

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

SCRAMOGE TECHNOLOGY LTD.,
Patent Owner.

IPR2022-00117
Patent 9,843,215 B2

Before JAMESON LEE, KARL D. EASTHOM, and
BRIAN J. McNAMARA, *Administrative Patent Judges*.

McNAMARA, *Administrative Patent Judge*.

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

I. BACKGROUND

In response to a Petition (“Pet.”), on May 12, 2022, we instituted an *inter partes* review of claims 1, 5, 8–13, and 17–22 of U.S. Patent No. 9,843,215 B2 (“the ’215 patent”). Paper 9 (“Dec. to Inst.”). Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), Petitioner filed a Petitioner Reply (Paper 22, “Reply”), and Patent Owner filed a Sur-reply (Paper 25, “Sur-reply”). A transcript of an oral hearing held on February 9, 2023 (Paper 32, “Hr’g Tr.”) has been entered into the record.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). We base our decision on the preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

Having reviewed the arguments of the parties and the supporting evidence, we conclude that Petitioner has demonstrated by a preponderance of the evidence that the challenged claims are unpatentable.

II. THE ’215 PATENT

The ’215 patent concerns a wireless charging and communication board and device. Ex. 1001, 1:18–20. Figure 1 of the ’215 patent is reproduced below.

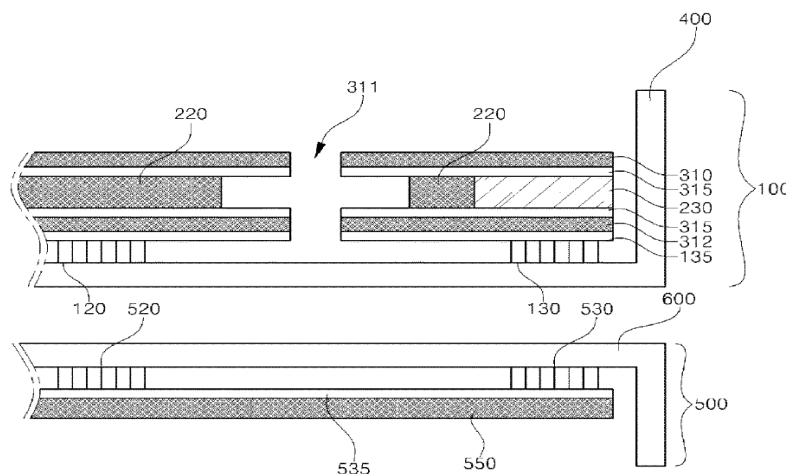


Figure 1 of the ’215 patent

Figure 1 of the '215 patent shows an embodiment of a charging and communication device that includes receiver 100 having reception coil pattern 120 for wireless power conversion and reception coil 130 for near field communication, as well as transmitter 500 having transmission coil pattern 520 for wireless power conversion and transmission coil pattern 530 for near field communication. *Id.* at 2:54–3:2, Fig. 1. Alternating current flowing in transmission coil pattern 520 induces current in reception coil pattern 120 that is transmitted to a separate circuit and rectified. *Id.* at 3:6–19. Receiver 100 includes a wireless charging and communication board and housing 400 that radiates heat from coil patterns 120, 130 to the outside. *Id.* at 3:33–37. The wireless communication board includes soft magnetic layer 220, 230; polymeric material layer 310, 312 disposed on one surface and the other surface of soft magnetic layer 220, 230 to extend longer than an exposed portion thereof and adhered thereto by adhesive layer 315; coil patterns 120, 130; and processing hole 311. *Id.* at 3:38–56, 4:39–57.

Figure 3 of the '215 patent is reproduced below.

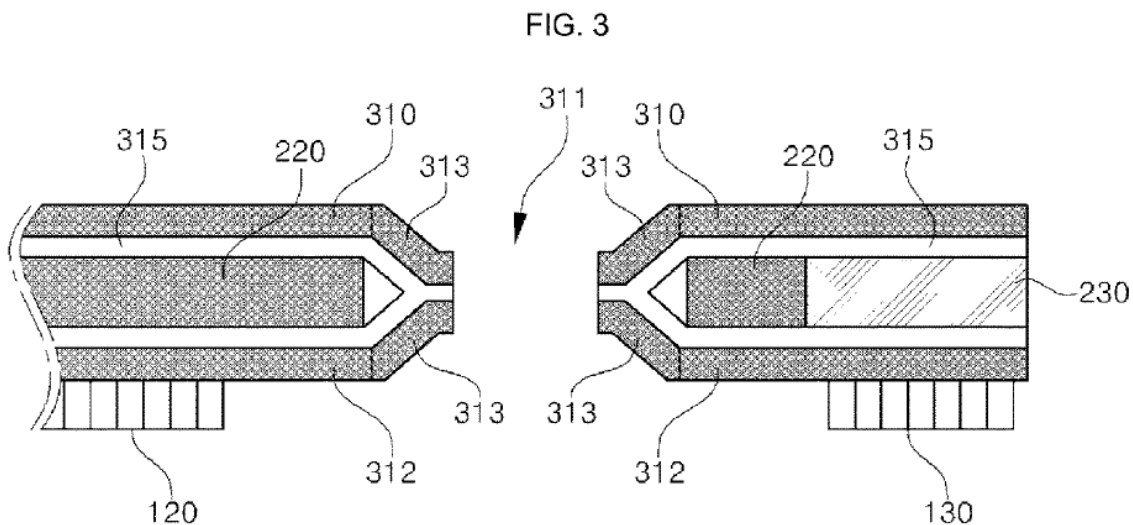


Figure 3 of the '215 patent is a cross-sectional view of an embodiment of a wireless charging and communication board. *Id.* at 2:1–3. Figure 3 shows polymeric material layers 310, 312 arranged on the surfaces of soft magnetic layer 220, 230 and extending longer than an exposed portion of soft magnetic layer 220, 230, and material connector 313 connecting first polymeric layer 310 and second polymeric layer 312, thereby surrounding the exposed portion of soft magnetic layer. *Id.* at 5:24–37. The '215 patent further explains that “a term of the polymeric material connector 313 can be used with a term of the extending portion,” so that “a first extending portion may be extended in the first polymeric material layer 310, and a second extending portion may be extended in [the] second polymeric material layer 312.” *Id.* at 5:37–42. “Accordingly, in the embodiment of FIG. 3, the exposed portion may refer to an end exposed by a processing hole 311 and the polymeric material connector 313 surrounding the exposed portion of the soft magnetic core 220 may prevent water penetration from the outside.” *Id.* at 5:43–47.

III. ILLUSTRATIVE CLAIM

Claim 1, reproduced below with the paragraph designations used in the Petition, is representative of the subject matter of the '215 patent.

- [1.0] A wireless charging and communication board, comprising:
 - [1.1] a plurality of soft magnetic layers comprising a first soft magnetic layer and a second soft magnetic layer;
 - [1.2] a first polymeric layer arranged on a first surface of the plurality of soft magnetic layers;
 - [1.3] a second polymeric material layer arranged on a second surface of the plurality of soft magnetic layers opposed to the first surface; and
 - [1.4] a coil pattern arranged on the second polymeric material layer;

- [1.5] wherein the plurality of soft magnetic layers are positioned between the first polymeric material layer and the second polymeric material layer,
- [1.6] wherein the first polymeric material layer includes a first extending portion extending longer than the plurality of soft magnetic layers,
- [1.7] wherein the second polymeric material layer includes a second extending portion extending longer than the plurality of soft magnetic layers,
- [1.8] wherein the first extending portion and the second extending portion are connected to each other,
- [1.9] wherein at least one of the first soft magnetic layer or the second soft magnetic layer is made with one or more of an amorphous alloy, a crystalline alloy, an amorphous alloy ribbon, a nanocrystalline ribbon, or a silicon steel plate.

IV. GROUNDS OF INSTITUTION

We instituted trial on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 8–11, 13, 17, 19–21	103	Sawa, ¹ Park ²
5, 12, 18, 22	103	Sawa, Park, Inoue ³

V. LEVEL OF ORDINARY SKILL

In the Decision to Institute, we applied Petitioner’s description of a person of ordinary skill as one having a bachelor’s degree in electrical engineering, or equivalent training, and approximately two years of experience working in the field of wireless power transmission or experience and additional education that could have substituted for each other. Dec. to Inst. 13–14. Neither party disputes this description, and we apply it in this Decision.

¹ U.S. Patent No. 9,443,648 B2 to Sawa (Ex. 1005).

² U.S. Patent No. 8,922,162 B2 to Park (Ex. 1006).

³ U.S. Patent No. 8,922,160 B2 to Inoue (Ex. 1007).

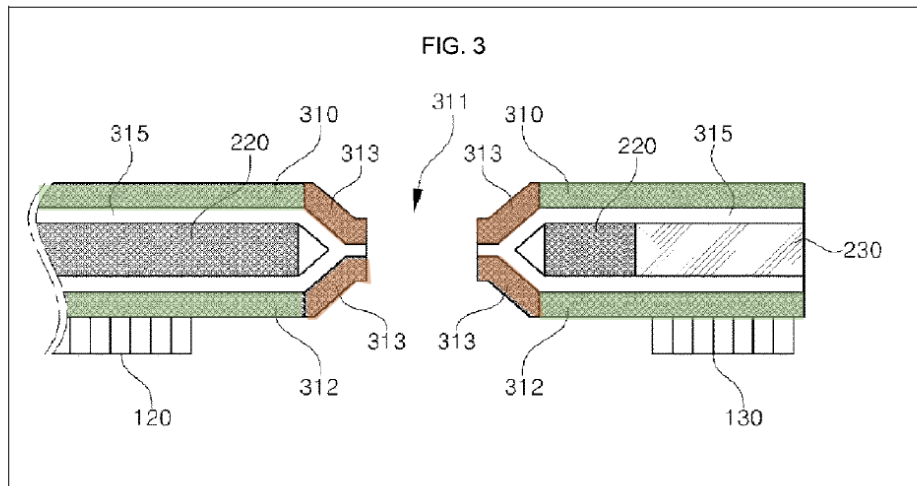
VI. CLAIM CONSTRUCTION

In our Decision to Institute, we noted that neither party proposed a construction of any claim term and we did not construe any terms. Dec. to Inst. 14–15. In its post-institution Patent Owner Response, Patent Owner contends that we should construe the claims to require two separate and distinct polymeric layers (claim limitations 1.2–1.8). PO Resp. 25–30.

In separate limitations, claim 1 recites first and second layers on first and second surfaces, i.e., different surfaces, of a plurality of soft magnetic layers. Ex. 1001, 9:59–62. Each of the first and second layers has a portion that extends longer than the magnetic layers and the extending portions are connected to each other. *Id.* at 10:1–8. According to Patent Owner, Applicant’s amendment of the claims from their original form reciting “a polymeric material layer arranged on one surface and the other surface of the soft magnetic layer and extending longer than an exposed portion of the soft magnetic layer” to their current form separately reciting first and second layers with extension portions that are connected to each other indicates the claim, as issued, should be construed to mean separate layers that are connected together. PO Resp. 28–30 (citing Ex. 1002, 81–82, 89, 214).

Patent Owner contends that its proposed construction is consistent with the claim language. *Id.* at 29. Patent Owner argues that claim 1 not only recites first and second polymeric layers separately, but also recites that each of the polymeric layers has an extending portion and the extending portions are connected to each other. *Id.*; see Ex. 1001, 10:1–8.

Patent Owner further contends that its proposed construction is consistent with the Specification. *Id.* at 27–28. Patent Owner’s annotated version of Figure 3 of the ’215 patent is reproduced below.



PO Resp. 27. Citing the description of Figure 3 at column 5, lines 34–37, of the '215 patent, Patent Owner argues that polymeric layers 310, 312 highlighted in green are described in the patent as distinct, separate layers arranged on opposite sides of soft magnetic layers 220, 230 connected to each other by polymeric material connector 313 highlighted in brown. *Id.* at 27–28; see Ex. 1001, 5:33–37 (“[T]he wireless charging and communication board . . . includes polymeric material connector 313 intended for connecting the first polymeric material layer 310 and the second polymeric material layer 312 and surrounding the exposed portion of the soft magnetic layer 220.”).

Patent Owner also cites the prosecution history of the '215 patent, noting that the Applicant obtained allowance of issued claim 1 by amending the claim to its current form in response to an Examiner’s rejection of a claim reciting “a polymeric material layer arranged on one surface and the other surface of the soft magnetic layer and extending longer than an exposed portion of the soft magnetic layer.” PO Resp. 28–30 (citing Ex. 1002, 81–82, 89, 214).

Petitioner contends that Patent Owner's separate and distinct construction is internally inconsistent and improperly implicates a product-by-process claim. Reply 19–20. In support of its argument that Patent Owner's separate and distinct construction is internally inconsistent, Petitioner relies on dictionaries that define “separate” as meaning “not connected” and “detached, disconnected, or disjointed.” *Id.* (citing Exs. 1025, 1026). With these definitions in mind, Petitioner contends that the first and second polymeric layers cannot be both physically separate, as argued by Patent Owner, and connected, as recited in the claim. *Id.* at 20. Petitioner further notes that claims 11 and 21 recite that the extending portions of the first and second material layers contact each other. *Id.*

Noting Patent Owner's argument that the '215 patent never suggests the claimed extending portions may be fabricated as a single integrated piece, Petitioner contends that, because the claims recite the extending portions are connected to each other, a single integrated piece is expressly encompassed by the claims. *Id.* at 21–22 (citing PO Resp. 37).

Petitioner further contends that, to the extent Patent Owner argues the claimed polymeric layers were previously separate and are subsequently connected, Patent Owner improperly construes independent apparatus claims 1 and 13 as product-by-process claims. *Id.* at 20–21 (citing *Regents of Univ. of Minn. v. AGA Med. Corp.*, 717 F.3d 929, 935–936 (Fed. Cir. 2013)). Petitioner argues that patentability does not depend on the method of production, but on the product itself. *Id.* at 21 (citing *In re Thorpe*, 777 F.2d 695, 698 (Fed. Cir. 1985)).

Patent Owner also cites *Regents*, arguing “the Federal Circuit explained that when two components are ‘connected’ it means those objects were previously separate.” PO Resp. 29 (citing *Regents*, 717 F.3d at 935–

36); *id.* at 36 (citing *Regents*, 717 F.3d at 938); *see also* Sur-reply 8 (citing *Regents* to argue that Petitioner’s product-by-process argument “runs contrary to the myriad of cases where the Federal Circuit has recognized that separate, physically distinct structures can be ‘connected,’ ‘coupled,’ ‘affixed,’ etc.”). Patent Owner relies on *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254–56 (Fed. Cir. 2010) and *Am. Piledriving Equip., Inc. v. Geoquip, Inc.*, 637 F.3d 1324, 1332–34 (Fed. Cir. 2011) as supporting its argument that elements claimed as connected to each other are structurally separate and distinct. PO Resp. 29–30.

In *Becton*, where a claim drawn to a shieldable needle recited a spring means connected to a hinged arm, the court found that by its plain terms, “the spring means and the hinged arms are separate structures which are ‘connected to’ each other” and concluded that the district court erred when its construction “did not require a spring means that was a distinct structural element from the hinged arm.” *Becton*, 616 F. 3d at 1253–54. The court noted that the *Becton* claims recited the spring means and the hinged arm as two separate elements, there was nothing to suggest the hinged arm and the spring means can be the same structure, and the only elements disclosed in the specification as spring means for urging a guard on the needle forward were separate structures from the hinged arm and its hinges. *Id.* at 1254. An issue that distinguishes *Becton* is the court’s observation that nothing in the specification suggests the hinge can perform the same function the spring performs, i.e., moving the guard forward. *Id.* In this case, the first and second polymeric layers each perform a similar function, i.e., each of the first and second layers covers a surface of the magnetic material between them, although the surfaces are opposite each other.

Regents concerned a series of patents claiming septal occluders (medical devices used to block holes in a thin wall of muscle and tissue dividing two chambers of the heart). *Regents*, 717 F.3d at 932. The summary of the invention of a generally common specification described the septal occluders as having “first and second occluding disks which are attached to one another” centrally. *Id.* at 932–933. The disks are collapsed for insertion into a delivery catheter that positions the disks on each side of a defective septum. *Id.* When the delivery catheter is withdrawn, the disks expand to cover both sides of the septum and block the hole. *Id.* The court found claim language explaining a conjoint disk is formed by affixing the membranes of the first and second occluding disks to one another “supports a requirement of separateness” of the first and second occluding disks. *Id.* at 935. The court further found that “dictionary definitions support the conclusion that when a physical object is described as having been ‘affixed,’ ‘joined,’ ‘connected,’ or ‘conjoin[ed]’ to another object, it means that those objects were previously separate.” *Id.* at 938. Noting that the specification is the best guide to the meaning of a disputed term, in *Regents* the court found the specification never teaches an embodiment constructed as a single piece, but that every embodiment disclosed in the drawings and the written description is made up of two separate disks. *Id.* at 936. Thus, an issue that distinguishes *Regents*’ conclusion that the claimed disks must be separate components from the circumstances of this case is that Applicant’s initial claim was drawn to a single polymeric material layer, i.e. “a polymeric material layer arranged on one surface and the other surface of the soft magnetic layer and extending longer than an exposed portion of the soft magnetic layer.” PO Resp. 28–30 (citing Ex. 1002, 81–82, 89, 214).

Contrary to Petitioner’s arguments that Patent Owner converts the subject claims to a product-by-process claim, in *Regents*, the court explicitly rejected a similar argument that the district court improperly imported process limitations in the construed claims. *Regents*, 717 F.3d at 938. The court noted that words like “affixed” or “conjoint” should be given their ordinary meaning with respect to the claimed product’s structure and, when read in context, such words “describe [] the product more by its structure than by the process used to obtain it.” *Id.* (citing *Hazani v. U.S. Int’l Trade Comm’n.*, 126 F.3d 1479 (Fed. Cir. 1997), *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003) (such words are “commonly and by default interpreted in their structural sense”)). The court contrasted words like “connected” with words such as “integral,” noting that in *Vanguard Products Corp. v. Parker Hannifin Corp.*, 234 F.3d 1370, 1372–73 (Fed. Cir. 2000), the court held “integral” to describe the relationship between elastomeric layers, not the means of joining them. *Regents*, 717 F.3d 938–939. The court noted that the decision in *Vanguard* found “integral” to be used in its ordinary sense to mean formed as a unit with another part, because the term describes the product, not as a designation of a specific manufacturing process. *Id.*

Other Federal Circuit cases support the notion that the plain meaning of “connected” does not require separate components. *See, e.g., Fisher–Price Inc. v. Safety 1st, Inc.*, 109 F. App’x 387, 396 (Fed. Cir. 2004) (rejecting the argument that “[i]f one component is said to be ‘movably connected’ to another, and if ‘movably connected’ is given its ordinary meaning, it would seem that the two components would have to be separate,” because “nothing in the plain meaning of the phrase “‘movably connected’ [inherently] eliminates the possibility of common portions

shared between the members so connected” (alteration in original)); *Animatics Corp. v. Quicksilver Controls, Inc.*, 102 F. App’x 659, 666 (Fed. Cir. 2004) (“We agree with Animatics that the district court erred in requiring that the microprocessor and the PID controller be physically separate circuits that are electrically connected. Claims are generally given their plain meaning unless the patentee chooses to be his own lexicographer.”).

The case before us is similar to the situation in *Animatics*. In *Animatics*, claim 26 at issue recited “a proportional-integral-derivative (PID) filter *connected to* said microprocessor.” *Animatics*, 102 F. App’x at 665 (emphasis added). Nevertheless, the court held that claim 26 did not require “physically separate circuits that are electrically connected,” reasoning that “[i]f the PID filter is implemented purely in software, then the physical line between the microprocessor and PID filter completely disappears.” *Id.* at 666–67. Here, claim 1 similarly recites that “the first extending portion and the second extending portion *are connected to each other*” (emphasis added). However, the text in the Specification that describes the embodiments of Figures 3–5 does not describe how to connect the extending portions with any specificity. *See* Ex. 1001, 5:24–64. In *Animatics*, rejecting the district court’s overly restrictive requirement that “connected” means “physically separate circuits that are electrically connected,” the Federal Circuit reasoned that this requirement is not the ordinary meaning and then found “no indication in the intrinsic evidence (claims, specification, or prosecution history) clearly indicating that the inventor intended to [narrow the ordinary meaning] and exclude a software-only implemented PID.” *See Animatics*, 102 F. App’x at 666–667. Similarly, there is nothing

here to indicate that the inventors intended to exclude an integral connection of extending portions to require physically separate connection portions.

Neither *Becton* nor *Regents* stands for a *per se* rule that two “connected” elements must have at one time been disconnected, unattached, or unaffixed to each other. Much depends on the specification, the prosecution history, and the nature of the two elements. The issue is case specific and determined on a case-by-case basis.

Where the specification describes the connected elements simply as material rather than an assembly of parts, and where the elements are essentially portions of one material located apart from each other, the considerations weigh more toward holding the elements are connected even if they were never structurally separated at any time. For instance, a one-piece iron dumbbell has a first enlarged end and a second enlarged end *connected* to each other by a bar. The two ends are *connected* even though they were never structurally separated at any time. On that basis, both *Becton* and *Regents* are distinguished from the facts here.

Moreover, under the facts of this case, holding that the first and second polymeric layers of claim 1, or extensions thereof, must have at one time been physically separate before being connected, as Patent Owner argues, adds a process step limitation to an apparatus claim, which even *Regents* recognizes as improper. *Regents*, 717 F.3d at 938.

Two additional facts distinguish this case from *Becton* and from *Regents*. First, Figure 5 of the ’215 patent shows connector 313 without an internal physical separation between an extension of the first polymeric layer 310 and an extension of the second polymeric layer 312. That reasonably indicates, in the context of the ’215 patent, two connected elements (upper extending portion and lower extending portion) may comprise a single

integral structure. If the extending portions may be so deemed “connected,” then so can first polymeric layer 310 and second polymeric layer 312. Second, as discussed above, Applicant initially claimed not a first and second polymeric layer but “a polymeric material layer arranged on one surface and the other surface of the soft magnetic layer and extending longer than an exposed portion of the soft magnetic layer.” Ex. 1002, 19, 81. That indicates the Specification differs from those in *Becton* and *Regents*, and that an integral layer including the first polymeric layer, the second polymeric layer, and the connecting extensions is not without meaning, pertinence, or significance. Although the amendment adds language about a first and a second layer, the change is not sufficient to exclude from the claim scope a single large layer folded over and under magnetic sheets to comprise the first layer and the second layer connected to each other through extension portions thereof.

In summary, we reject Patent Owner’s argument that we should construe the claims to require two separate and distinct polymeric layers (claim limitations 1.2–1.3, 1.6–1.8). PO Resp. 25–30. Moreover, as explained in our patentability analysis below, even if we agree with Patent Owner that claim 1 recites structural limitations in the form of separate layers (*see* limitations 1.2, 1.3) that are connected to each other via their extended portions (*see* limitations 1.6, 1.7, 1.8), Petitioner shows by a preponderance of evidence that claim 1 would have been obvious. *See*, Section VII.B.3.a herein.

VII. ANALYSIS OF PRIOR ART CHALLENGES

A. Introduction

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is

unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); *see In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

An obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418; *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Petitioner cannot satisfy its burden of proving obviousness by employing “mere

conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

A reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR*, 550 U.S. at 418–21).

Before determining whether a claim is obvious in light of the prior art, we consider any relevant evidence of secondary considerations of non-obviousness. *See Graham*, 383 U.S. at 17. Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). No evidence of secondary considerations has been presented in this proceeding.

We analyze the asserted grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish unpatentability by a preponderance of the evidence.

B. Claims 1, 8–11, 13, 17 and 19–21 As Obvious Over Sawa and Park

1. Sawa – Ex. 1005

Sawa concerns a magnetic sheet for a non-contact power receiving device. Ex. 1005, 3:46–47. Figure 3 of Sawa is reproduced below.

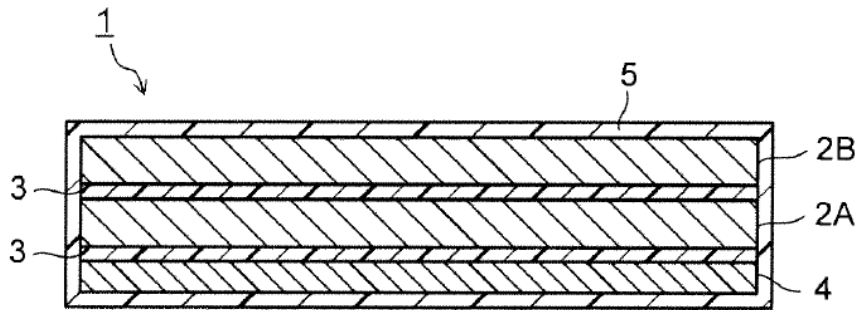


Figure 3 of Sawa shows magnetic device 1 having a laminate structure of two first magnetic thin plates 2A, 2B and one second magnetic thin plate 4 covered by resin film 5. *Id.* at 5:8–11. Sawa states that covering the laminate of thin plates with resin film 5 is an effective solution if the laminate of thin plates is subject to corrosion or if electrical insulation is required. *Id.* at 5:11–16. Sawa further notes that adhesive layers 3 are not necessary if the entire laminate is covered by resin film 5. *Id.* at 5.

2. Park – Ex. 1006

Park discloses “a portable terminal having a structure that facilitates mounting of a secondary coil for wireless charging and a Near Field Communication (NFC) antenna element, without increasing the thickness of the portable terminal.” Ex. 1006, 2:12–16. In Park, “a shielding member is attached to an inner surface of an external part, a first coil is attached to a surface of the shielding member that faces the inner surface of the external part, and a second coil is attached to the surface of the shielding member,

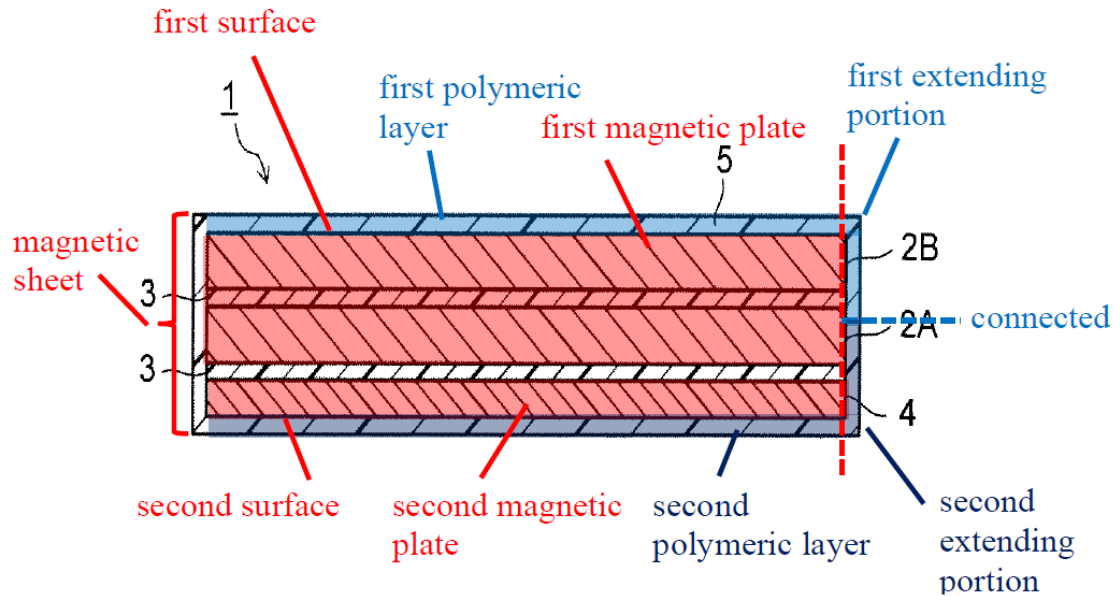
with the second coil surrounding the first coil on a same plane.” *Id.* at 2:26–32.

3. *Independent claim 1*

The preamble of claim 1, identified by Petitioner as claim element 1.0, recites “[a] wireless charging and communication board.” Petitioner contends that, although the preamble of claim 1 is not limiting, Sawa discloses the claimed subject matter, e.g., a non-contact power receiving device 11 with a spiral coil 16 disposed along a plane of magnetic sheet 1, that forms a substantially planar multi-layer board. Pet. 27–31. Petitioner contends it would have been obvious for Sawa’s wireless charging device to include an NFC coil for data communication in the manner taught by Park, resulting in a wireless charging and communications board. *Id.* at 30 (citing Ex. 1003, Declaration of Dr. Joshua Phinney (“Phinney Decl.”) ¶ 57). Petitioner notes that Sawa and Park pertain to the same field of endeavor, i.e., contactless charging via electro-mechanical induction. *Id.* at 24. Park explicitly discloses “[a] portable terminal having a wireless charger coil and an antenna element on the same plane.” Ex. 1006 (code 57). We agree with Petitioner that a person of ordinary skill would have had reason to combine the teachings of Sawa and Park to arrive at a wireless charging and communication board.

a) *Claim limitations 1.2–1.8*

An annotated version of Figure 3 of Sawa from the Petition is reproduced below.



Pet. 40. Petitioner identifies Sawa's thin magnetic plates 3, 4 as disclosing a plurality of soft magnetic layers comprising a first soft magnetic layer and a second soft magnetic layer, recited in claim limitation 1.1. *Id.* at 31–32 (citing Ex. 1003, Phinney Decl. ¶¶ 59–62; Ex. 1005, 4:10–14, 8:65–67, 9:65–10:1, Fig. 3). Petitioner cites Sawa's resin film 5, i.e., a polymeric layer that encapsulates the magnetic plates, as disclosing a polymeric layer on a first (top) surface and a second (bottom) surface of the plurality of soft magnetic layers, as recited in claim limitations 1.2 and 1.3. *Id.* at 32–35 (citing Ex. 1003, Phinney Decl. ¶¶ 63–70; Ex. 1005, 4:39–43, 5:8–23). Petitioner cites spiral coil 16 of Sawa as disclosing the coil pattern arranged on the second polymeric material layer recited in claim limitation 1.4. *Id.* at 35–36 (citing Ex. 1003, Phinney Decl. ¶¶ 72–74; Ex. 1005, 15:51–61). Petitioner further notes that in Sawa magnetic plates 2, 4 are positioned between the first and second polymeric layers, as recited in claim limitation 1.5. *Id.* at 36–37 (citing Ex. 1003, Phinney Decl. ¶¶ 73, 75).

Noting that Sawa's magnetic sheets 2, 4 are encapsulated in polymer resin 5, Petitioner shows in its annotated version of Sawa's Figure 3 first and

second extending portions of the first and second polymeric layer that extend longer than the plurality of soft magnetic layers, as recited in claim limitations 1.6 and 1.7, and are connected to each other, as recited in claim limitation 1.8. Pet. 37–42. According to Petitioner, “because Sawa’s polymer resin 5 encapsulates the magnetic sheets, which includes a first extending portion that is connected to the second extending portion, Sawa renders obvious ‘*wherein the first extending portion and the second extending portion are connected to each other.*’” *Id.* at 42 (citing Ex. 1003 ¶ 84).

Patent Owner argues that Petitioner’s reliance on Sawa as disclosing a polymer resin that encapsulates a magnetic sheet fails to demonstrate that Sawa discloses the claimed first and second resin layers. PO Resp. 33–39. Petitioner argues that it “cites different and distinct portions of Sawa’s resin film for the two polymeric material layers,” i.e. the upper layer of Sawa’s resin film as the first polymeric layer and a different and distinct portion of Sawa’s resin film on the bottom of the magnetic plate as the second polymeric layer. Reply 17–18.

Our construction of claim 1 does not require that the first and second polymeric material be separate and distinct. *See* Section VI herein. Nevertheless, for reasons discussed below, even under Patent Owner’s construction, we find that Petitioner has demonstrated that Sawa discloses claim limitations 1.2–1.8.

The Petition characterizes Figures 5 and 10 of the ’215 patent as showing the polymeric material “encapsulating” the magnetic material Pet. 8–10 (citing Ex. 1001, 5:33–37). Notwithstanding Petitioner’s characterization, the text Petitioner cites, which describes the embodiment in Figure 3, does not mention encapsulation, and instead describes “a

polymeric material connector 313 intended for connecting the first polymeric layer 310 and the second polymeric layer 312 and surrounding the exposed portion of the soft magnetic layer 220.” Ex. 1001, 5:33–37. The text describing the embodiment in Figures 4 and 5, in which the polymeric material is bonded to the magnetic layer by thermal compression without an adhesive layer, also does not mention encapsulation. *Id.* at 5:51–64. Both the ’215 patent and Sawa refer to the polymeric material as being a film. Ex. 1001, 3:51–52 (“the polymeric material . . . may be made with a black film”); Ex. 1005, 5:15–17 (“the entire laminate is covered by . . . resin film 5”).

Patent Owner contends that Petitioner arbitrarily splits Sawa’s encapsulated resin film 5 into separate pieces corresponding to the claimed first and second polymeric layers, and extensions thereof that are connected. PO Resp. 34. We disagree with Patent Owner’s contention that Petitioner’s splitting of Sawa’s layer 5 into a top layer, a bottom layer, and connecting portions on the sides is arbitrary. *Id.* Petitioner’s reading is not arbitrary but reasonable, based on the fact that the top and bottom portions cover different surfaces of different magnetic sheets, as is self-evident from Sawa’s Figure 3.

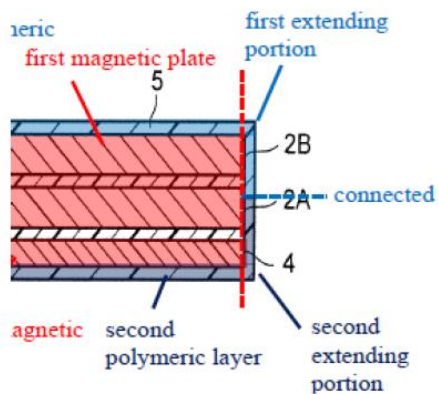
For the foregoing reasons, we find that in Sawa the portion of layer 5 covering the top surface of magnetic plate 2B (Fig. 3) is a first polymeric layer and the portion of layer 5 covering the bottom surface of magnetic plate 4 (Fig. 3) is a second polymeric layer, and that they are connected to each other through a first extension portion of the first polymeric layer and a second extending portion of the second polymeric layer, as depicted on page 40 of the Petition. Petitioner persuasively has shown that Sawa discloses a first polymeric layer in the form of the portion of layer 5 covering the top

surface of magnetic plate 2B, and a second polymeric layer in the form of the portion of layer 5 covering the bottom surface of magnetic plate 4. Petitioner also persuasively has shown that Sawa discloses a first extending portion of the first polymeric layer and a second extending portion of the second polymeric layer, connected to each other, in the form of a side wall portion of layer 5, as depicted on page 40 of the Petition. Thus, even under Patent Owner’s construction, Sawa discloses separate first and second polymeric layers.

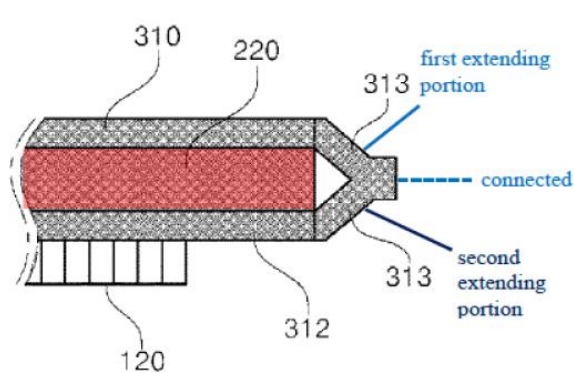
Further, Sawa does not use the word “encapsulate,” but describes “covering the entire laminate of the magnetic thin plates 2, 4 by the resin film.” Ex. 1005, 5:12–13. Sawa discloses “concrete examples of the resin film 5 can be . . . a PET film, a PI film, a PPS film, a PP film, a PTFE film and so on.” Ex. 1005, 5:22–23; Ex. 1003, Phinney Decl. ¶ 40. Sawa does not describe how the resin film is applied to cover or encapsulate the laminate. *See* Ex. 2020, Declaration of Dr. David Ricketts (“Ricketts Decl.”) ¶ 93 (“Sawa does not provide any detail as to how the magnetic sheet laminate is ‘completely covered by a resin film,’ *e.g.*, by spraying the encapsulating resin, dipping the magnetic sheet in the encapsulating resin, or otherwise.”). Dr. Ricketts does not address whether the types of resin discussed in Sawa, *e.g.*, PET (polyethylene terephthalate) film, PI (polyimide film), PPS (polyphenylene sulfide) film, PP film, PTFE (PolyTetraFluoroEthylene film), can be applied by spraying or dipping. Dr. Phinney testifies that a person of ordinary skill would have known implementation techniques for securing such polymer resin films to all sides of Sawa’s magnetic sheet, *e.g.*, using adhesive layers to secure an insulating film layer. Ex. 1003, Phinney Decl. ¶¶ 124–127 (citing Ex. 1007, 7:47–49). Dr. Phinney’s testimony is consistent with well-known forms of films

mentioned in Sawa that are available as sheets of material. *See id.* ¶ 138 (“A POSITA would have found it obvious for Sawa’s encapsulating polymer film to comprise two separate pieces that meet and connect on the sides of the magnetic sheet, for example when encapsulating with adhesive tape (i.e., an adhesive backed by a polymer film carrier), a *common* encapsulation technique at the time.” (emphasis added)).

Claim 1 is drawn to a product, independent of the process used to produce the product. Figure 3 of the ’215 patent illustrates an embodiment in which the first and second resin layers 310, 312 are attached to the magnetic material by adhesive 315. Ex. 1001, 3:47–56, Fig. 3. Figures 4 and 5 of the ’215 patent illustrate an embodiment that does not require adhesive layer 315. *Id.* at 5:51–55, Fig. 5. A figure from the Petitioner Reply is reproduced below.



Ex.1003, Fig. 5; Petition, 40



Ex.1001, Fig. 5; Petition, 42.

Reply 22. On the left is an annotated version of Figure 5 of Sawa used in the Petition and on the right is an annotated version of Figure 5 of the ’215 patent, also used in the Petition. As Petitioner notes, both figures shown side-by-side illustrate similar product structures, the only difference being the length of the extension that connects the first and second

polymeric layers to each other. As Figure 5 of Sawa on the left shows, the resin film on the top and bottom of the magnetic material extends past the edge of material and are connected by resin film. In view of the similarity of the structures, we find that Sawa would have disclosed or suggested to a person of ordinary skill in the art the claimed first and second polymeric layers (limitations 1.2, 1.3), as well as the extending portions connected to each other (limitations 1.6–1.8), as recited in claim 1. As discussed above, we also find that Sawa discloses the claimed coil pattern (limitation 1.4) and the plurality of soft magnetic layers positioned between the first and second polymeric material layers (limitation 1.5).

b) Claim limitations 1.1 and 1.9 – the plurality of soft magnetic layers

Claim limitation 1.1 recites a plurality of soft magnetic layers comprising a first soft magnetic layer and a second soft magnetic layer. Ex. 1001, 9:56–57. The Petition cites Sawa as disclosing power receiving device 11 with first and second magnetic plates 2, 4 that may be formed of soft magnetic material. Pet. 31–32 (citing Ex. 1005, 8:65–67 (disclosing first magnetic thin plates 2 can be an Fe alloy of an Fe-Cr system, an Fe-Ni system, an Fe-Si system, or the like), 9:55–10:1 (disclosing that Si is an element effective for control of a soft magnetic material)). The Petition further cites paragraphs of Dr. Phinney’s Declaration that provide a more detailed discussion of the material in Sawa’s magnetic laminate. Pet. 31–32 (citing Ex. 1003, Phinney Decl. ¶¶ 59–62). Dr. Phinney cites Sawa as disclosing compositions that make magnetic sheet 2 of the laminate hard to saturate and magnetic plate 4 more permeable. Ex. 1003, Phinney Decl. ¶¶ 59–60. Dr. Phinney also cites Sawa as disclosing that silicon is an

element effective at controlling the soft magnetic characteristics of a material. *Id.* ¶ 62 (citing Ex. 1005, 9:65–10:1).

Claim limitation 1.9 recites that at least one of the layers is made with one or more of an amorphous alloy, a crystalline alloy, an amorphous ribbon, a nanocrystalline ribbon, or a silicon steel plate. Ex. 1001, 10:9–13. The Petition cites Sawa’s disclosure that the second magnetic plate is preferably made of Co-based amorphous alloy as rendering obvious claim limitation 1.9. Pet. 42–43 (citing Ex. 1003, Phinney Decl. ¶¶ 85–86; Ex. 1005, 11:12–19).

Noting that Sawa discloses two magnetic thin plates with different properties, Patent Owner argues that Sawa teaches away from the first magnetic layer being a soft magnetic layer, as claimed. PO Resp. 31. Patent Owner cites Sawa as explaining that “conventional magnetic thin plates, being ‘excellent in soft magnetic characteristic’ will saturate too easily in the presence of a magnet.” *Id.* at 18 (citing Ex. 1005, 2:47–52). Patent Owner cites Sawa as aiming to achieve sufficient shielding and high charging efficiency by laminating thin magnetic sheets with different characteristics, such that first thin magnetic plate 2 is hard to saturate and second thin magnetic plate 4 obtains high magnetic permeability at the power frequency, resulting in suppression of undesired heat and noise. *Id.* at 18–19 (citing Ex. 1005, 4:18–29, 5:56–63; Ex. 2020, Ricketts Decl. ¶ 82), 22 (citing Ex. 1005, 5:24–51; Ex. 2020, Ricketts Decl. ¶¶ 83–84). As evidence that Sawa does not disclose the claimed soft magnetic first plate, Patent Owner cites multiple examples in Sawa of the composition of the first magnetic plate (e.g., Fe-Cr system, Fe-Ni or Fe-Si alloys, where the Ni and Si are kept below certain percentages to ensure the first magnetic plate is hard to saturate, and a stainless steel thin plate) and Dr. Ricketts’s opinion that

processing steps Sawa discloses to form the first thin plate create a hard magnetic material from compositions that may exhibit soft magnetic material characteristics in many other forms. *See id.* at 21–24 (citing e.g., Ex. 1005, 10:56–11:10; Ex. 2020, Ricketts Decl. ¶¶ 89–90). Patent Owner does not identify any subject matter in Sawa that explicitly states the composition or processing of the material results in a material that is not a soft magnetic material.

Although Petitioner cites Sawa as disclosing each magnetic plate may include silicon (Si) as an effective element for controlling a soft magnetic characteristic, Patent Owner contends that Sawa does not disclose how silicon should be used with respect to soft/hard characteristics. PO Resp. 32 (citing Ex. 2020, Ricketts Decl. ¶¶ 102–104). Patent Owner further cites Dr. Ricketts’s testimony that magnetic softness/hardness depends not only on the material, but on the processing of the material. *Id.* (citing Ex. 2020, Ricketts Decl. ¶¶ 63–64). According to Patent Owner, Sawa teaches using a soft magnetic material for the first layer would reduce the shield effect. PO Resp. 31 (citing Ex. 1005, 2:47–59; Ex. 2020, Ricketts Decl. ¶ 99).

Noting that Patent Owner asserts that Sawa’s first magnetic plate is not “soft” because it would be hard to saturate, Petitioner contends that “[t]his argument fails on its face because the standard for determining whether a material is a hard or soft magnet is not based on how hard it is to saturate[,] but rather on its coercivity—something Patent Owner’s expert admits he did not analyze.” Reply 2, 5 (citing Ex. 1022⁴, 117). To

⁴ S. Tumanski. 23 Jun 2011, *Magnetic Materials from: Handbook of Magnetic Measurements* CRC Press, Accessed on: 17 Oct 2022, <https://www.routledgehandbooks.com/doi/10.1201/b10979-4>

emphasize this point, Petitioner cites the following material from a textbook relied on by Patent Owner:

Whether a ferro- or ferrimagnetic material is a hard or a soft magnet depends on the strength of the magnetic field needed to align the magnetic domains. **This property is characterized by HC, the coercivity.** Ex.2019, 36.

Hard magnets have a high coercivity (HC), and thus retain their magnetization in the absence of an applied field, whereas **soft magnets have low values.** Ex.2019, 36.

Id. at 6 (citing Ex. 2019, 36). Petitioner further cites Dr. Ricketts’s acknowledgements that a hard magnet is one that has low coercivity, a hard magnet is one that has high coercivity (*id.* (citing Ex. 1017, Ricketts Tr. 11:21–12:21, 12:15–15:6, 54:11–14)) and that he did not consider whether Sawa’s materials have high or low coercivity (*id.* at 6 (citing Ex. 1017, 40:1–6 (Dr. Ricketts testifying “I do not have any information on the coercivity of these [Sawa’s] materials, whether it’s high or low.”))).

Although the parties generally agree that Sawa discloses a number of compositions and processes that make a magnetic material hard to saturate, Patent Owner argues that the Petition failed to demonstrate that Sawa discloses the first magnetic layer is a soft material. Arguing that the Board routinely rejects new unpatentability arguments that were not raised in the petition, Patent Owner urges us to refuse to consider the arguments raised in Petitioner’s Reply. Sur-reply 4 (citing e.g., *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016); *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 775 (Fed. Cir. 2018)). According to Patent Owner, “Petitioner failed to meet its burden of proof in the Petition by merely concluding, without explanation, that Sawa discloses a plurality of soft magnetic layers and waited until

Patent Owner raised serious question about those considerations before proffering any evidence outside its highlights of Sawa.” *Id.* Petitioner argues that the Petition identified Sawa’s layers as being soft and that silicon can be used to control the softness. Hr’g Tr. 14:16–15:24; see Pet. 31–32 (citing Ex. 1003, Phinney Decl. ¶¶ 59–62).

Sawa describes the state of the art as follows:

In a present international standard of the non-contact charging method, there are a method of using a magnet and a method of not using a magnet in positioning of an apparatus in a power receiving side. Since a magnetic thin plate used in the conventional magnetic shield is excellent in soft magnetic characteristic, use of a laminate in a range of one or three or less magnetic thin plate(s) with a saturation magnetic flux density of 0.55 to 2 T causes magnetic saturation easily, if a magnet exists in the neighborhood. Under the circumstances, a magnetic sheet for non-contact power receiving device is desired which enables a sufficient magnetic shield effect and a high charging efficiency independently of existence/absence of a magnet in a power feeding device side.

Ex. 1005, 2:62–3:8. Thus, Sawa discloses that a person of ordinary skill would have known about the use of a conventional magnetic shield plate of soft magnetic material in the laminate and that such material saturates easily in the presence of a magnet. *Id.* Sawa also discloses the desirability of a magnetic sheet that improves the shielding effect. *Id.* Sawa achieves this result with compositions and processes that make the material harder to saturate, but does not discuss making the soft magnetic material hard. Reply 9–10 (citing Ex. 1005, 9:4–11, disclosing the plate thickness and inner strain of an Fe-Cr, system, an Fe-Ni system, or an Fe-Si system are easily adjusted by a processing step, such as rolling, to generate magnetic anisotropy by an interaction with magnetostriction, making magnetic thin plate 2 hard to saturate); see also Ex. 1005, 9:25–10:17 (discussing tradeoffs and

manufacturing considerations for a ferrite system, including using silicon to control the softness characteristic, as a deoxidizer, and to improve hot workability). Petitioner’s expert, Dr. Phinney, also notes that a magnetic sheet of hard magnetic material would not accomplish Sawa’s shielding and charging efficiency goals and would be “ill-suited for wireless power charging systems.” *Id.* at 13–14 (citing Ex. 1018, Phinney Reply Decl. ¶ 45).

Petitioner points to the deposition of Patent Owner’s expert, Dr. Ricketts, stating “[w]e asked Dr. Ricketts in deposition if he agreed that Sawa describes a hard magnetic layer, and he said no. Dr. Ricketts clarified that Sawa’s magnetic plate is hard to saturate.” Hr’g Tr. 13:15–20; Ex. 1017, Transcript of Deposition of Dr. Ricketts (“Ricketts Tr.”) 6:18–61:2 (as to whether Sawa’s magnetic sheet is significantly thicker because it uses hard magnetic material, Dr. Ricketts testified: “No. Sawa is describing a hard to magnetically saturate material with a high saturation magnetization”).

As discussed above, Sawa explicitly describes a laminate of soft magnetic layers and, as the Petition points out, states that silicon can be used to control the magnetic material softness. Pet. 31–32. Petitioner does not argue that silicon makes a magnetic plate soft, but that silicon can be used to control the characteristic of a plate that is known to be soft. Hr’g Tr. 11:15–12:9, 12:21–13:4; Reply 4 (citing Ex. 1022, Figs 3.1, 3.2 (showing materials identified by Sawa (Ex. 1005, 8:59–9:11) are known to be soft magnetic materials); Ex. 1020, 1:17–20 (“discussing Fe-Ni alloys as widely accepted for their soft magnetic properties”)). Although Petitioner bears the burden of proof in an *inter partes* review, *Dynamic Drinkware*, 800 F.3d at 1378, to the extent Patent Owner challenges Petitioner’s assertion that Sawa

describes a first layer of soft magnetic material, it was incumbent on Patent Owner to apply the correct standard for judging softness. Instead, Patent Owner argued that Sawa discloses making the magnetic material harder to saturate—a matter that is undisputed. PO Resp. 18–24. Petitioner’s Reply did not advance a new argument, but properly rebutted Patent Owner’s assertion that Sawa discloses a hard magnetic material by pointing out the deficiency in Patent Owner’s argument, i.e., that by arguing making material hard to saturate as the basis for asserting Sawa does not disclose a soft magnetic material and ignoring coercivity (a property understood in the art to be indicative of whether a material is magnetically soft), Patent Owner applied the wrong standard.

The preponderance of the evidence demonstrates that Sawa discloses the use of soft magnetic materials in the laminate. Patent Owner’s evidence that Sawa discloses compositions and materials that make the material harder to saturate does not address the question of whether the materials are soft magnetic materials after such processing.

c) Claim 1 conclusion

Having reviewed the evidence and arguments of record, we find Petitioner has demonstrated that Sawa and Park would have disclosed or suggested all the limitations of claim 1 to a person of ordinary skill in the art.

4. Independent claim 13

Independent claim 13 recites a portable terminal having a housing and layers arranged in the housing in a manner similar to that recited in claim 1. Petitioner asserts that claim 13 is unpatentable for the same reasons claim 1 is unpatentable. Pet. 50–53. Patent Owner does not offer arguments concerning the additional limitations of claim 13. For the same reasons as

those addressed in our discussion of claim 1, we find that, based on the arguments and evidence of record, Petitioner has demonstrated that the combined teachings of Sawa and Park would have disclosed or suggested the limitations of claim 13 to a person of ordinary skill.

5. *Claims 8 and 17*

Claims 8 and 17 depend from claims 1 and 13, respectively, and recite that the first polymeric material and the first extending portion are made with a same material. Petitioner notes that a person of ordinary skill would have understood that by encapsulating the magnetic sheets with polymer resin, the resin on the top magnetic sheet would be the same as that on the sides. Pet. 43–44.

Patent Owner does not offer arguments concerning the additional limitations of claims 8 and 17. Having considered the arguments and evidence of record, we find that Petitioner has demonstrated the combined teachings of Sawa and Park would have disclosed or suggested the limitations of claims 8 and 17 to a person of ordinary skill.

6. *Claims 9 and 19*

Claims 9 and 19 depend from claims 1 and 13, respectively, and recite that the second soft magnetic layer is arranged on the first soft magnetic layer. Petitioner points out that Sawa describes how the first magnetic plate (the first soft magnetic layer) is fixed on the second magnetic plate (the second soft magnetic layer) via adhesive 3, such that second magnetic plate 4 is fixed to the bottom side of magnetic plate 2. Pet. 44–45 (citing Ex. 1005, 4:30–35; Ex. 1003, Phinney Decl. ¶ 90).

Patent Owner does not offer arguments concerning the additional limitations of claims 9 and 19. Having considered the arguments and evidence of record, we find that Petitioner has demonstrated the combined

teachings of Sawa and Park would have disclosed or suggested the limitations of claims 9 and 19 to a person of ordinary skill.

7. *Claims 10 and 20*

Claims 10 and 20 depend from claims 1 and 13, respectively, and recite that the coil pattern includes a first coil pattern and a second coil pattern arranged to surround a side of the first coil pattern and that the first coil pattern includes a wireless charging antenna and the second coil pattern includes a near field communication antenna. Petitioner cites Sawa as disclosing a receiving coil and Park as disclosing a plurality of antenna elements to carry out both wireless coil charging and NFC communications. Pet. 45–46 (citing Ex. 1005, 15:10–11, 15:51–61; Ex. 1006, 1:18–19; Ex. 1003, Phinney Decl. ¶ 93). Petitioner further cites Figures 3 and 4 of Park as disclosing a pair of coils (first coil 133, used as a secondary coil for wireless charging, and second coil 135, used for NFC communications) attached to shielding member 131; the coils are mounted in the same plane and are accommodated in grooves 141, 142, where the second coil surrounds the first coil. *Id.* at 46–47 (citing Ex. 1006, 3:4–11, 3:61–4:6; 4:16–24, Figs. 3–4; Ex. 1003, Phinney Decl. ¶ 95). We agree with Petitioner’s contention that a person of ordinary skill would have had reason to include Park’s NFC coil in Sawa’s device because it was well known for mobile devices to include both wireless charging and NFC capability for communication purposes. *Id.* at 47–48 (citing Ex. 1010 ¶¶ 65, 69, Fig. 5 (describing an NFC antenna surrounding a wireless power coil); Ex. 1003, Phinney Decl. ¶ 95).

Patent Owner does not offer arguments concerning the additional limitations of claims 10 and 20. Having considered the arguments and evidence of record, we find that Petitioner has demonstrated the combined

teachings of Sawa and Park would have disclosed or suggested the limitations of claims 10 and 20 to a person of ordinary skill.

8. *Claims 11 and 21*

Claims 11 and 21 depend from claims 1 and 13, respectively, and recite that the first extending portion and the second extending portion contact each other. Petitioner asserts that Sawa's encapsulation of the entire magnetic sheet discloses the limitations of claims 11 and 21 because when "the entire magnetic sheet is encapsulated, the upper portion of the side polymer (*'first extending portion'*) and lower portion of the side polymer (*'second extending portion'*) are in contact with each other." Pet. 48–49.

Petitioner further contends that the '215 patent contemplates the first extended portion and the second extended portion forming an integrated piece because Figure 5 of the '215 patent "illustrates that the upper 'polymeric material connector 313' is in contact with and integrated with the lower 'polymeric material connector 313.'" *Id.* at 49 (citing Ex.1001, 5:37–55; Ex. 1003, Phinney Decl. ¶ 98). We note that the '215 patent's discussion of the embodiments in Figures 4 and 5 does not mention polymeric material layer 313. The '215 patent describes the embodiment in Figures 4 and 5 as one in which "the polymeric material layer 310, 312 may be directly formed on the soft magnetic layer 220, 230 without forming an adhesive layer 315 for adhering the polymeric layer 310, 312 to the soft magnetic layer 220, 330," and discloses that "polymeric material layer . . . may be directly formed on the soft magnetic layer 220, 230 via thermal compression bonding." Ex. 1001, 5:51–58.

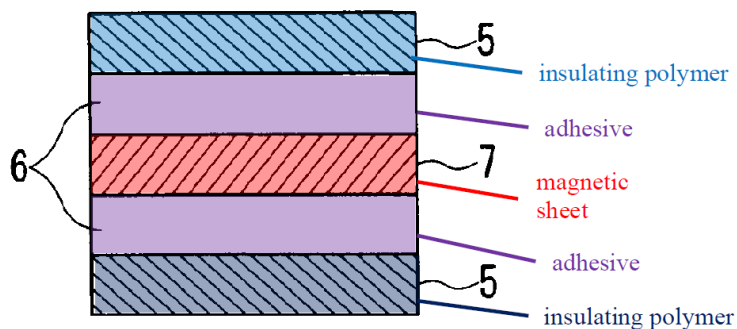
Patent Owner does not offer arguments concerning the additional limitations of claims 11 and 21. We agree with Petitioner that a person of ordinary skill would have understood that, when the magnetic layers are

encapsulated, as disclosed by Sawa, the first and second extending portions are in contact with each other, as recited in claims 11 and 21.

C. Claims 5, 12, 18 and 22 As Obvious Over Sawa, Park and Inoue

1. Inoue

Inoue discloses a power receiving apparatus for a non-contact type charging system. Ex. 1007, 3:36–38. Petitioner provides the following annotated version of Figure 3B of Inoue.



Ex.1007, Fig. 3B (annotated); Ex.1003, ¶ 119.

Pet. 56. Petitioner notes that in Figure 3B Inoue shows adhesive layers 6 between insulating polymer 5 and magnetic sheet 7. *Id.* at 55–56. The Petition cites Inoue as “evidence that, within the context of a wireless charging device, it was known secure insulating polymer layers to the top and bottom of a magnetic sheet with an adhesive.” Pet. 56 (citing Ex. 1007, 5:55–57, 7:44–55, 7:17–34, 7:47–49, Figs. 1, 3B; Ex. 1003, Phinney Decl. ¶¶ 117–120.

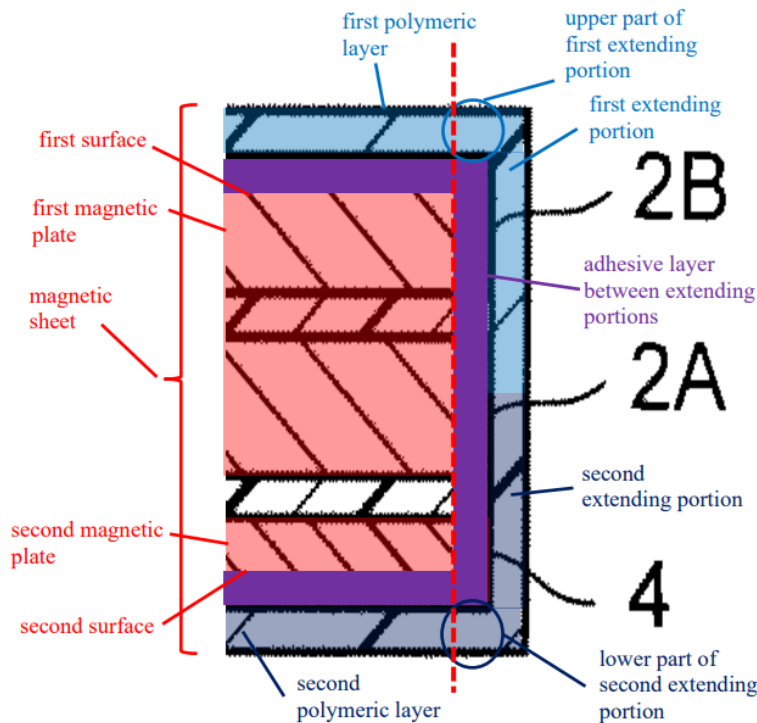
2. Claims 5, 8, 12, and 22

Claims 5 and 18 depend from claims 1 and 13, respectively, and recite an adhesive layer that adheres the first polymeric material layer and the second polymeric material layer to the plurality of soft magnetic layers. Noting that Inoue teaches securing a polymer to a magnetic layer using

adhesive, Petitioner asserts a person of ordinary skill would have found it obvious to adhere Sawa's polymer resin 5 to the surface of Sawa's magnetic plates 2, 4 such that the top, bottom, and side portions of polymer resin 5 would be adhered to the magnetic plates using adhesive. Pet. 60–61.

Claims 12 and 22 depend from claims 1 and 13, respectively, and recite an adhesive layer positioned between the first extending portion and the second extending portion, wherein the first extending portion adheres to the second extending portion.

Noting that Sawa's polymer resin 5 would have been adhered to all sides of the magnetic sheet using an adhesive layer, Petitioner provides the annotated version of Figure 3 of Sawa shown below.



Ex.1005, Fig. 3 (partial, annotated); Ex.1003, ¶ 135.

Pet. 63–64. Petitioner's annotated version of Sawa's Figure 3 includes circled parts of the upper and lower extending portions that Petitioner contends are connected to each other by the adhesive layer between them.

Petitioner argues that, in this way, the adhesive layer is positioned between the first extending portion and the second extending portion, such that first and second polymeric layers are connected to each other. *Id.* at 65.

Petitioner notes that, although the first clause of claims 12 and 21 recites an adhesive layer between the first and second extending portion, the second clause that recites the first extending portion adheres to the second extending portion does not recite specifically that it is the adhesive layer that adheres the first and second extending portions. *Id.* Petitioner's expert, Dr. Phinney, identifies common encapsulating techniques using an adhesive backed polymer film carrier. Ex. 1003 ¶ 138 (citing Ex. 1008, 20:18–19, 23:7–14; Ex. 1014, 8:13–17, 7:53–58). Petitioner further cites Dr. Phinney's testimony that a person of ordinary skill would have understood as obvious that two pieces would adhere together past the end of Sawa's sheet, rather than at sharp ninety-degree angles. *Id.* at 66 (citing Ex. 1003, Phinney Decl. ¶ 139, further citing Ex. 1014, 15:38–44, 8:13–17, Fig. 3, 15:15–16:10).

Petitioner contends that a person of ordinary skill would have had reason to combine the teachings of Sawa and Inoue because both references concern contactless charging via electromechanical induction using a power receiving coil and an adjacent magnetic layer and were filed by the same assignee. Pet. 56–57. Petitioner further notes that, as Sawa describes encapsulating its magnetic plates in a polymer resin, a person of ordinary skill would have looked to known techniques, such as using adhesives as disclosed in Inoue, for securing polymer resin to a sheet, and would have reasonably expected Sawa's polymer resin would have been suitable for adherence to magnetic sheets as taught by Inoue. *Id.* at 57–59 (citing Ex. 1003, Phinney Decl. ¶¶ 121–128).

Patent Owner asserts that a person of ordinary skill would not have looked to Inoue to add an adhesive layer to the encapsulating resin because Sawa discloses a multilayer laminate can be constructed with an adhesive layer that bonds the first magnetic thin plate to the second thin plate. PO Resp. 40–42. Patent Owner further argues that “[wh]en the encapsulating resin of Figure 3 is used, Sawa makes explicitly clear that the adhesive layer between magnetic plates of the same kind is not necessary.” *Id.* at 43. According to Patent Owner, Petitioner has not explained why a person of ordinary skill would modify Sawa’s Figure 3 embodiment, noting that “Sawa taught that such an adhesive layer was not necessary, except to maintain electrical insulation, when an encapsulating resin is used because the entire laminated magnetic sheet structure is secured by the encapsulating resin.” Sur-reply 11. Patent Owner contends that Petitioner fails to identify any benefit to adding an adhesive to the encapsulating resin and that such an added adhesive would have drawbacks including increased manufacturing complexity and size. Thus, according to Patent Owner, “Ppetitioner has failed to make the requisite showing that a POSITA would have been motivated to combine Inoue with Sawa because Inoue’s adhesive layer is *not* a desirable modification to Sawa’s Figure 3 embodiment.” *Id.* at 12–13.

Ppetitioner states that the proposed motivation to combine the teachings of Sawa and Inoue has nothing to do with the adhesive between the layers of the magnetic plate laminate. Reply 24. As Petitioner points out, Inoue does not merely establish that a person of ordinary skill could have made the proposed combination, but instead, Inoue provides direct evidence that persons of ordinary skill actually did make the proposed combination, i.e., securing a known polymer to a known magnetic sheet with a known adhesive. *Id.* at 25 (citing Ex. 1007, 5:55–57, 7:44–45, 7:17–34,

Fig. 3B). Inoue's Figure 3B shows magnetic sheet 7 covered by insulating material 5 using adhesive material 6 to form a multi-layered composite body. Ex. 1007, 7:46–55.

Patent Owner essentially argues that a person of ordinary skill would not have made the proposed combination because the primary reference, Sawa, does not disclose the combination. We agree with Petitioner that there was no need to provide a roadmap to the claimed combination because persons of ordinary skill were already making use of it, as shown by Inoue. Reply 26. We also agree with Petitioner that manufacturing considerations would not have deterred a person of ordinary skill from adhering the polymer film to the magnetic layers using adhesive, as Inoue demonstrates that was a well-known technique within the background knowledge of an ordinarily skilled artisan. *Id.* at 27. Petitioner responds to Patent Owner's increased size arguments by observing that the additional size resulting from incorporation of an adhesive layer is such that the calculated thickness would fall well within the exemplary design tolerances provided by Sawa. *Id.*

Neither Petitioner's nor Patent Owner's discussion of this ground mentions Park, which discloses a portable terminal having a wireless charger coil. Ex. 1006 (code 57). The combination of Sawa and Park is discussed in Section VII.B herein. Having considered the arguments and evidence of record, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Sawa, Inoue, and Park, and the combination teaches the limitations recited in claims 5, 12, 18 and 22.

VIII. CONCLUSION⁵

Having considered all the arguments and evidence of record, we find that Petitioner has demonstrated by a preponderance of the evidence that all the challenged claims are unpatentable.

In summary:

Claims	35 U.S.C. §	Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 8–11, 13, 17, 19–21	103	Sawa, Park	1, 8–11, 13, 17, 19–21	
5, 12, 18, 22	103	Sawa, Inoue, Park	5, 12, 18, 22	
Overall Outcome			1, 5, 8–13, 17–22	

IX. ORDER

In consideration of the above, it is:

ORDERED that claims 1, 5, 8–13, and 17–22 are unpatentable, and

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

⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

IPR2022-00117
Patent 9,843,215 B2

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