

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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SAMSUNG ELECTRONICS CO., LTD. AND SAMSUNG ELECTRONICS  
AMERICA, INC.,

Petitioners,

v.

AQ CORPORATION,

Patent Owner.

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CASE: IPR2026-00234

U.S. PATENT NO. 11,728,564

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**PATENT OWNER'S PAPER SUPPORTING DISCRETIONARY DENIAL**

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**TABLE OF PATENT OWNER EXHIBITS**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                           |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 2001               | AQ Email to Samsung dated Nov. 8, 2021 (Original and Certified Translation)                                                                  |
| 2002               | AQ Email dated Dec. 2, 2021 (Original and Certified Translation)                                                                             |
| 2003               | Preliminary Amendment dated Nov. 5, 2021                                                                                                     |
| 2004               | Samsung Electronics' 2025 Interim Business Report                                                                                            |
| 2005               | Samsung C&T Corp., 2024 Corporate Governance Report                                                                                          |
| 2006               | LexMachina Analysis – Judge Gilstrap                                                                                                         |
| 2007               | <i>AQ Corp. v. Samsung Elecs. Co., Ltd. et al.</i> , Case No. 2:25-cv-01012-JRG, Dkt. No. 23 (E.D. Tex. Feb. 4, 2026) (Docket Control Order) |
| 2008               | Notice of References Cited dated January 30, 2023                                                                                            |
| 2009               | U.S. Patent App. No. 2010/0309081 to Kobayashi et al. (“ <i>Kobayashi</i> ”)                                                                 |
| 2010               | U.S. Patent App. No. 2014/0339915 to Kanno et al. (“ <i>Kanno</i> ”)                                                                         |

Patent Owner AQ Corporation (“AQ”), submits this Paper regarding discretionary denial pursuant to the Board’s guidance on “Interim Processes for PTAB Workload Management,” dated March 26, 2025 (“Process Memorandum”).

## I. INTRODUCTION

Petitioner Samsung Electronics Co., Ltd. (“Samsung Electronics”) and Samsung Electronics America, Inc. (“Samsung Electronics America”) (collectively, “Samsung” or “Petitioner”) have been aware of the claims of family members of the ’564 Patent for almost five years. In 2021, AQ provided Samsung a copy of the ’564 Patent’s parent application publication corresponding to U.S. Patent No. 11,303,011 (the “’011 Patent”), bringing the ’011 Patent to Samsung’s attention. The ’564 Patent is a continuation of the ’011 Patent, which issued about one year after the ’011 Patent issued. Samsung sat on its hands for years, ignoring AQ’s outreach, only filing this challenge *after* AQ brought suit, despite being aware of the claims of the parent ’011 Patent and the established course of dealings between the parties regarding AQ’s claimed invention. After Samsung disregarded AQ’s technology (the subject of the outreach in 2021) and designed *into* AQ’s claimed technology, AQ was forced to bring its infringement case. Samsung has had notice of the ’564 Patent and its family members since issuance, yet waited almost five years to bring this challenge.

Under the prior discretionary denial standards, and pursuant to the new factors in the Process Memorandum (and subsequent decisions such as *Dabico Airport*

*Solutions Inc. v. AXA Power APS*, IPR2025-00408, Paper 21 (P.T.A.B. June 18, 2025)), the Petition should be denied to better allocate resources elsewhere.

Even if the settled expectations between the parties do not warrant denial, the Petition relies on prior art cumulative of what was previously considered during prosecution. Therefore, under 35 U.S.C. § 325(d), discretionary denial is warranted.

Independently, the Petition should be denied because it fails to identify all real parties-in-interest (“RPI”), in violation of 35 U.S.C. § 312(a)(2). Because proper identification of all RPIs is a statutory prerequisite to institution, this defect alone requires denial of the Petition.

Finally, *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential) favors discretionary denial given the significant overlap between the district court action and this proceeding, and the advanced stage that the litigation will be in when any final written decision would issue.

## **II. THE PETITION SHOULD BE DISCRETIONARILY DENIED**

The USPTO’s Process Memorandum makes clear that the Board may deny institution based on discretionary considerations that extend beyond the *Fintiv* factors, including fairness, efficiency, integrity of the proceedings, and the parties’ reasonable reliance interests. *See* Process Memorandum at 2. These “relevant considerations” are intended to ensure that *inter partes* review (“IPR”) is not used in a manner that disrupts settled expectations, encourages gamesmanship, or

otherwise undermines confidence in the patent system.

The Process Memorandum allows patent owners to address grounds for discretionary denial including: (a) “relevant considerations” now identified in the Guidance; and (b) “discretionary considerations enumerated in existing Board precedent.” *Id.* AQ respectfully submits that discretionary denial is appropriate under both sets of considerations. Last, as addressed in Section (b) below, the *Fintiv* factors also favor discretionary denial of the Petition.

**A. Discretionary Denial Is Appropriate Under the “Relevant Considerations” Identified in the Guidance**

i. Petitioner’s Nearly Five-Year Delay Created Settled Expectations.

Petitioner has been actually aware of the publication and prosecution history leading to the ’564 Patent for almost five years because AQ provided Petitioner with the ’564 Patent’s parent publication on November 8, 2021. Ex. 2001. Specifically, at Samsung’s request, AQ provided notice of its intellectual property to Samsung, including the then-pending claims of the ’011 Patent, which issued as the challenged claims. Ex. 2001; Ex. 2002, 10 (“Received inquiry from SEC ... regarding AQ patents” and “[s]ent email explaining the described content of the disclosed patent”). AQ did so to inform Samsung that if it continued with its contemplated design, it would design into AQ’s claimed invention. Ex. 2002. Just days earlier, on November 5, 2021, AQ filed a preliminary amendment introducing the very claims

that ultimately issued with only minor amendments as the '011 Patent, from which the '564 Patent is a continuation. Ex. 2003. Therefore, Petitioner had actual notice of the disclosure underlying the '564 Patent and of the publicly available prosecution history that produced the issued claims years before filing its Petition.

Patent Owner placed Petitioner on notice of the '011 Patent family years ago, providing Petitioner actual notice of the claimed technology and the scope of the invention. That notice is sufficient to establish settled expectations as to the entire patent family, particularly where the later-issued patents share the same specification and claim substantially the same subject matter. *See iRhythm Techs., Inc. v. Welch Allyn, Inc.*, IPR2025-00363, Paper 10 (P.T.A.B. June 6, 2025); *Amgen Inc. v. Bristol-Myers Squibb Co.*, IPR2025-00601 (P.T.A.B. July 24, 2025).

While “actual notice of a patent or of possible infringement is not necessary to create settled expectations,” actual notice paired with prolonged inaction strengthens those expectations. *Dabico Airport Sols., Inc.*, IPR2025-00408, Paper 21 at 3. Approximately six years of time post-issuance creates settled expectations between the parties, without any actual knowledge. *Id.*; *Yangtze Memory Techs. Co., Ltd. v. Micron Tech, Inc.*, IPR2025-00501, Paper 10 at 2 (P.T.A.B. Aug. 14, 2025); *Kahoot! AS v. Interstellar Inc.*, IPR2025-00696, Paper 12 at 2 (P.T.A.B. July 31, 2025); *Amgen, Inc. v. Bristol-Myers Squibb Co.*, IPR2025-00601, Paper 9 (P.T.A.B. July 24, 2025). Here, the actual awareness overcomes the slightly less time.

Despite having actual notice of the antenna architecture disclosed in the claims that issued as the '011 Patent and later formed the basis of the '564 Patent, Petitioner waited almost five years after learning about the subject matter claimed, and more than three and a half years after the '564 Patent issued, before seeking IPR. This is unlike other scenarios where a patent owner has no knowledge of whether or not another entity has access to or awareness of its patents, as patent owners rarely know when another party submits their patents in an Information Disclosure Statement (*see, e.g., iRhythm v. Welch Allyn*, IPR2025-00363, Paper 10). Rather, AQ has known from the very beginning that Petitioner was aware of its patent claims and could have, but did not, challenge the patent. AQ reasonably relied on the absence of any challenge to this family, and allowing Petitioner to proceed now after years of inaction despite long-standing notice of the '564 Patent would undermine the stability and predictability the patent system is intended to promote.

ii. Petitioner Failed to Identify All Real Parties-in-Interest

Under 35 U.S.C. § 312(a)(2) and 37 C.F.R. § 42.8(b)(1), a petition for IPR “may be considered only if ... the petition identifies all [RPI].” 35 U.S.C. § 312(a)(2); *see Corning Optical Commc’ns RF v. PPC Broadband, Inc.*, IPR2014-00440, Paper 68 at 24 (P.T.A.B. Aug. 18, 2015) (precedential, except for § II.E.1). The RPI requirement is not merely formalistic, it ensures the (1) proper application of estoppel under 35 U.S.C. § 315(e); (2) transparency and fairness to

patent owners; and (3) integrity of the discretionary process. Consolidated Trial Practice Guide, 12-13 (Nov. 2019) (“TPG”).

“When a patent owner provides sufficient evidence that reasonably brings into question the accuracy of a petitioner’s identification of RPI,” the petitioner bears the burden “to establish that it has complied with the statutory requirement to identify all RPI.” *Corning*, Paper 68 at 13. Uncertainty regarding RPI identification (even absent a definitive showing of an undisclosed RPI) may weigh against institution as a matter of discretion. *Id.* at 15 (“A non-party’s participation with a petitioner may be overt or covert, and the evidence may be direct or circumstantial, but the evidence as a whole must show that the non-party possessed effective control over the IPR proceeding”). This is particularly true where the record suggests that entities other than the named petitioner may have directed, funded, controlled, or participated in the proceeding. *See* TPG, 17-19. A party may be a RPI even if it does not have “actual control” so long as it has the “opportunity to control.”

Here, the Petition only identifies Samsung Electronics and Samsung Electronics America as the RPI. Petition, 138. Samsung’s own publicly available documents, however, confirms that Samsung Construction & Trading Corporation (“Samsung C&T”) maintains a formally recognized related-party relationship with Samsung Electronics, suggesting the requisite opportunity to control. For example, Samsung Electronics’ 2025 Interim Business Report (“2025 Business Report”)

expressly identifies Samsung C&T as a “related party.” Ex. 2004. Notably, the 2025 Business Report includes two footnotes, only one of which is applicable to Samsung C&T: “The amounts represent transactions with individual entities that are *related parties of the Company*.” *Id.* at 81. The second footnote states: “Although these entities are not related parties of the Company in accordance with Korean IFRS 1024, they belong to the same large enterprise group in accordance with the Monopoly Regulation and Fair Trade Act.” *Id.* This second footnote does apply to another Samsung entity (Samsung E&A Co., Ltd.), but not to Samsung C&T. As such, Samsung C&T’s status as a “related party” is made pursuant to Korean IFRS 1024 and therefore represents that Samsung C&T stands in a formally recognized related-party relationship with Samsung Electronics, requiring disclosure here.

This public disclosure, which includes a “Letter of Certification” signed by Samsung Electronics’ Vice President and CEO and Vice President and CFO, is significant. *Id.* at 3. Related-party designations in a regulated business report are not aspirational or informal; they reflect Samsung Electronics’ acknowledgment that Samsung C&T occupies a position of affiliation or influence sufficient to warrant special reporting and oversight. That admission is fundamentally inconsistent with any suggestion that Samsung C&T is a remote or independent entity whose interests are wholly disconnected from those of Samsung Electronics.

Samsung C&T’s documents also reflect a RPI relationship between Samsung

C&T and Samsung Electronics. Specifically, Samsung C&T's 2024 Corporate Governance Report identified Samsung Electronics as a "specially related party," under Monopoly Regulation and Fair Trade Act ("MRFTA") Article 542-9. *See* Ex. 2005. Under the MRFTA, "specially related parties" function as RPI for purposes of governance oversight, triggering enhanced disclosure and board-level review due to the potential for conflicts of interest and group-level risk. This disclosure reasonably suggests that Samsung C&T has implemented centralized governance mechanisms with Samsung Electronics precisely because affiliate actions may present group-level legal, financial, or strategic risk.

Taken together, these documents "reasonably bring[] into question the accuracy of a petitioner's identification of real parties-in-interest," and suggest that Samsung C&T stands in a position of influence sufficient to create, at minimum, an opportunity to control matters involving Samsung Electronics' legal and strategic interests, such as this IPR proceeding. *See Sirius XM Radio, Inc. v. Fraunhofer-Gesellschaft*, No. IPR2018-00681, Paper 12 at 3 (P.T.A.B. Sept. 6, 2018).

iii. The Petition's Over-Reliance on Expert Testimony Favors Denial.

Discretionary denial is also warranted based on the Petition's overreliance on expert testimony. One relevant factor within the Board's "discretionary considerations" is "[t]he extent of the petition's reliance on expert testimony." Process Memorandum, 2. The Petition's challenge turns almost entirely on expert

testimony rather than teachings in the prior art itself, particularly with respect to the claim limitation reciting “wherein the inner coil and the outer coil are electrically connected in parallel.” None of the cited references disclose the claimed parallel electrical connection of an inner and outer coil. Petition, 55. Rather, the Petition provides a five-sentence argument that relies solely on expert testimony to impermissibly stitch together unrelated disclosures, which is insufficient to support institution. *See, e.g.*, Petition, 55. This reliance on expert testimony is necessary, as none of the references teach the claimed structure, leaving Petitioner to rely solely on its expert’s conclusions to support its theory for this element.

**B. The *Fintiv* Factors Favor Denial**

The *Fintiv* analysis provides an independent basis to deny institution.

i. A District Court Stay Is Unlikely (Factor 1).

Although Samsung filed a motion to stay the district court case on February 17, 2026, this factor is either neutral (as the PTAB will have to speculate whether a stay would be granted) or favors using discretion to deny the Petition.

The presiding judge in the district court case, Judge Gilstrap, normally, if not almost exclusively, denies motions to stay pending PTAB decisions. *See* Ex. 2006. He also generally resolves a party’s motion to stay relatively quickly. *See id.* It is the “majority rule” and “universal practice” in the Eastern District of Texas “that when the PTAB has not yet acted on a petition for [IPR], the courts have uniformly

denied motions for a stay.” *See Trover Grp., Inc. v. Dedicated Micros USA*, No. 2:13-CV-1047-WCB, 2015 WL 1069179, at \*6 (E.D. Tex. Mar. 11, 2015) (collecting cases); *Rembrandt Wireless Techs., LP v. Samsung Elecs. Co.*, No. 2:13-cv-213, 2015 WL 627887 (E.D. Tex. Jan. 29, 2015) (denying Samsung’s motion to stay pending IPR). It is therefore expected that Judge Gilstrap will decide Petitioner’s motion to stay approximately four months before the institution deadline. And, based on the above-mentioned “universal practice” in Eastern District of Texas courts, it is expected that Samsung’s motion to stay will be denied. To the extent the Director is unpersuaded regarding whether a stay would or would not be granted, any evidence on this factor is at best neutral. *Fintiv* cautions against speculating regarding stay requests. *Fintiv*, Paper 15 at 12.

ii. Proximity of the Court’s Trial Date Is Neutral (Factor 2).

The trial is set for November 1, 2027. Ex. 2007. As *Fintiv* outlines, “if the court’s trial date is at or ***around the same time as the projected statutory deadline*** ... or even significantly after the projected statutory deadline, the decision whether to institute will likely implicate other factors.” *Fintiv*, Paper 15 at 9. This factor is neutral.

iii. The Parallel District Court Proceeding Favors Denial (Factor 3).

Petitioner here is the defendants in the parallel district court litigation, and this factor favors denial of institution under § 314(a). *See Sotera Wireless, Inc.*,

IPR2020-01019, Paper 12 at 19. Moreover, “proceeding in parallel with the district court litigation is an inefficient use of our time and resources.” *NHK Spring Co., LTD., v. Intri-plex Techs., Inc.*, IPR2018-00752, Paper 8 at 11 (P.T.A.B. Sept. 12, 2018) (precedential). By the time of a FWD, claim construction and expert reports will be complete in Texas, dispositive motion deadlines will be imminent, and pretrial disclosures will be less than one month away (Ex. 2007), leaving the case substantially complete and institution of little practical benefit.

iv. Sotera-type Stipulation Is Not Dispositive (Factor 4).

Petitioner’s filing of a *Sotera*-type stipulation on March 5, 2026 (about six weeks after filing its IPR) is not dispositive to the *Fintiv* analysis. *Motorola Sols., Inc. v. Stellar, LLC*, IPR2024-01205, Paper 19 at 4 (P.T.A.B. Mar. 25, 2025) (“[A]lthough Petitioner’s *Sotera* stipulation may mitigate some concern of duplication between the parallel proceeding and this proceeding, the stipulation does not outweigh the substantial investment in the district court proceeding or *Fintiv* factors 1, 2, and 5, which the Board found weighed in favor of denial.”).

v. The Parties Here and in the Parallel Litigation Are Identical (Factor 5).

*Fintiv* Factor 5 weighs in favor of discretionary denial. The parties in this IPR are the same as those in the parallel district court action.

vi. The Additional Factors Outlined Herein Favor Denial (Factor 6).

*Fintiv* provides for the analysis of “other factors,” such as those in Section A

and C. These “other factors” favor discretionary denial. As Factors 3, 5, and 6 favor denial, Factor 2 is neutral, and Factor 1 either favors denial or is neutral, the *Fintiv* analysis favors discretionary denial. *See Datadome S.A. v. Arkose Labs Holding, Inc.*, IPR2025-00693, Paper 13 at 2-3 (P.T.A.B. Aug. 14, 2025) (granting discretionary denial where parties were engaged in parallel litigation and petitioner had actual knowledge of patents for three years before IPR).

**C. Discretionary Denial is Appropriate Under 35 U.S.C. § 325(d)**

Each of the Petition’s grounds relies on references that are cumulative of the references considered during prosecution of the ’564 Patent. The Petition does not explain why the Board should re-evaluate the claims in view of cumulative art. *Ex. 2008*.

The Petition’s challenges use the same building blocks as the prosecution art, including (i) coil conductors formed on substrates (including on opposing surfaces) and (ii) wireless power transfer using coupled coils/resonant behavior. However, like with the art cited during prosecution, the Petition lacks any parallel connection between an inner and outer coil. Rather, the gap-filling by Petitioner’s expert does not cure the commonality between the cited references in the IPR and those overcome during prosecution. Those building blocks were already presented and the claims were allowed at least because of the presence of the limitation “wherein the inner coil and the outer coil are electrically connected in parallel.” The Petition

should be denied. *Adv. Bionics LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 9 (P.T.A.B. Feb. 13, 2020).

i. Ground 1 (*Seong, Kang, Cho*) Is Cumulative of Examination

*Seong, Kang, and Cho* do not present a materially new technical teaching beyond the references from prosecution. The Petition simply repackages the same core teachings already presented to the USPTO, including (i) multi-surface coil conductors/spiral coil geometry (*Kobayashi*, (Ex. 2009)), and (ii) coil-based wireless power transfer fundamentals (*Kanno*, (Ex. 2010)), supporting discretionary denial under § 325(d). *Kobayashi* and *Kanno* were identified by the Patent Office during prosecution (Ex. 2008).

| Petition Art                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Prosecution Art                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>(1) Coils formed on a single flexible substrate</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                          |
| <b><i>Seong</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b><i>Kobayashi</i></b>                                                                                                                                                                                                                                                                  |
| <p>“According to the present invention, an NFC antenna, an MST antenna, and a WPC antenna are formed together in one substrate[.]” (Ex. 1006, Abstract, ¶ [12]).</p> <p>“The present invention relates to an antenna structure, and more particularly, to a composite antenna structure in which an NFC pattern, an MST pattern, and a WPC pattern are simultaneously formed on one substrate.” (<i>Id.</i> ¶ [1]).</p> <p>“First, an antenna pattern is formed on the top or bottom surface of the substrate, 10 (S210). Here, the substrate, 10, can be a PCB or FPCB, and the antenna pattern can form one or more of an NFC pattern, 12, an MST pattern, 14, and a WPC pattern, 17.” (<i>Id.</i> ¶ [80]).</p> | <p>“A spiral coil conductor defining its winding central section as a conductor opening section is formed on a flexible substrate.” (Ex. 2009, Abstract)</p> <p>“[I]t is strongly desired that an antenna incorporated in a mobile electronic apparatus achieve high performance, be</p> |
| <b><i>Kang</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                          |
| “A thin, flexible antenna module is provided for use in a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                          |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                 |
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| <p>smartphone. When the antenna module is assembled in the smartphone, the antenna module provides an MST antenna and an NFC antenna. For this, the antenna module includes a flexible PCB containing coils and further includes a magnetic sheet engaged with flexible PCB. The flexible PCB and the magnetic sheet are attached to each other to form a single body.” (Ex. 1012, Abstract).</p> <p>“[A] flexible PCB comprising a first coil antenna (e.g., coil A) and a second coil antenna (e.g., coil B)[.]” (<i>Id.</i> ¶ [0026]).</p> | <p>inexpensive, and be small.” (<i>Id.</i> ¶ [0003])).</p> <p>“A first conductor is formed on a first principal surface, and a second conductor is formed on a second principal surface of the flexible substrate.” (<i>Id.</i> ¶ [0050])).</p> |
| <b>Cho</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                 |
| <p>“[I]n a first portion of the substrate where the substrate 100, the wireless charging coil 110, and the first wireless communication coil 120 overlap, the wireless charging coil 110 may be formed on one surface of the first portion region of the substrate and the first wireless communication coil 120 may be formed on the other surface of the first portion region of the substrate, respectively.” (Ex. 1010, ¶ [0039]).</p>                                                                                                    |                                                                                                                                                                                                                                                 |
| <b>(2) Coil for Wireless Power and Communication</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                 |
| <b>Seong</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Kanno</b>                                                                                                                                                                                                                                    |
| <p>“The present invention relates to an antenna structure including an NFC antenna, an MST antenna, and a WPC antenna.” (Ex. 1006, Abstract, ¶ [0012]).</p>                                                                                                                                                                                                                                                                                                                                                                                   | <p>“A power transmitting antenna includes a first resonant circuit including a power transmitting coil, and a power receiving antenna includes a second resonant circuit including a power receiving coil.” (Ex. 2010, Abstract).</p>           |
| <b>Kang</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                 |
| <p>“[T]he antenna module provides an MST antenna and an NFC antenna.” (Ex. 1012, Abstract).</p> <p>“Each coil can be used as one of an MST antenna, an NFC antenna and other antenna that uses a coil antenna, such as wireless charging antenna.” (<i>Id.</i> ¶ [0238]).</p>                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                 |
| <b>Cho</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                 |
| <p>“The wireless charging coil 111 has hollow spaces on one surface 11 of the substrate in some regions 810, 820, 830. In those hollow spaces on said one surface 11 of the substrate, a second wireless communication coil 121 is formed. The substrate comprises a protruding terminal</p>                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                 |

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>portion on one side, and both terminals of each coil may be formed on one surface of the terminal portion. The first coil portion 131 of the first wireless communication coil 151 is formed on one side close to the terminal portion. Therefore, the first coil portion 131 is not formed in the space where the terminals of each coil are formed. This is to prevent each terminal and the first coil portion 131 from being in direct contact.” (Ex. 1010, ¶ [0064]).</p>                      |                                                                                                                                                                                                                                                             |
| <b>(3) Structural Spacing/Separation in Coil Arrangements</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                             |
| <b><i>Seong</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b><i>Kobayashi</i></b>                                                                                                                                                                                                                                     |
| <p>“In addition, the upper surface or the lower surface of the substrate, NFC pattern, MST pattern, WPC pattern may be formed spaced apart.” (Ex. 1006, ¶ [17]).</p>                                                                                                                                                                                                                                                                                                                                   | <p>“[T]he coil conductor formed at the bend of the flexible substrate is spaced apart from the end face of the magnetic material core by the cut shape (i.e., the cutout portion of the end face of the magnetic material core).” (Ex. 2009, ¶ [0009]).</p> |
| <b><i>Cho</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |
| <p>“[T]he wireless charging coil 111 has hollow spaces on one surface 11 of the substrate.” (Ex. 1010, ¶ [0064]).</p> <p>“[T]he second wireless communication coil 151 also has hollow spaces on one surface 11 of the substrate in some regions 840. In these corresponding empty spaces on said one surface 11 of the substrate, a coil pattern may be formed for withdrawing terminals of the wireless charging coil 111 or the second wireless communication coil 121.” (<i>Id.</i> ¶ [0068]).</p> |                                                                                                                                                                                                                                                             |

ii. Ground 2 (*Ahn* and *721Lee*) Is Cumulative of Examination

*Ahn* and *721Lee* similarly present the same familiar building blocks that were already presented to the Office through prior art considered during prosecution.

| Petition Art                                                                                                                                                                                             | Prosecution Art                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>(1) Spiral coil on multi-surface substrate</b>                                                                                                                                                        |                                                                                     |
| <b><i>Ahn</i></b>                                                                                                                                                                                        | <b><i>Kobayashi</i></b>                                                             |
| <p>“A coil assembly includes: a substrate; and a coil wiring coupled to the substrate and including a spiral wiring.” (Ex. 1007, Abstract)</p> <p>“[T]he coil assembly 110 may be formed on opposite</p> | <p>“A spiral coil conductor defining its winding central section as a conductor</p> |

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| <p>surfaces of a flexible insulating substrate such as a film by photolithography, and may be manufactured using, for example, a double-sided flexible printed circuit board (FPCB).” (<i>Id.</i> ¶ [0067]).</p> <p>“[T]he spiral wirings 131<i>a</i> and 131<i>b</i> may be disposed on the opposite surfaces of the substrate 120, respectively, to face each other. That is, the spiral wiring 131<i>a</i> may be a first spiral wiring 131<i>a</i> formed on a first surface 120<i>a</i> of the substrate 120, and the spiral wiring 131<i>b</i> may be a second spiral wiring 131<i>b</i> formed on a second surface 120<i>b</i> of the substrate 120.” (<i>Id.</i> ¶ [0071]).</p> | <p>opening section is formed on a flexible substrate.” (Ex. 2009, at Abstract).</p> <p>“The flexible substrate has a U-shaped bend along a line passing through the conductor opening section so as to envelop a magnetic material core.” (<i>Id.</i> ¶ [0048]).</p> |
| <b>721Lee</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                      |
| <p>“Referring to FIG. 25, the electronic device according to the present disclosure may include an MST coil 2530. An NFC coil 2540 may be disposed on the outer side of the MST coil 2530, and a wireless charging coil 2510 may be disposed on the inner side of the MST coil 2530.” (Ex. 1011, ¶ [0195]).</p> <p>“The electronic device includes a housing; a plurality of coils that are disposed on a first layer within the housing; a plurality of other coils disposed on a second layer substantially parallel to the first layer [.]” (<i>Id.</i> ¶ [0012]).</p>                                                                                                               | <p>“A first conductor is formed on a first principal surface, and a second conductor is formed on a second principal surface of the flexible substrate.” (<i>Id.</i> ¶ [0050]).</p>                                                                                  |
| <b>(2) Structural Openings/Routing Through Coil Regions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                      |
| <b>Ahn</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                      |
| <p>“[T]he lead wirings 137 may be disposed to traverse the first spiral wiring 131<i>a</i> through the disconnected region in a diameter (radial) direction of the first spiral wiring 131<i>a</i>. The lead wirings 137 are wirings connecting one end of the first spiral wiring 131<i>a</i> disposed at the center (e.g., the innermost turn) of the first spiral wiring 131<i>a</i> and one of the connection pads 138 to each other, and connecting another end of the first spiral wiring 131 disposed at an outer portion (e.g., the outermost turn) and another one of the connection pads 138 to each</p>                                                                      | <p>“[T]he coil conductor formed at the bend of the flexible substrate is spaced apart from the end face of the magnetic material core by the cut shape (i.e., the cutout portion of the end face of the magnetic material</p>                                        |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                       |
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| <p>other.” (Ex. 1007, ¶ [0073]).</p> <p>“[T]he first spiral wiring 131a and the second spiral wiring 131b are electrically connected to each other through interlayer connection conductors 139.” (<i>Id.</i> ¶ [0074]).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>core).” (Ex. 2009, ¶ [0009]).</p> <p>“If the cut shapes do not exist, a magnetic circuit tends to be closed in the vicinity of the coil conductor sections ... and as a result, self-inductance tends to be excessive.” (<i>Id.</i> ¶ [0059]).</p> |
| <p><b>721Lee</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                       |
| <p>“a plurality of coils ... disposed on a first layer ... [and] a plurality of other coils disposed on a second layer substantially parallel to the first layer ...” (Ex. 1011, Abstract)</p> <p>“The electronic device includes a housing; a plurality of coils that are disposed on a first layer within the housing; a plurality of other coils disposed on a second layer substantially parallel to the first layer; a first conductor that connects an end point of a first coil of the plurality of coils and a start point of a second coil of the plurality of other coils and conducts a current from the end point of the first coil to the start point of the second coil[.]” (<i>Id.</i> ¶ [0012]).</p> <p>“Referring to FIG. 25, the electronic device according to the present disclosure may include an MST coil 2530. An NFC coil 2540 may be disposed on the outer side of the MST coil 2530, and a wireless charging coil 2510 may be disposed on the inner side of the MST coil 2530. In addition, a magnetic field strength may be relatively weak at the center of the MST coil 2530 and, in this case, a null area may be generated. Accordingly, the electronic device according to various embodiments of the present disclosure may further include an additional MST coil 2520 disposed on the inner side of the wireless charging coil 2510 to compensate for the null area. The generation of the null area may be prevented by the magnetic field of the additional MST coil 2520.” (<i>Id.</i> ¶ [0195]).</p> |                                                                                                                                                                                                                                                       |
| <p><b>(3) Coil-based wireless power and communication</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |
| <p><b>Ahn</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p><b>Kanno</b></p>                                                                                                                                                                                                                                   |

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| <p>“Recently, systems for wirelessly transmitting power in addition to performing functions such as radio frequency identification (RFID), near field communication (NFC), magnetic secure transmission (MST), in order to charge batteries of portable terminals with the power, have been added to portable terminals.” (Ex. 1007, ¶ [0003]).</p> <p>“The coil wiring may be configured to transmit and receive power for wireless charging. The coil assembly may further include a second coil wiring and a third coil wiring disposed in a vicinity of the spiral wiring, wherein each of the second and third coil wirings are configured to perform any one of a radio frequency identification (RFID) function, a near field communications (NFC) function, and a magnetic secure transmission (MST) function.” (<i>Id.</i> ¶¶ [0018]-[0019]).</p> | <p>“A power transmitting antenna includes a first resonant circuit including a power transmitting coil. A power receiving antenna includes a second resonant circuit including a power receiving coil.” (Ex. 2010, Abstract).</p> <p>“[T]he power transmitting antenna and the power receiving antenna are electromagnetically coupled[.]” (<i>Id.</i> ¶ [0303]).</p> |
| <b>721Lee</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                       |
| <p>“[T]he electronic device may perform magnetic secure transmission (MST).” (Ex. 1011, ¶ [0005]).</p> <p>“A wireless charging coil 1030 may be disposed on the inner side of the MST coil 1020. The wireless charging coil 1030 may be manufactured to have a resonant frequency defined in an induction type (for example, WPC standard type) or a resonance type (for example, A4WP standard type).” (<i>Id.</i> ¶ [0139]).</p>                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                       |

iii. Ground 3 (005Lee, Seong, and Cho) Is Cumulative of Examination

005Lee, Seong, and Cho also present the same familiar building blocks that were already presented to the Office through prior art considered during prosecution.

| Petition Art                                                                                                            | Prosecution Art                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>(1) Spiral and Multi-Coil Antenna Structures on Substrates</b>                                                       |                                                                                                        |
| <b>005Lee</b>                                                                                                           | <b>Kobayashi</b>                                                                                       |
| “[A]n electronic device may include: a housing, a conductive pattern that is arranged within the housing and includes a | “A spiral coil conductor defining its winding central section as a conductor opening section is formed |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <p>plurality of coils[.]” (Ex. 1008, 2:20-22).</p> <p>“Referring to FIGS. 5A and 5B, the conductive pattern unit 505 may include a base member 551 and one or more conductive patterns 553<i>a</i>, 553<i>b</i>, and 553<i>c</i>. The base member 551 may include a film that is made of an insulator or a dielectric material, and can provide an area to form the conductive patterns 553<i>a</i>, 553<i>b</i>, and 553<i>c</i>. The conductive pattern unit 505 can have an appearance corresponding to that of the flexible printed circuit board.” (<i>Id.</i> at 17:4-11).</p> | <p>on a flexible substrate.” (Ex. 2009, Abstract).</p> <p>“[I]t is strongly desired that an antenna incorporated in a mobile electronic apparatus achieve high performance, be inexpensive, and be small.” (<i>Id.</i> ¶ [0003]).</p>                                                                                                                                                                                                                                        |
| <p><b><i>Seong</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>See Section II.C.i.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b><i>Cho</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>See Section II.C.i.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b><i>(2) Structural Opening and Separation in Coil Arrangements</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b><i>Seong</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p><b><i>Kobayashi</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>See Section II.C.i.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>“[T]he coil conductor formed at the bend of the flexible substrate is spaced apart from the end face of the magnetic material core by the cut shape (i.e., the cutout portion of the end face of the magnetic material core).” (Ex. 2009, ¶ [0009]).</p> <p>“If the cut shapes do not exist, a magnetic circuit tends to be closed in the vicinity of the coil conductor sections ... and as a result, self-inductance tends to be excessive.” (<i>Id.</i> ¶ [0059]).</p> |
| <p><b><i>Cho</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>See Section II.C.i.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b><i>(3) Coil-based wireless power and communication</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b><i>005Lee</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p><b><i>Kanno</i></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “According to various embodiments of the present disclosure, an electronic device may include: a magnetic secure transfer (MST) module; and at least one coil connected to the MST module.” (Ex. 1008, 51:4-7). | “A power transmitting antenna includes a first resonant circuit including a power transmitting coil. A power receiving antenna includes a second resonant circuit including a power receiving coil.” (Ex. 2010, Abstract). |
| <b><i>Seong</i></b>                                                                                                                                                                                             |                                                                                                                                                                                                                            |
| See Section II.C.i.                                                                                                                                                                                             |                                                                                                                                                                                                                            |
| <b><i>Cho</i></b>                                                                                                                                                                                               |                                                                                                                                                                                                                            |
| See Section II.C.i.                                                                                                                                                                                             | “[T]he power transmitting antenna and the power receiving antenna are electromagnetically coupled[.]” ( <i>Id.</i> ¶ [0303]).                                                                                              |

While the Petition’s references were not themselves part of any rejection, the Petition undertakes no effort to explain why its *Ahn*, *Cho*, *Kang*, *Seong*, *721Lee*, and *005Lee*-based challenges are not cumulative of information already considered during prosecution. *Gardner Denver v. Utex Indus., Inc.*, IPR2020-00333, Paper 12 at 13-14 (P.T.A.B. Aug. 5, 2020) (denying institution where newly asserted references were no more relevant than references presented during prosecution). Petitioner makes no effort to identify or explain any error in the previous evaluation of *Kobayashi*, nor does Petitioner identify any material distinction between those references and the newly asserted art.

### III. CONCLUSION

Under the factors set forth in the Guidance, including those articulated in *Advanced Bionics*, *Fintiv*, and *NHK*, AQ respectfully requests that the Petition be denied as an inefficient use of the Board’s time and resources.

Dated: March 27, 2026

Respectfully submitted,

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

The undersigned hereby certifies that the foregoing contains fewer than 20 pages as required by the Interim Director Discretionary Process.

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**CERTIFICATE OF SERVICE**

I hereby certify that on March 27, 2026, I caused a true and correct copy of the foregoing to be served on the following counsel of record for Petitioner by electronic mail to the following addresses:

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