

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC,
Petitioner,

v.

ENGLE GRANGE, LLC,
Patent Owner.

IPR2020-01334
Patent 8,548,645 B2

Before BARRY L. GROSSMAN, BART A. GERSTENBLITH, and
JAMES J. MAYBERRY, *Administrative Patent Judges*.

GERSTENBLITH, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

Granting Petitioner's Motion to Seal

Granting Petitioner's Motion for Entry of Protective Order

35 U.S.C. § 318(a)

I. INTRODUCTION

A. *Background*

Unified Patents, LLC (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting institution of *inter partes* review of claim 1 of U.S. Patent No. 8,548,645 B2 (Ex. 1001, “the ’645 patent”). Engle Grange, LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”). Applying the standard set forth in 35 U.S.C. § 314(a), we instituted an *inter partes* review as to claim 1 on all grounds set forth in the Petition. Paper 7 (“Inst. Dec.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), Petitioner filed a Reply to Patent Owner’s Response (Paper 23, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 26, “PO Sur-reply”). Additionally, Petitioner filed a combined Motion to Seal Exhibits 1032 (deposition transcript of Kevin Jakel, dated Apr. 7, 2021) and 1034 (Petitioner’s Membership Agreement) and Motion for Entry of the Default Protective Order (Paper 21, “Motion”), and Patent Owner filed an Opposition to Petitioner’s Motions (Paper 24, “Opp.”).¹ An oral hearing was held on October 20, 2021, and a copy of the transcript was entered in the record. Paper 34 (“Tr.”).²

We have jurisdiction pursuant to 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) (2018) and 37 C.F.R. § 42.73 (2020) as to the patentability of the claims on which we instituted trial. Petitioner bears the burden of proving unpatentability of the

¹ Petitioner did not file a reply in response to Patent Owner’s Opposition.

² A duplicate of the transcript was entered into the record (Paper 35) and will be expunged.

challenged claim. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. See 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). Having reviewed the arguments and the supporting evidence, we determine that Petitioner has shown, by a preponderance of the evidence, that claim 1 of the '645 patent is unpatentable.

B. Related Proceedings

Petitioner and Patent Owner identify the following related matter: *Engle Grange, LLC v. Ford Motor Co. et al.*, No. 1:20-cv-00569-CFC (D. Del.).³ Pet. 1; Paper 3 (Patent Owner's Mandatory Notice), 2.

C. Real Parties in Interest

Petitioner identifies Unified Patents, LLC as the real party in interest. Pet. 1. Patent Owner identifies Engle Grange, LLC as the real party in interest. Paper 3, 2.

Patent Owner contends that Petitioner is not the only real party in interest, arguing that members of Petitioner's "Transportation Zone" ("Unnamed RPIs"), including Ford Motor Company ("Ford"), are real parties in interest and "[s]ince these members were not identified, the Board should therefore dismiss the Petition." PO Resp. 37. Patent Owner asserts that Petitioner "divides its business into 'zones,' each of which relates to a specific technology sector." *Id.* at 38. Patent Owner argues: (1) "[t]he Unnamed RPIs each had a preexisting, established relationship with

³ At Patent Owner's request, the district court proceeding was dismissed without prejudice. See Ex. 3001 (Patent Owner's Notice of Voluntary Dismissal Without Prejudice, Doc. 12, filed Sept. 4, 2020); Ex. 3002, 3 (district court docket report, entry dated Sept. 9, 2020, indicating that the case was terminated).

[Petitioner] when this IPR was filed, or entered into one during this IPR” and (2) “[t]he Unnamed RPIs are also clear beneficiaries of this IPR” because Petitioner “structures its business so that its customers are able to maximize the value of the benefits (including IPRs) that [Petitioner] provides.” *Id.* Patent Owner contends that “[w]hen a customer joins a zone, it does so with the knowledge and expectation that [Petitioner] will use subscription fees to file IPRs for its customers’ benefit.” *Id.* at 39. Thus, Patent Owner asserts that because the “Unnamed RPIs” (1) “all have preexisting, established relationships with [Petitioner] by way of their membership contracts,” and (2) “each joined with the knowledge and expectation that [Petitioner] would be filing IPRs against automotive patents, including the . . . ’645 patent,” “the Board should dismiss the Petition because it fails to list all RPIs.” *Id.*

Petitioner replies that “no time bar or estoppel provisions under 35 U.S.C. § 315 are implicated.” Pet. Reply 19 (citing *SharkNinja Operating LLC v. iRobot Corp.*, IPR2020-00734, Paper 11 at 18 (PTAB Oct. 6, 2020) (precedential)). Specifically, “[t]o Petitioner’s knowledge, the ’645 patent was asserted for the first time on April 27, 2020, and this [P]etition was filed on August 25, 2020.” *Id.* Petitioner contends that members of its Transportation zone are not RPIs at least because (1) Petitioner “is a membership organization whose deterrence work includes prior art searching and contests, amicus briefing, drafting legal reviews, data analytics, monitoring of patent transactions and assertions, and a myriad of domestic and foreign validity challenges” while “bolster[ing] patent quality by deterring assertions of invalid patents by non-practicing entities (‘NPEs’), without coordinating with members,” (2) Petitioner’s “members have no

control or influence over [Petitioner's] activities, and [Petitioner] has sole control over how to allocate spending across a variety of activities to fulfill its mission of NPE deterrence,” (3) Petitioner “does not and has never had an attorney-client relationship with its members,” and (4) Petitioner “does not coordinate with members regarding . . . filings or . . . litigation, and members are unable to exercise any direction or control over [Petitioner's] filings.” *Id.* at 21–22 (citations omitted). Additionally, Petitioner notes that “this challenge, even if successful, could not have extricated Ford from litigation, because [Patent Owner] was asserting two additional patents (other than the '645 patent) in litigation.” *Id.* at 24 (citing *Engle Grange*, No. 1:20-cv-00569-CFC).

In its Sur-reply, Patent Owner contends that “Ford pays annually for this legal service provided by [Petitioner], and thus [Petitioner] is acting for Ford just as any attorney would.” PO Sur-reply 15. Patent Owner asserts that “[j]ust because Ford provided [Petitioner] with general marching orders up front to attack small patent owners, asserting patents in the transportation zone, it does not free them from being an RPI or in privity with [Petitioner].” *Id.* Thus, Patent Owner argues that “Ford, as well as the other ‘members’ of [Petitioner's] Transportation Zone, are actual, real clients and should be disclosed. To not require such perpetuates [Petitioner's] sham patent attacks.” *Id.*

For the following reasons, and without deciding whether Ford or any other members of Petitioner's Transportation Zone are un-named RPI, we do not agree that this proceeding should be terminated for failure to identify all RPIs. First, Patent Owner's argument is based on an incorrect premise that 35 U.S.C. § 312(a) is a jurisdictional statute that must be satisfied to give the

Board jurisdiction. This premise is contrary to the Board's precedential decision in *Lumentum Holdings, Inc. v. Capella Photonics, Inc.*, IPR2015-00739, Paper 38 at 5 (PTAB Mar. 4, 2016) (precedential) ("§ 312(a) is not jurisdictional"). *Lumentum* makes clear that § 312(a) is not jurisdictional because a party may rectify non-compliance with the statute. *Id.* The United States Court of Appeals for the Federal Circuit has upheld the Board's finding that § 312(a) is not jurisdictional. *See Mayne Pharma Int'l Pty. Ltd. v. Merck Sharp & Dohme Corp.*, 927 F.3d 1232, 1240 (Fed. Cir. 2019) ("[I]f a petition fails to identify all real parties in interest under § 312(a)(2), the Director can, and does, allow the petitioner to add a real party in interest.").

Second, Patent Owner does not allege and the evidence does not support that Ford or any other members of Petitioner's Transportation Zone were time barred from filing a petition challenging the '645 patent when Petitioner filed the Petition. Consequently, even if we were to determine that Ford or any other members of Petitioner's Transportation Zone are RPIs of Petitioner, there is no basis to deny or terminate the Petition pursuant to § 315(b).

Moreover, estoppel under § 315(e) only arises after "a final written decision under section 318(a)" has issued with respect to a challenged claim. *See* 35 U.S.C. §§ 315(e)(1),(2). This Decision will be the first such final written decision as to any claim of the '645 patent. Thus, even if we were to determine that Ford or any other members of Petitioner's Transportation Zone are unnamed RPIs, § 315(e)(1) would prevent them from requesting a future proceeding challenging claim 1 on a basis that has been raised or

reasonably could have been raised in this proceeding, but does not require termination of this proceeding.

Accordingly, because we determine that neither the time bar nor estoppel provisions of 35 U.S.C. § 315 are implicated in this case, we need not address whether Ford or any other members of Petitioner’s Transportation Zone are unnamed RPIs. *See SharkNinja*, Paper 11 at 18; *see also Unified Patents LLC v. Velos Media, LLC*, IPR2020-00352, Paper 39 at 46–47 (PTAB June 28, 2021) (applying *SharkNinja* in the context of a final written decision).

D. The Instituted Grounds of Unpatentability and Declaration Evidence

Petitioner asserts the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §⁴	Reference(s)/Basis
1	102	Cha ⁵
1	103(a)	Cha, Chung ⁶
1	103(a)	McCullough, ⁷ DeBono, ⁸ Chung

⁴ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’645 patent has an effective filing date before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability.

⁵ Cha (Ex. 1008) is a certified, English-language translation of Korean Patent KR10-0901292 (Ex. 1007), published June 9, 2009, and is accompanied by a declaration from the translator (Ex. 1019).

⁶ U.S. Patent Application Publication No. 2009/0151412 A1, published June 18, 2009 (Ex. 1012, “Chung”).

⁷ U.S. Patent Application Publication No. 2010/0255953 A1, published Oct. 7, 2010 (Ex. 1009, “McCullough”).

⁸ U.S. Patent No. 6,927,671 B2, issued Aug. 9, 2005 (Ex. 1010, “DeBono”).

Claim(s) Challenged	35 U.S.C. §⁴	Reference(s)/Basis
1	103(a)	Chung, Suzuki ⁹

Pet. 3–4. Petitioner supports its challenge with two declarations by Scott Andrews, one submitted with the Petition (Ex. 1003 (Declaration of Scott Andrews)) and the other submitted with Petitioner’s Reply (Ex. 1031 (Reply Declaration of Scott Andrews)), a Declaration of Kevin Jakel (Ex. 1005), and a Declaration of Immanuel Kim (Ex. 1019). Patent Owner supports its arguments with a Declaration of Edward F. Miller, Ph.D. (Ex. 2013).

E. The ’645 Patent

The ’645 patent is directed to “[a] keyless ignition start system in which authentication of a coded key fob is carried out twice, first to activate the ignition switch to allow starting the engine and second at the time when the brake pedal is depressed to put the car in a drive gear.” Ex. 1001, Abs. The ’645 patent explains that “[t]he two step authentication prevents driving off a car which has been started without having the key fob for security purposes and also to avoid inconvenient situations that can otherwise occur.” *Id.*

The ’645 patent states that “keyless automobile lock and ignition systems (often referred to as smart key)” are known, in which “the presence of a key fob is electronically detected by means of a radio pulse transponder in the key fob and antennas in the car body.” Ex. 1001, 1:11–15. Additionally, the ’645 patent explains that “[i]t is also known to lock the transmission shift lever until the key fob is authenticated by the smart key

⁹ U.S. Patent Application Publication No. 2003/0137195A1, published July 24, 2003 (Ex. 1011, “Suzuki”).

controller system as described in U.S. 2009/0151412A1” [i.e., Chung]. *Id.* at 1:59–61.

Figure 1 of the '645 patent is reproduced below:

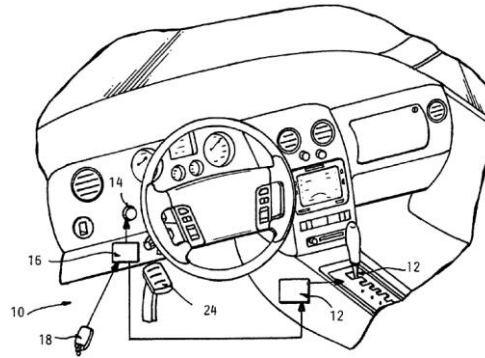


FIG. 1

Figure 1 of the '645 patent “is a pictorial diagrammatic view of a portion of the passenger compartment of an automobile with keyless system components included.”¹⁰ Ex. 1001, 2:34–36. Figure 1 shows passenger compartment 10, including center-mounted transmission shift lever 12, dash mounted start button 14, keyless system controller 16, and coded key fob 18. *Id.* at 2:52–64. The '645 patent explains that system controller 16 “enables the ignition push button 14 when the presence of the correctly coded key fob 18 in the compartment 10 is detected and authenticated, such that the car can be started by merely pushing the button 14 without the use of a key, in the well[-]known manner.” *Id.* at 2:65–3:2.

¹⁰ Figure 1 of the '645 patent appears to contain a typographical error. It illustrates two reference numerals as “12.” Ex. 1001, Fig. 1. One is shown as directed to the transmission shift lever, while the other appears to be the transmission lever lock, which is described as reference numeral “22” in the '645 patent’s description. Compare *id.* at Fig. 1, with *id.* at 1:55–56 (describing transmission shift lever 12) and 3:3–4 (describing transmission lever lock 22).

Figure 2 of the '645 patent is reproduced below:

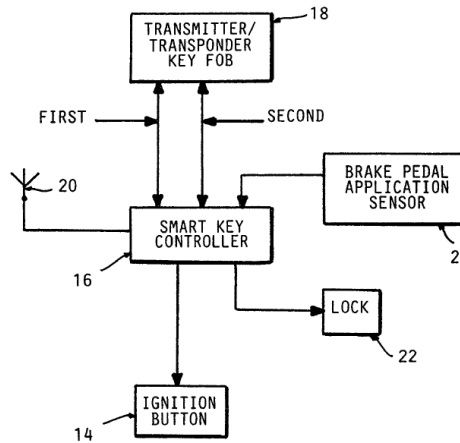


FIG. 2

Figure 2 of the '645 patent “is a block diagram of components of the keyless system depicting the two step authentication operation.” Ex. 1001, 2:38–40. In describing a transmission lever lock, the '645 patent expressly refers to Chung, as follows:

a transmission lever lock 22 is provided, such as described in [Chung], which positively prevents movement of the transmission selector or shift lever 12 to a drive position unless the brake pedal 24 is depressed and also unless the key fob 18 in the passenger compartment 12 is again detected and authenticated by the system controller 16.

Id. at 3:3–10. The “detection-authentication necessary to shift the lever 12 is not carried out at the same time as when the ignition detection-authentication is carried out.” *Id.* at 3:11–14. Rather, as the '645 patent explains:

This second authentication is carried out at the time the brake pedal is pressed and a signal is generated and sent by a sensor 26 which detects the pressing of the brake pedal 24 to the smart key controller 22, which carries out a second detection authentication of the key fob 18 prior to operating the release of the transmission lever lock actuator 22.

Id. at 3:14–19.

The '645 patent states that “if the key fob 18 is removed from the passenger compartment 10 after the car is started, the vehicle will not be able to be operated as the transmission lever 12 will remain locked even when the brake pedal is pressed.” Ex. 1001, 3:21–24. According to the '645 patent, “[t]his prevents operation of the vehicle even after the key fob 18 has been initially authenticated and the car started and running, and thus positively prevents operation of the vehicle unless the key fob 18 is authenticated as being within the passenger compartment.” *Id.* at 3:25–29.

F. Challenged Claim

The '645 patent has one claim, claim 1, which is challenged in this proceeding and reproduced below, with Petitioner's bracketing and paragraphing added for reference:¹¹

1.[pre] A smart key system for an automobile having an engine, transmission, and brake pedal including a coded key fob able to be detected and authenticated within a passenger compartment and authenticated by a smart key system controller and enabling an ignition switch to start said engine, said automobile also including a transmission operating lever enabling shifting said transmission into gear, and a lever lock preventing movement of said transmission lever to shift into gear until said brake pedal is depressed, the improvement wherein

[1.1] a two step key fob authentication is required in which said smart key controller detects and authenticates the presence of a key fob at the time said engine is started and again attempts to detects [sic] and authenticate the presence of the coded key fob in said passenger compartment whenever said brake pedal is depressed

¹¹ In the '645 patent, claim 1 consists of a single paragraph. Ex. 1001, 4:2–28.

[1.2] which only if said coded key fob is detected and authenticated causes operation of said transmission lever lock actuator to release said lock lever and thereby allow said transmission lever to be moved to shift said transmission into gear,

[1.3] said smart key controller preventing operation of said transmission lever lock actuator to release said lock lever even when said brake pedal is depressed with said engine started in the absence of detection and authentication of said key fob,

[1.4] whereby said transmission lever is locked after starting said engine and release of said depressed brake pedal to prevent driving said automobile after said engine is initially started and said brake pedal is depressed by a driver without said key fob being located in said passenger compartment after starting of said engine.

Ex. 1001, 4:2–28; see Pet., App. (showing bracketing and paragraphing).

G. Level of Ordinary Skill in the Art

Petitioner, supported by Mr. Andrews’s testimony, proposes that a person of ordinary skill in the art at the time of the invention would have had “at least a bachelor’s degree in electrical or mechanical engineering (or an equivalent field) and at least two years of work experience involving automotive control systems.” Pet. 5–6. Petitioner asserts “[m]ore education can supplement practical experience and vice versa.” *Id.* at 6 (citing Ex. 1003 ¶¶ 24–29).

In the Institution Decision, we noted that Patent Owner had not expressed a position on the level of ordinary skill in the art in the Preliminary Response, and, on the preliminary record at that time, we adopted Petitioner’s unopposed position, finding it consistent with the level of ordinary skill in the art reflected by the ’645 patent and the prior art of record. Inst. Dec. 8 (citing *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed.

Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978)).

In the Patent Owner Response, Patent Owner does not take a position as to the level of ordinary skill in the art (*see generally* PO Resp.).

Dr. Miller states that he applied the level of ordinary skill in the art as proposed by Petitioner “for the purposes of [his] declaration” (Ex. 2013 ¶ 26). Dr. Miller further states that he

also recognize[s] that automotive control systems are vehicle control systems, and can be more generally referred to as electronic or electro-mechanical control systems that interact with a human user controlling the state of a complex system in much the way a Graphical User Interface (GUI) control[s] the overall state and the behavior of a complex software system.

Id. Dr. Miller, however, does not explain what, if any, implication his characterization of automotive control systems has on the level of ordinary skill in the art. *See, e.g., id.* ¶¶ 25–27 (discussing the level of ordinary skill in the art). And, Patent Owner does not cite to or otherwise refer to this testimony.

On the complete record before us, we see no reason to disturb our preliminary finding as to the level of ordinary skill in the art and, thus, for the same reasons, we maintain that finding and reaffirm that one of ordinary skill in the art at the time of the invention would have had “at least a bachelor’s degree in electrical or mechanical engineering (or an equivalent field) and at least two years of work experience involving automotive control systems,” and that “[m]ore education can supplement practical experience and vice versa.” *See* Inst. Dec. 8.

II. CLAIM CONSTRUCTION

In this *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2019). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art at the time of the invention. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Phillips*, 415 F.3d at 1315–17.

If the specification “reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess[,] . . . the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316 (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). Another exception to the general rule that claims are given their ordinary and customary meaning is “when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Uship Intellectual Props., LLC v. United States*, 714 F.3d 1311, 1313 (Fed. Cir. 2013) (quoting *Thorner v. Sony Computer Entm’t Am., LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)). Neither of these exceptions apply to the case before us.

Additionally, only terms that are in controversy need to be construed, and these need be construed only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*,

868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

In the Petition, Petitioner contends that the claim terms of the '645 patent should be construed in accordance with their ordinary and customary meaning. Pet. 11. Patent Owner's Preliminary Response did not contest Petitioner's position, and, therefore, we did not construe any claim terms expressly in the Institution Decision because none were in dispute. Inst. Dec. 9 (citing *Vivid Techs.*, 200 F.3d at 803).

A. "whenever"

Claim 1 recites, in relevant part,

the improvement wherein a two step key fob authentication is required in which said smart key controller detects and authenticates the presence of a key fob at the time said engine is started and again attempts to detects [sic] and authenticate the presence of the coded key fob in said passenger compartment *whenever* said brake pedal is depressed.

Ex. 1001, 4:10–16 (emphasis added). In Petitioner's Reply, Petitioner asserts that Patent Owner interprets "whenever" more narrowly than is justified. Pet. Reply 1–2. In particular, Petitioner contends that Patent Owner's arguments presume that "whenever" means "only after." *Id.* at 2. In contrast, Petitioner argues that "[t]his distinction has significance" because

a system that checks for key fob authentication data continuously or at the same time as a brake pedal press would check for authentication *whenever said brake pedal is depressed* but may not meet [Patent Owner's] narrower interpretation that requires the authentication check be 'initiated' by or performed 'in response to' a brake pedal press.

Id. at 1–2.

In its Sur-reply, Patent Owner states that it “has not sought a claim construction other than a plain and ordinary meaning.” PO Sur-reply 1. Patent Owner asserts that “whenever said brake pedal is depressed” “means that the time for the *second* authentication is after the *first* authentication and *when* the brake pedal is pressed.” *Id.* Patent Owner contends that it “has never used the term ‘only after’ in construing or considering any of the limitations of claim 1” and “recognizes that one of ordinary skill in the art would understand the term ‘whenever’ . . . to mean --at a time when--.” *Id.* Thus, Patent Owner asserts that “[s]imply stated, at *a time when* the brake is pressed, a second authentication is to occur.” *Id.* at 1–2. Patent Owner explains that “[t]his is not an interpretation that is different from what the Petition presented” and “is how the Petitioner’s expert treated the term.” *Id.* at 2.

During the oral hearing, Petitioner explained that it agrees with Patent Owner’s proposed construction of “whenever” as meaning “at a time when” and that Petitioner no longer “believe[s] there’s any dispute here.” Tr. 17:13–23.

Accordingly, because the parties agree that “whenever” means “at a time when,” the meaning of this claim term is not in controversy and there is no need for us to construe it expressly. Additionally, as the meaning of no other claim term is in dispute, we do not construe any other terms expressly. *See Vivid Techs.*, 200 F.3d at 803; *Nidec Motor Corp.*, 868 F.3d at 1017.

III. ANALYSIS

A. *Legal Standards – Obviousness*

The U.S. Supreme Court set forth the framework for applying the statutory language of 35 U.S.C. § 103 in *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966):

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

As explained by the Supreme Court in *KSR International Co. v. Teleflex Inc.*:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit.

550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”)).

“Whether an ordinarily skilled artisan would have been motivated to modify the teachings of a reference is a question of fact.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1327 (Fed. Cir. 2016) (citations omitted).

“[W]here a party argues a skilled artisan would have been motivated to combine references, it must show the artisan ‘would have had a reasonable expectation of success from doing so.’” *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1360–61 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

*B. Obviousness over McCullough, DeBono, and Chung
(Ground 3)*

Petitioner asserts that the subject matter of claim 1 would have been obvious to one of ordinary skill in the art at the time of the invention in light of McCullough in view of DeBono and Chung. Pet. 4, 37–61. Patent Owner opposes. *See, e.g.*, PO Resp. 17–28.

1. Level of Ordinary Skill in the Art

The level of ordinary skill in the art is set forth above. *See supra* § I.G.

2. Scope and Content of the Prior Art

a. McCullough

McCullough is directed to “vehicle systems and methods of operating vehicle systems including keyless starting systems.” Ex. 1009¶ 1.

McCullough’s Figure 1 is reproduced below:

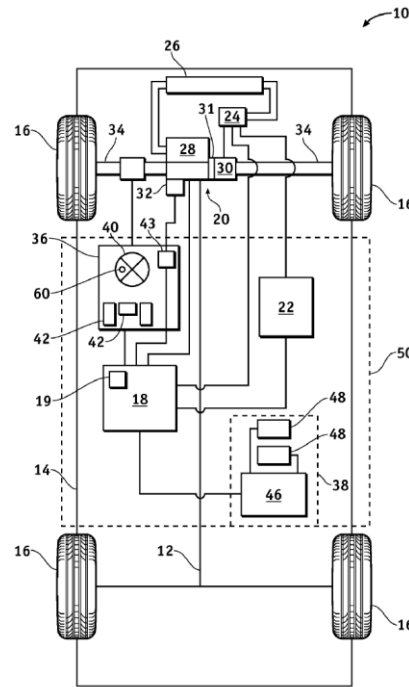


FIG. 1

Figure 1 of McCullough “is a schematic view of an automobile.” *Id.* ¶ 10. Figure 1 illustrates that vehicle 10 includes an automotive control subsystem 36 and keyless start subsystem 38. *Id.* ¶ 23. McCullough explains that keyless start subsystem 38 “serves as an authorization means and is in operable communication with the electronic control system 18.” *Id.* ¶ 26. McCullough provides:

keyless start subsystem 38 is adapted to detect an identification signal and to supply an authorization signal to the electronic control system 18 indicating the identification signal has been verified. In this regard, according to an embodiment, the keyless start subsystem 38 may include a keyless start control module 46 and at least one antenna 48. . . . Although not shown, the keyless start control module 46 may include a Radio Frequency Identification (RFID) reader and/or a radio frequency (RF) receiver, as is commonly understood. The keyless start subsystem 38, and in particular the range of the antennae 48, may define a keyless entry authorization zone (or simply “authorization zone”) 50 for the vehicle 10. As shown in the embodiment depicted in FIG. 1, the authorization zone 50

may completely or substantially be within the body 14 (or a passenger compartment) of the vehicle 10.

Id.

Figure 5, reproduced below, “illustrates a method 100 for controlling an operational state of the vehicle 10.” Ex. 1009 ¶ 34; *see id.* ¶¶ 34–39.

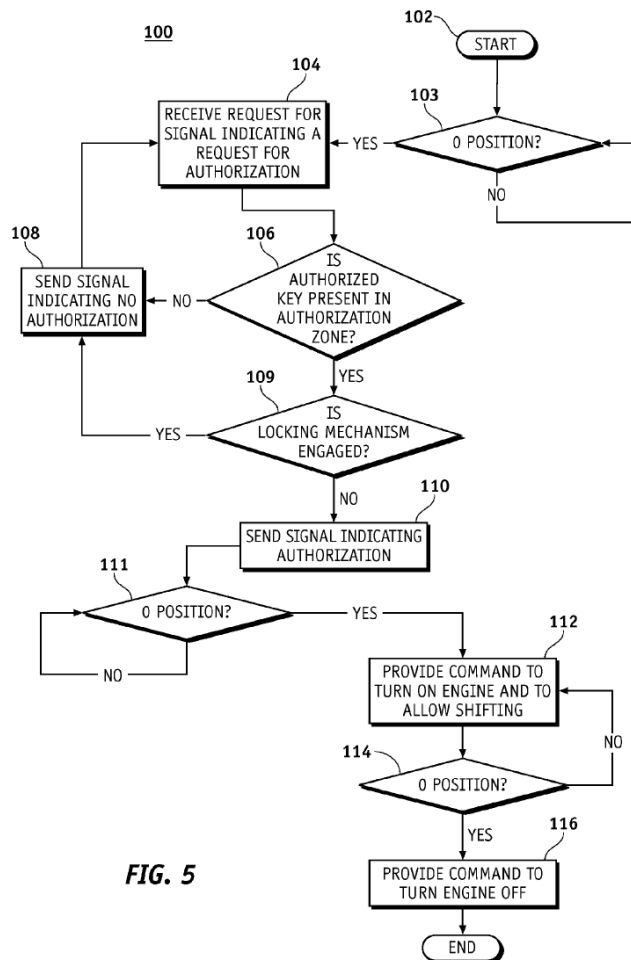


FIG. 5

McCullough’s Figure 5 “is a flow diagram illustrating a method for operating the automobile of FIG. 1.” *Id.* ¶¶ 14, 34.

As explained in the text describing Figure 5, reproduced below, McCullough discloses a keyless ignition start system in which, in one embodiment, braking system 42 transmits a signal indicating that a request for authorization of a coded key fob is made when the brake pedal is

depressed. Ex. 1009 ¶ 35. Two results of McCullough's method 100 are shown in box 112 as turning on the engine and allowing shifting. *See id.* at Fig. 5, box 112.

As shown in Figure 5, and described in the related text, the method 100 begins as block 102 when the driver enters the vehicle 10. According to an embodiment, the method 100 starts when the driver shifts the transmission shifter means 43, 200, 300 to an ON position. In an embodiment, a determination may be made whether the shifting means has been shifted to the "0" position, block 103. If not, the method 100 may iterate as shown. If so, the transmission shifter means 43, 200, 300 transmits a signal to the electronic control system 18 that a request for authorization has been made, and the method 100 may continue to block 104. *In another embodiment, the driver may depress (or apply a force onto) the brake pedal. In such case, the braking system 42 transmits a signal to the electronic control system 18 that a request for authorization has been made.*

In one embodiment, the electronic control system 18, at block 104, receives a signal that indicates that the action associated with requesting authorization has taken place. At block 106, the electronic control system 18 detects whether an authorization signal has been received from an authorization means (e.g., keyless start subsystem 38). For example, the electronic control system 18 may detect whether the keyless start subsystem 38 has determined if an authorized electronic key (e.g., the fob 62) is within the authorization zone 50 shown in FIG. 1. . . . The fob 62 and the keyless start control module 46 communicate via encrypted challenge and response data exchanges to verify that an authorized electronic key is present in the vehicle authorization zone. When an authorized key is present, the keyless start subsystem 38 sends an authorization signal to the electronic control system 18. In another embodiment, this authorization may be granted by the electronic control system 18 determining that access to the vehicle 10 was granted using an authorized electronic device (e.g., the fob 62).

If the keyless start control module 46 does not recognize the identification signal from the fob 62 as one corresponding to an authorization key that has been given access to the particular vehicle 10, then in block 108, the keyless start control module 46 sends a signal to the electronic control system 18 indicating that operation of the transmission shifter means 43, 200, 300 is not authorized (or simply no signal is sent to the electronic control system 18). As such, operation of the transmission shifter means 43, 200, 300 is prevented and the engine remains OFF. The method 100 then returns to block 104 and awaits another indication of a request for authorization.

At block 106, when the keyless start control module 46 determines that an authorized key is present in the authorization zone, then in block 109 the electronic control system 18 may additionally or alternatively determine if the locking mechanism 54 is engaged (e.g., the steering system 40 is locked), step 109. If the locking mechanism 54 is engaged, then in block 108, the keyless start control module 46 detects a signals from the steering system 40 and sends a signal to the electronic control system 18 indicating that operation of the transmission shifter means 43, 200, 300 has not been authorized, and the method 100 then returns to block 104 and awaits another indication of a request for authorization. If the locking mechanism 54 is not engaged, then the keyless start control module 46 sends a signal to the electronic control system 18 indicating that operation of the transmission shifter means 43, 200, 300 has been authorized, in block 110. The method then continues to block 111.

In block 111, a determination is made whether the transmission shifting means has been shifted to the “0” position. If not, the method iterates as shown. If so, then the transmission shifting means 43, 200, 300 sends a signal to the electronic control system 18 in block 112, which provides a command to the engine to start the engine. In block 114, a determination is made whether the transmission shifting means has been shifted to the “0” position. If not, the method iterates as shown. If so, then the transmission shifting means 43, 200,

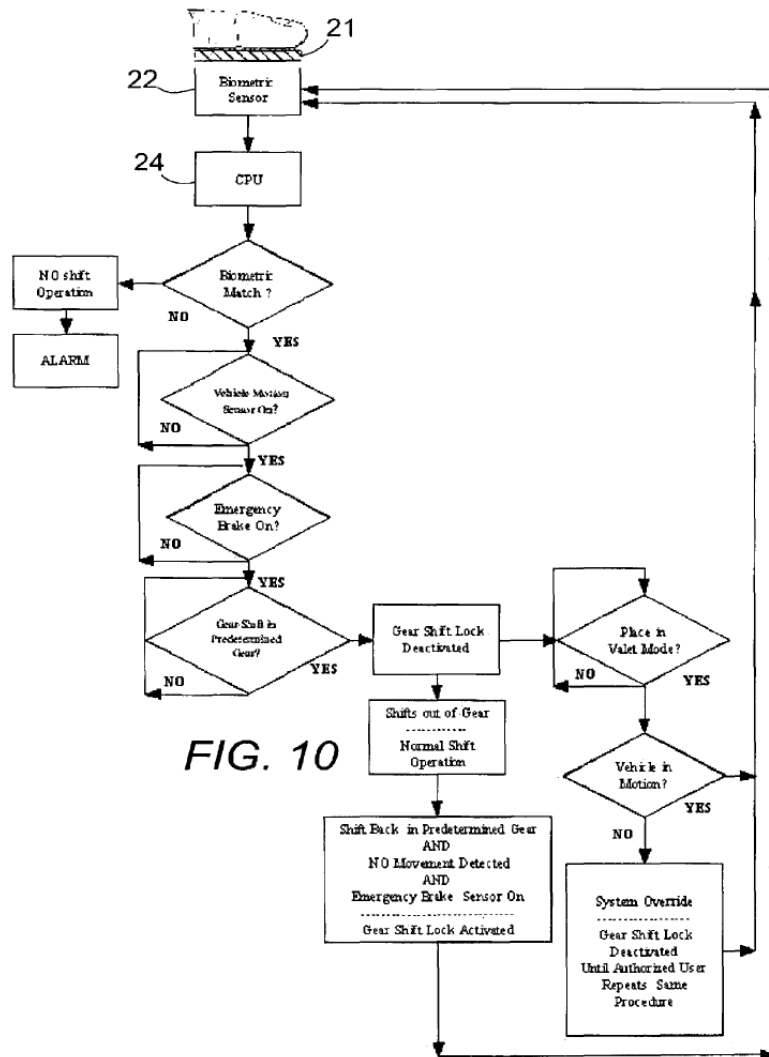
300 sends a signal to the electronic control system 18 in block 116, which provides a command to the engine to stop, and the engine is shut OFF. The method then ends.

Id. ¶¶ 35–39 (emphasis added).

b. DeBono

DeBono is directed to “a biometric shifter lock control which uses a biometric sensor to control the release of a shifter lock on any vehicle, equipment, or machinery having a transmission shift actuator on land, water, or air.” Ex. 1010, 1:8–11. DeBono explains that “[a]s a person enters the vehicle, the vehicle will open, start and function normally with only one difference: the person will not be able to place the vehicle or equipment in gear until that person completes a biometric verification.” *Id.* at 6:15–18. DeBono teaches that “[u]pon verification, the shifter lock control or override mechanism will be released and the vehicle . . . will function normally.” *Id.* at 6:18–21. If, however, “the person cannot pass the biometric verification, the shifter lock control will not be released and the vehicle . . . will not be able to be shifted into a gear to engage the transmission.” *Id.* at 6:21–24.

Figure 10 of DeBono is reproduced below:



DeBono's Figure 10 "is a diagrammatic view of a flow chart showing the steps involved in using the shifter lock control . . . on a standard shift vehicle." Ex. 1010, 7:57–59. DeBono explains the following regarding Figure 10:

In FIG. 10 the steps involved in using the shifter lock control of the present invention on a standard shift vehicle include inputting biometric information, such as a finger print, through the scanning window 21 of a biometric scanner 22 and into the CPU 24. If the biometric information does not match the biometric information stored in the CPU for authorized

users the shift will not operate and an alarm is activated. If a match is made and the vehicle motion sensor 120 in FIG. 3 and the emergency brake sensor 101 in FIG. 3 and the shift is in a predetermined gear [sic], the authorized user may then shift normally.

Id. at 10:49–59.

c. Chung

Chung is directed to “a mechanism for locking the shift lever of a vehicle equipped with a smart key system, particularly a technology that restricts motion of the shift lever to prevent carjacking, using a locking mechanism.” Ex. 1012 ¶ 2. Chung provides “a mechanism for locking a shift lever of a vehicle equipped with a smart key system” that “includes a smart key system, a locking lever, a[n] actuator, and a mechanical lock.” *Id.* ¶ 12. In particular, “[t]he smart key system turns on the power and starts the vehicle depending on whether a user is authenticated by an FOB key when a start button is pushed.” *Id.* Chung explains that “[t]he locking lever pivots to lock of shift a shift lever from a P-range to another range.” *Id.* Chung teaches that “[t]he actuator is activated only when the FOB key is authenticated by in [sic] the smart key system to unlock the locking lever.” *Id.* And, Chung states that “[t]he mechanical lock includes an unlock lever that pivots the locking lever to unlock the shift lever and actuates the unlock lever to pivot the locking lever when a mechanical key is inserted and turned.” *Id.*

Chung explains the following with regard to the operation of its mechanism:

when a driver with authentic FOB key 3 pushes start button 1, the power is on and the vehicle starts, in which when the drive[r] steps on the brake pedal, locking lever 9 is unlocked by

actuator 13 and shift lever 7 can shift from the P-range to another range, such that the vehicle is in ready for running.

Ex. 1012 ¶ 28. Chung states that “[w]hen the vehicle stops running, the power can be off only when shift lever 7 returns to the P-range by smart key controller 21. Therefore, the driver should turn[] shift lever 7 to the P-range when stopping the vehicle.” *Id.* ¶ 29.

With regard to operation of mechanical key 17, Chung teaches:

At the P-range, when a driver wants to park the vehicle at the N-range or it is inevitably required to pull the vehicle, the driver can unlock shift lever 7 using mechanical key 17.

. . . when mechanical key 18 is inserted in mechanical lock 19 and then turned, unlock lever 15 pivots and locking lever 9 is pivoted by unlock lever 15, such that shift lever 7 can be shifted to the N-range.

Ex. 1012 ¶¶ 30–31. Thus, Chung explains, “according to the above mechanism for locking a shift lever of a vehicle equipped with a smart key system of an embodiment of the invention, it is impossible to unlock shift lever 7 locked at the P-range without mechanical key 17.” *Id.* ¶ 32.

Additionally, Chung is specifically referenced in the ’645 patent. First, the ’645 patent states that “[i]t is also known to lock the transmission shift lever until the key fob is authenticated by the smart key controller system as described in [Chung].” Ex. 1001, 1:59–61. Second, the ’645 patent incorporates a “transmission lever lock . . . such as described in [Chung].” *Id.* at 3:3–5.

3. *Differences Between the Prior Art and the Claim;
Motivation to Modify*

a. *Petitioner’s Reliance on Chung*

In Ground 3, Petitioner asserts that the subject matter of claim 1 would have been obvious to one of ordinary skill in the art at the time of the

invention in light of McCullough “in view of” DeBono and Chung. Pet. 4, 37–61. In addressing two of the limitations of claim 1—limitation 1.pre and limitation 1.2—the Petition mentions Chung when explaining how the prior art teaches or suggests the subject matter of those limitations.¹² In its Patent Owner Response, Patent Owner challenges Petitioner’s reliance on Chung. In particular, Patent Owner asserts that “the Petition has not established any meaningful reason for its use of Chung or a reasoned basis for why one skilled in the art would seek to combine Chung with both McCullough and DeBono.”¹³ PO Resp. 18. Patent Owner contends that “this failure” renders Ground 3 “fatally defective.” *Id.*

As explained further below, the analysis in the Petition directed to limitation 1.pre presents three independent alternatives to show how the prior art teaches the subject matter recited therein. *See* Pet. 46–48 (relying independently upon (1) the Jepson form of the preamble, (2) Chung, or (3) McCullough). Additionally, the analysis in the Petition directed to the transmission lever lock actuator of limitation 1.2 is presented in the alternative as well. Specifically, the Petition relies on McCullough, but notes that the ’645 patent *additionally* indicates that transmission lever lock

¹² The Petition includes a generic statement of Ground 3 following each limitation of claim 1, but only mentions Chung in the analysis of limitations 1.pre and 1.2. *See, e.g.,* Pet. 48 (“McCullough in view of DeBono and Chung, discloses, or at least renders obvious, [1.1].”). This sentence is repeated as the first sentence following the heading for each limitation in the Petition’s analysis of claim 1 under Ground 3 whether or not Chung is actually relied on *for that particular limitation* in the discussion that follows. *See id.* at 46 (limitation 1.pre), 48 (limitation 1.1), 54 (limitation 1.2), 55 (limitation 1.3), 57 (limitation 1.4).

¹³ Italics, used by the parties for reference names, have been omitted from quotations in this Decision unless otherwise indicated.

actuators were well known by incorporating the lever lock of Chung. *See id.* at 54 (stating the same).

For the reasons explained below, we do not agree with Patent Owner that Petitioner's use of Chung renders the Petition deficient. In particular, in each instance where the Petition relies on Chung in Ground 3, the Petition does so as an alternative. Additionally, in our analysis of the merits below, we do not rely on Chung because the other alternatives presented in the Petition sufficiently teach the subject matter of claim 1. Thus, in the particular context before us, the teachings of Chung are not required in order to establish that the prior art teaches or suggests the subject matter of claim 1. We discuss the parties' arguments in more detail.

As noted above, Patent Owner contends that the Petition is unclear as to how and why Chung is combined with McCullough and DeBono. PO Resp. 18. Patent Owner asserts that this challenge includes McCullough, DeBono, and Chung, but "the Petition only casually references Chung and offers no meaningful analysis as to what purpose Chung is to serve with respect to its combination with McCullough and DeBono." *Id.* Patent Owner contends that "at best, Chung is merely referenced with respect to general physical components of a smart key system" and that "[a]ll other references of Chung (with respect to [this] ground) merely mention the reference by name in a conclusory allegation of obviousness." *Id.* (citing Pet. 46, 48, 54, 55, 57). According to Patent Owner, "the Petition has not established any meaningful reason for its use of Chung or a reasoned basis for why one skilled in the art would seek to combine Chung with both McCullough and DeBono." *Id.* Patent Owner thus contends that the Petition "fails to offer the required 'particular findings' required to establish

a motivation for an ordinary artisan, with no knowledge of the claimed invention, to combine the references and to ‘have selected these components for combination in the manner claimed.’” *Id.* (quoting *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 n.4 (Fed. Cir. 2018)). Patent Owner argues that this “failure” renders this ground “fatally defective.” *Id.*

In its Reply, Petitioner explains that “Chung merely evidences the knowledge of a [person of ordinary skill in the art], given that the ‘645 patent mentions Chung in the specification twice.”¹⁴ Pet. Reply 9; *see id.* at 11 (referring to the same argument). Petitioner asserts that its reliance on Chung is proper in light of the Federal Circuit’s decision in *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330 (Fed. Cir. 2020). *Id.* at 9. Petitioner contends that “like Chung here, Google only relied on the background reference to support the idea that a [person of ordinary skill in the art] would be aware of well-known features and techniques.”¹⁵ *Id.* at 10

¹⁴ Although not discussed in detail herein, Petitioner’s Ground 2 is based on Cha and Chung, and Patent Owner raises the same argument regarding Petitioner’s use of Chung in that ground. *See* PO Resp. 15–16 (addressing the use of Chung in Ground 2). Petitioner addresses Patent Owner’s argument in the discussion of Ground 2 (*see* Pet. Reply 9–11) and refers back to that argument in Ground 3 (*see id.* at 11 (“the Petition’s use of Chung in Ground 3 is the same as Ground 2 and is proper for the same reasons”)). For this reason, although we address Ground 3, several of our citations are to Petitioner’s discussion of Ground 2 in its Reply.

¹⁵ Although not necessary to explain the basis for our determination here, we feel compelled to note that we disagree with one aspect of Petitioner’s characterization of *Koninklijke Philips*. Petitioner quotes the following from *Koninklijke Philips*:

the relevant inquiry is not whether a skilled artisan would have been motivated to combine SMIL 1.0 [primary reference] with the teachings of Hua [additional reference], but rather whether a skilled artisan would have been motivated to combine

(citing *Koninklijke Philips*, 948 F.3d at 1337–38). Notably, Petitioner asserts that Grounds 2 and 3 rely on Chung as *one alternative* to explain why the elements of the preamble were disclosed. *Id.* at 11 (citing Pet. 18); see *id.* at 11 (relying on the same arguments for Ground 3).

In its Sur-reply, Patent Owner contends that Petitioner’s acknowledgement that the Petition did not need to rely on Chung “makes its Ground 3 allegation fatally defective. The Petition, as instituted, identified Ground 3 as a combination of McCullough in combination with DeBono and Chung.” PO Sur-reply 12 (citing Inst. Dec. 3, 11). Patent Owner asserts that

SMIL 1.0 with his general knowledge of pipelining [technique described by the additional reference].

Pet. Reply 10 (quoting *Koninklijke Philips*, 948 F.3d at 1338). Petitioner then states

[h]ere, the relevant inquiry for Ground 2 is not whether [Petitioner] provided an explicit motivation to combine Cha with Chung. Rather, the inquiry is whether a [person of ordinary skill in the art] would have been able to fill in any missing component from Cha with the general knowledge and techniques from Chung.

Id. We disagree with Petitioner’s characterization. If Petitioner were, in fact, filling in missing components from Cha with general knowledge and techniques from Chung, Petitioner would be required to explain why one of ordinary skill in the art would have been motivated to do so. That is precisely what the quoted portion of *Koninklijke Philips* states: “the relevant inquiry is . . . whether a skilled artisan *would have been motivated to combine* SMIL 1.0 with his general knowledge of pipelining.” *Koninklijke Philips*, 948 F.3d at 1338 (emphasis added). The Federal Circuit did not say motivation was not required. Rather, the Federal Circuit was explaining the teachings for which motivation *was* required—SMIL 1.0 + general knowledge, as opposed to SMIL 1.0 + Hua. See *id.*

Regarding Ground 3, however, Petitioner’s statement is of no moment because, for the reasons explained herein, Petitioner’s failure to allege motivation to combine Chung with McCullough and DeBono is not outcome determinative with respect to this Ground.

any attempt to make Ground 3 premised on only McCullough in combination with DeBono “would be a *new* ground, beyond the scope of the Petition, and beyond the grounds authorized for trial.” *Id.* (citing PO Resp. 18) (referring to PO Sur-reply § III addressing Ground 2).

The Federal Circuit addressed an analogous factual situation in *Realtime Data, LLC v. Iancu*, 912 F.3d 1368 (Fed. Cir. 2019). In that case, the petitioner set forth alternative positions as to how the prior art taught the elements of the claims. *See id.* at 1373 (“As both the Board and Realtime recognized, HP also argued *in the alternative* that Nelson disclosed some of the elements in the claims at issue.”). Because the Board relied on one of the alternatives (the O’Brien reference alone), the Federal Circuit held that “the Board was not required to make any finding regarding a motivation to combine” the teachings of O’Brien with Nelson (the reference relied on in the alternative to O’Brien alone). *Id.* The Federal Circuit recognized that

[u]nder these circumstances, the Board was free to come to the very conclusion it reached And because the Board did not rely on Nelson for the disclosure of a particular element or teaching, the Board had no obligation to find a motivation to combine O’Brien and Nelson.

Id.

Additionally, the Federal Circuit determined that the Board did not “violate[] 35 U.S.C. § 312(a)(3) or other notice requirements by relying on O’Brien alone.” *Realtime Data*, 912 F.3d at 1373. In particular, the Federal Circuit explained that “[t]he Board’s decision rested solely on the arguments and grounds proffered by HP in its petition, for which Realtime had both notice and opportunity to respond.” *Id.*

The facts presented here are analogous. First, as discussed above, regarding limitation 1.pre, the Petition sets forth three alternatives as to how

the prior art teaches the subject matter recited therein: (1) the general knowledge of one of ordinary skill in the art; (2) teachings of Chung; or (3) teachings of McCullough. *See* Pet. 46–48 (addressing each). Regarding limitation 1.2, the Petition presented two alternatives as to how the prior art teaches the transmission lever lock actuator recited in therein:

(1) McCullough (*see* Pet. 54 (“McCullough discloses a *transmission lever lock actuator*”)) and (2) the ’645 patent (*see id.* (“Additionally, the ’645 patent itself acknowledges such transmission locks were well known, and [the ’645 patent] specifically incorporates the transmission lock described by Chung”)). The Petition does not propose combining the alternatives listed for either limitation 1.pre or limitation 1.2. Rather, each is set forth as an additional teaching of the same subject matter.

Second, the Institution Decision delineated the alternative arguments set forth in the Petition. *See* Inst. Dec. 20–21 (discussing the three alternatives for limitation 1.pre), 31 (noting that Petitioner “[a]dditionally” pointed to the ’645 patent’s incorporation of Chung’s transmission lever lock actuator in the context of limitation 1.2). And, the Institution Decision found each of the alternatives set forth in the Petition with respect to limitation 1.pre persuasive, on the preliminary record at that time. *See id.* at 21 (“We find that each of Petitioner’s alternative positions provides a sufficient basis to determine that Petitioner’s showing is sufficient regarding limitation 1.pre.”).

Third, Patent Owner had ample and sufficient notice of the alternative positions set forth in the Petition. As explained above, the alternatives were set forth in the Petition and the Institution Decision identified the same

alternatives. Additionally, the Petition further explains its reliance on Chung as follows:

Chung is mostly used as evidence of the general knowledge of a person of ordinary skill in the art . . . for obviousness determinations, based on the '645 patent's discussion of Chung in the background of the invention (EX1001, 1:59-64) and explicit incorporation . . . of Chung in its specification (*id.* at 3:3-10).

Pet. 5.

Fourth, as noted above and as reflected in our analysis below, we do not rely on Chung in reaching our determination as to Ground 3 in this Final Written Decision.

In light of the particular circumstances presented here, we disagree with Patent Owner's assertion that Petitioner (or the Board) is seeking to change the grounds on which institution was based. And, we disagree that the Petition is defective for failing to provide a motivation to combine the alternative teachings of Chung. *See Realtime Data*, 912 F.3d at 1373.

We now address the parties' arguments regarding the limitations of claim 1.

b. Limitation 1.pre

Limitation 1.pre recites:

A smart key system for an automobile having an engine, transmission, and brake pedal including a coded key fob able to be detected and authenticated within a passenger compartment and authenticated by a smart key system controller and enabling an ignition switch to start said engine, said automobile also including a transmission operating lever enabling shifting said transmission into gear, and a lever lock preventing movement of said transmission lever to shift into gear until said brake pedal is depressed, the improvement wherein.

Ex. 1001, 4:2–10.

Limitation 1.pre includes the preamble of claim 1. Petitioner asserts that “[t]o the extent the preamble is limiting, McCullough in view of DeBono and Chung discloses [it], or at least renders [it] obvious.” Pet. 46. The preamble of claim 1 is written in Jepson form. “Jepson form allows a patentee to use the preamble to recite ‘elements or steps of the claimed invention which are conventional or known.’” *Epcon Gas Sys. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1029 (Fed. Cir. 2002) (quoting *Kegel Co. v. AMF Bowling, Inc.*, 127 F.3d 1420, 1426 (Fed. Cir. 1997)); see 37 C.F.R. § 1.75(e) (describing the structure of a Jepson claim). Because a Jepson claim “evidences the intention to use the preamble to define, in part, the structural elements of [a] claimed invention,” the Federal Circuit has held that a “preamble is a limitation in a Jepson-type claim.” *Epcon Gas*, 279 F.3d at 1029 (quotation omitted). Accordingly, we determine that the preamble of claim 1 is limiting and address it herein.

As discussed above, Petitioner raises three alternatives, each teaching the preamble. First, Petitioner contends that, by writing the preamble in Jepson form, Patent Owner acknowledges that the “components . . . were within the general knowledge” of one of ordinary skill in the art. Pet. 46. Second, Petitioner asserts that Chung’s “smart key system, which is explicitly incorporated by the ’645 patent as [Applicant Admitted Prior Art], discloses the elements of” the preamble. *Id.* (citing Ex. 1012 ¶¶ 8–12, 21, 28, Figs. 2–4) (referring to Petition § VI.A.2.b (“Overview of AAPA and Chung”)). Third, Petitioner contends McCullough discloses or renders obvious limitation 1.pre and identifies, in detail, how the teachings of McCullough map to limitation 1.pre. See *id.* at 47–48 (citing Ex. 1009 ¶¶ 17–18, 22–26, 31–33, 35, 40, Figs. 1–4).

The only argument raised by Patent Owner related to limitation 1.pre is that which we addressed above regarding the Petition's use of Chung. See PO Resp. 17–18 (discussing Chung). Patent Owner, however, does not contend that McCullough fails to teach the subject matter of limitation 1.pre. See generally *id.*

For the reasons explained by Petitioner, which we find supported by the complete record before us, Petitioner has shown that McCullough teaches limitation 1.pre. See Pet. 47–48 (citing Ex. 1009, Figs. 1–4, ¶¶ 17, 18, 22–26, 31–33, 35, 36).¹⁶ In reaching this finding, we do not rely on the alternative positions based on (1) the Jepson form of the preamble and (2) Chung.

i. Limitation 1.1

Limitation 1.1 recites:

a two step key fob authentication is required in which said smart key controller detects and authenticates the presence of a key fob at the time said engine is started and again attempts to detects and authenticate the presence of the coded key fob in said passenger compartment whenever said brake pedal is depressed.

Ex. 1001, 4:11–15.

Petitioner proposes two alternatives teaching the subject matter of limitation 1.1: (1) McCullough in combination with the general knowledge

¹⁶ We also determine that Patent Owner has waived any argument that McCullough does not teach limitation 1.pre by not raising such argument in its Patent Owner Response. See Paper 8 (“Scheduling Order”), 8 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”); see also *In re NuVasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016) (determining that an argument not raised in a patent owner response was waived).

of one of ordinary skill in the art (Pet. 48–51) and (2) McCullough in combination with DeBono (*id.* at 51–53). We address each of Petitioner’s alternatives including Patent Owner’s arguments in response.

a) First Alternative – McCullough and General Knowledge

In the first alternative, Petitioner contends McCullough “discloses a smart key controller able to detect and authenticate the presence of a key fob at the time the engine is started in the passenger compartment.” Pet. 48 (citing Ex. 1009 ¶ 26). Petitioner asserts McCullough “describes an authorization zone 50, representing the zone where the key fob may be identified and authorized by the vehicle,” as shown in Figure 1.¹⁷ *Id.* at 48–49. Petitioner explains:

McCullough’s key fob is “adapted to wirelessly communicate with an authorization means” and “[u]pon entering a passenger compartment of the vehicle 10, the driver will bring the fob 62 with him or her (e.g., in a pocket of an article of clothing or in a purse) into the authorization zone 50 shown in FIG. 1.”

Id. at 49 (quoting Ex. 1009 ¶¶ 32–33) (emphases omitted).

¹⁷ McCullough’s Figure 1 is reproduced *supra*. See § III.B.2.a.

Petitioner provides the following annotated version of McCullough's Figure 5:

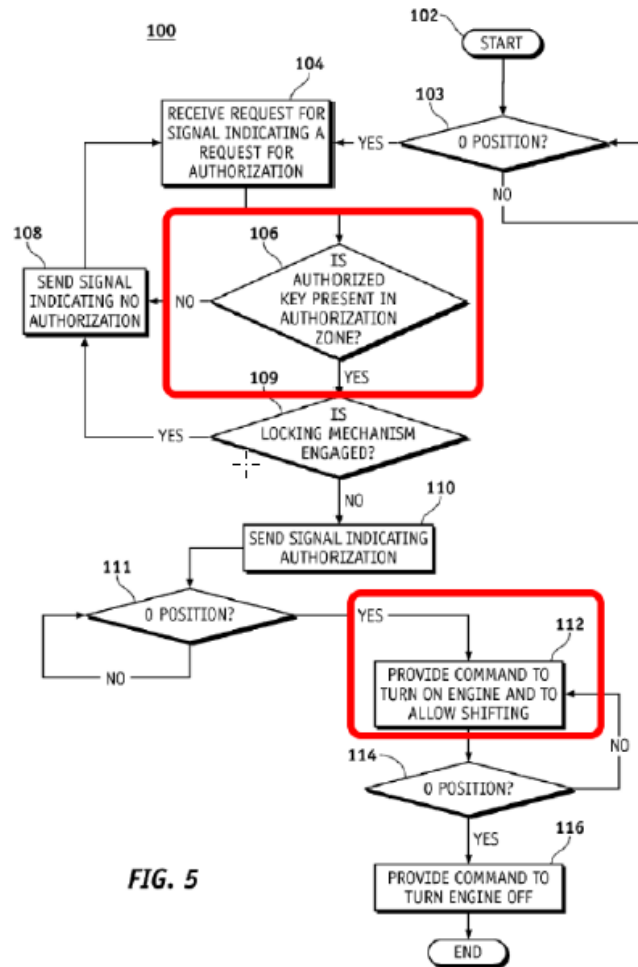


FIG. 5

EX1009, Fig. 5 (annotated)

McCullough's Figure 5, which is a flow diagram illustrating a method for operating the automobile of McCullough's Figure 1 (Ex. 1009 ¶ 14), is reproduced above including Petitioner's annotations, which add two red boxes around steps 106 and 112. Pet. 50. Petitioner asserts step 106 of Figure 5 "shows an authorization check to determine whether the key fob is detected and authenticated within the authorization zone." *Id.* (citing Ex. 1009 ¶¶ 36–39). Petitioner contends that, "[i]f authenticated, at step 112, a command is sent to turn on the engine and allow shifting." *Id.*

(citing Ex. 1009 ¶¶ 36–39). Thus, Petitioner asserts McCullough “detects and authenticates the presence of a key fob at the time the engine is started.” *Id.* (citations omitted).

Additionally, Petitioner contends McCullough “also discloses that an authentication check can occur by depressing the brake pedal.” Pet. 50–51. Petitioner quotes McCullough: “[I]n another embodiment, the driver may depress (or apply a force onto) a brake pedal. In such case, the braking system 42 transmits a signal to the electronic control system 18 that a request for authorization has been made.” *Id.* at 51 (quoting Ex. 1009 ¶ 35).

Petitioner asserts one of ordinary skill in the art

would have understood that because McCullough discloses that depressing a brake pedal transmits a request for authorization, and because a common method employed in vehicles with an automatic transmission is to require a brake pedal press any time the driver attempts to shift a car from park into drive, it would have been obvious to perform McCullough’s authentication check whenever a brake pedal is depressed.

Id. (citing Ex. 1009 ¶ 35; Ex. 1003 ¶ 20 (citing Exs. 1021,¹⁸ 1028¹⁹).

Petitioner further contends the preamble describes that a brake pedal must be depressed before a lever lock is operated. *Id.* (citing limitation 1.pre). Thus, Petitioner asserts McCullough “in view of the general knowledge of a [person of ordinary skill in the art] discloses, or at least renders obvious, authenticating *again . . . whenever said brake pedal is depressed.*” *Id.* (citing Ex. 1009 ¶ 35; Ex. 1003 ¶ 86) (alteration by Petitioner).

¹⁸ U.S. Patent No. 5,736,935, issued Apr. 7, 1998.

¹⁹ U.S. Patent Application Publication No. 2003/0135321 A1, published July 17, 2003.

Patent Owner's Response primarily focuses on Petitioner's second alternative based on McCullough and DeBono, and those arguments are addressed below. See PO Resp. 19–23 (addressing McCullough and DeBono), 26–28 (same). With respect to the first alternative based on McCullough and the knowledge of one of ordinary skill in the art, Patent Owner contends that McCullough “teaches only a *single* authentication for start of the vehicle's engine.” *Id.* at 24 (citing Ex. 2013 ¶ 65; Ex. 2015 (Mr. Andrews's Deposition Transcript), 98:8–14)). Patent Owner asserts that McCullough “offers no suggestion for the use or need for a second, subsequent detection and authentication of a key fob and certainly there is no suggestion for such to be initiated by a brake press.” *Id.* (citing Ex. 2013 ¶ 65).

Patent Owner contends that paragraphs 24 and 35 of McCullough do not support Petitioner's assertions. PO Resp. 24–25. In particular, paragraph 24 “simply notes that the vehicle includes a braking system 24 that includes a brake pedal that can be pressed by the driver to signal intent to have the vehicle move.” *Id.* (citing Ex. 2013 ¶ 66). Additionally, paragraph 35 is directed to Figure 5 and “notes that the engine start process is initiated by placing the transmission shifter means 43, 200, 300 to ‘an ON position.’ In effect, McCullough is using the ON position of the transmission shifter as an engine start button.” *Id.* at 25 (citing Ex. 1009 ¶¶ 6, 17, Fig. 5 (step 103)); see *id.* (citing Ex. 2015, 93:17–20). Patent Owner argues that the last sentence of McCullough's paragraph 35 “mentions an alternative embodiment where a signal resulting from pressing of the brake pedal could additionally be used to participate in the engine start process.” *Id.* (citing Ex. 2013 ¶ 66). But, Patent Owner contends that the

mention of brake press is “in the context of starting an engine, which includes the one-time authentication of a key fob as required to start the engine. . . . These statements simply indicate the conventional notion that pressing on a brake pedal can be required to start the engine.” *Id.* (citing Ex. 2013 ¶ 66; Ex. 1009, Fig. 5 (step 106)). Patent Owner asserts that “[t]he brake press, if required, would be an additional condition beyond the primary requirement that the transmission shifter being in ‘an ON position’ in order to permit engine start.” *Id.* (citing Ex. 2013 ¶ 66). And, Patent Owner points to claims 8, 14, and 17 of McCullough, which Patent Owner contends confirms that McCullough uses a brake press in conjunction with the transmission shifter position to start an engine. *Id.*; *see id.* at 25–26 (noting that Petitioner’s expert agreed that McCullough’s authentication check is prior to engine start) (citing Ex. 2015, 98:6–18, 100:6–8).

In its Reply, Petitioner contends that Patent Owner seeks to distinguish McCullough’s teaching in paragraph 35 “as only occurring during the engine start routine,” but “only looks at McCullough alone, and fails to address the Petition’s demonstration that it would have been obvious to perform this check again after the engine is started whenever the brake pedal is pressed.” Pet. Reply 15 (citing Pet. 51–53); *see id.* at 13–14 (“the Petition demonstrated that [a person of ordinary skill in the art] would have found a second authentication step obvious in view of McCullough alone together with knowledge of a [person of ordinary skill in the art]” (citing Pet. 51–52)).

Patent Owner does not address Petitioner’s reliance on this first alternative, based on McCullough and the knowledge of one of ordinary skill

in the art, in its Sur-reply. *See, e.g.*, PO Sur-reply 12–13 (addressing Ground 3).

McCullough teaches subject matter very similar to that recited by limitation 1.1. McCullough’s Figure 5, which is reproduced above, “illustrat[es] a method for operating [an] automobile.” Ex. 1009 ¶ 14; *see id.* ¶ 34. McCullough explains that “method 100 may be described below as being carried out and/or processed by the electronic control system 18 (FIG. 1) and/or the keyless start subsystem 38 (FIG. 1), the particular steps . . . may be performed by various components” within the systems. *Id.* ¶ 34. McCullough teaches that “method 100 begins as block 102 when the driver enters the vehicle 10.” *Id.* ¶ 35. McCullough explains that, in an embodiment, “method 100 starts when the driver shifts the transmission shifter means 43, 200, 300 to an ON position.”²⁰ *Id.* McCullough then describes two alternatives for requesting authorization to determine whether an authorization signal has been received from an authorization means, which includes, e.g., determining if an electric key (e.g., fob 62) is within the authorization zone of the vehicle. *See id.* ¶ 35 (describing the two alternatives for requesting authorization); *see also id.* ¶ 36 (describing detecting whether an authorization signal has been received). Paragraph 35 sets forth those two alternatives as: (1) transmission shifter means 43, 200, 300 “transmit[ting] a signal to the electronic control system 18 that a request for authorization has been made” and (2) “the braking system 42

²⁰ McCullough describes a variety of transmission shifter means positions, any number of which could represent “ON” positions in different embodiments. *See, e.g.*, Ex. 1009 ¶¶ 27 (describing positions 0–6, and alternatively positions D, R, etc.), 31 (describing embodiments wherein positions 2–6 “may indicate electric system and engine ON positions”).

transmit[ing] a signal to the electronic control system 18 that a request for authorization has been made” in response to a driver depressing the brake pedal. *Id.* ¶ 35. As shown in box 112 of Figure 5, two results of McCullough’s method are providing commands to (1) turning on the engine and (2) *allowing shifting*. *Id.* at Fig. 5 (emphasis added).

Patent Owner contends, and its expert (Dr. Miller) opines, that one of ordinary skill in the art would have understood McCullough’s express teachings as limited to situations in which a vehicle’s engine has not already started.²¹ See PO Resp. 24–26; Ex. 2013 ¶¶ 65–67. We agree that McCullough expressly teaches its method as part of the engine start process. Nonetheless, this finding does not end the inquiry because Petitioner does not rely upon McCullough alone; rather, Petitioner also relies upon the knowledge of one of ordinary skill in the art as informed by Mr. Andrews’s testimony. See Pet. 51. In particular, Petitioner provides uncontroverted argument and evidence, supported by Mr. Andrews’ testimony, that it was well-known in the art (i.e., general knowledge of one of ordinary skill in the art) that “a common method employed in vehicles with an automatic transmission is to require a brake pedal press any time the driver attempts to shift a car from park into drive.” *Id.* (citing Ex. 1003 ¶ 20 (citing Exs. 1021, 1028)). Petitioner further notes (*see id.*) that the knowledge in the art is confirmed by the preamble of claim 1 (written in Jepson form), where it recites “a lever lock preventing movement of said transmission lever to shift into gear until said brake pedal is depressed.” Ex. 1001, 4:8–10. And, as

²¹ In his deposition, Mr. Andrews agreed that McCullough does not disclose authenticating when a brake pedal is pressed after the engine is started. See Ex. 2015, 100:6–8.

noted above, in this first alternative directed to limitation 1.1, Petitioner expressly relies upon the knowledge of one of ordinary skill in the art as well as Mr. Andrews's testimony that it would have been obvious to perform McCullough's authentication check whenever the brake pedal is pressed—meaning also *after* engine start. Pet. 51.

Patent Owner's arguments in response to Petitioner's reliance on McCullough and the general knowledge of one of ordinary skill in the art fail to acknowledge the role of the latter.²² In particular, Patent Owner's arguments (directed to this first alternative), as reiterated above, and Dr. Miller's testimony in support thereof, are directed to the *express* teachings of McCullough *alone* and do not address directly Petitioner's contentions that McCullough "in view of general knowledge of" one of ordinary skill in the art "discloses, or at least renders obvious, authenticating *again . . . whenever said brake pedal is depressed.*"²³ See Pet. 51 (citing

²² We also note that neither Patent Owner nor Dr. Miller acknowledges the significance of another result of McCullough's brake-press-initiated request for authorization of key fob—allowing shifting. Notably, the result of the claimed detection and authentication of limitation 1.1, is explained in limitation 1.2 as "caus[ing] operation of said transmission level lock actuator to release said lock lever and thereby allow said transmission lever to be moved to shift said transmission into gear." Ex. 1001, 4:15–19. In other words, limitation 1.1 recites a two-step key fob authentication, "at the time said engine is started" "and again . . . whenever said brake pedal is depressed." And, although McCullough describes method 100 in the context of starting an engine, there is no indication in McCullough, and neither Patent Owner nor Dr. Miller contends, that McCullough's method would be inapplicable if applied in the context where an engine was already started, which is the context proposed by Petitioner's first alternative.

²³ As discussed below, Patent Owner raises several arguments in response to Petitioner's second alternative based on McCullough and DeBono. But, neither the Patent Owner Response nor Sur-reply address Petitioner's

Ex. 1009 ¶ 35; Ex. 1003 ¶ 86) (alteration by Petitioner); PO Resp. 24–26; Ex. 2013 ¶¶ 64–67. Thus, Petitioner’s first alternative as to how McCullough and the general knowledge in the art teaches or suggests limitation 1.1 stands unrebutted.²⁴

On the complete record before us, we find that Petitioner has established that the first alternative—McCullough in view of the general knowledge of one of ordinary skill in the art—would have taught or suggested the subject matter of limitation 1.1 to one of ordinary skill in the art.²⁵

b) Second Alternative – McCullough and DeBono

In a second, and independent, alternative, relying on McCullough and DeBono, Petitioner asserts “[t]o the extent McCullough does not explicitly teach that an additional authentication check occurs **after** the engine is started (authenticating *again . . . whenever said brake pedal is depressed*)—DeBono does.” Pet. 51 (alteration by Petitioner). Petitioner contends DeBono’s “biometric shifter lock control authenticates the driver every time

alternative based on McCullough and the general knowledge of one of ordinary skill in the art.

²⁴ Because Patent Owner’s Response does not raise any specific response directed to Petitioner’s challenge based on McCullough *and* the general knowledge of one of ordinary skill in the art, we also find those arguments waived. See Paper 8 (“Scheduling Order”), 8 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”); see also *In re NuVasive, Inc.*, 842 F.3d at 1381 (determining that an argument not raised in a patent owner response was waived).

²⁵ Below, we address Petitioner’s second alternative—based on McCullough and DeBono—and find that it provides an independent basis for our determination that the subject matter of limitation 1.1 was taught or suggested by the combined teachings of the references.

the driver tries to shift the car into gear, even after the engine has started.”

Id. at 51–52 (citing Ex. 1010, Abs., 6:15–36). Petitioner quotes the following from DeBono:

As a person enters the vehicle, the vehicle will open, start and function normally with one difference: the person will not be able to place the vehicle or equipment into gear until that person completes a biometric verification [i.e., authentication]. Upon verification, the shifter lock control . . . will be released.

Id. at 52 (alterations by Petitioner) (emphasis omitted) (quoting Ex. 1010, 6:15–36). Petitioner states that “[t]his disclosure confirms that DeBono’s verification check occurs even after the engine is running.” *Id.* And, Petitioner asserts one of ordinary skill in the art “would have understood that for DeBono’s shifter lock to perform as an effective anti-theft mechanism, it must continue to verify a driver even after the vehicle starts.” *Id.* (citing Ex. 1003 ¶ 87).

Petitioner contends that DeBono “authenticates a user every time a driver attempts to shift a car into gear (even after engine start)” and “further discloses that this authentication is activated by depressing the brake pedal.” Pet. 52. Petitioner points to DeBono’s teachings that the brake pedal is connected to the locking switches that control the shifter lock via the CPU (*id.* (citing Ex. 1010, 8:11–30)) and that “the gear shifter locking means comprises a built-in solenoid 25 activated by a brake sensor in an automatic shift vehicle (*id.* (citing Ex. 1010, 9:45–58)). Thus, Petitioner asserts DeBono “discloses an authentication procedure that occurs after the engine is started and is triggered *whenever said brake pedal is depressed.*” *Id.*

Petitioner explains the combination of teachings as follows:

The combination therefore would use McCullough’s system that can detect and authenticate the presence of a key

fob at the time the engine is started, together with DeBono's teaching of performing an additional authentication check whenever a driver attempts to shift the car into gear and the brake is depressed, to arrive at the two step key fob authentication as claimed. See § VI.B.2, *supra*; Andrews, ¶¶80–83. The first authentication check performed by McCullough's system would proceed as described above and discloses the first authentication step. See § VI.B.2, *supra*; Andrews, ¶¶80–83. Once this first step is complete, the combination would then perform an additional key fob authentication step before allowing the driver to shift the car into gear (based on DeBono's teaching), whenever the brake pedal [is] depressed. See § VI.B.2, *supra*; Andrews, ¶¶80–83. As discussed in § VI.B.2, it would have been obvious to repeat McCullough's key fob authentication when a driver attempts to shift the car into gear (based on DeBono), because key fob authentication and biometric verification techniques were known to be interchangeable anti-theft techniques as early as 2002. EX1020, 8:46–59^[26]; Andrews, ¶81. A [person of ordinary skill in the art] would have been motivated to combine McCullough and DeBono in this way for the reasons discussed above in § VI.B.2, *supra*.

Pet. 53. In Section VI.B.2 of the Petition, Petitioner sets forth a detailed explanation of the reasons why one of ordinary skill in the art would have been motivated to combine the teachings of McCullough and DeBono as proposed. See *id.* at 41–46. In short, Petitioner asserts that one of ordinary skill in the art “would have been motivated to incorporate DeBono's teaching of performing an authenticating check each time an attempt is made to shift a vehicle into gear into McCullough's key fob authentication system to enhance its anti-theft capabilities with a reasonable expectation of success.” *Id.* at 41 (citing Ex. 1003 ¶¶ 77–84). Petitioner summarizes its reasoning as follows:

²⁶ U.S. Patent No. 6,788,189 B2, issued Sept. 7, 2004.

- i. Combining prior art elements (DeBono's teaching of an authentication check when the driver attempts to shift the car into gear with McCullough's key fob authentication system) according to known methods (implementing a second key fob authentication check based on DeBono's teaching to enhance the anti-theft capabilities of McCullough's system) to yield predictable results (McCullough's system having an additional layer of anti-theft protection after engine start);
- ii. Use of known technique (DeBono's authentication check when the driver attempts to shift the car into gear) to improve similar devices (McCullough's key fob authentication system) in the same way (McCullough's system now having the ability to prevent a driver from shifting a car into gear after the car has started, unless authorized); and
- iii. Applying a known technique (DeBono's authentication check when the driver attempts to shift the car into gear) to a known device (McCullough's key fob authentication system) ready for improvement to yield predictable results (a more robust key fob authentication system using the additional anti-theft teachings from DeBono).

Id. at 44–45 (citing *KSR*, 550 U.S. at 415–22).

Additionally, Petitioner asserts one of ordinary skill in the art “would have had a reasonable expectation of success in combining McCullough and DeBono because they both use similar structural elements, and both consider performing authentication of a driver before allowing certain operations.” Pet. 45 (citing Ex. 1009 ¶¶ 3, 6, 25–26, 31; Ex. 1010, Abs., 4:14–34, 4:52–5:60). Petitioner contends “McCullough explicitly discloses a key fob authentication system and a [person of ordinary skill in the art] would have understood that DeBono's additional authentication check could be implemented into McCullough's system. *Id.* (citing Petition § VI.B.1.b; Ex. 1010, 4:25–34; Ex. 1020, 8:46–59; Ex. 1003 ¶ 84). Petitioner explains

that the combination “would use DeBono’s teaching of a second authentication check, implemented into McCullough’s key fob authentication system, to provide an improved system that also authenticates a key fob when a driver attempts to shift the car into gear, even after engine start.” *Id.* Petitioner asserts that the combination

would require minimal modifications to McCullough’s system (only the addition of a second key fob authentication check, that functionally is performed in the same way as McCullough already describes) (EX1009, [0025]-[0026], [0032]-[0035]), and the combination would have led to a predictable result (a system based on McCullough that performs the already-taught key fob authentication check again when a driver attempts to shift the car into gear, adding another layer of anti-theft protection).

Id. at 45–46 (citing Ex. 1003 ¶ 84; *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1364 (Fed. Cir. 2007)).

Patent Owner raises several arguments in response to Petitioner’s second alternative based on McCullough and DeBono. *See* PO Resp. 19–23, 26–28. We address each.

1. Interchangeability

Patent Owner contends that the “Petition asserts that key fob and biometric verification are interchangeable, yet relies on them used together.” PO Resp. 20 (emphasis from heading omitted). Patent Owner asserts that replacing McCullough’s key fob authentication at engine start with the biometric verification of DeBono at transmission shift, would “still only [be] a *single* authentication, which would be the biometric authentication of DeBono because the key fob authentication of McCullough was replaced.” *Id.* Patent Owner contends that such result would not teach or suggest a

second detection and authentication whenever said brake pedal is depressed.
Id.

Patent Owner, however, recognizes that the Petition does not propose to interchange “these different approaches, but instead to use them in combination.” PO Resp. 21. Patent Owner contends that “the Petition’s asserted reliance on the combination of McCullough and DeBono, whereby both their independent solutions are used in tandem, is inconsistent with the Petition’s interchangeable rationale that was used to justify combining the references.” *Id.* (citing Ex. 2013 ¶ 78). Patent Owner asserts that “[t]he change in rationale with respect to the combination is yet another indication that the Petition’s tortured effort to combine McCullough and DeBono is legally deficient and fueled by improper hindsight.” *Id.* And, Patent Owner further argues that the Petition lacks the “‘particular findings’ required to show motivation to combine these references because the Petition’s interchangeability rationale is not applicable to the manner in which the Petition sought to combine these references.” *Id.*

In its Reply, Petitioner explains that “interchangeability was mentioned in the Petition to show McCullough and DeBono were in the same field and were solving the same problems (i.e., implementing security techniques as part of a vehicle’s immobilization security system).” Pet. Reply 12. Petitioner contends that its statement regarding interchangeability demonstrates that one of ordinary skill in the art “would have looked to McCullough and DeBono to solve problems surrounding vehicle security and would have been motivated to apply techniques from one reference to the other (i.e., performing McCullough’s already-disclosed key fob authentication in the same way a second time during gear shift, as taught by

DeBono).” *Id.* (citing Pet. 42–43). Petitioner argues that Patent Owner “never addresses the combination identified by the Petition.” *Id.*

Additionally, Petitioner asserts that the Petition

provided many other rationales as to why a [person of ordinary skill in the art] would have been motivated to combine McCullough and DeBono, which stand uncontested:

(1) DeBono’s teaching would provide additional functionality to McCullough’s system and improved anti-theft characteristics (Pet. 41-42); (2) DeBono’s shift lock is expressly compatible with other shift locks found in automobiles (Pet. 41-42); (3) McCullough describes a locking mechanism for the shifter means that could implement DeBono’s teachings (Pet. 43-44); and (4) three explicit rationales under *KSR* that support motivation to combine (Pet. 44-45).

Pet. Reply 12–13. Petitioner contends that it “also explained why there would be a reasonable expectation of success in combining the two” and that its arguments as to motivation and reasonable expectation of success were supported by citations to the references and Mr. Andrews’s testimony, all of which “stands unrebutted by” Patent Owner. *Id.* at 13 (citing Pet. 41–46).

Patent Owner does not further address these issues in its Sur-reply.

Above, we set forth the discussion from the Petition regarding the teachings of McCullough and DeBono relied on, how Petitioner proposes to combine those teachings, the reasons provided by Petitioner as to why one of ordinary skill in the art would have been motivated to combine the teachings as proposed, and why one of ordinary skill in the art would have had a reasonable expectation of success in so doing. Patent Owner’s arguments regarding interchangeability do not specifically address the particular combination proposed by Petitioner and even if tangentially related thereto, do not raise a deficiency with respect to those arguments or the evidence Petitioner cited in support thereof. For the reasons explained by Petitioner

(as set forth above), which we hereby adopt, we find Petitioner’s arguments supported by the evidence cited and sufficient to show how the combination of McCullough and DeBono satisfies limitation 1.1.

2. *DeBono*

Patent Owner raises several arguments directed to DeBono. Patent Owner asserts that DeBono “does not teach, suggest, or provide an ‘additional authentication check’ as the Petition proclaims.” PO Resp. 21 (citing Pet. 45, 51, 53). Patent Owner contends that DeBono “teaches a biometric authentication of a driver that is contrary to the second detection and authentication of a key fob of claim 1 in several ways.” *Id.* (citing Ex. 2013 ¶ 80). Patent Owner argues

[f]irst, DeBono teaches authentication of a user by biometric means (e.g., fingerprint scan) (EX1010, 8:18-19), not authentication of a key fob within a vehicle, and certainly not the key fob that was previously detected and authenticated in order to start the vehicle’s engine. Miller, ¶ 74. Second, although the biometric authentication in DeBono serves to unlock a gear shifter and allows putting the vehicle in gear (EX1010, 6:15-18), the biometric authentication of DeBono is not requested by a brake press. *Id.* Miller, ¶¶ 72, 74. Lastly, DeBono is silent as to and does not even teaching [sic] or suggest a “second” authentication – it only teaches the need for a single biometric authentication that occurs at user initiation and is required to place the vehicle in gear. EX1010, 6:15-18. Miller, ¶ 74.

Id. at 21–22.

Additionally, Patent Owner contends that “given DeBono’s actual teachings [i.e., of a biometric authentication of a user, not a second authentication of a key fob], the alleged combination, if permitted, would be using a key fob to start the vehicle’s engine and a biometric match for shifting into gear.” PO Resp. 27 (citing Ex. 2013 ¶ 73). Patent Owner

asserts that none of the references “offer [any] teaching or motivation to initiate a second detection and authentication of a key fob in response to a brake press.” *Id.* (citing Ex. 2013 ¶ 70). Patent Owner also argues that “[w]hile McCullough mentions alternative use of a brake press, it does so for engine start and is merely denoting another condition that can be required before engine start, but is not the impetus for authentication of a key fob.” *Id.*

Further, Patent Owner asserts that “[n]othing in DeBono teaches or suggests that the brake press is in any way initiating the biometric verification of the driver.” PO Resp. 27–28. Rather, Patent Owner contends that DeBono’s verification is “initiated when the driver touches the biometric sensor.” *Id.* at 28 (citing Ex. 2015, 105:14–22). Thus, Patent Owner asserts “DeBono has no teaching or suggestion for a second authentication step of any type” and “no notion of a brake press initiating a request for key fob authentication (after a prior key fob authentication for starting the engine).” *Id.* (citing Ex. 2013 ¶¶ 74–75; Ex. 2015, 98:4–17²⁷).

In its Reply, Petitioner asserts that Patent Owner “does not challenge the teachings of the combined system [Petitioner] proposed; instead, [Patent Owner] challenges the teachings of the references individually.” Pet. Reply 13 (citing PO Resp. 21–28). In particular, Petitioner contends that it

²⁷ Patent Owner includes a parenthetical after this citation to Exhibit 2015 (Andrews’s deposition transcript) where Patent Owner states “any authentication in DeBono is before engine start.” See PO Resp. 28. Mr. Andrews did not so opine. Rather, his testimony on that page was directed to McCullough, not DeBono, and in response to a question asked regarding McCullough’s Figure 5, Mr. Andrews testified that “Figure 5 does provide, among other things, a command to turn on the engine and to allow shifting.” Ex. 2015, 98:4–10.

proposed “a combined system that implements DeBono’s teaching into McCullough’s key fob system,” not that DeBono teaches a second authentication step using a key fob. *Id.* (citing PO Resp. 21–22; Pet. 41–46, 48–60). Petitioner explains that it “never proposed bodily incorporating DeBono’s biometric shifter into McCullough’s system, and accordingly, [Patent Owner’s] arguments as to DeBono alone miss the mark.” *Id.* at 14 (citing Pet. 41–46, 53). Petitioner reiterates that its “actual combination of McCullough and DeBono” “perform[s] McCullough’s already-disclosed key fob authentication in the same way a second time during gear shift, as taught by DeBono.” *Id.*

Additionally, Petitioner takes issue with Patent Owner’s characterization that neither McCullough nor DeBono “teach a second authentication of the key fob *in response to* a brake press.” Pet. Reply 14 (emphasis added) (citing PO Resp. 27–28). Petitioner explains that Patent Owner’s argument is overly narrow because limitation 1.1 recites that a second authentication check occurs “whenever” the brake pedal is depressed, not “in response to” depressing the brake pedal. *Id.* at 14–15 (emphasis omitted).

Patent Owner’s arguments miss the mark. As set forth in our discussion of the Petition above, Petitioner does not rely on DeBono as teaching authentication (whether once or twice) of a key fob. Rather, Petitioner relies on DeBono as teaching an authentication step that occurs separately from an engine start process, i.e., *after* the engine is started. *See, e.g.,* Ex. 1010, 6:15–18 (“As a person enters the vehicle, the vehicle will open, start and function normally with only one difference: the person will not be able to place the vehicle or equipment in gear until that person

completes a biometric verification.” (emphases added)) *cited in, e.g.,* Pet. 41. When the Petition refers to DeBono as teaching a “second” or “additional” authentication check, it is readily apparent that the Petition does so in the context of the combination proposed, where DeBono’s teaching of a verification *after* engine start provides the explicit teaching missing from McCullough (in this alternative) of an authentication check *after* engine start. *See, e.g.,* Pet. 43–46 (explaining, *inter alia*, that “in this combination, McCullough’s system would be performing the same function it previously disclosed—determining whether an authentic key fob is present within a vehicle (e.g., at engine start)—but *would additionally perform the exact same key fob authentication check at a later point in time* (e.g., when a driver attempts to shift the car into gear after engine start)” (emphasis added)).

In light of the combination actually proposed by Petitioner, it is of no significant moment whether DeBono teaches authenticating a key fob or whether DeBono teaches *two* verification/authentication checks. Rather, as presented in the Petition, the teaching from DeBono applied by Petitioner is simply of an authentication check *after* engine start. We find persuasive, and supported on the complete record before us, Petitioner’s position that, in light of DeBono’s teaching, one of ordinary skill in the art would have had reasons with rationale underpinning to modify the teachings of McCullough (with a reasonable expectation of success) such that an authentication check would have been performed at the time an engine is started (as McCullough teaches), and *again* whenever said brake pedal is depressed after the engine is started. As discussed above, in one embodiment, McCullough teaches that in the case where a driver depresses a brake pedal, “the braking

system 42 transmits a signal to the electronic control system 18 that a request for authorization has been made.”²⁸ Ex. 1009 ¶ 35. Thus, applying DeBono’s teaching to this embodiment of McCullough, which transmits a signal when the brake is pressed, reads on limitation 1.1’s requirement of “again attempts to detects and authenticate the presence of the coded key fob in said passenger compartment whenever said brake pedal is depressed” because the signal transmitted following the brake press is not limited to an engine start process.

3. Applying Required Obviousness Framework

Relying on its discussion of DeBono, including differences between DeBono and claim 1, Patent Owner asserts that the Petition ignored those differences and did not consider them in the context of its obviousness analysis. PO Resp. 22. Patent Owner contends that

the Petition rendered its obviousness assertions based on an abstracted single difference, denoted as “only the addition of a second key fob authentication check” ([P]et. 45), and ignored various other actual differences of DeBono (e.g., authentication of person by biometric means vs. authentication of a key fob; [and] second authentication of key fob (after initial key fob authentication to start engine) at initiation of brake press).

Id. Patent Owner argues that by failing to consider the differences between the prior art and claim 1, the Petition “fails to comply with the required obviousness framework of *Graham* [v. *John Deere*].” *Id.* at 22–23.

²⁸ As discussed above, in this embodiment, McCullough explains that braking system 42 (as opposed to transmission shifter means 43, 200, 300) transmits the signal that a request for authorization has been made. Ex. 1009 ¶ 35.

Additionally, Patent Owner contends that Petitioner “is not free to ignore teachings of the references or to manipulate the teachings, using hindsight, to fabricate a single abstracted teaching.” PO Resp. 23. Patent Owner asserts that Mr. Andrews’s testimony is also deficient because it

“fail[s] to provide any meaningful explanation for why one of ordinary skill in the art would be motivated to combine these references at the time of this invention”; “fails to explain why a person of ordinary skill in the art would have combined elements from specific references in the way the claimed invention does”; and, ultimately, “fails ‘to resist the temptation to read into the prior art the teachings of the invention in issue,’” as outlined in *Graham*.

Id. (alteration in original) (citing *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019)).

In its Reply, Petitioner responds:

[Patent Owner] makes several bare allegations regarding hindsight and proper application of the obviousness framework. PO [Resp.] 6, 21, 23, 34, 35. But [Petitioner’s] Petition identified the priority date of the patent-at-issue. Pet. 4. Any reasonable reader would understand that the extensive discussions of the fact that “[a] [person of ordinary skill in the art] would have been motivated” to combine each set of references was as of that date. *Id.* [Petitioner] also defined a [person of ordinary skill in the art] “as of the earliest claimed priority date.” Pet., 5-6. Second, [Petitioner] provided several pages of analysis as to why a [person of ordinary skill in the art] would combine elements from the prior art in the way the claimed invention does, without a single mention to the ’645 patent. Pet. 41-46 (Ground 3), 63-66 (Ground 4). [And, Petitioner] provided specific rationales from the references themselves, independent of the ’645 patent, and supported by expert testimony, to arrive at its proposed combinations. *Id.*

Pet. Reply 18–19.

We do not agree with Patent Owner's argument that Petitioner failed to apply the correct obviousness framework. In particular, Petitioner did not overlook differences between DeBono and claim 1; rather Petitioner provided an extensive discussion of DeBono, including identifying differences between its teachings and the claim. *See* Pet. 39–41 (discussing DeBono). As explained in detail above, Petitioner provided a detailed discussion as to why one of ordinary skill in the art would have combined elements of DeBono with McCullough, provided reasons with rational underpinning for that combination, and established that one of ordinary skill in the art would have had a reasonable expectation of success in achieving the combination proposed. As also explained above, Petitioner's argument is supported on the record by the teachings of McCullough and DeBono as well as the testimony of Mr. Andrews, which we credit. Further, Patent Owner has not identified and we do not detect any instance in which Petitioner read the teachings of the invention into the prior art in its analysis. That Petitioner identified a single difference between McCullough and limitation 1.1 does not mean otherwise. In fact, identifying the differences between the prior art and the claimed subject matter is part of the obviousness analysis, as Patent Owner's arguments recognize.

Accordingly, we do not agree that Petitioner applies an improper obviousness analysis or relies on impermissible hindsight.

4. Summary Regarding Petitioner's Second Alternative Based on McCullough and DeBono

For the reasons explained above and on the complete record before us, we find that Petitioner has established that the combination of McCullough and DeBono teaches or suggests the subject matter of limitation 1.1.

c) Summary Regarding Limitation 1.1

For the reasons explained above and on the complete record before us, we find that Petitioner has established that each of the two alternatives—(1) McCullough in combination with the general knowledge of one of ordinary skill in the art (Pet. 48–51) and (2) McCullough in combination with DeBono (*id.* at 51–53)—teach or suggest the subject matter of limitation 1.1.

ii. Limitation 1.2

Limitation 1.2 recites “which only if said coded key fob is detected and authenticated causes operation of said transmission lever lock actuator to release said lock lever and thereby allow said transmission lever to be moved to shift said transmission into gear.” Ex. 1001, 4:15–19.

As with limitation 1.pre, Petitioner presents two teachings demonstrating that transmission lever lock actuators were disclosed prior to the effective date of the ’645 patent. First, Petitioner asserts that McCullough “discloses a *transmission lever lock actuator* as a ‘locking mechanism’ which may be a ‘solenoid, and/or other suitable device, to lock the transmission shifter means.” Pet. 54 (citing Ex. 1009 ¶ 31). Second, Petitioner points to the ’645 patent, which acknowledges that transmission locks were known prior to the effective date of the invention. *Id.* (citing Petition § VI.A.2.b). In particular, Petitioner points to the ’645 patent’s incorporation of the transmission lock described in Chung. *Id.*

Addressing the limitation of releasing the lever lock only if said coded key fob is detected and authenticated, Petitioner contends that DeBono “is explicit that unless a user is authenticated, the transmission lever lock is not released.” Pet. 54 (citing Ex. 1010, 6:15–36). Petitioner also asserts that

McCullough describes using a locking mechanism for the shifting means. *Id.* (citing Ex. 1009 ¶ 31). In particular, Petitioner states that McCullough “discloses that the ‘shifting configuration may only be established when an authorized key is present within the authorization zone.’” *Id.* (quoting Ex. 1009 ¶ 40) (citing Ex. 1003 ¶ 73).

Relying on its discussion of limitation 1.1, Petitioner contends that “in the combination, an additional key fob authentication check is performed any time the driver attempts to shift the vehicle into gear, even after the engine is running.” Pet. 54–55 (citing Petition § VI.B.3.b; Ex. 1003 ¶¶ 80–83). Petitioner asserts that “in the combination, the shifter lock would not be released unless the second key fob authentication check is performed successfully—and therefore, the shifter lock is released *only if said coded key fob is detected and authenticated*, as claimed.” *Id.* at 55 (citing Ex. 1003 ¶¶ 80–83). Petitioner contends one of ordinary skill in the art would have been motivated to combine the teachings of McCullough and DeBono in this manner for the reasons discussed previously. *Id.* (citing Petition § VI.B.2; Ex. 1003 ¶¶ 77–84).

Patent Owner does not raise an argument specifically addressing limitation 1.2 in the Patent Owner Response. *See generally* PO Resp. To the extent Patent Owner’s arguments regarding Ground 3, in general, or limitation 1.1 apply to limitation 1.2, we have addressed them in our discussion above. Additionally, we need not and do not rely on Petitioner’s alternative teaching based on the ’645 patent’s incorporation of Chung, because we find that Petitioner establishes that McCullough teaches a transmission lever lock actuator. *See* Ex. 1009 ¶ 31 (“a housing/locking mechanism may be included, which may comprise, for example, an electric

motor, solenoid, and/or other suitable device, to lock the transmission lever shifter means 200, 300 to prevent it from shifting undesirably within the housing 54”). Petitioner’s additional analysis of limitation 1.2, reproduced above, is persuasive for the reasons explained by Petitioner and sufficiently supported on the complete record before us.

Accordingly, for the reasons explained above and on the complete record before us, we find that Petitioner has established that the combination of McCullough and DeBono teaches or suggests the subject matter of limitation 1.2.

iii. Limitation 1.3

Limitation 1.3 recites “said smart key controller preventing operation of said transmission lever lock actuator to release said lock lever even when said brake pedal is depressed with said engine started in the absence of detection and authentication of said key fob.” Ex. 1001, 4:19–22.

Petitioner asserts limitation 1.3’s “requirement that the *smart key controller prevent[s] operation of said transmission lever lock . . . in the absence of detection and authentication of said key fob*,” is substantially similar to limitation 1.2, and is disclosed by the combination for the same reasons as limitation 1.2. Pet. 55–56 (citing Petition § VI.B.3.c). Petitioner reiterates that DeBono “teaches that unless a user is authenticated, the lever lock is not released,” and McCullough teaches that “shifting may only be established when an authorized key is present in the authorization zone.” *Id.* at 56 (citing Petition § VI.B.3.c). Petitioner thus asserts that “in the combination, when McCullough’s keyless start subsystem performs the second key fob authentication check at the time the driver attempts to shift the car into gear, if the key fob is not present in the authorization zone, the

lever lock will not be released.” *Id.* (citing Petition §§ VI.B.3.c, VI.B.2; Ex. 1003 ¶¶ 80–83).

Petitioner contends that the proposed combination meets limitation 1.3’s requirement that “the smart key controller prevents *release [of] said lock lever even when said brake pedal is depressed with said engine started*” for the reasons discussed with respect to limitation 1.1. Pet. 56 (alteration by Petitioner) (citing Petition § VI.B.3.b). Petitioner reiterates that DeBono teaches preventing release of the lock when the brake pedal is depressed with the engine started, because DeBono “discloses that ‘the vehicle will open, start, and function normally with one difference: the person will not be able to place the vehicle or equipment into gear until that person completes a biometric verification [i.e., authentication].’” *Id.* (citing Ex. 1010, 6:15–36) (alteration by Petitioner). Additionally, Petitioner states “DeBono’s gear shifter lock is activated by a brake sensor that is triggered by depressing a brake pedal with the engine started” (*id.* (citing Ex. 1010, 8:11–30, 9:45–58)), and “the combination would also prevent *release [of] said lock lever even when said brake pedal is depressed with said engine started*, unless the key fob is authenticated” (*id.* at 56–57 (citing Petition §§ VI.B.2, VI.B.3.c; Ex. 1003 ¶¶ 80–83)) (alteration by Petitioner). Petitioner contends that one of ordinary skill in the art would have been motivated to combine the teachings of McCullough and DeBono in this manner for the reasons discussed previously. *Id.* at 57 (citing Petition § VI.B.2; Ex. 1003 ¶¶ 77–84).

Patent Owner does not raise an argument specifically addressing limitation 1.3 in the Patent Owner Response. *See generally* PO Resp. To the extent Patent Owner’s arguments regarding Ground 3, in general, or

limitation 1.1 apply to limitation 1.3, we have addressed them in our discussion above. Petitioner’s additional analysis of limitation 1.3, reproduced above, is persuasive for the reasons explained by Petitioner and sufficiently supported on the complete record before us.

Accordingly, for the reasons explained above and on the complete record before us, we find that Petitioner has established that the combination of McCullough and DeBono teaches or suggests the subject matter of limitation 1.3.

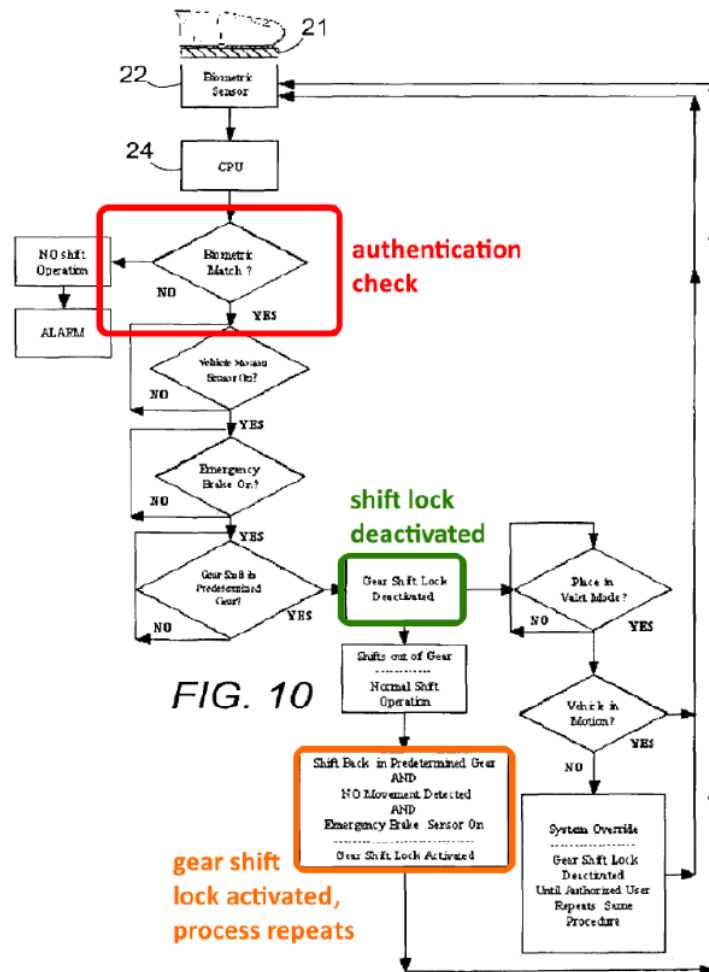
iv. Limitation 1.4

Limitation 1.4 recites:

whereby said transmission lever is locked after starting said engine and release of said depressed brake pedal to prevent driving said automobile after said engine is initially started and said brake pedal is depressed by a driver without said key fob being located in said passenger compartment after starting of said engine.

Ex. 1001, 4:23–28. Petitioner contends that limitation 1.4 recites a “whereby” clause that merely states the result of the other limitations of the claim and, thus, is nonlimiting. Pet. 57 (referring to Petition § VI.A.3.e (discussing Grounds 1 and 2)); *id.* at 31 (citing *Tex. Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1172 (Fed. Cir. 1993)). Petitioner asserts limitation 1.4 “claims the result of what is recited in the prior limitations—i.e., if the key fob is not located in the vehicle after starting the engine, the transmission lever is locked and the car cannot be driven.” *Id.* at 31. Nonetheless, Petitioner argues that, to the extent limitation 1.4 is limiting, the combined teachings of the prior art disclose or at least render limitation 1.4 obvious. *Id.* at 57.

Regarding “whereby said transmission lever is locked after starting said engine and release of said depressed brake pedal,” Petitioner contends “DeBono teaches that the transmission lever should always be locked—even after the engine is started—unless the driver passes an authentication check at the time the driver attempts to shift the vehicle into gear.” Pet. 57 (citing Ex. 1010, 6:15–36). Petitioner provides the following annotated version of DeBono’s Figure 10, which Petitioner contends is “a flowchart of user authentication when the driver attempts to shift the car into gear”:



EX1010, Fig. 10 (annotated)

As shown above, Petitioner annotated DeBono’s Figure 10 to (1) box the “Biometric Match?” step and add the phrase “authentication check,” (2) box

the “Gear Shift Lock Deactivated” step and add the phrase “shift lock deactivated,” and (3) box the “Shift Back in Predetermined Gear AND NO Movement Detected AND Emergency Brake Sensor On” and “Gear Shift Lock Activated” step and add the phrase “gear shift lock activated, process repeats.” *Id.* at 57–58.

Petitioner contends “[a]s described in DeBono, the car engine is already started before the flowchart of Figure 10 begins.” Pet. 58 (citing Ex. 1010, 6:15–36; Ex. 1003 ¶ 90). Petitioner explains that “if the authentication (biometric match) check is performed successfully, the shift lock is deactivated,” but “[i]f authentication is not successful, there is ‘NO shift operation.’” *Id.* at 58–59 (citing Ex. 1010, Fig. 10). Petitioner asserts that one of ordinary skill in the art “would have understood Figure 10 to show that the default state of the gear shift lock in DeBono is a locked position after the engine is started.” *Id.* at 59 (citing Ex. 1003 ¶ 90).

Additionally, Petitioner asserts:

Figure 10 also shows that, even if authentication is successful at one point in time, and the shift lock is deactivated—as soon as DeBono is shifted back into a predetermined gear (e.g., park) and the car is stationary, the gear shift lock is activated once again, and the system would therefore repeat Figure 10 and require an additional authentication check before shift lock is deactivated once again.

Id. (citing Ex. 1010, Fig. 10, 10:49–62; Ex. 1003 ¶ 91).

Petitioner contends that, in the combination proposed, DeBono’s teaching of “locking the shift lever even after the engine is running” is applied to “the second key fob authentication step.” Pet. 59 (citing Petition § VI.B.2; Ex. 1003 ¶¶ 80–83). According to Petitioner, “[t]his means that in the combination, even after the engine is started successfully based on a first

key fob authentication step (as is disclosed in McCullough), the shift lock would remain locked until a second key fob authentication has taken place (by applying the teachings of DeBono).” *Id.* (citing Ex. 1003 ¶¶ 80–83). And, one of ordinary skill in the art would have been motivated to combine the teachings of McCullough and DeBono for the reasons discussed previously. *Id.* (citing Petition § VI.B.2; Ex. 1003 ¶¶ 77–84).

Regarding “to prevent driving said automobile after said engine is initially started and said brake pedal is depressed by a driver without said key fob being located in said passenger compartment after starting of said engine,” Petitioner contends that this phrase “merely describes the intended result of preventing driving when the key fob is absent from the vehicle, even if the brake pedal is depressed and the engine is started, and should not be considered limiting.” Pet. 60. Petitioner asserts, to the extent this phrase is deemed limiting, it is substantially similar to limitations 1.1–1.3. *Id.* (citing Petition §§ VI.B.3.b–d). Petitioner states that “[a]s explained there, the combination prevents operating the shift lever if the key fob is not authenticated, even when the engine is started and the brake pedal is depressed; and if the car cannot be shifted into gear, the system effectively prevents driving of the automobile.” *Id.* Thus, Petitioner contends that this portion of limitation 1.4 “is disclosed by the combination for the same reasons discussed above” regarding limitations 1.1–1.3. *Id.* (citing Petition §§ VI.B.3.b–d).

In the Institution Decision, we discussed limitation 1.4, and specifically its format as a “wherein clause”:

“The determination of whether a ‘wherein’ clause imposes a limitation in a claim must be determined on a case-by-case basis.” *MPHJ Tech. Invs., LLC v. Ricoh Ams. Corp.*,

847 F.3d 1363, 1379 (Fed. Cir. 2017) (O’Malley, J., concurring in part, dissenting in part). A “wherein” clause that gives meaning and purpose to the “manipulative steps” of a claim has been found limiting, whereas a “whereby” clause that “merely states the result of the limitations in [a] claim” has been found to add nothing to patentability or substance of the claim. *Id.* (discussing *Griffin v. Bertina*, 285 F.3d 1029, 1033–34 (Fed. Cir. 2002), and *Tex. Instruments*, 988 F.2d at 1172).

On the present record, the “whereby” clause recited in limitation 1.4 appears to merely state the result of the limitations of claim 1. Specifically, the whereby clause recites that the transmission lever is locked after starting the engine and releasing the brake pedal, which prevents driving the vehicle after it is started (because the transmission cannot be shifted into gear) when the brake pedal is depressed by a driver without the key fob being located in the passenger compartment after the engine is started. Each of the circumstances recited in limitation 1.4 result from implementing limitations 1.pre through 1.3, as reflected in our discussion of those limitations. Thus, at this stage of the proceeding and on the present record, we determine that limitation 1.4 does not add to the patentability or substance of the claim.²⁹

Further, to the extent limitation 1.4 is limiting, at this stage of the proceeding and on the present record, we find Petitioner’s showing sufficient regarding limitation 1.4.

Inst. Dec. 38–39. Additionally, we expressly requested that “[i]f Patent Owner contends the ‘whereby’ limitation of limitation 1.4 is limiting or the latter portion of limitation 1.4 does not merely recite an intended result of the limitations recited previously, Patent Owner should explain, in detail, the basis for those positions in its Patent Owner Response.” *Id.* at 39–40.

²⁹ Additionally, we further find that the latter portion of limitation 1.4—“to prevent driving . . . after starting of said engine”—recites an intended result of the previous limitations of claim 1, as asserted by Petitioner. See Pet. 59–60.

Patent Owner does not raise an argument specifically addressing limitation 1.4 in the Patent Owner Response, does not contend that the whereby limitation of limitation 1.4 is limiting, and does not assert that the latter portion of limitation 1.4 recites more than an intended result of the limitations recited previously. *See generally* PO Resp. By not responding to these issues, Patent Owner has waived any argument to the contrary with respect to limitation 1.4. *See* Paper 8 (“Scheduling Order”), 8 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”); *see also In re NuVasive, Inc.*, 842 F.3d at 1381 (determining that an argument not raised in a patent owner response was waived). Additionally, the record with respect to the analysis of limitation 1.4 has not changed in any substantive manner since the Institution Decision. Accordingly, we maintain and expressly adopt our analysis of limitation 1.4 therein.

Further, to the extent Patent Owner’s arguments regarding Ground 3, in general, or limitation 1.1 apply to limitation 1.4, we have addressed them above. Petitioner’s additional analysis of limitation 1.4, reproduced above, is persuasive and sufficiently supported on the complete record before us.

Accordingly, for the reasons explained above and on the complete record before us, we find that limitation 1.4 does not add to the patentability or substance of claim 1 and, to the extent limitation 1.4 is limiting, Petitioner has established that the combination of McCullough and DeBono teaches or suggests the subject matter of limitation 1.4.

4. *Objective Considerations of Nonobviousness*

Neither party presents evidence of objective considerations of nonobviousness.

5. *Weighing the Graham Factors*

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves the weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.” *Arctic Cat*, 876 F.3d at 1361. On balance, considering the complete record before us and for the reasons explained above, we determine that Petitioner has established by a preponderance of the evidence that the combination of McCullough and DeBono would have rendered the subject matter of claim 1 obvious to one of ordinary skill in the art at the time of the invention.

C. *Other Asserted Grounds of Unpatentability*

Petitioner asserts three other grounds challenging the patentability of claim 1: (1) anticipation by Cha; (2) obviousness over Cha and Chung; and (3) obviousness over Chung and Suzuki. Pet. 3–4, 11–36, 61–74. Because Petitioner’s challenge based on the combination of McCullough and DeBono is dispositive as to claim 1, we need not reach these additional grounds. See *SAS Inst. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding that a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (nonprecedential) (stating that the “Board need not address issues that are not necessary to the resolution of the proceeding,” such as “alternative arguments with respect to claims [the Board] found unpatentable on other grounds”); cf. *In re Gleave*, 560 F.3d 1331, 1338 (Fed. Cir. 2009) (not reaching other grounds of unpatentability after affirming a ground based on anticipation); see also *Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (An administrative agency is at liberty to reach a decision based on a dispositive issue because doing so “can not only save

the parties, the [agency], and [the reviewing] court unnecessary cost and effort,” but “can greatly ease the burden on [an agency] commonly faced with a . . . proceeding involving numerous complex issues and required by statute to reach its conclusion within rigid time limits.”); *SK Hynix Inc. v. Netlist, Inc.*, IPR2017-00692, Paper 25 at 40 (PTAB July 5, 2018) (determining all challenged claims to be unpatentable and not addressing additional grounds).

D. Petitioner’s Motion to Seal and Motion for Entry of the Default Protective Order

Petitioner filed a combined Motion to Seal Exhibits 1032 and 1034 and Motion for Entry of the Default Protective Order (Paper 21, “Motion”). With its Motion, Petitioner filed a redacted version of Exhibit 1032 (as Exhibit 1033), and a copy of the Default Protective Order (Exhibit 1035). Patent Owner filed an Opposition (Paper 24, “Opp.”).

The record for an *inter partes* review shall be made available to the public, except as otherwise ordered, and a document filed with a motion to seal shall be sealed provisionally until the motion is decided. See 35 U.S.C. § 316(a)(1); 37 C.F.R. § 42.14. Additionally, “[a] party may file a motion to seal where the motion to seal contains a proposed protective order, such as the default protective order set forth in the Office Patent Trial Practice Guide.”³⁰ 37 C.F.R. § 54(a).

There is a strong public policy that favors making information filed in *inter partes* review proceedings open to the public. See *Garmin Int’l v. Cuozzo Speed Techs., LLC*, IPR2012-00001, Paper 34 at 1–2 (PTAB

³⁰ See Consolidated Trial Practice Guide, November 2019 (“CTPG”) available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

Mar. 14, 2013) (Paper 34). The standard for granting a motion to seal is good cause. *See* 37 C.F.R. § 42.54(a). The Board has stated that

a movant to seal must demonstrate adequately that (1) the information sought to be sealed is truly confidential, (2) a concrete harm would result upon public disclosure, (3) there exists a genuine need to rely in the trial on the specific information sought to be sealed, and (4), on balance, an interest in maintaining confidentiality outweighs the strong public interest in having an open record.

Argentum Pharms. LLC v. Alcon Research, Ltd., IPR2017-01053, Paper 27 at 4 (PTAB Jan. 19, 2018) (informative) (citing 37 C.F.R. § 42.54(a)). The Consolidated Trial Practice Guide explains that “[t]he rules aim to strike a balance between the public’s interest in maintaining a complete and understandable file history and the parties’ interest in protecting truly sensitive information.” CTPG 19.

Further, the moving party bears the burden of showing that the relief requested should be granted. *See* 37 C.F.R. § 42.20(c).

1. *Exhibit 1032*

Petitioner explains that “Exhibit 1032 is a deposition transcript of [Petitioner’s] Chief Executive Officer, Kevin Jakel, that addresses confidential aspects of [Petitioner’s] business.” Motion 1. Petitioner asserts that the redacted portions of Exhibit 1032 contain “non-public proprietary (‘Information’), including information about [Petitioner’s] members and information regarding [Petitioner’s] business operations, that Petitioner maintains as confidential trade secrets.” *Id.* at 2. Petitioner contends that it would incur several potential harms if this highly confidential Information were disclosed, including harm to third parties not involved in this proceeding. *Id.* at 3. Additionally, Petitioner asserts that it relies on

particular information in these exhibits in response to Patent Owner's argument as to the real party in interest. *Id.* Further, Petitioner argues that "on balance, the interest in maintaining confidentiality outweighs the public interest in having an entirely open record." *Id.* at 3–4.

Patent Owner asserts that not all of the information Petitioner redacts from Exhibit 1032 is confidential information. Opp. 5–8. Specifically, Patent Owner lists the redactions to which it has no objection (*see id.* at 6) and also lists the redactions to which it objects (*see id.* at 6–7). Regarding the redactions to which Patent Owner objects, Patent Owner asserts that "[h]ow Petitioner operates is not a mystery" and that "[e]ven if the items are somewhat confidential, they are marginally so." *Id.* at 7. Additionally, Patent Owner contends that "reliance on Exhibit 1032 is not needed in this trial but Petitioner choose to do so" and that none of the material redacted is cited in any of the briefing in the case. *Id.* at 7–8.

We have reviewed the redactions to Exhibit 1032 and we find that Petitioner has established good cause for its Motion to Seal those portions of the exhibit. In particular, the information that Patent Owner asserts is at most "marginally" confidential pertains to Petitioner's business operations and internal deliberations. Additionally, as discussed above in our consideration of the real party in interest, because we determine that neither the time bar nor estoppel provisions of 35 U.S.C. § 315 are implicated in this case, we did not determine whether Ford or any other third parties should have been identified as a real party in interest. *See supra* § I.C.

Further, as Patent Owner notes, the parties do not rely on any of the redacted material in the briefing before us, none of the briefs were filed under seal, and this Final Written Decision is not filed under seal (because it

is not necessary to reproduce any of the confidential information here). Thus, redacting those portions of Exhibit 1032 would not inhibit “the public’s interest in maintaining a complete and understandable file history” because the material on which the parties and this Decision relies will remain publicly available. *See* CTPG 19. Under the circumstances here, where a document includes both confidential and non-confidential information and a party seeks to rely only on the non-confidential information, it would not make sense to deny a motion to seal solely because that party does not also seek to rely on the confidential information contained in the same document. In other words, requiring reliance on the confidential information of Exhibit 1032 in order to justify sealing those portions of the exhibit would not make sense in this instance.

We find that, on balance, Petitioner’s interest in maintaining confidentiality outweighs the strong public interest in having an open record at least because (1) the information sought to be sealed appears to be confidential, (2) Patent Owner has established that a concrete harm may result from public disclosure, and (3) under the circumstances presented here, the parties do not rely (in their briefing) on the confidential information sought to be sealed; rather, they only rely on the non-confidential information. Accordingly, for these reasons, and as detailed in Petitioner’s Motion, Petitioner has established good cause to seal the Exhibit 1032.

2. *Exhibit 1034*

Petitioner explains that “Exhibit 1034 is a confidential membership agreement.” Motion 1. Petitioner asserts that “[t]his entire document contains sensitive business information which Petitioner asserts has not been published or otherwise been made public and for which Petitioner is

obligated to keep confidential.” *Id.* at 4. Additionally, Petitioner contends that “[d]ue to the nature of this document, Petitioner cannot meaningfully provide a redacted version of this document and requests that it remains sealed in its entirety.” *Id.* Several of Petitioner’s arguments with respect to Exhibit 1032 also apply to Exhibit 1034. *See id.* at 4–6.

Patent Owner contends that Exhibit 1034 does not appear to be a confidential membership agreement. Opp. 5. Additionally, Patent Owner contends that even if Exhibit 1034 were Petitioner’s membership agreement, Petitioner has not established a basis to seal it. *Id.* In particular, Patent Owner asserts that Petitioner was not required to file the agreement and that “Petitioner wants to be considered the sole real party [in] interest even though it acts on behalf of others. . . . What Petitioner’s membership agreement says or doesn’t say is not dispositive.” *Id.*

Subsequent to Patent Owner’s Opposition, we granted an unopposed request by Petitioner to expunge the document originally filed as Exhibit 1034 (due to a clerical error) and to permit Petitioner to replace that document with the document Petitioner had intended to file. *See* Paper 25 (Decision Granting Petitioner’s Request to Expunge and Replace Exhibit 1034). Thereafter, we expunged Exhibit 1034 and Petitioner filed a new document as Exhibit 1034, which is the membership agreement. Thus, although Patent Owner is correct that the document originally filed as Exhibit 1034 was not the membership agreement, that issue has been resolved.³¹

³¹ Patent Owner did not request to supplement or otherwise modify its briefing in light of Petitioner’s replacement of Exhibit 1034. *See* Ex. 3003 (Email from Petitioner’s counsel, dated Aug. 20, 2021) (noting that Petitioner would not oppose a request by Patent Owner to supplement or

As discussed above in our consideration of the real party in interest, because we determine that neither the time bar nor estoppel provisions of 35 U.S.C. § 315 are implicated in this case, we did not determine whether Ford or any other third parties should have been identified as a real party in interest. *See supra* § I.C. Additionally, as with the confidential portions of Exhibit 1032 discussed above, neither party relies on any of the confidential information presented in Exhibit 1034. Thus, whether the document is maintained in the file under seal or expunged is of no moment to the public's ability to understand the facts relevant to our determination in this proceeding. Nonetheless, to maintain a complete record at this time, we find that the better option is to seal Exhibit 1034.

Therefore, we find that, on balance, Petitioner's interest in maintaining confidentiality outweighs the strong public interest in having an open record at least because (1) the information sought to be sealed appears to be confidential, (2) Patent Owner has established that a concrete harm may result from public disclosure, and (3) under the circumstances presented here (where the parties do not rely on the confidential information of the exhibit in their briefing), we determine that instead of expunging Exhibit 1034 from the record, the better course is to maintain the exhibit under seal. Accordingly, for these reasons, Petitioner has established good cause to seal Exhibit 1034.

modify its briefing). Since Patent Owner's Opposition includes arguments directed to sealing Petitioner's membership agreement, it is of no surprise that Patent Owner did not seek to supplement its Opposition. *See* Opp. 5 (addressing whether Petitioner's membership agreement should be sealed).

3. *Protective Order*

As noted above, Petitioner’s Motion for Entry of the Default Protective Order was filed as part of its Motion to Seal. *See* Motion. Patent Owner’s Opposition states that “Patent Owner consents and does not object to entry of the Default Protective Order” and “does not object to entry of Petitioner’s [Exhibit] 1035, provided such exhibit is identical to the default protective order in the PTAB rules.” Opp. 1.

We understand that Exhibit 1035 is the same default protective order referenced in 37 C.F.R. § 42.54(a) and the Consolidated Trial Practice Guide, as Petitioner has explained, and that Patent Owner, therefore, does not object to its entry. Further, because we find that Exhibits 1032 and 1034 contain confidential information, entry of Exhibit 1035 is appropriate.

Accordingly, we hereby enter Exhibit 1035 as the Protective Order governing the treatment and filing and confidential information in this proceeding.

E. Constitutionality

Patent Owner contends that the Board was unconstitutionally appointed. PO Resp. 36. We decline to address Patent Owner’s constitutional challenge except to note that the constitutionality of the appointments of the Administrative Patent Judges was addressed by the United States Supreme Court in *United States v. Arthrex, Inc.*, 141 S. Ct. 1970, 1986–87, 1997 (2021).

IV. SUMMARY³²

For the reasons discussed above, Petitioner has demonstrated, by a preponderance of the evidence, that claim 1 of the '645 patent is unpatentable based on the arguments and evidence asserted in Ground 3.³³ Additionally, we grant Petitioner's Motion to Seal (Paper 21) and seal Exhibits 1032 and 1034, and we grant Petitioner's Motion for Entry of the Default Protective Order (Paper 21) and enter the Default Protective Order (Ex. 1035), which governs the treatment and filing of confidential information in this proceeding.

Our conclusions regarding claim 1 are summarized below:

³² Should Patent Owner wish to pursue amendment of claim 1 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).

³³ As explained above, Ground 3 relies upon Chung in the alternative, and we have not relied upon Chung in reaching this determination.

Claims Challenged	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1	102 ³⁴	Cha		
1	103(a) ³⁵	Cha, Chung		
1	103(a)	McCullough, DeBono, Chung	1	
1	103(a) ³⁶	Chung, Suzuki		
Overall Outcome			1	

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claim 1 of U.S. Patent No. 8,548,645 B2 is determined to be unpatentable;

FURTHER ORDERED that Petitioner's Motion to Seal Exhibits 1032 and 1034 (Paper 21) is *granted* and Exhibits 1032 and 1034 are hereby sealed;

³⁴ As explained above, because Petitioner's challenge based on Ground 3 is dispositive as to claim 1, we do not reach this asserted ground. *See supra* § III.C.

³⁵ As explained above, because Petitioner's challenge based on Ground 3 is dispositive as to claim 1, we do not reach this asserted ground. *See supra* § III.C.

³⁶ As explained above, because Petitioner's challenge based on Ground 3 is dispositive as to claim 1, we do not reach this asserted ground. *See supra* § III.C.

FURTHER ORDERED that Petitioner's Motion for Entry of the Default Protective Order (Paper 21) is *granted* and the Default Protective Order (Ex. 1035) is hereby entered into the record and governs the treatment and filing of confidential information in this proceeding;

FURTHER ORDERED that Paper 35 (which is a duplicate of Paper 34) is hereby expunged; and

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

IPR2020-01334
Patent 8,548,645 B2

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