two separate IPR petitions allowed each asserted ground of unpatentability to be presented in a more clear and comprehensive manner.” Req. 4. Thereafter, the 2019 Trial Practice Guide Update issued on the same day as our conference call to discuss the parties’ requests for additional briefing (July 16, 2019), and these concurrent events would not have allowed the parties time to review and apply the guidance in a manner that would have permitted them to tailor their requests for additional briefing or their filing strategy to accommodate the newly-issued guidance. In the subsequent briefing by both parties, the impact of the 2019 Trial Practice Guide Update, although discussed briefly, was not the primary focus. *See generally* Reply; Sur-Reply. This is understandable, given the breadth of the complex estoppel issues raised in this case as well as the contemporaneous issuance of the guidance in the 2019 Trial Practice Guide Update.

Thus, on account of the timing of the Petition filed in this case relative to other events, and based on the reasoning presented by Petitioner in the

Request, which we discuss in more detail below, we are persuaded that we should reconsider whether to allow institution of *inter partes* review based on the arguments presented in the Petition.

The petition in IPR2019-00859, on which we instituted *inter partes* review, addresses Lee-based grounds rooted in anticipation (and obviousness over Lee and secondary references). IPR2019-00859, Paper 1. The petition in IPR2019-00861 addresses Partovi-based grounds rooted in obviousness. IPR2019-00861, Paper 1. In the Request, Petitioner argues that there is “almost no overlap” between the Partovi-based Petition in this case and Petitioner’s Lee-based petition in IPR2019-00859 (Req. 3), noting that “all grounds of the instant Petition rely on Partovi as the primary reference while the ’859 proceeding grounds rely on Lee as the primary reference” (*id.* at 2). In support, Petitioner provides a table depicting the various grounds presented in the two cases, and the differences between the two. *Id.* at 3. Petitioner also argues that “Partovi’s teachings are not redundant of Lee’s” because the references “disclose the claimed features of the ’046 patent in different ways.” *Id.* More particularly, Petitioner explains that “Lee is generally focused on an inductor structure” while “Partovi contains a more complete and clear disclosure of methods and circuitry for operating inductors,” which is important because the “dependent claims involve additional circuitry used in an inductor’s operation.” *Id.* at 4. Although Petitioner acknowledges that it “could, in theory, have filed a single petition including all of its grounds within the page limits,” Petitioner contends that “doing so would have resulted in a reduction in the thoroughness and completeness of the analysis presented due to the large number of challenged claims.” *Id.* Specifically, Petitioner argues that “NuCurrent

chose to assert 98 claims from four patents against Samsung in a parallel district court litigation” and that Petitioner had to file two petitions in order to address “the sheer number of claims at issue.” *Id.* at 5.

On this record, we are persuaded that Petitioner’s arguments concerning the differences between the petitions, and Petitioner’s reasons for presenting its arguments in two petitions, as it did, merit reconsideration of our denial of institution. The differences between the petitions in this instance, as explained by Petitioner, support its position that there is a need for the Partovi reference to distinctly address certain limitations of the dependent claims. The number of claims asserted against Petitioner in corresponding litigation, as well, is a factor enumerated in the 2019 Trial Practice Guide Update as a circumstance in which more than one petition may be necessary. 2019 Trial Practice Guide Update, 26 (“circumstances in which more than one petition may be necessary” include “when the patent owner has asserted a large number of claims in litigation”). We note again that although Patent Owner was authorized to file a ten-page response to Petitioner’s Request (Dec. 5), in which it could have addressed, *inter alia*, Petitioner’s arguments about the differences between these Petitions or the number of claims at issue, Patent Owner did not file a response to the Request, leaving Petitioner’s contentions regarding rehearing undisputed on the present record.

Finally, as noted by Petitioner, “the Board has already instituted two other petitions (IPR2019-00862, -00863) whose grounds and claims extensively overlap with those in the instant petition.” Req. 2. We note that the patents challenged in IPR2019-00862 (U.S. Patent No. 8,710,948) and IPR2019-00863 (U.S. Patent No. 8,698,591) are different than the patent

challenged in IPR2019-00859 and IPR2019-00861. *Id.* at 6. The Petitions in IPR2019-00862 and IPR2019-00863, however, also rely primarily on Partovi as a reference. IPR2019-00862, Paper 1; IPR2019-00863, Paper 1. The Petitioner further notes that all the subject patents have identical specifications, and the '046 patent's claims "extensively overlap with the claims of the instituted '948 and '591 patents." Req. 6. Petitioner presents further evidence in support of its argument that "the instant Petition relies on the same primary reference (Partovi) and essentially the same combinations of prior art references that are already of record and discussed in instituted proceedings IPR2019-00862 and -00863." *Id.* at 10–11. The instant petition does, as Petitioner notes, also rely on Hu in its challenge as to claim 5. *Id.* Although whether a petition will place a substantial and unnecessary burden on the Board or the patent owner is not necessarily, on its own, dispositive of whether to institute *inter partes* review on a second petition, we find that in this case, the fact that we have instituted *inter partes* review in IPR2019-00862 and IPR2019-00863 lessens the burden on the Board and Patent Owner. In IPR2019-00862 and IPR2019-00863, we will be analyzing the same primary reference, the same specification, many of the same secondary references, and what we anticipate to be very similar arguments from the parties. Thus, due to this additional unusual circumstance, we would not be unduly burdened if we were to institute *inter partes* review in this case.

We do not find that we need to reach Petitioner's fourth argument, given our treatment and disposition of Petitioner's earlier arguments and requests for relief.

B. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art of the '046 patent “would have had at least a Bachelor’s degree in electrical engineering, or a similar discipline and at least two years additional relevant experience with power electronics, including design or manufacturing of inductors,” but that “[m]ore education can supplement practical experience and vice versa.” Pet. 6 (citing Ex. 1002 ¶¶ 15–16).

On this record, we adopt Petitioner’s definition of the level of ordinary skill at this stage of the proceeding. We further note that the prior art itself demonstrates the level of skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that “specific findings on the level of skill in the art . . . [are not required] ‘where the prior art itself reflects an appropriate level and a need for testimony is not shown’” (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

C. Claim Construction

We apply the claim construction standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). *See Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100 (2019)). Under *Phillips*, claim terms are generally afforded “their ordinary and customary meaning,” read “in the context of the entire patent, including the specification.” *Phillips*, 415 F.3d at 1312–13. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in

question at the time of the invention.” *Id.* at 1313. Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Petitioner contends that “no express constructions of the claims are necessary to assess whether the prior art reads on the challenged claims.” Pet. 9 (citing Ex. 1002 ¶ 37). Patent Owner also declines to address the construction of the claims. *See generally* Prelim. Resp.

We decline to construe any claim term of the ’046 patent because it is not necessary to do so in reaching our decision that Petitioner has established a reasonable likelihood that it would prevail in establishing the unpatentability of at least one challenged claim.

D. Patent Owner’s Arguments

1. Background

Patent Owner asserts that, after representatives for Patent Owner and Petitioner initially met and expressed interest in a business relationship, Patent Owner asked for a confidentiality agreement. Prelim. Resp. 3. After executing a first confidentiality agreement, the parties signed a second Mutual Non-Disclosure Agreement (“the NDA”) in 2016, which included the following forum selection clause:

This Agreement shall be construed in accordance with and all disputes hereunder shall be governed by the laws of the State of New York, without giving effect to any choice of law principles that would require the application of the laws of a different country or state. Any legal action, suit or proceeding arising out of or relating to this Agreement or the transactions contemplated hereby must be instituted exclusively in a court of competent jurisdiction, federal or state, located within the Borough of

Manhattan, City of New York, State of New York and in no other jurisdiction.

Id. at 4 (quoting Ex. 2001⁹ ¶ 15). Patent Owner argues that the forum selection clause “explicitly covers proceedings relating to ‘the transactions contemplated hereby.’” *Id.*

According to Patent Owner, relations between the parties deteriorated and Patent Owner brought a complaint for misappropriation of trade secrets and patent infringement against Petitioner in the Eastern District of Texas. *Id.* at 5 (citing Ex. 2003). Petitioner filed a Motion to Transfer that case to New York, arguing that Patent Owner’s causes of action fell within the scope of the NDA’s forum selection clause. *Id.* at 6–7 (citing Ex. 2005, 1; Ex. 2012, 11).

The Eastern District of Texas agreed to transfer the case to the Southern District of New York on January 28, 2019. *Id.* at 7–8. Subsequently, Petitioner filed this petition, along with five others. *Id.* at 8. Patent Owner filed a motion for preliminary injunction in the Southern District of New York to request that the district court order Petitioner to withdraw its petitions, citing the Federal Circuit’s decision in *Dodocase VR, Inc. v. MerchSource, LLC*, No. 2018-1724, 2019 WL 1758481, at *3 (Fed. Cir. Apr. 18, 2019). *Id.* at 8–9 (citing Ex. 2007). The SDNY district court denied Patent Owner’s motion for preliminary injunction. Reply 5–6 (citing Ex. 1042, 9–10); Ex. 1042 (*NuCurrent, Inc. v. Samsung Elecs Co.*, No. 19-CV-798 (DLC) (S.D.N.Y. July 22, 2019) (Docket No. 212)).

⁹ Patent Owner cites Ex. 2005 but this appears to be an inadvertent typographical error because paragraph 15 of Exhibit 2001 (the NDA) includes this language.

Notably, as Petitioner represents, “the district court (with NuCurrent’s consent) has also stayed the infringement litigation (except for certain ongoing discovery) pending the resolution of the IPR proceedings before the Board. *See NuCurrent, Inc. v. Samsung Elecs Co.*, No. 19-CV-798 (DLC) (S.D.N.Y. July 22, 2019) (Docket No. 216); Reply 9.

2. *Forum Selection Clause*

Patent Owner contends that, due to issue preclusion, the forum selection clause of the NDA applies to this proceeding. Prelim. Resp. 14. Specifically, Patent Owner argues that the parties litigated the forum selection clause issue before the Eastern District of Texas, which resulted in transfer to the Southern District of New York. *Id.* (citing Ex. 2006). Patent Owner contends that issue preclusion forecloses Petitioner from bringing an invalidity challenge in any forum other than the Southern District of New York. *Id.* (citing *Jet, Inc. v. Sewage Aeration Sys.*, 223 F.3d 1360, 1366 (Fed. Cir. 2000) (reviewing the four factors for issue preclusion: (1) identity of the issues in a prior proceeding; (2) the issues were actually litigated; (3) the determination of the issues was necessary to the resulting judgment; and (4) the party defending against preclusion had a full and fair opportunity to litigate the issues)).

For the first factor (i.e., whether the issue is the same as in the prior proceeding), Patent Owner asserts that the forum selection clause issue is the same as in the prior proceeding because the Eastern District of Texas determined that Petitioner’s asserted affirmative defenses of invalidity are compulsory counterclaims to the patent infringement litigation arising out of and relating to the NDA. *Id.* at 14–16 (citing Ex. 2005; Ex. 2015; *Critical-*

Vac Filtration Corp. v. Minuteman Int’l, Inc., 233 F.3d 697, 704 (2d Cir. 2000)).

Patent Owner contends that the remaining three factors (i.e., whether the issue has been actually litigated, whether the determination of the issue was necessary for the resulting judgment, and whether the party defending against preclusion had a full and fair opportunity to litigate the issues) are largely coextensive because Petitioner pursued enforcement of the forum selection clause and now tries to defend against it. *Id.* at 14, 16. In sum, Patent Owner contends Petitioner’s arguments before the Eastern District of Texas, and subsequent determinations by the New York district court, satisfy the “actually litigated” issue and the “full and fair opportunity” factors, and determining whether the forum selection clause was enforceable and applicable was necessary to the resulting judgment. *Id.* at 16–17 (citing Ex. 2005; Ex. 2006; Ex. 2010).

Patent Owner argues that matters of issue preclusion apply equally to an Article I tribunal and an Article III court. *Id.* at 17 (citing *B&B Hardware, Inc. v. Hargis Indus., Inc.*, 135 S. Ct. 1293, 1305 (2015); *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004)).

In its Sur-Reply, Patent Owner argues that issue preclusion and judicial estoppel are jurisdictional questions, not affirmative defenses. Sur-Reply 1 (citing *Chisolm v. United States*, 82 Fed. Cl. 185, 194 (2008), *aff’d*, 298 F. App’x 957 (Fed. Cir. 2008)). Patent Owner argues that, although the Board has previously declined to evaluate preclusion and estoppel, the Board is obligated to resolve jurisdictional defenses, just as an Article III court must. *Id.* at 2–3 (citing *Chisolm*, 82 Fed. Cl. at 194; *Henderson ex rel. Henderson v. Shinseki*, 562 U.S. 428, 434 (2011)). Patent Owner further

contends that, if Petitioner were correct that the Board has no authority to resolve facts and adjudicate issue preclusion and judicial estoppel defenses, it would follow that the Board cannot determine its own jurisdiction when a matter involves these issues. *Id.* at 4–5 (citing Reply 8; *Henderson*, 562 U.S. at 434).

As Petitioner notes, we have consistently held that equitable estoppel defenses, including contractual estoppel based on a forum selection clause, are not a proper basis to deny institution. Reply 1–3 (citing *Dot Hill Sys. Corp. v. Crossroads Sys., Inc.*, IPR2015-00822, Paper 18 at 7–8 (PTAB Sept. 17, 2015); *Bally Gaming, Inc. v. New Vision Gaming & Dev., Inc.*, CBM2018-00006, Paper 47 at 7–8 (PTAB June 19, 2019); *Athena Automation Ltd. v. Husky Injection Molding Sys. Ltd.*, IPR2013-00290, Paper 18 at 13 (PTAB Oct. 25, 2013) (precedential)). As Petitioner further notes, we have applied this reasoning to contractual estoppel defenses and have expressly declined to consider forum selection clauses. *Id.* at 3–4 (citing *Dot Hill*, IPR2015-00822, Paper 18 at 7–8; *Esselte Corp. v. Dymo*, IPR2015-00779, Paper 13 at 7 (PTAB Aug. 28, 2015); *Bally Gaming*, CBM2018-00006, Paper 47 at 7–8). Congress “has demonstrated that it will provide expressly for the application of equitable defenses when it so desires,” and has “explicitly provided for estoppel in limited, defined circumstances,” such as for estoppel based on a party’s previous challenge to the same patent, but Congress did not provide for contractual estoppel as a defense to unpatentability in an AIA proceeding. *Esselte*, IPR2015-00779, Paper 13 at 4–7 (citing 35 U.S.C. § 315(e)). Therefore, we determine that Patent Owner’s arguments based on the forum selection clause do not provide a basis for us to deny institution of the Petition.

Even if equitable estoppel doctrines were defenses to an *inter partes* proceeding, on this record, it appears that Patent Owner litigated these issues in the Southern District of New York and lost. Reply 1–2, 5; Ex. 1042, 9 (Opinion and Order on NuCurrent’s motion for a preliminary injunction ordering Samsung to request permission from the Board to withdraw its IPR petitions). The New York district court rejected Patent Owner’s argument that Petitioner was barred by the forum selection clause and by Petitioner’s arguments before the Texas district court from requesting an *inter partes* review. Ex. 1042, 9–10. The New York district court held that Patent Owner did not show that the claims at issue in the *inter partes* petitions were subject to the forum selection clause, the NDA expired more than a year before Petitioner filed its petitions with the Board, and the petitions do not relate to the surviving confidentiality obligations. *Id.* The New York district court further found that the presumption that forum selection clauses survive the expiration of the contract containing them was “insufficient to overcome the expressed intent of the parties,” because “NuCurrent and Samsung elected not to retain in the NDA language from the MCA [Mutual Confidentiality Agreement] that expressly provided for the survivability of the forum selection clause.” *Id.* at 10. Finally, the New York district court found that Samsung did not brief, and the Texas district court did not decide whether the NDA’s forum selection clause could apply to *inter partes* proceedings that are (a) unrelated to a disclosure of confidential information, and (b) filed after the expiration of the NDA, and thus the Texas district court did not decide whether Petitioner was barred from requesting *inter partes* review. *Id.* at 11–12.

These findings by the New York district court are sufficiently definitive, in our opinion, regardless of whether the Board has jurisdiction to consider the same issues. To the extent that Patent Owner argued to the New York district court that proceedings before the Board were improper on the basis of issue preclusion grounded on the Texas district court's decision, the decision by the New York district court addressing the Board proceedings, and distinguishing them from the proceedings at issue in the Texas district court, supports the propriety of Board proceedings, including the *inter partes* review sought by Petitioner. *Id.* at 9–12. Moreover, Patent Owner fails to address squarely how the Board, on this record, is required to resolve facts or adjudicate the issue of preclusion and judicial estoppel defenses. *See generally* Prelim. Resp.; Sur-Reply. While Patent Owner relies on “competing district court decisions, . . . creat[ing] a number of unresolved factual and legal questions” (Sur-Reply 4), it fails to set forth any such questions with any particularity that remain after the New York district court's determination that Petitioner was free to request *inter partes* review. With the New York district court proceeding stayed, and given the New York district court's determinations regarding the coextensive issues brought before it by Patent Owner, we see no reason that we should reconsider the determinations of that court in our evaluation of the Petition before us.

3. *Dodocase*

Patent Owner argues that *Dodocase* controls the outcome of Petitioner's challenges to Patent Owner's patents. Prelim. Resp. 18 (citing *Dodocase VR, Inc.*, 2019 WL 1758481 at *1). According to Patent Owner, *Dodocase* filed a complaint seeking an injunction against MerchSource to prevent the cessation of royalty payments under a Master License

Agreement and seek a declaratory judgment; MerchSource subsequently filed petitions before the Board; and Dodocase responded with a motion for preliminary injunction to require withdrawal of the petitions. *Id.* at 18–19 (citing *Dodocase VR, Inc.*, 2019 WL 1758481 at *1). Also, according to Patent Owner, the district court granted the preliminary injunction and ordered MerchSource to attempt withdrawal of its petitions, and the Federal Circuit, on appeal, determined the parties could not pursue validity challenges before the Board. *Id.* at 19–20 (citing *Dodocase VR, Inc.*, 2019 WL 1758481 at *1–2). Patent Owner asserts that *Dodocase* is binding on the Board, absent a reversal. *Id.* at 20.

Patent Owner argues that the Texas district court’s decision regarding the forum selection clause supports denying institution, and that it does not require any contract interpretation by the Board. *Id.* at 21–23. Patent Owner also asserts that the forum selection clause meets requirements for enforcement under the applicable law (*id.* at 23–25), that Petitioner waived its right to challenge the validity of the patent before the Board (*id.* at 26–29), and that the forum selection clause has not expired (*id.* at 29–31).

Petitioner responds that *Dodocase* does not foreclose the *inter partes* challenges because *Dodocase* involved a patent license agreement with a clause “in which the licensee agreed not to challenge the patents.” Reply 8 n.4 (quoting Ex. 1042, 12 n.4). Petitioner argues the NDA does not grant such a license and thus the Petition does not relate to the underlying agreement and its forum selection clause. *Id.*

Petitioner further argues that a patent owner can ask a district court to issue a preliminary injunction prohibiting a petitioner from filing an *inter partes* petition or requiring one to be withdrawn. *Id.* at 7–8 (citing

Dodocase, 767 F. App'x 930 (Fed. Cir. 2019)). Petitioner argues that Patent Owner tried this, but failed. *Id.* at 8.

We refer again to the New York district court's analysis of the similar issues brought by Patent Owner in that venue. As noted above, the New York district court determined that the claims asserted in the IPR petitions are not subject to the forum selection clause. Ex. 1042, 9. The New York district court also evaluated Patent Owner's reliance on *Dodocase*, stating that "Dodocase is an unpublished opinion; it is not precedential. In any event, the forum selection clause in Dodocase was contained within a licensing agreement that included a clause in which the licensee agreed not to challenge the patents." *Id.* at 12 n.4. Similarly, the New York district court determined that the forum selection clause was not breached when Petitioner filed IPR petitions after the expiration of the NDA. *Id.* at 11. In view of the New York district court's analysis and reasoning on this issue, we find that we need not engage in further contract interpretation.

4. Estoppel from Disputing Applicability of Forum Selection Clause

Patent Owner asserts that Petitioner made statements to achieve its goal of transferring litigation to the Southern District of New York, these statements are binding upon Petitioner, and that Petitioner is judicially estopped from controverting these statements before the Board. Prelim. Resp. 31–32. Patent Owner contends that the Board is bound by judicial estoppel and should decline institution because Petitioner has waived its right to request the Board to exercise its jurisdiction. *Id.* at 32 (citing *Trustees in Bankr. of N. Am. Rubber Thread Co. v. United States*, 593 F.3d

1346, 1354 (Fed. Cir. 2010); *Bartels by & through Bartels v. Saber Healthcare Grp., LLC*, 880 F.3d 668, 681 (4th Cir. 2018)).

As noted above, Petitioner responds by arguing that the Board has consistently held that equitable estoppel defenses, including contractual estoppel based on a forum selection clause, are not a proper basis to deny institution. Reply 1–3. With regard to judicial estoppel, Petitioner asserts that the Board has already held that judicial estoppel is not a defense to *inter partes* review. *Id.* at 5 (citing *CeramTec GmbH v. CeraMedic, LLC*, IPR2015-01328, Paper 23 at 15 (PTAB Dec. 16, 2015)). Petitioner further contends that Petitioner never argued, when moving to transfer litigation from the Texas district court, that the forum selection clause was broad enough to cover *inter partes* review. *Id.* at 7 (citing Ex. 1042, 11–12).

As discussed above, Patent Owner responds that issue preclusion and judicial estoppel are jurisdictional questions, not affirmative defenses. Sur-Reply 1 (citing *Chisolm*, 82 Fed. Cl. at 194).

As Petitioner correctly notes, we have held that judicial estoppel is not a defense to *inter partes* review. *CeramTec*, Paper 23 at 15, *cited in* Reply 1. We are not persuaded that any of the arguments presented by Patent Owner give us a reason to reevaluate the Board’s position on judicial estoppel in this matter, because we are not aware of any reasons this set of facts differs materially from other situations in which we have declined to apply judicial estoppel or other estoppel-based arguments.

As we indicated above, the findings by the New York district court are sufficiently definitive, in our opinion, regardless of whether the Board has jurisdiction to consider the same issues. With the New York district court proceeding stayed, and with the New York district court’s

determinations regarding the issues brought before it by Patent Owner in the record, we see no reason that we should not respect the determinations of that court in proceeding to evaluate the Petition before us.

5. *Allegedly Inconsistent Statements by Petitioner*

Patent Owner also argues Petitioner did not inform the Board of the history between the parties, that there was a relevant forum selection clause, or that Petitioner had previously sought enforcement of the forum selection clause in another forum. Prelim. Resp. 32–33. Patent Owner asserts Petitioner “has acted inconsistently with its previous filing before the Texas Court and in violation of its duty of candor” and Petitioner should not be permitted to benefit from its inconsistent actions and statements regarding the forum selection clause. *Id.* at 33 (citing 37 C.F.R. §§ 42.11(a), 42.12).

According to Patent Owner, Petitioner also argued before the Southern District of New York that the *inter partes* proceeding is merely a vehicle to define the scope of the prior art. *Id.* at 33–34 (citing Ex. 2008, 1). Patent Owner contends, however, that the purpose of an *inter partes* proceeding is to cancel one or more claims of a patent and, if the petition were merely an attempt to define the scope of the prior art, the Board would not have jurisdiction. *Id.* at 34. In view of these purportedly inconsistent statements, Patent Owner argues the Board should deny institution. *Id.*

Petitioner contends that it did not brief, and the Texas district court did not decide, whether Petitioner was barred from requesting *inter partes* review (i.e., whether the NDA’s forum selection clause could apply to *inter partes* proceedings unrelated to a disclosure of confidential information and filed after the expiration of the NDA). Reply 6–7 (citing Ex. 2006, 23; Ex. 1042, 11–12; Ex. 2008, 18–20). According to Petitioner, for these

reasons, Patent Owner's allegations of inconsistency are meritless. *Id.* at 7 n.3.

We are not persuaded by Patent Owner's argument that we should exercise our discretion to not institute *inter partes* review on the basis of Petitioner's allegedly inconsistent statements. As noted by Petitioner, the question of whether Petitioner is barred from requesting *inter partes* review was not decided by the Texas district court. Reply 7. Moreover, the New York district court indicated by denying the preliminary injunction, and by staying the district court proceeding, that Petitioner was not precluded from pursuing petitions for *inter partes* review. Ex. 1042; Reply 9 (citing *NuCurrent, Inc. v. Samsung Elecs Co.*, No. 19-CV-798 (DLC) (S.D.N.Y. July 22, 2019) (Docket No. 216)). Accordingly, we are not persuaded that Petitioner's statements made to the two district courts require us to exercise our discretion to deny *inter partes* review.

6. 35 U.S.C. § 314(a)

Patent Owner contends that this petition and that of IPR2019-00859 were filed on the same day, by the same petitioner, and challenge the same claims of the same patent with art and arguments that are not substantially different. Prelim. Resp. 35. Patent Owner asserts that the Lee and Partovi prior art references were known at the time the petitions were filed because both references were cited in this proceeding, while Petitioner used each as primary references in the two proceedings. *Id.* at 35–36 (citing *General Plastic*, Paper 19 at 9–10. Patent Owner argues the Board has declined to institute serial petitions in such situations. *Id.* at 36 (citing *Comcast Cable Communications, LLC v. Rovi Guides, Inc.*, IPR2019-00232, Paper 14 at 11–12 (PTAB May 20, 2019)).

Patent Owner further argues that Petitioner has made no effort to show that Lee and Partovi teach substantially different features, noting that these references are used in grounds challenging claims, including the challenge to claims 1–3, 5–8, 10, 15–21, and 23–29 as anticipated by Lee, and that Petitioner has not proffered different claim constructions in the proceedings. *Id.* at 36–37. Patent Owner asserts there are cumulative pleadings that force Patent Owner and the Board to analyze a plurality of references. *Id.* at 37–38. Patent Owner argues the six total filings by Petitioner against Patent Owner’s patents implicate the *General Plastic* factors regarding the Board’s resources, fairness to the Patent Owner, and the statutory one year deadline for a final determination. *Id.* at 38. In view of this, Patent Owner requests that, at a minimum, Petitioner be ordered to choose its best argument for review, and Patent Owner further requests that if the Board considers institution, Petitioner be required to choose between its proceedings. *Id.* at 38–39.

Petitioner argues that the Petition comports with the requirements of *General Plastic*. Reply 10. Petitioner argues that while there are six petitions for four patents, Patent Owner has asserted more than 80 claims against Petitioner. *Id.* Petitioner contends that the same primary reference (i.e., Partovi) and very similar analysis is used in four petitions and the same primary reference (i.e., Lee) and very similar analysis is used in the other two petitions. *Id.* Based on this, Petitioner asserts that the added burden on Patent Owner and the Board is minimal, and forcing Petitioner to choose between the two petitions for the ’046 patent would hinder Petitioner’s ability to mount an adequate challenge. *Id.*

Patent Owner responds that Petitioner's Petition is a serial petition and Petitioner's argument regarding overlap between petitions acknowledges that the Petition is a transparent attempt to circumvent page limits. Sur-Reply 5–6.

As discussed above in our discussion of Petitioner's Request for Rehearing, on this record, we do not agree that proceeding to trial would be an inefficient use of Board resources. The number of Patent Owner's patents that are being challenged is not a reason to deny institution. "[R]ecogniz[ing] the potential for abuse of the review process by repeated attacks on patents," the Board has enumerated factors that guide its discretion as to whether to deny institution under § 314(a), "especially as to 'follow-on' petitions challenging the same patent as challenged previously in an IPR . . . proceeding." Trial Practice Guide Update 9 (August 2018) (quoting *General Plastic*, slip op. 16–17). Although a multiplicity of grounds relying on a number of principal references addressed in a number of separate petitions may raise concerns regarding fairness in some instances, we find no such concerns here, for largely the same reasons articulated above with respect to our disposition of the Request for Rehearing.

In these circumstances, as discussed above, we are not persuaded that defending against both challenges is unfair, abusive, or unduly burdensome for Patent Owner. Accordingly, we decline to exercise our discretion to deny institution under 35 U.S.C. § 314(a). See *Comcast Cable Communications, LLC v. Veveo, Inc.*, IPR2019-00237, Paper 15 at 14–15 (PTAB Jul. 5, 2019) (instituting *inter partes* review on two petitions addressing the same patent).

E. Asserted Obviousness over Partovi in view of Chiang

Petitioner challenges claims 1–3, 10, 15–21, 23–26, 28, and 29 as unpatentable for obviousness over Partovi in view of Chiang. Pet. 10–64.

1. Partovi

Partovi is a patent application publication titled “System and Method for Inductive Charging of Portable Devices.” Ex. 1009, at [54]. Figure 2 of Partovi, shown below, depicts an embodiment of a circuit diagram. *Id.* ¶ 17.

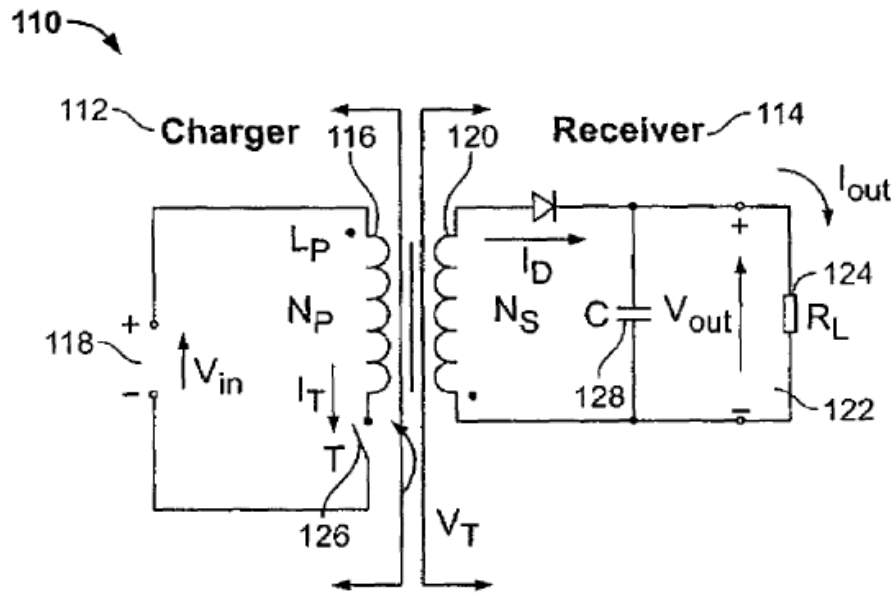


FIG. 2

Figure 2 illustrates an inductive power transfer system 110 that includes charger 112 having power source 118 and switch T 126 that switches at an appropriate frequency to generate an AC voltage across primary coil 116 of the charger, which generates an AC magnetic field. *Id.* ¶ 117. This field generates a voltage in a coil 120 of a receiver 114, which provides power 122 to a load 124. *Id.*

Partovi discloses that a mobile device charger can provide power and the mobile device can regulate that power. *Id.* ¶ 119. Further, the mobile device or battery charger or power supply, after exchanging information with the mobile device or battery, can determine the appropriate charging/powering conditions for the mobile device, and power the mobile device with the appropriate parameters. *Id.* For instance, the value of the voltage for the mobile device charger can be set. *Id.* In another example, the duty cycle of the charger switching unit or its frequency can be changed to modify the voltage in the mobile device or battery, or a combination of these exemplary approaches can be used. *Id.*

Partovi discloses that coils can be stacked to achieve higher flux densities. *Id.* ¶ 212. Partovi discloses that a coil is constructed with two or more layers, such as by using two or more layers of printed circuit board (“PCB”) to allow compact fabrication of high flux density coils. *Id.* Figure 18 of Partovi, shown below, illustrates a means of stacking coils. *Id.* ¶ 33.

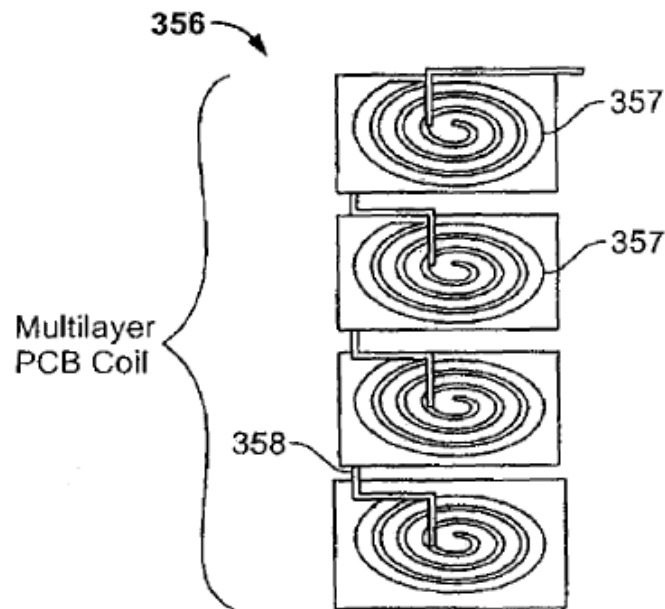


FIG.18

Figure 18 depicts multi-layer PCB coil 356 that is created via separate PCB layers 357 manufactured together via common techniques used in PCB fabrication with connections 358 (e.g., a via or contact). *Id.* ¶ 224. Partovi teaches that this technique permits the use of a wide, low resistance coil, but the overall width of the coil is not increased, and the coil can create higher flux densities with more efficient power transfer. *Id.*

Partovi discloses that Printed Circuit Board Coils (“PCBC’s”) are printed on rigid or flexible PCB material or stamped out of sheets of copper or other methods. *Id.* ¶ 248. Partovi also teaches that the dimensions (e.g., thickness, width, and number of turns) of a coil in each layer can be altered and multiple layers can be stacked to adjust the resistance, inductance, flux density, and coupling efficiency of the coils so they are optimized for a particular application. *Id.* ¶ 212. According to Partovi, the

coils can be formed in any number of different shapes and can be distributed in layers of coils, spirals, and other various shapes. *Id.* ¶ 225.

Partovi discloses that when a charger or power supply are separable from a receiver (e.g., for inductive charging of devices) the charger or power supply can include basic control and switching functions while the receiver includes devices for smoothing output voltage. *Id.* ¶ 260. Partovi teaches that these separable parts need to communicate wirelessly with each other. *Id.* Figure 28 of Partovi, shown below, depicts a charger in which a primary stage and a receiver stage communicate wirelessly. *Id.* ¶ 43.

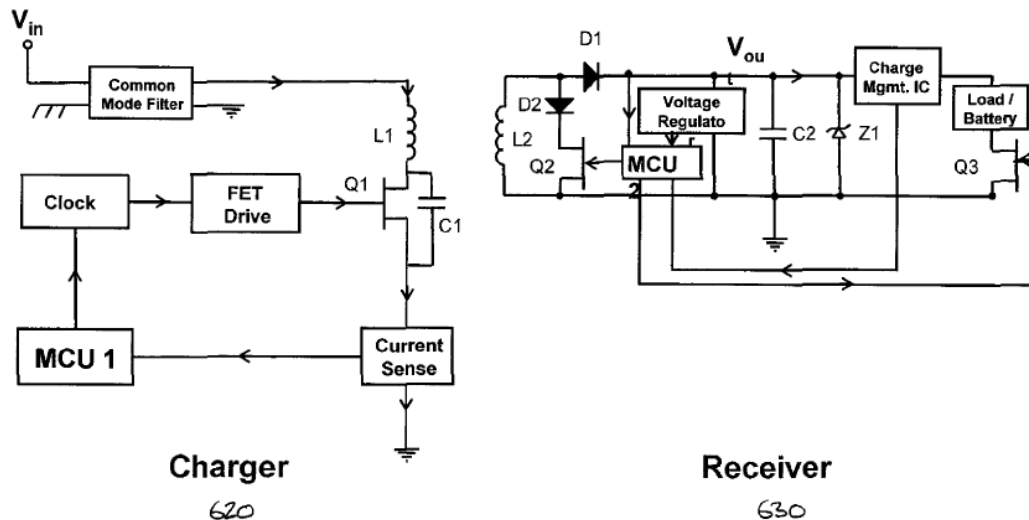


Figure 28

Figure 28 shows charger or power supply 620, which is controlled by Micro Control Unit (MCU1) that receives signals from a current sensor. *Id.* ¶ 261, Fig. 28. Partovi further discloses that charger or power supply 620 and receiver 630 communicate through the coil used for power transfer. *Id.* Partovi states that the operating frequency of the circuit can be 1–2 MHz and data transmission for control is at 14.4 kbits/sec. *Id.* ¶ 265.

2. Chiang

Chiang is a patent titled “Multi-Layer Printed Circuit Board Inductor Winding With Added Metal Foil Layers.” Ex. 1023, at [54]. Chiang relates to electromagnetic components for electric circuits, such as inductors and transformers, and to the formation of one or more winding turns of an inductor using a multi-layer PCB. *Id.* at 1:7–10.

Figure 3 of Chiang, shown below, is an exploded view of an inductor in which a PCB has six layers and the inductor has two turns. *Id.* at 4:20–22.

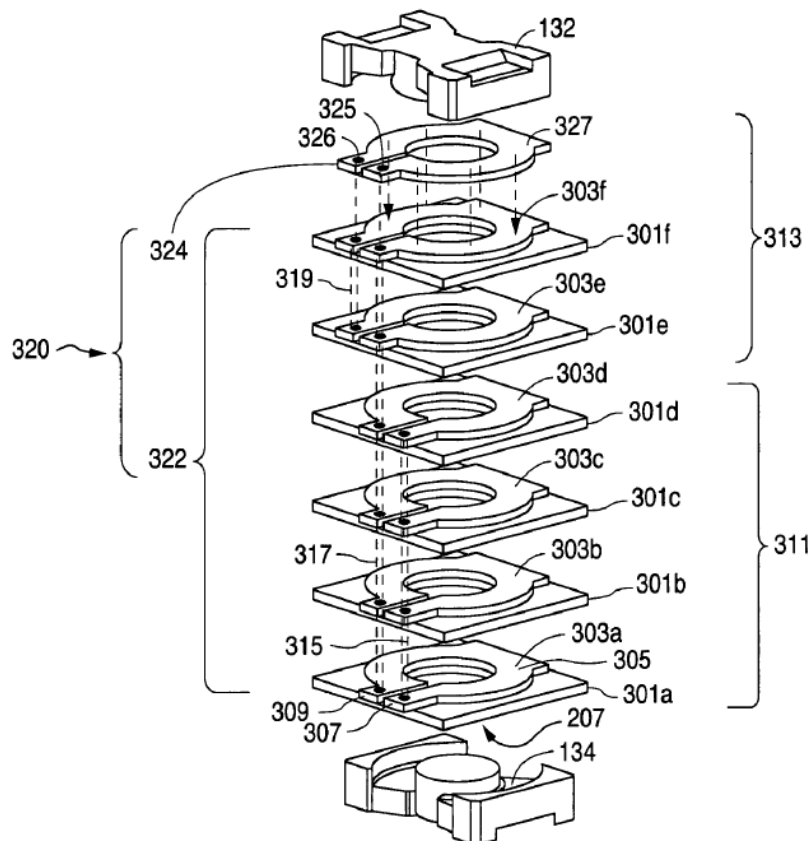


FIG. 3

Figure 3 illustrates winding 320 that includes conducting layers 324 and multi-layer PCB 322 that are connected and form first turn 311 of the

winding 320, which includes four PCB layers, while second turn 313 includes two PCB layers. *Id.* at 6:19–27. The multi-layer PCB 322 further includes six alternating insulating layers 301 and conducting layers 303 with conducting layer 324 soldered to one of the layers 303. *Id.* at 6:27–30. Chiang discloses that each conducting layer 303 has a curved portion 305 terminating in a first end 307 and a second end 309 with ends 307, 309 interconnected through the insulating layers 301 by one or more plated through holes (indicated by dashed lines in Fig. 3). *Id.* at 6:30–40. Chiang teaches that the plated through holes are preferably formed as plated microvias to increase conductivity of the conductor between conductive traces of adjacent layers of the PCB 322. *Id.* at 6:45–48.

Chiang discloses that PCB traces can all be connected in series to form a winding so that each trace is a separate turn of the winding. *Id.* at 1:57–59. Chiang also discloses that two or more traces can be connected in parallel to decrease the impedance of a particular winding turn. *Id.* at 62–64.

Figure 5 of Chiang, shown below, is a circuit diagram of the embodiment of Figure 3. *Id.* at 4:24.

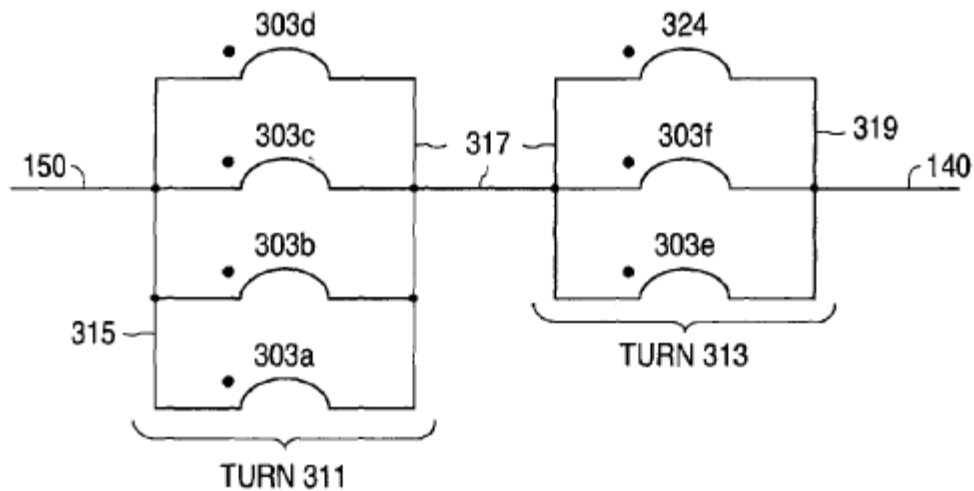


FIG. 5

Figure 5 shows that a winding can have first turn 311 formed by conducting layers 303a–303d wired in parallel and second turn 313 formed by conducting layers 303d–303f and layer 324 wired in parallel. *Id.* at 7:5–10. Chiang discloses plated through holes 315, 317, 319, which are shown schematically in Figure 5. *Id.* at 7:10–12.

3. Petitioner's Contentions

Petitioner argues that claims 1–3, 10, 15–21, 23–26, 28, and 29 would have been obvious over the combination of Partovi and Chiang. Pet. 10–64.

Independent Claim 1

Petitioner asserts that Partovi discloses a method of manufacturing an inductor structure because Partovi's coil 116 in Figure 2 is used in an inductive power transfer system 110 that includes charger 112 having primary coil 116, power source 118, and switch 126. Pet. 10–11 (citing Ex. 1009, at [57], ¶¶ 13, 91, 117–119, Fig. 2; Ex. 1002 ¶¶ 38–43, 46, 47). Petitioner argues that the combination of Partovi and Chiang discloses how to construct the primary coil 116 for the reasons that will be discussed below. *Id.* at 12.

Petitioner contends that Partovi discloses a coil, such as the primary coil 116 in Figure 2, which can be constructed with two or more layers, such as by using two or more layers of printed circuit board. *Id.* at 12–13 (citing Ex. 1009 ¶¶ 117, 212, 224, Fig. 18; Ex. 1002 ¶¶ 48–81). Petitioner identifies the top layer 357 in Partovi’s Figure 18 as a first conductor layer. *Id.* at 13 (citing Ex. 1009, Fig. 2; Ex. 1002 ¶ 50). Petitioner asserts that one of ordinary skill in the art would have understood that a PCB layer is a conductive layer because Partovi’s PCB layers are connected by a via or contact and Partovi discloses that an inductor coil can be made of copper material. *Id.* at 14 (citing Ex. 1009 ¶¶ 224, 225, 248; Ex. 1002 ¶ 50).

Petitioner asserts that it would have been apparent to one of ordinary skill in the art that the multi-layer coil structure of Figure 18 was applicable to the primary coil 116 of Figure 2. *Id.* (citing Ex. 1002 ¶ 50).

Alternatively, to the extent Figures 2 and 18 are unrelated embodiments, Petitioner argues it would have been obvious to make the primary coil 116 of Figure 2 a multi-layer structure, as in Figure 18, because Partovi teaches that the multi-layer structure allows compact fabrication of high flux density coils with more efficient power transfer without increasing the overall width of the coil. *Id.* at 14–16 (citing Ex. 1009 ¶¶ 212, 224; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 415–18 (2007); Ex. 1002 ¶ 51). Petitioner also argues that the modification would have furthered Partovi’s objective of having a compact design. *Id.* at 15 (citing Ex. 1009 ¶¶ 10, 212, 224; Ex. 1002 ¶ 52).

Petitioner contends that the second PCB layer 357 in Partovi’s Figure 18 functions as a second conductor layer that, like the first PCB layer 357,

can be made of copper material and thus is electrically conductive. *Id.* at 16–17 (citing Ex. 1009 ¶¶ 212–226, 248, Fig. 18; Ex. 1002 ¶¶ 55, 56).

For the limitation, “positioning an insulator layer between the first conductor layer and the second conductor layer,” Petitioner argues that because Partovi teaches that the multi-layer PCB coil 356 “is created in separate PCB layers 357” connected by a via or contact using common techniques for PCB fabrication, a person of ordinary skill in the art “would have understood that there is an insulator between them as otherwise the two layers would be deemed the same layer and no connector would be needed” and the presence of a via or contact indicates an insulating layer between the traces. *Id.* at 18–19 (citing Ex. 1009 ¶ 224, Fig. 18; Ex. 1002 ¶¶ 57–61).

Petitioner contends that, to the extent Patent Owner contends or the Boards finds an insulator layer is not explicit or implied between Partovi’s PCB layers 357, the combination of Partovi and Chiang would provide such an insulation layer. *Id.* at 19–20 (citing Ex. 1002 ¶ 59). Specifically, Petitioner argues that Chiang discloses techniques for forming inductors with multi-layer PCBs in which PCB layers are separated from one another by insulating layers 301. *Id.* at 20 (citing Ex. 1023 at 1:7–10, 4:67–5:9, 6:19–7:4, Fig. 3). Petitioner contends the PCB layers are connected by plated through holes formed by micro-vias and thus Chiang discloses a first insulator layer (i.e., insulating layer 301d in Fig. 3) between a first conductor layer (i.e., conducting layer 303d) and a second conductor layer (i.e., conducting layer 303c). *Id.* at 20–21 (citing Ex. 1023 at 6:23–7:4, Fig. 3; Ex. 1002 ¶ 60).

Petitioner asserts that one of ordinary skill in the art would have combined Partovi and Chiang to provide an insulator between each of

Partovi's PCB layers 357 to ensure they are electrically insulated from each other and capable of functioning in an expected manner. *Id.* at 21–22 (citing Ex. 1002 ¶¶ 61). Petitioner argues that one of ordinary skill in the art would have been motivated to do so because this is a typical configuration for PCBs and is required to ensure that adjacent PCB layers are not shorted. *Id.* at 21–22 (citing Ex. 1002 ¶ 61). Petitioner further asserts that if an insulating layer did not exist between two PCB layers, the PCB layers would be just one layer and not separate, as Partovi discloses. *Id.* at 22 (citing Ex. 1009 ¶ 224; Ex. 1002 ¶ 61). Petitioner also contends that the combination would have been nothing more than the combination of familiar elements according to known functions to yield a predictable result of a functional PCB-based inductor. *Id.* (citing Ex. 1002 ¶ 61; *KSR*, 550 U.S. at 416–421).

Petitioner contends that Partovi's PCB layers 357 are connected by a via or contact and thus Partovi discloses connecting the conductor layers. *Id.* at 22–23 (citing Ex. 1009 ¶ 224, Fig. 18; Ex. 1002 ¶ 62–70). Petitioner states that Partovi does not explicitly disclose connecting the first and second conductor layers in an electrically parallel connection with at least two connectors that each has an electrical impedance, as claim 1 recites, but contends this would have been obvious in view of Chiang. *Id.* at 23 (citing Ex. 1002 ¶ 63). In particular, Petitioner argues Chiang discloses a winding 320 that includes a multi-layer PCB 322 formed by six conductive layers 303a–303f and six insulating layers 301a–303f. *Id.* at 24 (citing Ex. 1023, at [54], [57], 1:7–10, 4:20–22, 4:62–5:4, 6:19–30, Figs. 3–5). Petitioner asserts that two ends 307, 309 on a conducting layer 303 are interconnected through

the insulating layers by one or more plated through holes. *Id.* at 24–25 (citing Ex. 1023, 6:23–40, Fig. 3; Ex. 1002 ¶ 64).

According to Petitioner, Chiang teaches that each of the conducting layers is connected in parallel to decrease impedance of a particular winding turn, with conducting layers 303c, 303d connected in parallel by plated through holes 315 and 317 and also by conducting layers 303a and 303b to form a first turn 311. *Id.* at 25–26 (citing Ex. 1023, 1:62–64, 6:45–50, 7:5–14; Ex. 1002 ¶ 65).

Petitioner contends it would have been obvious for one of ordinary skill in the art to modify the multi-layer coil 356 in Partovi’s Figure 18 so that the connector connects the PCB layers 357 in parallel because doing so would have decreased the resistance of the coil, as taught by Chiang, and this was an objective of Partovi. *Id.* at 26–28 (citing 1009 ¶¶ 167, 212, 255, Fig. 18; Ex. 1023, 1:62–64; Ex. 1025 ¶¶ 30, 36; Ex. 1002 ¶ 67).

For the limitation “wherein when an electrical current is propagated within at least the first conductor layer, a magnetic flux is generated within the inductor when a change occurs in at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current,” Petitioner asserts that Partovi discloses an AC current and voltage flowing through the primary coil 116 to generate an AC magnetic field. *Id.* at 28 (citing Ex. 1009 ¶¶ 13, 117–119, Fig. 2; Ex. 1002 ¶¶ 71–77). Petitioner contends that the generation of a magnetic field is associated with the generation of a magnetic flux. *Id.* at 28–29 (citing Ex. 1009 ¶ 212, Fig. 18; Ex. 1002 ¶¶ 72–73; Ex. 1006 at 592, 593, 601). Petitioner further contends that this limitation is merely an inherent property of an inductor, such as Partovi’s primary coil 116. *Id.* at 30 (citing Ex. 1006 at 557–559, 560–565,

604; Ex. 1002 ¶ 74; Ex. 1001, 1:55–57). Petitioner also asserts that the combination of Partovi and Chiang discloses the limitation because it discloses using an inductor. *Id.* at 30–31 (citing Ex. 1002 ¶¶ 75–76; Ex. 1009 ¶ 247). Petitioner asserts that Partovi teaches that an alternating current flowing through the primary coil 116 generates an alternating current magnetic field and the modification of Partovi in view of Chiang would not affect this effect, which Petitioner argues is an inherent property of an inductor like Partovi’s primary coil 116. *Id.* at 31–32 (citing Ex. 1009 ¶¶ 13, 117–119, 212, Fig. 2; Ex. 1002 ¶¶ 72–74; Ex. 1006 at 557–565, 604; Ex. 1001 at 1:55–57).

Petitioner further contends that generation of a magnetic flux with a change in at least one of a frequency, magnitude, or waveform shape of a propagated electrical current through an inductor, is an inherent property of an inductor. *Id.* at 30–31 (citing Ex. 1002 ¶¶ 75, 76; Ex. 1001, 1:55–65, 14:17–27; Ex. 1009 ¶ 247). As to a change in a magnitude of the propagated electrical current, Petitioner relies on Partovi disclosing switching the switch 126 at a frequency to generate an alternating current through an inductor coil and that one of ordinary skill in the art would have understood that the magnitude of an alternating current changes with time. *Id.* at 31–33 (citing Ex. 1009 ¶¶ 13, 117–119, Fig. 2; Ex. 1002 ¶ 78; Ex. 1010, 25). As to changes in the frequency or waveform shape, Petitioner relies on Partovi disclosing that the duty cycle of a charger switching circuit or its frequency can be changed, which means the duty cycle or switching frequency of switch 126 is changed, and argues that this would in turn change the frequency and waveform shape of the current through primary coil 126. *Id.* at 33 (citing Ex. 1009 ¶¶ 119, 130, 237, 246, 263; Ex. 1002 ¶¶ 80, 81).

Independent Claim 28

Petitioner contends that the combination of Partovi and Chiang discloses a method of manufacturing an inductor structure by citing the arguments for claim 1 above. Pet. 56 (citing Ex. 1002 ¶ 111). Petitioner also argues that Partovi in view of Chiang discloses the first inductor subassembly of claim 28 because Partovi discloses an inductor (i.e., Partovi's primary coil 116) using a multi-layer PCB coil, which has first and second conductor layers, for the reasons set forth in Petitioner's obviousness ground of claim 1 above. *Id.* at 56–59 (citing Ex. 1009 ¶ 224, Fig. 18; Ex. 1002 ¶¶ 111–120).

With regard to connecting the first and second conductor layers, as claim 28 recites, Petitioner argues the combination of Partovi and Chiang discloses this limitation for the reasons discussed above for claim 1. *Id.* at 58–59 (citing Ex. 1009 at Fig. 18; Ex. 1002 ¶¶ 113, 114).

Petitioner argues that the combination of Partovi and Chiang discloses the second inductor subassembly of claim 28 because the multi-layer PCB coil 356 in Partovi's Figure 18 includes two additional layers 357 that function as a third conductor layer and a fourth conductor layer. *Id.* at 59–60 (citing Ex. 1009 ¶¶ 212–224, Fig. 18; Ex. 1002 ¶ 115). Citing the reasons discussed above for the ground of obviousness for claim 1 over Partovi alone, Petitioner asserts that these conductor layers are spaced apart and are electrically conductive, as claim 28 recites. *Id.* at 60 (citing Ex. 1009 ¶¶ 224, 225, Fig. 18; Ex. 1002 ¶ 115).

Petitioner also contends that Partovi discloses the multi-layer PCB coil 356 is created in separate PCB layers 357 connected by a via or contacts and thus discloses or suggests the second insulator layer of claim 28 for

reasons similar to those discussed in the ground for claim 1. *Id.* at 61 (Ex. 1002 ¶ 116; Ex. 1009 ¶ 224). Petitioner argues that the combination of Partovi and Chiang discloses connecting the third and fourth conductor layers in parallel with a second connector, as claim 28 recites, for reasons similar to those discussed for claim 19. *Id.* at 61 (citing Ex. 1002 ¶ 117). Specifically, Petitioner asserts Figure 18 of Partovi shows a parallel connector connecting the third and fourth conductor layers. *Id.* at 61–62 (citing Ex. 1009, Fig. 18; Ex. 1002 ¶ 117).

Petitioner contends that the combination of Partovi and Chiang discloses connecting the first and second inductor subassemblies in series, as claim 28 recites, because Partovi’s Figure 18 depicts a serial connection between the subassemblies. *Id.* at 62–63 (citing Ex. 1009 at Fig. 18; Ex. 1002 ¶ 119). Petitioner further contends, in addressing claim 19, that a person of ordinary skill in the art “would have done so in order to increase the inductance of the inductor coil” (*id.* at 44 (citing Ex. 1002 ¶ 97)), and cites to this assertion in its contentions regarding claim 28 (*id.* at 62 (citing *id.* at 40–47 (Section IX.A.9(a)); Ex. 1002 ¶ 119)).

For the limitation “wherein when an electrical current is propagated within at least the first conductor layer, a magnetic flux is generated within the inductor when a change occurs in at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current,” Petitioner cites the arguments presented for the corresponding limitation of claim 1. *Id.* at 63 (citing Ex. 1002 ¶ 120).

4. Conclusion

As discussed above, Patent Owner does not substantively address the merits of any of Petitioner's grounds, limiting its contentions to its position that review by the Board would be improper. *See generally* Prelim. Resp.

Based on our review of the current record, as to independent claims 1 and 28, we discern no deficiency in Petitioner's characterization of the cited references and the knowledge in the art, or in Petitioner's assertions as to the reasonable inferences an ordinary artisan would have made from those references, to the extent the ground relies on AC current and voltage and the inherent characteristics of inductors for the limitation "wherein when an electrical current is propagated within at least the first conductor layer, a magnetic flux is generated within the inductor when a change occurs in at least one of a frequency, a magnitude, or a waveform shape of the propagated electrical current." Because this showing is sufficient to demonstrate teaching of this claim element was in the prior art as alleged, we need not reach Petitioner's alternative reasoning grounded on changes in the duty cycle as to frequency and waveform shape meeting this particular claim limitation.

Thus, based on the information presented at this stage of the proceeding, Petitioner has shown sufficiently that there is a reasonable likelihood that it would prevail in establishing the unpatentability of independent claims 1 and 28 as obvious over Partovi in view of Chiang.

We have also considered the additional arguments and evidence as to the asserted unpatentability of dependent claims 2, 3, 10, 15–21, 23–26, and 29 for obviousness over the cited references, which stand un rebutted at this juncture and tend to establish obviousness over Partovi and Chiang. Pet.

34–56, 63–64. At this stage of the proceeding, for reasons discussed by Petitioner, we are satisfied that Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of these dependent claims.

F. Asserted Obviousness over Partovi in view of Chiang and Tseng
Petitioner challenges claims 6, 7, and 13 as unpatentable for obviousness over Partovi in view of Chiang and Tseng. Pet. 65–69.

1. Tseng

Tseng is a patent titled “Method and Apparatus for Wireless Power Transmission.” Ex. 1022, at [54]. Tseng is directed “to a method and system for transferring power wirelessly to electronic devices.” *Id.* at 2:31–33. Specifically, Tseng’s embodiments relate to an array of spiral coils for transmitting power to receiver coils. *Id.* at 2:40–42. Tseng discloses that such a system can use PCB transformers and multiple layers of coils to generate magnetic fields. *Id.* at 5:37–40.

An embodiment of Tseng includes a microcontroller that interfaces with a sensing mechanism to identify the size, position, and load impedance of devices on a charging system. *Id.* at 10:37–46. The microcontroller uses algorithms to anticipate a resonant frequency in relation to the size of a load, its position, and orientation so the microcontroller can adjust a switching frequency to maximize the efficiency of power transfer. *Id.* at 10:48–51.

Tseng teaches that the efficiency of power transfer degrades due to various losses in the system, similar to a far-field antenna system transmitting a radio frequency signal. *Id.* at 11:8–11. According to Tseng, these losses include conductor loss in coils, dielectric loss in substrates where coils are fabricated, coupling loss between coils, and impedance

mismatch loss. *Id.* at 11:11–14. Tseng teaches that losses due to the skin effect can be reduced by making metal thickness more than twice the skin depth. *Id.* at 12:3–6. In addition, Tseng discloses that narrow trace spacing increases coupling efficiency, with thin trace width coils having a 50% lower quality factor than large trace gap spiral coils. *Id.* at 8:1–11, Fig. 24. In view of this, Tseng discloses embodiments where the traces are widened and gaps narrowed so the ratio of trace to gap width can be optimized for efficiency. *Id.* at 11–15.

2. *Petitioner's Contentions*

Petitioner argues that claims 6, 7, and 13 would have been obvious over the combination of Partovi, Chiang, and Tseng. Pet. 65–69. Specifically, Petitioner contends that while “[t]he Partovi-Chiang combination does not explicitly disclose . . . providing a thickness of the PCB [conductor] layer 357 (‘first conductor’) ranging from about 1.25 times to about 4 times a thickness of a skin depth of the first conductor layer at a given frequency,” “Tseng discloses such a feature,” and that “it would have been obvious to implement PCB [conductor] layer 357 in Partovi such that its thickness is at least two times the skin depth at a given frequency.” *Id.* at 65 (citing Ex. 1002 ¶ 124). Petitioner relies on “Tseng disclos[ing] that to reduce power loss in coils due to skin depth effect, ‘the metal thickness should be more than twice of the skin depth’” and contends that a person of ordinary skill in the art “would have found it obvious to ensure that the thickness of each of the PCB [conductor] layers 357 is at least twice the skin depth at the system’s operating frequency in order to minimize conductor loss in these layers” (emphasis omitted). *Id.* at 66 (citing Ex. 1002 ¶ 126; Ex. 1024, 1:34–38). Petitioner also relies on Partovi disclosing that different

thicknesses “can be used to optimize the inductive circuit for a particular application.” *Id.* at 67 (citing Ex. 1002 ¶ 127; Ex. 1009 ¶¶ 167, 212). Petitioner contends that implementing the claimed feature “would have involved no more than applying a known technique to a known device to obtain a predictable result (e.g., designing and implementing a conductor based on the skin depth at a certain operating frequency).” *Id.* (citing Ex. 1002 ¶ 128; *KSR*, 550 U.S. at 416). This, Petitioner contends, renders claims 6 and 7 obvious. *Id.* at 67–68.

As to claim 13, reciting “providing an inductor quality factor greater than about 5,” Petitioner relies on Tseng “disclos[ing] a high Q value of about 100 by optimizing the spacing between the conductor traces of an inductor” and on its teachings of how to improve the Q value. *Id.* at 68–69 (citing Ex. 1022, 8:1–18, Fig. 24; Ex. 1002 ¶¶ 131–133). Petitioner also relies on “Partovi disclos[ing] that coil dimensions, such as thickness, width, and number of turns, can be altered, such that ‘the resistance, inductance, flux density, and coupling efficiency for the coils can be adjusted so as to be optimized for a particular application’ (emphasis omitted).” *Id.* at 69 (citing Ex. 1009 ¶ 212; Ex. 1002 ¶ 133). Petitioner contends that a person of ordinary skill in the art “would have the knowledge and skill to modify the disclosed coil and/or circuits and to combine the same.” *Id.* (citing Ex. 1002 ¶ 134). Petitioner contends that “a skilled person in the art would have found it obvious to optimize the Partovi-Chiang inductor to improve its Q factor, i.e., improving efficiency or reducing power loss, in view of Tseng.” *Id.* (citing Ex. 1002 ¶ 132; *KSR*, 550 U.S. at 416).

3. Conclusion

As discussed above, Patent Owner does not substantively address the merits of any of Petitioner's grounds, limiting its contentions to its position that review by the Board would be improper. *See generally* Prelim. Resp.

Based on our review of the current record, we discern no deficiency in Petitioner's characterization of the cited references and the knowledge in the art, or in Petitioner's assertions as to the reasonable inferences an ordinary artisan would have made from those references. Thus, based on the information presented at this stage of the proceeding, Petitioner has shown sufficiently that there is a reasonable likelihood that it would prevail in establishing the unpatentability of claims 6, 7, and 13 over Partovi, Chiang, and Tseng.

G. Asserted Obviousness over Partovi in view of Chiang and Phan

Petitioner challenges claims 8, 12, 26, and 27 as unpatentable for obviousness over Partovi in view of Chiang and Phan. Pet. 70–79.

1. Phan

Phan is a patent titled “Printed Circuit Boards for High-Speed Communication.” Ex. 1029, at [54]. Phan is directed a system for communicating high-speed signals between multiple PCBs. *Id.* at 1:7–9. Figure 3 of Phan, shown below, depicts a multi-layer flexible conductor. *Id.* at 3:12–13.

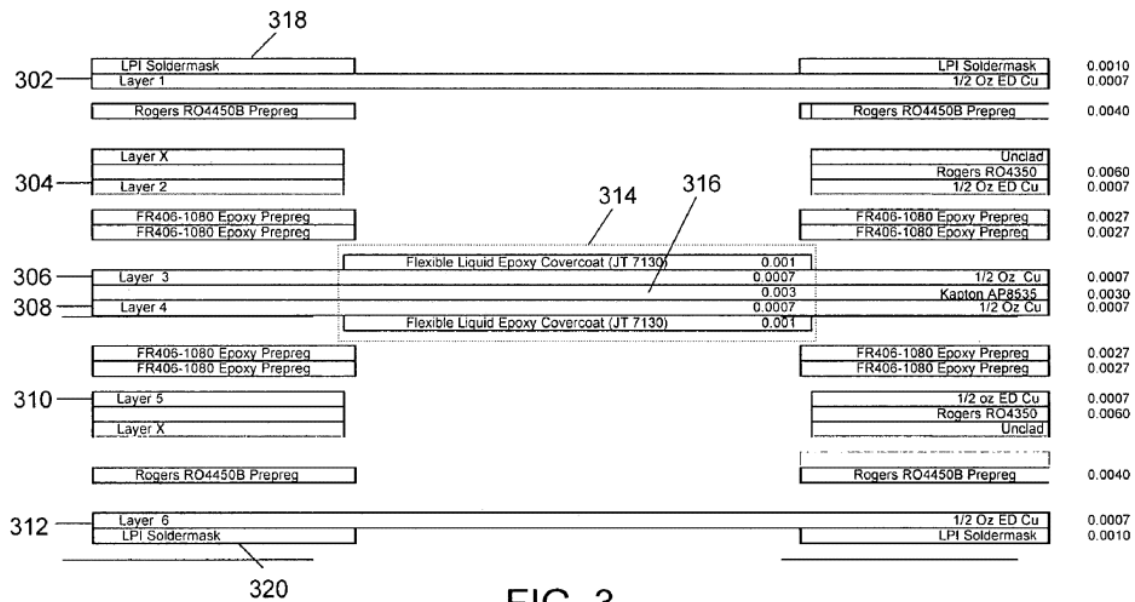


FIG. 3

Figure 3 shows that a multi-layer PCB 300 includes six conducting layers 302, 304, 306, 308, 310, 312 and that each conducting layer can be made of half ounce copper and be 0.0007 inches in thickness. *Id.* at 5:40–48. In another embodiment, Phan discloses that a multi-layer PCB can have six layers but the number of layers is not limited to six. *Id.* at 4:28–33. Phan also discloses insulating layers between conducting layers, including an insulating layer 316 of Kapton positioned between conducting layers 306 and 308. *Id.* at 5:40–52, Fig. 3. Phan also discloses total thicknesses for the multi-layer PCB of 0.0400 inches, indicating thicknesses of conductor layers and insulating layers on the order of thousandths of an inch.

2. Petitioner's Contentions

Petitioner argues that claims 8, 12, 26, and 27 would have been obvious over the combination of Partovi, Chiang, and Phan. Pet. 70–79.

As to claim 8, reciting “providing a first conductor layer thickness about the same as a second conductor layer thickness,” Petitioner contends that “using layers of the same thickness would have been obvious because it

would be one of a ‘finite number of identified, predictable solutions,’” where the choices are layers of the same or different thickness (*id.* at 70–71 (citing Ex. 1002 ¶¶ 137–138)), and because using conductor layers of the same thickness is a known technique, relying on Phan’s disclosure, that can be applied using known techniques to yield the predictable result of an inductor having conducting layers of the same thickness (*id.* at 71–73 (citing Ex. 1002 ¶¶ 139–140; Ex. 1029, 3:55–61, 3:66–4:4, 5:43–48, Fig. 3; *KSR*, 550 U.S. at 416–21)). Petitioner also relies on “Partovi . . . disclos[ing] that coil dimensions, such as thickness, width, and number of turns, can be altered, such that ‘the resistance, inductance, flux density, and coupling efficiency for the coils can be adjusted so as to be optimized for a particular application’” (emphasis omitted). *Id.* at 73 (citing Ex. 1009 ¶ 212; Ex. 1002 ¶ 140).

As to claim 12, reciting “further providing a thickness of the insulating layer less than about 5 cm,” Petitioner contends that a person of ordinary skill in the art would have found it obvious to use such in the proposed combination in order to obtain the benefit of a compact and lightweight portable device (*id.* at 74 (citing Ex. 1002 ¶¶ 141–142; Ex. 1009 ¶¶ 10, 212, 224)), where insulating layers meeting the claim limitation were well-known (*id.* at 74–75 (citing Ex. 1002 ¶¶ 143–144; Ex. 1029, 5:40–49, Fig. 3)) and the combination would have been nothing more than the combination of familiar elements according to known functions to yield a predictable result (*id.* at 75–76 (citing Ex. 1002 ¶ 144; *KSR*, 550 U.S. at 416–21)). Petitioner further contends that “the thickness of an insulating layer is a ‘result-effective variable’ because it affects the overall thickness of the PCB and also determines the amount of the insulation between

conducting layers on both sides of the insulating layer” and argues obviousness on this basis. *Id.* at 76 (citing Ex. 1002 ¶ 145).

As to claims 26 and 27, each depending from claim 1 and specifying further limitations as to providing the insulator layer, Petitioner relies on the combination of Partovi and Chiang “disclos[ing] or suggesting that the insulating layer is an ‘electrically insulative material.’” *Id.* at 77 (citing Ex. 1002 ¶ 147). Petitioner also relies on “Phan disclos[ing] ‘an insulating layer 316 of Kapton’ positioned between conducting layers 306 and 308” and “Kapton [being] an ‘electrically insulative material’ . . . [and] a ‘dielectric material.’” *Id.* at 78–79 (citing Ex. 1002 ¶¶ 148–149; Ex. 1029, 5:40–49, Fig. 3). Petitioner contends that a person of ordinary skill in the art would have found it obvious to use Kapton, which provides a flexible insulating layer, for the advantages of a flexible PCB. *Id.* at 79 (citing Ex. 1002 ¶ 150; Ex. 1009 ¶¶ 137, 151; Ex. 1029, 3:48–55, 5:50–52).

3. Conclusion

As discussed above, Patent Owner does not substantively address the merits of any of Petitioner’s grounds, limiting its contentions to its position that review by the Board would be improper. *See generally* Prelim. Resp.

Based on our review of the current record, we discern no deficiency in Petitioner’s characterization of the cited references and the knowledge in the art, or in Petitioner’s assertions as to the reasonable inferences an ordinary artisan would have made from those references. Thus, based on the information presented at this stage of the proceeding, Petitioner has shown sufficiently that there is a reasonable likelihood that it would prevail in establishing the unpatentability of claims 8, 12, 26, and 27 over Partovi, Chiang, and Phan.

H. Asserted Obviousness over Partovi in view of Chiang and Hu

Petitioner contends that the subject matter of claim 5 would have been obvious over Partovi in view of Chiang and Hu. Pet. 79–77.

1. Hu

Hu is a publication titled “AC Resistance of Planar Power Inductors and the Quasidistributed Gap Technique.” Ex. 1033, 558. Hu relates to low-AC-resistance planar or foil-wound inductors constructed using a quasidistributed gap. *Id.* at 558, Abstract. In one example, Hu discloses an inductor for a high-current, low-voltage regulator module for microprocessor power delivery. *Id.* at 564. Hu teaches that conductor thickness is “well understood” and, because current mainly flows in the top skin depth, a thickness of one to two skin depths is sufficient to achieve a near minimum AC resistance. *Id.* at 559.

2. Petitioner’s Contentions

Petitioner argues that claim 5 would have been obvious over the combination of Partovi, Chiang, and Hu. Pet. 79–81. Specifically, Petitioner contends that, to the extent that Lee does not disclose “providing a thickness of the first conductor layer about equal to a thickness of a skin depth of the first conductor layer at a given frequency” (*id.* at 79–80 (quoting claim 5)), Hu discloses that the choice of conductor thickness is well-understood and, in particular, that “a thickness of one to two skin depths is sufficient to achieve near minimum ac resistance” (*id.* at 80 (emphasis omitted) (citing Ex. 1033, 559)). Petitioner contends that a person of ordinary skill in the art “would have found it obvious to ensure that the thickness of each of the conductive traces is at least one to two skin depths . . . to minimize conductor loss in these layers” and that

implementing the claimed feature would have been obvious. *Id.* at 80–81 (citing Ex. 1002 ¶¶ 153–154).

3. Conclusion

As discussed above, Patent Owner does not substantively address the merits of any of Petitioner’s grounds, limiting its contentions to its position that review by the Board would be improper. *See generally* Prelim. Resp.

Based on our review of the current record, we discern no deficiency in Petitioner’s characterization of the cited references and the knowledge in the art, or in Petitioner’s assertions as to the reasonable inferences an ordinary artisan would have made from those references. Thus, based on the information presented at this stage of the proceeding, Petitioner has shown sufficiently that there is a reasonable likelihood that it would prevail in establishing the unpatentability of claim 5 over Partovi, Chieng, and Hu.

III. CONCLUSION

We have reviewed and considered the arguments in Petitioner’s Request for Rehearing and are persuaded by Petitioner’s argument and the fact of this case that we should reconsider our decision whether to institute *inter partes* review. 37 C.F.R. § 42.71(d).

For the reasons set forth above, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the ’046 patent. Thus, we institute an *inter partes* review on all challenged claims and on all grounds presented.

IV. ORDER

Accordingly, it is:

ORDERED that Petitioner's Request for Rehearing is *granted*;

FURTHER ORDERED that an *inter partes* review is instituted on each of the grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this decision.

IPR2019-00861
Patent 9,300,046 B2

For PETITIONER:

Naveen Modi
Joseph Palys
Chetan Bansal
David Valente
PAUL HASTINGS LLP
naveenmodi@paulhastings.com
josephpalys@paulhastings.com
chetanbansal@paulhastings.com
davidvalente@paulhastings.com

For PATENT OWNER:

Hamad Hamad
Alexis Mosser
CALDWELL, CASSADY & CURRY P.C.
hhamad@caldwellcc.com
amosser@caldwellcc.com