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Paper 31
Date: December 13, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NXP USA, INC.,
Petitioner,

v.

IMPINJ, INC.,
Patent Owner.

IPR2020-01062
Patent 8,134,451 B1

Before KEN B. BARRETT, ROBERT J. WEINSCHENK, and KEVIN C. TROCK, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Granting in Part Patent Owner's Revised Non-Contingent Motion to Amend
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

NXP USA, Inc. ("Petitioner")[1] filed a Petition requesting *inter partes* review of U.S. Patent No. 8,134,451 B1 ("the '451 patent," Ex. 1001). Paper 1 ("Pet."). The Petition challenges the patentability of claims 1–15, 19, 20, and 22–24 of the '451 patent. We instituted an *inter partes* review of all challenged claims on all proposed grounds of unpatentability. Paper 7 ("Institution Decision").

After institution, Impinj, Inc. ("Patent Owner")[2] did not file a Response to the Petition, but filed a non-contingent Motion to Amend requesting that we cancel original claims 1–15, 19–20, and 22–24 and add proposed substitute claims 26–44. Paper 11 ("MTA"), 1. Petitioner filed an Opposition (Paper 12, "Pet. Opp.") to the Motion to Amend. Pursuant to Patent Owner's request (MTA 1), we provided Preliminary Guidance on the Motion to Amend. Paper 15 ("Prelim. Guidance"). Patent Owner then filed a non-contingent Revised Motion to Amend, revising proposed substitute claims 26–44 and again requesting that we cancel original claims 1–15, 19–20, and 22–24. Paper 16 ("Rev'd MTA"), 1, App'x A. Petitioner filed an Opposition to the Revised Motion to Amend (Paper 19, "Opp. to Rev'd MTA" or "Opposition"), Patent Owner filed a Reply (Paper 24, "Reply to Opp." or "Reply"), and Petitioner filed a Sur-reply to Patent Owner's Reply (Paper 26, "Pet. Sur-reply"). An oral hearing was held on October 8, 2021, and a transcript of the hearing is included in the record. Paper 30 ("Tr.").

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[1] Petitioner identifies NXP USA, Inc. ("Petitioner"), NXP Semiconductors N.V., NXP B.V., and Freescale Semiconductor Holdings V, Inc. as real parties-in-interest. Pet. 75.

[2] Patent Owner identifies itself as the real party-in-interest. Paper 5, 2.

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). Having reviewed the arguments of the parties and the supporting evidence, we grant Patent Owner's request to cancel original claims 1–15, 19–20, and 22–24, we grant Patent Owner's request to add proposed substitute claims 26–29, 31–38, and 40–44, and we deny Patent Owner's request to add proposed substitute claims 30 and 39.

B. Related Proceedings

One or both parties identify, as matters involving or related to the '451 patent, *Impinj, Inc. v. NXP USA, Inc.*, No. 4:19-cv-03161 (N.D. Cal.), and several Patent Trial and Appeal Board cases. Pet. 75; Paper 5, 2–4.

C. The '451 Patent

According to the '451 patent, it "addresses the field of Radio Frequency IDentification (RFID) systems, and more specifically to causing such systems to yield their data more expeditiously." Ex. 1001, 1:29–32. "RFID systems can be used in many ways for locating and identifying objects to which the tags are attached." *Id.* at 1:36–40. In a RFID system, a RFID reader may transmit an interrogating RF wave, and a RFID tag in the vicinity may sense the RF wave and respond by transmitting back another RF wave. *Id.* at 1:45–54. "The tag generates the transmitted back RF wave either originally, or by reflecting back a portion of the interrogating RF wave in a process known as backscatter." *Id.* at 1:54–57.

> The reflected-back RF wave may further encode data stored internally in the tag, such as a number. The response is demodulated and decoded by the reader, which thereby identifies, counts, or otherwise interacts with the associated item. The decoded data can denote a serial number, a price, a date, a destination, other attribute(s), any combination of attributes, and so on. Accordingly, when a reader reads a tag

> code, data can be learned about the associated item that hosts the tag, and/or about the tag itself.

Id. at 1:59–67.

According to the '451 patent, "[a] well-known problem in RFID systems is expedience in reading the tags, especially where it is desired to read more than one of the codes stored in each tag." *Id.* at 2:11–13. "The problem becomes exacerbated if there are many tags, or the host items are moving and thus allow only limited time to read their tags." *Id.* at 2:13–15.

The '451 patent states that "the present invention provides RFID tags and chips for RFID tags that store a first code and a second code in memory," with the tags being capable of backscattering a combination of at least portions of the first code and the second code, without receiving any commands in the interim. *Id.* at 2:20–25. In some embodiments, separate reader commands do not have to be sent for reading the first and the second codes. *Id.* at 2:29–31. "Not sending separate commands can save time in inventorying the tags. Plus, it can enable reading of tag codes during tag manufacturing that are not otherwise readily available to read in the field." *Id.* at 2:31–34.

The '451 patent explains that, in prior art systems, the reader would have to issue two commands to read two codes. *See id.* at 9:49–10:15. Figure 7, depicting a prior art method of reading tag data, is reproduced below. *Id.* at 9:49–53.

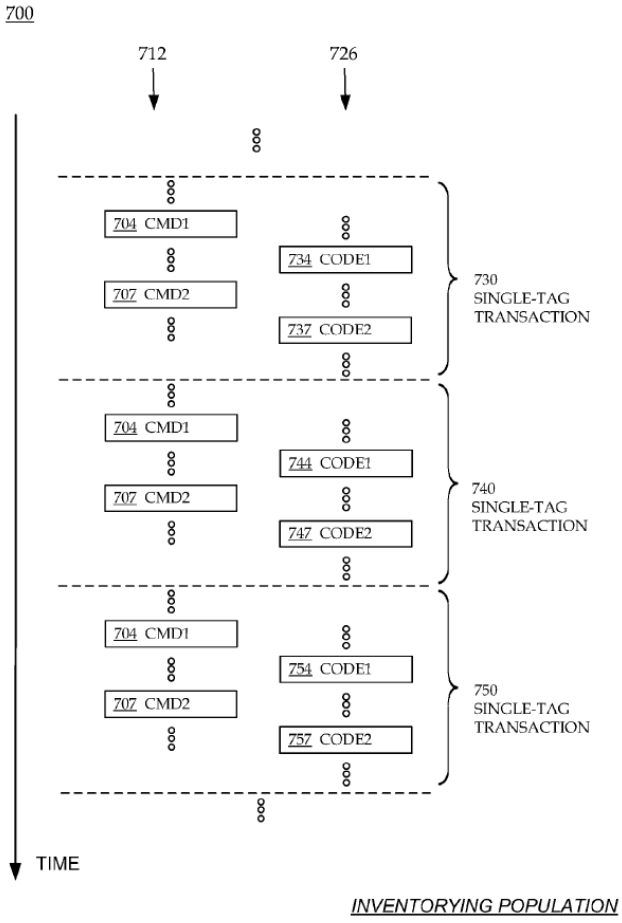

FIG. 7 (PRIOR ART)

Figure 7 "is a timing diagram showing conventional commands from an RFID reader and replies from a population of RFID tags for reading first and second codes of the tags." *Id.* at 2:57–59. "In timing diagram 700, the reader singulates each tag successively, such that only one tag replies at a time, while the other tags are silent." *Id.* at 9:58–60. "In first transaction 730 with one tag, a first command CMD1 704 elicits a first code CODE1 734 from the tag." *Id.* at 10:4–7. "Then a second command CMD2 707 elicits a second code CODE2 737 from the tag." *Id.* at 10:6–7. This cycle is repeated for other tags as shown in transactions 740 and 750. *Id.* at 10:7–15. According to the '451 patent, each command and each reply takes time and there can be many transactions, and the time to read the tags

may be limited, and "[t]he invention addresses this timeliness problem." *Id.* at 10:34–35.

Figure 11 of the '451 patent is reproduced below.

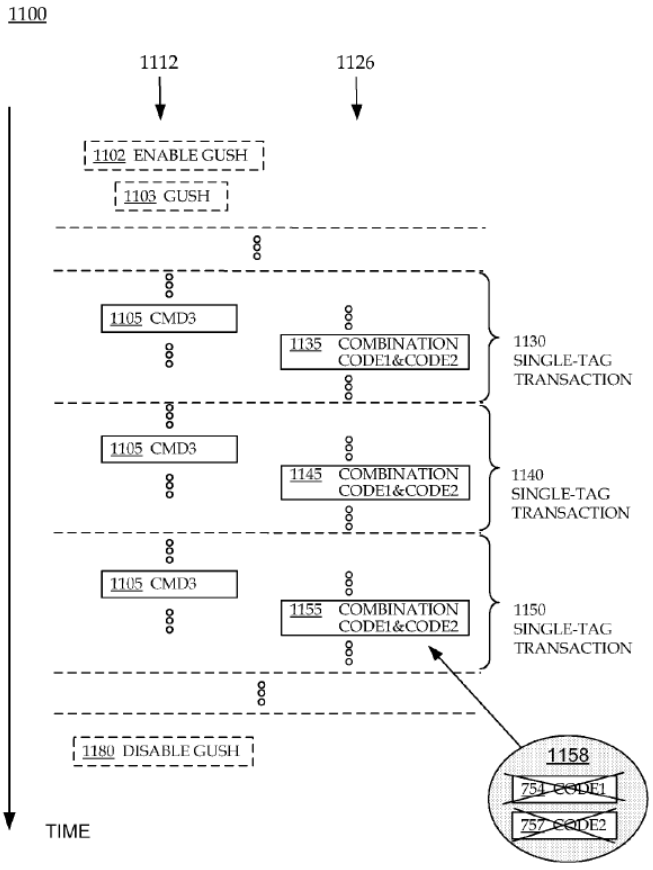

FIG. 11

Figure 11 "is a timing diagram showing commands from an RFID reader and replies from a population of RFID tags for reading combinations of the first and the second codes of the tags." *Id.* at 2:66–3:2. In the timing diagram 1100 of Figure 11, "the reader singulates each tag successively, such that only one tag replies at a time, while the other tags are silent" and [w]hile each tag is thus singulated, the reader reads its data by having a transaction with the tag." *Id.* at 12:43–49. Each transaction (1130, 1140, and 1150) includes a command (CMD3) which elicits a combination (1135,

1145, and 1155) of the first code and the second code stored in memory. *Id.* at 12: 56–64. According to the '451 patent, the transactions of Figure 11 can take less time than the respective transactions of Figure 7. *Id.* at 12:65–67.

The third command may be different from or identical to the first command. *Id.* at 13:5–9.

The Specification of the '451 patent describes the codes stored in memory.

> The first code and the second code can be any suitable codes. For example, the first code can be an Electronic Product Code (EPC) of the tag, associated with a host item to which the tag is attached. The second code can be a TID [Tag Identifier] code of the tag, which complies with the Gen2 Spec. Or, the second code can be any one or more of: a date of expiration of the tag's host item, a date by which the host item is to be sold by, a date at which the host item was sold, a code for a sale of the host item, a receipt of the sale, an identifier for a retailer that made the sale, an identifier for a store through which the sale is made, and so on. The second code could also alternately be an identifier for the tag, a password for the tag, an indicator for how a memory of the first tag is configured, and so on. Other codes can equivalently be used for the first and the second codes. In addition, what is called first and second codes can be interchanged, and so on.

Id. at 10:16–31.

D. Cancelled Claims 1–15, 19–20, and 22–24

Our rules provide for cancellation of challenged claims. *See* 37 C.F.R. § 42.121(a)(3) ("A motion to amend may cancel a challenged claim"). Patent Owner's Non-Contingent Motion to Amend requests cancellation of all the challenged claims, 1–15, 19–20 and 22–24.[3] Rev'd

[3] In a non-contingent motion to amend, "the Board provides a final decision on the patentability of substitute claims in place of determining the

MTA 1. Patent Owner's counsel confirmed at the oral hearing that it intended to cancel all of the challenged claims. Tr. 53:26–54:6. Patent Owner's request to cancel challenged claims 1–15, 19–20 and 22–24 of the '451 patent is *granted*.

E. Proposed Substitute Claims 26–42

Of the proposed substitute claims, apparatus claim 26 and method claim 38 are independent claims. The remaining proposed substitute claims depend directly or indirectly from claim 26 or claim 38. Claim 26 is proposed as a substitute for canceled claim 1 and is representative of the subject matter of the claims at issue. Proposed substitute claim 26, with additions to issued claim 1 shown in underline and deletions shown in strikethrough and with Petitioner's bracketed annotations, is shown below:

> [26 Pre] An Integrated Circuit (IC) for use with a Radio Frequency Identification (RFID) tag having an antenna, the IC comprising:
>
> [26a] a first memory bank configured to store an Electronic Product Code (EPC);
>
> [26b] a second memory bank configured to store a code different from the EPC ~~for storing a first code and a second code~~; and
>
> [26c] a processing block for coupling with the antenna and operable to:
>
> [26d] receive a first command from an RFID reader [26e] and in response to receiving the first command: retrieve the EPC from the first memory bank and cause the EPC in its entirety ~~the first code~~ to be

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patentability of corresponding original claims." Notice Regarding a New Pilot Program Concerning Motion To Amend Practice and Procedures in Trial Proceedings Under the America Invents Act Before the Patent Trial and Appeal Board, 84 Fed. Reg. 9497, 9505 (Mar. 15, 2019).

backscattered ~~if a first command is received from an RFID reader~~;

[26f] receive a second command different from, and received after, the first command, from the RFID reader, and [26g] in response to receiving the second command: retrieve the code different from the EPC from the second memory bank and cause the code different from the EPC to be backscattered in its entirety;

[26h] receive a Gush command to enter a Gush mode and [26i] while in the Gush mode receive the first ~~a third~~ command from the RFID reader and in response to receiving the first command backscatter the EPC and the code different from the EPC that are stored in separate memory banks of the IC [26j] by at least:~~; and~~

retrieving the EPC from the first memory bank,

retrieving the code different from the EPC from the second memory bank,

concatenating the EPC and the code different from the EPC to form a combination, and

~~cause~~ causing the combination to be backscattered ~~responsive to receiving the third command a combination made from at least portions of the first code and the second code~~, without receiving any commands while the combination is being backscattered.

Rev'd. MTA, App'x A at 1–2; *id.* at 7–8 (bracketed annotations added).

F. Evidence

Petitioner relies on the following references:

Reference	**Exhibit No.**
US 2007/0069866 A1; filed Sept. 29, 2006; published March 29, 2007 ("Schuessler")	1009
EPC™ RADIO-FREQUENCY IDENTITY PROTOCOLS CLASS-1 GENERATION-2 UHF RFID PROTOCOL FOR COMMUNICATIONS AT 860 MHZ–960 MHZ, Version 1.0.9, EPCglobal Inc., copyright 2004 ("Gen2")	1010

Petitioner also relies on declarations of Jeffrey Fischer (Ex. 1003 (dated June 6, 2020), Ex. 1025 (dated May 31, 2021), and Ex. 1032 (dated August 21, 2021)) in support of its arguments and Patent Owner relies on the declarations of Dr. Gregory Durgin (Ex. 2001 (dated September 18, 2020) and Ex. 2003 (dated September 13, 2021)) in support of its arguments. The parties rely on other exhibits as discussed below.

G. Asserted Grounds

Petitioner asserts that all of the proposed substitute claims, claims 26–44, are unpatentable on the following ground (*e.g.*, Opp. to Rev'd. MTA 1):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
26–44	103(a)	Schuessler, Gen2

Petitioner additionally asserts that the proposed claims of Patent Owner's Revised Motion to Amend lack written description support and are impermissibly broadened. Opp. to Rev'd MTA 1–2; *see also id.* at 4 n.1 ("Construing 'a first and second memory bank' to mean, for example, two memories instead of 'a memory' also impermissibly broadens the claims." (citation omitted)); Pet. Sur-reply 1–2 (impermissible broadening). In the last brief filed before the oral argument, Petitioner asserted for the first time that the proposed substitute claims are indefinite. *See* Pet. Sur-reply 2–3; *see also* Tr. 22:20–22.

II. ANALYSIS

A. Principles of Law

In an *inter partes* review, amended claims are not added to a patent as a matter of right; rather, they must be proposed as a part of a motion to amend. 35 U.S.C. § 316(d). In reviewing a motion to amend, the Board assesses the patentability of the proposed substitute claims "without placing

the burden of persuasion on the patent owner." *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1328 (Fed. Cir. 2017) (en banc); *see* 37 C.F.R. § 42.121(d) (setting forth the burdens of persuasion on a motion to amend); *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 3–4 (PTAB Feb. 25, 2019) (precedential) (providing guidance on motions to amend).

In accordance with *Aqua Products* and 37 C.F.R. § 42.121(d), a patent owner does not bear the burden of persuasion to demonstrate the patentability of the substitute claims presented in the motion to amend. Rather, ordinarily, "[a] petitioner bears the burden of persuasion to show, by a preponderance of the evidence, that any proposed substitute claims are unpatentable." 37 C.F.R. § 42.121(d)(2); *see Lectrosonics*, Paper 15 at 3–4. In determining whether a petitioner has proven unpatentability of the proposed substitute claims, we focus on "arguments and theories raised by the petitioner in its petition or opposition to the motion to amend." *Nike, Inc. v. Adidas AG*, 955 F.3d 45, 51 (Fed. Cir. 2020).

Notwithstanding the foregoing, a patent owner's proposed substitute claims must meet the statutory requirements of 35 U.S.C. § 316(d) and the procedural requirements of 37 C.F.R. § 42.121. 37 C.F.R. § 42.121(d)(1); *Lectrosonics*, Paper 15 at 4–8. In particular, a patent owner bears the burden of persuasion to show, by a preponderance of the evidence: (1) the amendment proposes a reasonable number of substitute claims; (2) the proposed claims are supported in the original disclosure (and any earlier filed disclosure for which the benefit of a filing date is sought); (3) the amendment responds to a ground of unpatentability involved in the trial; and (4) the amendment does not seek to enlarge the scope of the claims of the

patent or introduce new subject matter. *See* 35 U.S.C. § 316(d); 37 C.F.R. §§ 42.121(a), (b), (d).

New subject matter is any addition to the claims that lacks sufficient support in the subject patent's original disclosure. *See TurboCare Div. of Demag Delaval Turbomach. v. Gen. Elec. Co.*, 264 F.3d 1111, 1118 (Fed. Cir. 2001) ("When [an] applicant adds a claim . . . , the new claim[] must find support in the original specification."). The Board requires that a patent owner show in a motion to amend that there is written description support in the originally filed disclosure of the subject patent for each proposed substitute claim. *See* 37 C.F.R. § 42.121(b)(1).

The test for sufficiency of written description is "whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). "[T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art." *Id.*

"A 'claim is enlarged if it includes within its scope any subject matter that would not have infringed the original patent.'" *Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369, 1374 (Fed. Cir. 1999) (quoting *In re Freeman*, 30 F.3d 1459, 1464 (Fed. Cir. 1994)).

A patent claim is indefinite when that claim, "viewed in light of the specification and prosecution history, [does not] inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. BioSig Instruments, Inc.*, 572 U.S. 898, 910 (2014).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) any objective evidence of obviousness or non-obviousness.[4] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (internal quotation marks and citation omitted).

Petitioner's declarant, Jeffrey Fischer, opines that:

> A person of ordinary skill in the art ("POSITA") at the time of the alleged invention . . . would have had a bachelor's degree in electrical engineering or computer engineering and at least two years of experience in the field of Radio Frequency

[4] The parties have not directed our attention to any objective evidence of obviousness or non-obviousness.

> Identification (RFID) systems, or an equivalent combination of education, work, and/or experience.

Ex. 1003 ¶¶ 78–79; *see* Pet. 10. In the Institution Decision, we adopted Mr. Fischer's definition for purposes of that decision. Institution Decision (Paper 7) 9–10. Patent Owner states that it "accepts that definition for the purposes of this proceeding." Rev'd MTA 24.

Mr. Fischer's definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). For purposes of this decision, we apply Mr. Fischer's definition of the person of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b) (2020).

In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner proposes constructions for "code" and "Electronic Product Code (EPC)." Opp. to Rev'd MTA 6. Patent Owner asserts that "the

limitations of the substitute claims do not require construction and should, instead, be construed in accordance with their ordinary meaning." Rev'd MTA 24. According to Patent Owner, the addition of certain features of the proposed substitute claims renders moot Petitioner's arguments concerning the meaning of the term "code." *Id.*

Additionally, Petitioner argues that the content of the recited codes—an EPC and a code different from the EPC—constitutes "printed matter" (non-functional descriptive material) and, therefore, are not entitled to patentable weight. Opp. to Rev'd MTA 7–10; Pet. Sur-reply 5–6. We need not reach this issue. Even if we construed the specifically recited codes as being non-functional descriptive material, Petitioner, for reasons discussed below, has not shown that the claimed subject matter is unpatentable. Also, the parties do not identify any other issue in this case that turns on whether the two recited codes are non-functional descriptive material. *See, e.g.*, Opp. to Rev'd MTA 11–12 (Petitioner arguing that the relied-on prior art discloses codes in the form of an EPC and a TID (i.e. a code other than the EPC)).

On this record, we determine that no claim terms require express construction.

D. Statutory and Regulatory Requirements

Patent Owner argues that the Revised Motion to Amend satisfies the statutory and regulatory requirements associated with a motion to amend because: (1) the revised motion proposes only seventeen substitute claims to replace the twenty challenged claims, which is a reasonable number of substitute claims, Rev'd MTA 6; (2) the proposed substitute claims have written description support and do not propose new matter, *id.* at 6–15;

(3) the amendment responds to a ground of unpatentability, *id.* at 16–17; and (4) the proposed substitute claims do not enlarge the scope of the original claims as issued in the '451 patent, *id.* at 17–18. Petitioner provides no arguments against most of the statutory and regulatory requirements, arguing only that the proposed substitute claims lack written description support and are impermissibly broadened. Opp. to Rev'd MTA 2–6, 20–21, 25; Pet. Sur-reply 1–2, 3–4. We address these issues below.

For the reasons discussed below, we determine that proposed substitute dependent claims 30 and 39 lack written description support and, therefore, fail to satisfy the requirements for a motion to amend. Having reviewed the record, we agree with Patent Owner that, with regard to the remaining proposed substitute claims, the Revised Motion to Amend meets all of the other statutory and regulatory requirements associated with a motion to amend for the reasons Patent Owner sets forth in its motion.

1. The Subject Matter of Illustrative Proposed Substitute Claim 26

According to Patent Owner, proposed substitute independent claim 26 covers an RFID tag having two modes—the mode of the prior art depicted in Figure 7 of the '451 patent and the Gush mode depicted in Figure 11 of the '451 patent. *See* Rev'd MTA 7–8 (Patent Owner relying on Figures 7 and 11 as written description support for the two modes); *see also* MTA 3 (Patent Owner characterizing the proposed substitute claim 26—as initially proposed in the first motion to amend—as "recit[ing] limitations regarding the processing block being operable to respond differently to a first command depending on *whether the IC is configured to respond as specified in the Gen2 Spec or if the IC is in a Gush mode* beyond what is specified in the Gen 2 Spec." (emphasis added)). Figures 7 and 11 of the '451 patent are reproduced below.

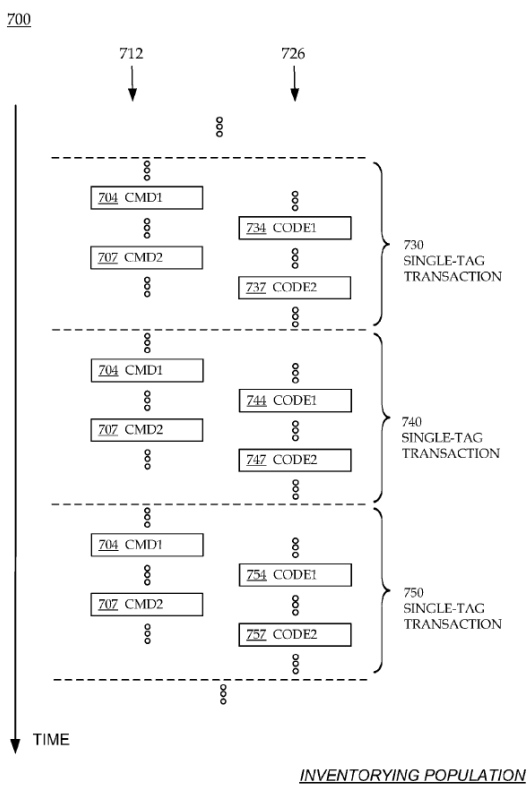


FIG. 7 (PRIOR ART)

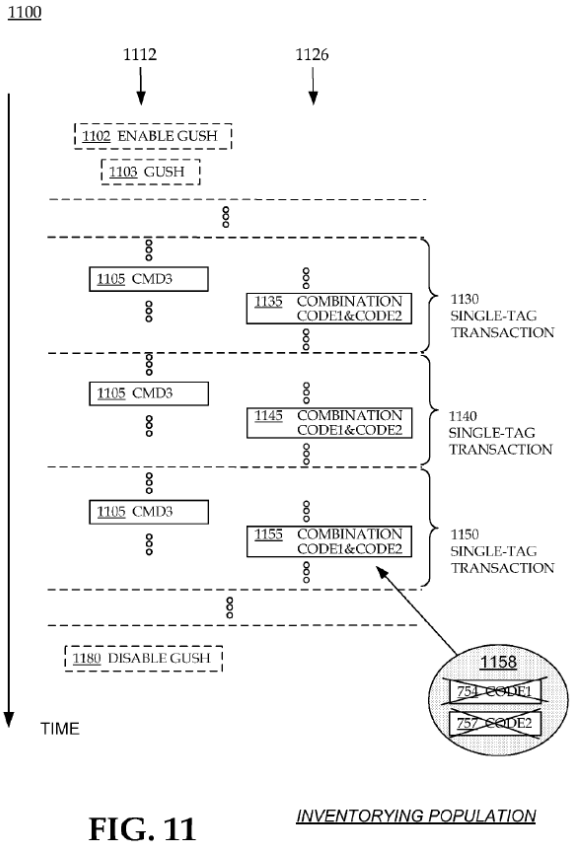


FIG. 11

Figure 7 "is a timing diagram showing conventional commands from an RFID reader and replies from a population of RFID tags for reading first and second codes of the tags," and Figure 11 "is a timing diagram showing commands from an RFID reader and replies from a population of RFID tags for reading combinations of the first and the second codes of the tags." Ex. 1001, 2:57–59, 2:66–3:2. The Gush mode is entered in response to a Gush command (limitation 26h). Both modes utilize a first command (limitations 26e and 26i). Patent Owner asserts that substitute claim 26 requires the RFID tag "to respond differently to receiving a first command depending on whether the IC is configured to be in a Gush mode." Rev'd MTA 2. In the prior art mode, the RFID responds to the first command with an EPC and responds to a second command with a different code (limitations 26c through 26f). In the Gush mode, the RFID tag responds to

the first command with a concatenated combination of the EPC and the different code (limitations 26h through 26j).

2. The Alleged Improper Broadening Regarding First and Second Memory Banks

The parties dispute whether Patent Owner has proposed an improper broadening amendment through the use of two memory banks.

Issued claim 1, for example, calls for "a memory for storing a first code and a second code." Ex. 1001, 16:28. Proposed substitute claim 26 recites: "a first memory bank configured to store an Electronic Product Code (EPC)" and "a second memory bank configured to store a code different from the EPC." Rev'd MTA, App'x A at 1.

Patent Owner contends that the proposed claims contain narrowing limitations in the form of "a first memory bank" and "a second memory bank" as compared to "a memory" in the original claims. Rev'd MTA 17; *see also* Reply to Opp. 3–4.

Petitioner contends, in a footnote in its Opposition to the Revised Motion to Amend, that "[c]onstruing 'a first and second memory bank' to mean, for example, two memories instead of 'a memory' also impermissibly broadens the claims." Opp. to Rev'd MTA 4 n.1 (citing Ex. 1032 ¶¶ 3024–3027); *see also* Pet. Sur-reply 1–2 ("the scope of the proposed claims is impermissibly broadened to encompass logical memory banks storing codes in more than one memory."); Tr. 7:12–13 ("That's improper because it enlarges the scope of claims to include two memories instead of just one."). Petitioner's argument appears to assume that the proposed substitute claims require two memories (as opposed to the recited "memory bank[s]") and that, because two memories are quantitatively more than one memory, the claims have been broadened.

We disagree with Petitioner's arguments. The arguments are contingent upon a construction of two memory banks being the same scope as two memories. *See* Opp. to Rev'd MTA 4 n.1 ("Construing . . . impermissibly broadens the claims."). Petitioner has not offered any persuasive argument or evidence that the two different terms—"memory" and "memory bank" are coextensive or that the more general term "memory" can encompass two of the more specific "memory bank[s]." Further, even if the proposed substitute claims required two memories rather than two memory banks, adding the requirement of a second memory (or, as written in the proposed claims, two memory banks rather than "a memory" as in the issued claim) is further limiting the claims and, therefore, is not broadening the scope. *See Hockerson-Halberstadt, Inc.*, 183 F.3d at 1374.

We agree with Patent Owner that the amended language regarding two memory banks does not impermissibly broaden the scope relative to the original claims.

3. The Alleged Lack of Written Description for Memory Bank

As mentioned, issued claim 1 calls for "a memory for storing a first code and a second code," Ex. 1001, 16:28, whereas proposed substitute claim 26, for example, recites: "a first memory bank configured to store an Electronic Product Code (EPC)" and "a second memory bank configured to store a code different from the EPC," Rev'd MTA, App'x A at 1.

Patent Owner contends that the original application provides support for the amended limitations and identifies several portions of the application in that regard. Rev'd MTA 6–7 (addressing independent claim 26). Patent Owner asserts that a person of ordinary skill in the art would have recognized that the inventors had possession of subject matter involving two codes stored in two memory banks from, for example, the application's

disclosure of an EPC in Membank [01] and a TID (a type of code) in Membank [10]. *See id.* at 7 (citing, *inter alia*, Application Figure 15 (Ex. 1004, 17)); Reply to Opp. 2–3.

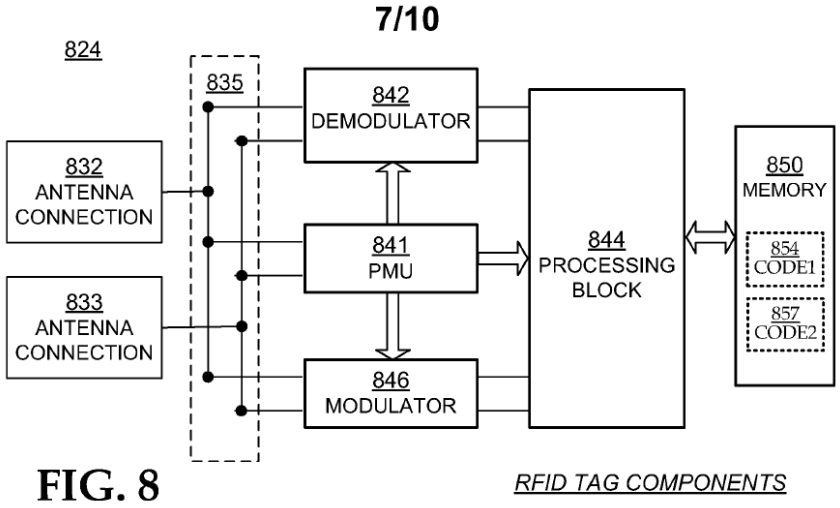
Petitioner argues that the term "memory bank" does not appear in the original application, that the specification's use of "Membank" is not adequate because the specification does not explain the meaning of that term, and that the file history never attached importance to a memory bank. Opp. to Rev'd MTA 2–5; *see also* Pet. Sur-reply 3–4. Petitioner also argues that the original application fails to provide written description support for codes stored in two memory banks. *See* Pet. Sur-reply 3.

Much of Petitioner's arguments omit the person of ordinary skill in the art from the analysis. *See, e.g.*, Pet. Sur-reply 3 (Petitioner arguing that, even if the application's term "membank" was well-known in the art, that is insufficient because "[t]he specification must describe the invention."). Petitioner specifically argues that "[n]or may Patent Owner rely on the knowledge of one skilled in the art as support for the claimed 'memory bank,' because '[i]t is the specification, not the knowledge of one skilled in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement.'" Opp. to Rev'd MTA 4 (quoting *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997)). Petitioner's reliance on *Genentech* is misplaced because, even if the term "memory bank" was considered to be a novel aspect of the claimed invention, the issue before us is one of written description, not enablement. We, in evaluating written description support, do not ignore the understanding and knowledge of the ordinary artisan. *See Ariad Pharms., Inc.*, 598 F.3d at 1351 ("[T]he test [for sufficiency of written description]

requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art.").

Having considered the parties' arguments and evidence, we agree with Patent Owner that the original application provides adequate support for and demonstrates possession of the proposed amended limitations concerning storing two codes in two memory banks.

The original application includes Figure 8, reproduced below.



Ex. 1004, 14. Figure 8 is a block diagram of an implementation of an electrical circuit formed in an IC of an RFID tag. *Id.* at 4–5, ¶¶ 18, 24. At the right of that figure, two codes are shown in memory 850. *See id.* at 18, ¶ 106 ("Circuit 824 additionally includes a memory 850, which stores data. . . . The data stored in memory 850 can be a first code 854 and a second code 857 as per the above."). "[T]he first code can be an Electronic Product Code (EPC)" and "[t]he second code can be a TID code of the tag, which complies with the Gen2 Spec." *Id.* at 33, ¶ 94.

The original application also includes Figure 15A, reproduced below.

ITEM	COMMAND	TARGET	ACTION	MEMBANK	POINTER	LENGTH	MASK	TRUNCATE	CRC-16
# OF BITS	4	3	3	2	EBV	8	VARIABLE	1	16
DESCR.	1010	000: **Inventoried** (S0) 001: **Inventoried** (S1) 010: **Inventoried** (S2) 011: **Inventoried** (S3) 100: **SL** 101: RFU 110: RFU 111: RFU	See Table 6.18	00: RFU 01: EPC 10: TID 11: User	Starting Mask address	Mask length (bits)	Mask value	0: Disable truncation 1: Enable truncation	

FIG. 15A *TABLE 6.17 - SELECT COMMAND OF THE GEN2 SPEC VERSION 1.1.0*

Ex. 1004, 17. Figure 15A "is a table illustrating the fields of the Select command of the Gen2 Spec version 1.1.0." *Id.* at 5, ¶ 31. In the fifth column, four Membanks are identified, including "01: EPC" and "10: TID." *Id.* at 17; *see also id.* at 24, ¶ 138 ("The Feature Enabling Field (FEF) enables the tag to verify that it is a proper recipient for the command, by comparing the transmitted FEF value against a value in Membank. In this case, Membank can be EPC, TID or USER memory."). The application associates Membank with a particular code memory. *See id.* at 24, ¶ 138 ("for example if Membank is TID memory as described in Gen2 vl.1.0 . . ."); *id.* at 42, ¶ 146 ("The Membank having a binary value of 10 point[s] to the TID memory").

We find persuasive Dr. Durgin's testimony that "a person of ordinary skill in the art would also be aware that 'membank' is a 'memory bank' from the Gen2 Specification," Ex. 2003 ¶ 25, and that "[t]he term 'membank' is clear by itself, since a person of ordinary skill in the art would know that it is simply an abbreviation for 'memory bank,'" *id.* ¶ 20; *see Ariad Pharms., Inc.*, 598 F.3d at 1352 ("[T]he description requirement does not demand . . . that the specification recite the claimed invention *in haec verba*."). The version of the Gen2 Spec relied on by Petitioner as a prior art reference, version 1.0.9, reinforces Dr. Durgin's testimony. That reference explains that "[t]ag memory shall be logically separated into four distinct banks" and "[c]ommands that access memory have a MemBank parameter that selects

the bank." Ex. 1010 § 6.3.2.1. Those memory banks are "Reserved memory," "EPC memory," "TID Memory," and "User Memory." *Id.* Figure 6.17 of the Gen2 Spec version 1.0.9 depicts those banks and is reproduced below.

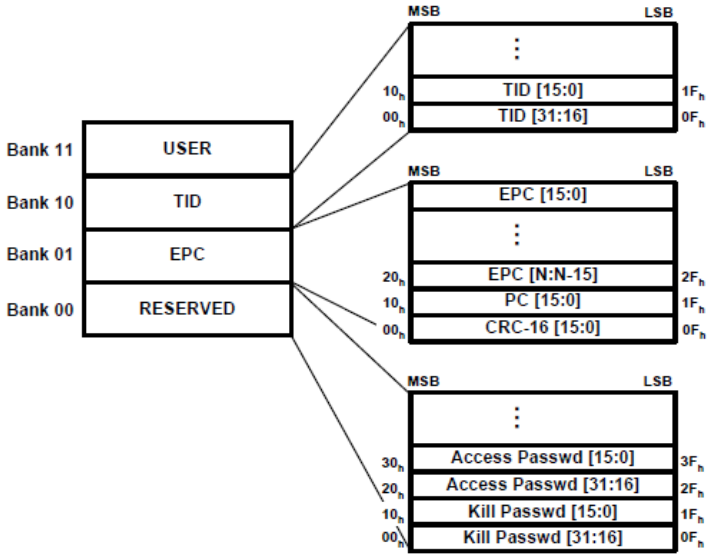


Figure 6.17 – Logical memory map

Figure 6.17 is a logical memory map. *Id.* We do not consider Patent Owner's and its expert's references to the Gen2 Spec improper incorporation by reference, as Petitioner implies. *See* Opp. to Rev'd MTA 3–4. Rather, we consider the Gen2 Spec to be evidence of the knowledge of an ordinary artisan and to inform us as to the perspective of that person when reading the original application. And, our determination here would not change if the Gen2 Spec was not considered in analyzing written description support for "memory bank." See Ex. 2003 ¶ 24 (Dr. Durgin persuasively testifying that "[a] person of ordinary skill in the art would not need to rely on any additional reference to understand that the '699 Application teaches a memory bank.").

We find that a person of ordinary skill in the art reading the original application would have recognized "Membank" as referring to a "memory

bank" as that term is used in the proposed substitute claims. The original application adequately supports and demonstrates possession of the limitations in the proposed substitute claims reciting: "a first memory bank configured to store an Electronic Product Code (EPC)" and "a second memory bank configured to store a code different from the EPC." Rev'd MTA, App'x A at 1.

4. The Alleged Lack of Written Description for Retrieving and Concatenating

Also in dispute is whether the original application provides written description support for the steps of retrieving and concatenating the codes. Proposed substitute claim 26, for example, recites a processing block operable to, while in the Gush mode, backscatter the codes by:

> retrieving the EPC from the first memory bank,
> retrieving the code different from the EPC from the second memory bank,
> concatenating the EPC and the code different from the EPC to form a combination, and
> causing the combination to be backscattered.

Rev'd MTA, App'x A (limitations 26h–26j).

Patent Owner contends that the original application provides support for the amended limitations and identifies several portions of the application in that regard. Rev'd MTA 8 (addressing independent claim 26). Patent Owner asserts that a person of ordinary skill in the art would have recognized that the inventors had possession of subject matter involving retrieving two codes stored in two memory banks and concatenating the codes to form a combination from, for example, the application's disclosure of transmitting two codes that were in memory (as discussed above) as a combination of "CODE1&CODE2" contiguously and with no interim pause

there between. *See id.* (citing, *inter alia*, Application Figures 11 and 12 and original claim 15 (Ex. 1004, 15–16, 46)); Reply to Opp. 4–6.

In its Opposition, Petitioner argues that none of Patent Owner's "identified passages" of the original application describes retrieving codes from two memory banks and concatenating the codes. Opp. to Rev'd MTA 5–6. In the Sur-reply, Petitioner argues that Patent Owner's cited support for the "memory bank" term "do[es] not describe storing, retrieving, and concatenating codes from two memory banks." Pet. Sur-reply 3; *see also id.* at 2 (relying on the written description arguments made in the Opposition for concatenating). Petitioner further argues that the term "'concatenated codes' could encompass a class of error-correcting codes that are used in wireless communications." Opp. to Rev'd MTA 6. According to Petitioner, instead of describing the claimed steps, "the [original] specification merely discloses a command that 'elicits a combination' of codes stored in 'tag memory' (not memory banks) by 'contiguously' backscattering the codes." *Id.* at 6 (citing Ex. 1004 ¶¶ 118, 128).

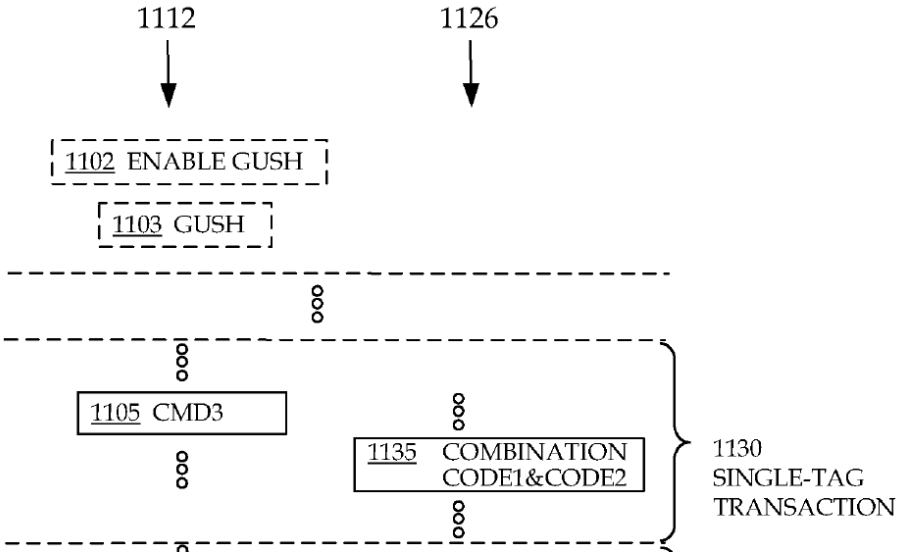
We disagree with Petitioner because Petitioner's arguments primarily are based on the lack of an explicit recitation of the terms "retrieving" and "concatenating" in the original application. *See Ariad Pharms., Inc.*, 598 F.3d at 1352 ("[T]he description requirement does not demand . . . that the specification recite the claimed invention *in haec verba*."). Further, Petitioner's "error-correcting" argument seemingly is based on reading the term "concatenated codes" in a vacuum, rather than in the context of the overall claimed invention, and Petitioner does not explain adequately why the disclosure of concatenating error-correction codes in wireless communications is necessary for written description support for the claimed

RFID tag. *See* Opp. to Rev'd MTA 6; *see* Tr. 18:25–19:7 (Petitioner arguing that concatenated error-correcting codes such as those used in LTE wireless communications are not disclosed).

Having considered the parties' arguments and evidence, we agree with Patent Owner that the original application provides adequate support for and demonstrates possession of the proposed amended limitations concerning retrieving two codes stored in two memory banks and concatenating those codes while in the Gush mode.

We have discussed above the original application's support for having two codes, an EPC and a TID, in two separate memory banks. We now turn to the "retrieving" and "concatenating" aspects.

The original application includes Figure 11, an excerpt of which is reproduced below.



Ex. 1004, 15. Above is a cropped version of Figure 11, which depicts a timing diagram showing commands from an RFID reader and a reply from an RFID tag with the combination of the first and the second code of the tag. *Id.* at 5, ¶ 27. Figure 11 shows the receipt, while in Gush mode, of third

command 1105 (which may be the same as the first command of the prior art mode) and, in response, backscattering combination 1135 of the two codes. *See id.* at 38, ¶¶ 121–122; *see also id.* at 37, ¶ 118 ("In first transaction 1130 with one tag, a third command CMD3 1105 elicits a combination 1135 of the tag. Combination 1135, as per the above, includes at least a portion of the first code and the second code stored in the tag memory."). In discussing the timing diagram of the prior art mode, Figure 7, the application explains that each code is "read out" in that a command "elicits" the respective code. *Id.* at 33, ¶ 93. We find persuasive Dr. Durgin's testimony on the aspect of "retrieving." *See* Ex. 2003 ¶¶ 32–33 (testifying, *inter alia*, that "a person of ordinary skill in the art would know that information stored in memory has to be retrieved from a memory location before further operations (such as transmitting to a reader in this case)."). We find that one of ordinary skill in the art would have recognized from the disclosure of the original application that, while in Gush mode, the backscattering of two codes stored in memory involves retrieving those codes from the respective memory locations.

The original application also includes Figure 12, reproduced below.

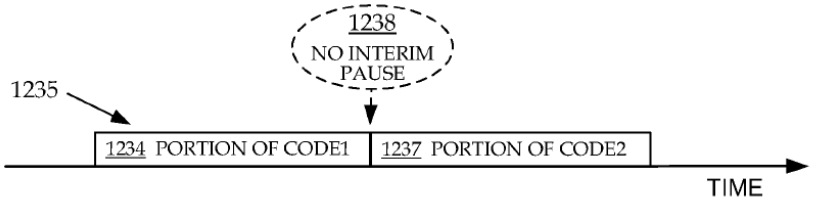


FIG. 12

Ex. 1004, 16. Figure 12 "is a diagram illustrating an embodiment where a combination of FIG. 11 is made from at least a portion of the first code followed by at least a portion of the second code, without an interim pause between them." *Id.* at 22, ¶ 28. According to the original application, "[i]n other words, portion 1234 occurs contiguously with portion 1237 in

combination 1235." *Id.* at 39, ¶128. The codes can be in their entirety, and not merely a portion. *See id.* at 39, ¶ 125 ("the combination can include the first code, in whole or in part, . . . [and] the second code, in whole or in part."). Dr. Durgin persuasively testifies that Figure 12 "shows in more detail that the two codes [of Figure 11] are scattered continuously with no interim pause, which satisfies the plain meaning of concatenating, i.e. linking in a series." Ex. 2003 ¶ 35. We find that a person of ordinary skill in the art would have recognized the possession of the subject matter of concatenating two codes retrieved from separate memory banks.

Petitioner, at oral argument, noted that proposed substitute claim 26 requires the processing block to perform the concatenating step, and argued that such is not disclosed in the original application; Petitioner speculated that one could envision the modulator (a component separate from the processing block) combining the codes. Tr. 20:5–21:24. Petitioner's belated argument fails to address adequately Patent Owner's reliance on application claim 15 for support for the concatenating step. *See* Rev'd MTA 8. Application claim 15 is a dependent claim and recites, "the portion of the first code and the portion of the second code occur contiguously in the combination." Ex. 1004, 46. Application claim 15 depends indirectly from independent claim 1, which calls for the processing block to be operable to cause the combination to be backscattered. *Id.* at 44. We find that a person of ordinary skill in the art would have understood the inventor to have had possession of the subject matter of the processing block performing the concatenating step.

We determine that the original application adequately supports the limitations in the proposed substitute claims pertaining to retrieving the two

codes from separate memory banks and concatenating the codes prior to backscattering and while in the Gush mode.

5. The Alleged Lack of Written Description for Proposed Substitute Dependent Claims 30 and 39

Proposed substitute claim 30 depends directly from proposed substitute independent apparatus claim 26 and recites: "while in the Gush mode, the processing block is operable to: in response to receiving the second command, cause the code different from the EPC in its entirety, but not the EPC, to be backscattered." Rev'd MTA, App'x A at 3. Proposed substitute method claim 39 recites a similar limitation. *Id.*, App'x A at 5.

Petitioner argues that "claim 30 lacks written description support because the '699 Application fails to describe the operation of a second command in a Gush mode (i.e., how a Gush mode actually works)." Opp. to Rev'd MTA 20–21 (citing Ex. 1032 ¶ 3058).

Patent Owner concedes that there is no explicit disclosure of the use of the second command, when in the Gush mode, to backscatter the second code (the code other than the EPC). *See* Rev'd MTA 14. Rather, Patent Owner asserts that the second command is disclosed for that purpose in the context of the prior art mode disclosed in Figure 7, and argues that the specification indicates that the responsiveness to that second command is not altered in the Gush mode. *See id.* (referring to the block diagram of a circuit); *see also* Ex. 2003 ¶¶ 82–88. Patent Owner points to a disclosure indicating that the subject responsiveness to a second command may be present "[i]n some embodiments," and argues that "[s]uch a capability to respond to the second command is agnostic of the Gush mode as further explained below." Rev'd MTA 14 (quoting Ex. 1004, 35, ¶ 107). Patent

Owner, however, does not point to a disclosure that one of the "some embodiments" is that now claimed in the proposed substitute claims.

Patent Owner also argues that

> The specification explains that "[t]o improve over the process of [prior art] FIG. 7, processing block 844 is ***additionally*** *able to receive a third command*, and in response cause to be backscattered a combination." *Id.* at ¶ 108 (emphasis added). Notably, the above description conveys that the ability to backscatter the combination of codes in response to the third command is *an additional capability* over the previous capabilities that included backscattering the second code responsive to the second command.

Id. at 14–15. This is not persuasive because it is referring to the improvement as the addition of a *third* command yielding a *combination of two codes* to the prior art process that used first and second commands, each yielding one code. The concept of a single command yielding a combination of two codes is embodied in the Gush mode of the proposed substitute claims, and dependent claims 30 and 39 propose to add one of the steps of the prior art mode (the second command yielding the second code) to that Gush mode. The specification describes the improvement as using a single command to return a combination of both codes, thereby saving time. *See* Ex. 1004, 21 ¶¶ 13–14. Patent Owner does not direct us to a disclosure that evidences possession of a further addition to that purported improvement in the form of only one step of the prior art process—namely, utilizing a second command to backscatter only the second code.

Patent Owner further argues that "there is no description that limits the responsiveness of the IC to the second command in the Gush mode" and "provides no qualifications or restrictions regarding the second command in the Gush mode and its ability to backscatter the second code." Rev'd

MTA 15. That the disclosure does not preclude the now-claimed subject matter does not suffice, in this case, to demonstrate possession of that same claimed subject matter.

We determine that Patent Owner has not demonstrated that proposed claims 30 and 39 are supported in the original disclosure and constitute new matter. Accordingly, we deny Patent Owner's Revised Motion to Amend with respect to Patent Owner's request that we enter claims 30 and 39 as substitutes for cancelled claims 7 and 20. *See* 35 U.S.C. § 316(d)(3); 37 C.F.R. § 42.121(a)(2)(ii).

E. The Alleged Indefiniteness of the Proposed Substitute Claims

Petitioner raises for the first time in its last brief an argument that the concatenating limitations are indefinite. *See* Pet. Sur-reply 2–3; Tr. 22:20–26. Petitioner argues that "the claims lack an objective basis" to determine whether a given duration of an interim pause between two backscattered codes disqualifies the combination from being concatenated. Pet. Sur-reply 2–3.

First, Petitioner's indefiniteness argument and attempt to inject a new ground into the case in the very last brief prior to the oral argument is untimely. *See* Patent Trial and Appeal Board Consolidated Trial Practice Guide 74–75 (Nov. 2019), *available at* https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf ("Consolidated Trial Practice Guide"). At the oral argument, Petitioner attempted to justify the lateness by arguing that the issue cropped up at the then-recent cross-examination of Patent Owner's expert, Dr. Durgin. Tr. 22:20–26. That, however, cuts against Petitioner in that neither it nor its expert apparently perceived a definiteness issue earlier and while applying the prior art to the claims.

Second, even if we were to treat the new ground as timely, Petitioner has failed to meet its burden on the issue. Petitioner points to no evidence addressing alleged indefiniteness beyond an exchange during the cross-examination of Dr. Durgin. *See* Pet. Sur-reply 2–3 (citing excerpts in Ex. 1035, 61:3–74:11); *see also* Tr. 23:1–11.

The issue involves Dr. Durgin's testimony regarding Figures 12 and 13 of the original application, which are reproduced below.

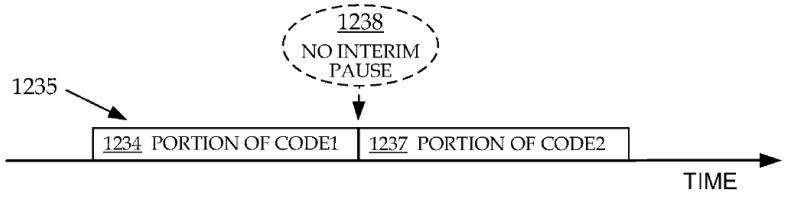


FIG. 12

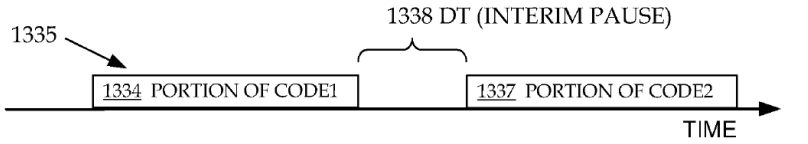


FIG. 13

Ex. 1004, 16. Figure 12 is a diagram depicting an embodiment with a combination made from at least a portion of the first code followed by at least a portion of the second code, without an interim pause between them; Figure 13 is a diagram with a similar depiction but with an interim pause between the two codes. *Id.* at 22, ¶¶ 28–29.

Dr. Durgin, on cross-examination, testified that Figure 12 of the original application shows written description support for a concatenated combination by depicting two codes with no interim pause there between, and offered the opinion that, "[i]f the time period is minuscule for [interim pause] DT in Figure 13, then [Figures 12 and 13 are] almost representing the

exact same thing." Ex. 1035, 60:18–65:25; *see also id.* at 69:4–6 ("And if Figure 13 DT was small enough, it would look a lot like Figure 12. So that, too, would be an illustration of concatenation."). The following exchange occurred:

> Q. How long a pause is required for Figure 13 not to be concatenation?
> MR. DAY: Object to form. Beyond the scope.
> A. That was really beyond the scope of the declaration that I filed, and it is a hypothetical that requires way too much – way too open-ended to really answer without more specification.

Id. at 66:11–19. Petitioner's counsel proceeded to ask whether pauses of various durations would be small enough for the codes to be considered concatenated. *See id.* at 69:7–74:11. Dr. Durgin responded that the questions posed incomplete hypotheticals, and that more information would be needed such as things like message lengths, bit lengths, and clock tolerances. *See id.* at 70:6–18.

The proposed substitute claims must "inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 572 U.S. at 910. Petitioner does not argue that a person of ordinary skill in the art of RFID tags would have been unfamiliar with the term "concatenating." Petitioner does not offer persuasive argument or evidence that reasonable certainty in the RFID art requires, as impliedly argued, the ability to define a precise line of demarcation between a concatenated set of two codes and a gapped, non-concatenated set of those two codes. Petitioner has not shown that a person of ordinary skill in the art would have been unable to ascertain with reasonable certainty the scope of the claimed invention with regard to "concatenating."

F. The Alleged Obviousness of the Proposed Substitute Claims Over Schuessler and Gen2

Petitioner alleges that all of the proposed substitute claims would have been obvious over Schuessler and Gen2. *See* Opp. to Rev'd MTA 10–25; Pet. Sur-reply 5–12. Patent Owner argues, *inter alia*, that Petitioner has failed to show how the proposed combination of references teach the retrieving of two codes from separate memory banks with a single command. Reply to Opp. 7–9.

1. Schuessler (Ex. 1009)

Schuessler is titled "Truncation, Compression, and Encryption of RFID Tag Communications." Ex. 1009, code (54). According to Schuessler, transmitting a tag reply containing the entirety of, for example, a serialized Global Trade Item Number ("sGTIN"), is inefficient because much of the payload bits are the unneeded serial number. *Id.* ¶ 10. "Thus there exists a need to reduce the amount of bits transmitted by tags during RFID communications while still maintaining compatibility with RFID communications standards." *Id.* ¶ 13. To address this perceived need, Schuessler discloses an RFID tag where a command, depending on the mode selected, causes the tag to reply with data stored in memory in a complete, truncated or encrypted form. *See id.*, code (57) (Abstract). The data includes a first and a second plurality of bits. *Id.*

> In an aspect of the invention, an RFID tag is capable of storing data, receiving a signal from a reader, determining a response taking into account the tag mode and the data, and transmitting a response to the reader. The data includes a first plurality of bits and a second plurality of bits. The tag mode may be set by a current or a prior command by the reader. Depending on the tag mode, the response may be complete (i.e.,

> an unaltered response), or the second plurality of bits may be altered, such as truncated, compressed, or encrypted.

Id. ¶ 15.

> If tag 202 is in normal mode, response 211 will include both first plurality of bits 306 and second plurality of bits 308. If tag 202 is in trailing truncate mode, response 211 will include first plurality of bits 306 and none of the second plurality of bits. If tag 202 is in trailing compress or trailing encrypt mode, response 211 will include the first plurality of bits 306 and an altered (e.g. compressed or encrypted) second plurality of bits.

Id. ¶ 54.

Schuessler's Figure 3A is reproduced below.

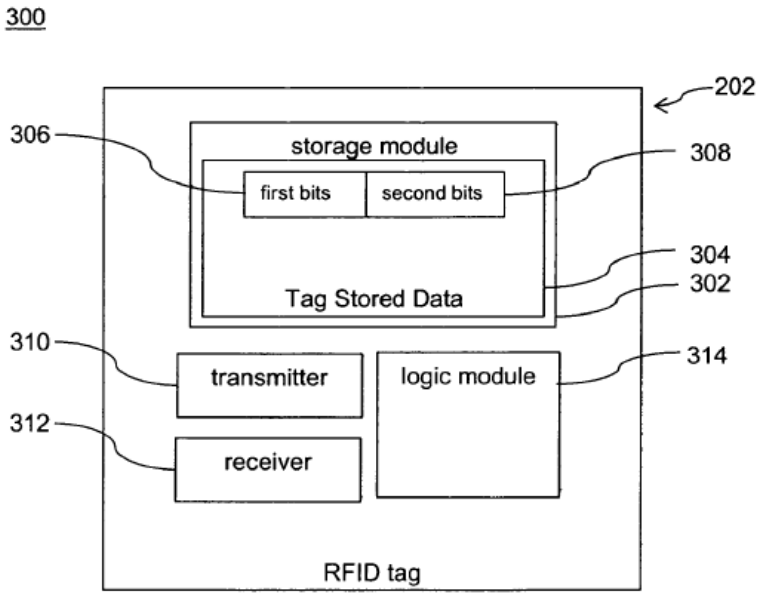


FIG. 3A

Figure 3A shows a block diagram of an RFID tag according to an embodiment of Schuessler. *Id.* ¶ 28. "Storage module 302 stores data 304, which includes a first plurality of bits 306 and a second plurality of bits 308." *Id.* ¶ 52. "Logic module 314 determines a response 211 to a received signal 210 or 110." *Id.*

2. Gen2 (Ex. 1010)

Gen2 is version 1.0.9 of the EPCglobal Generation-2 UHF RFID Protocol. Ex. 1010, 1. Gen2 "defines the physical and logical requirements for a passive-backscatter, Interrogator-talks-first (ITF), radio-frequency identification (RFID) system operating in the 860 MHz – 960 MHz frequency range." *Id.* at 9 ("Introduction"). "The system comprises Interrogators, also known as Readers, and Tags, also known as Labels." *Id.*

Gen2 discloses RFID tags having a memory logically separated into four banks. Ex. 1010, § 6.3.2.1. Figure 6.17 is reproduced below.

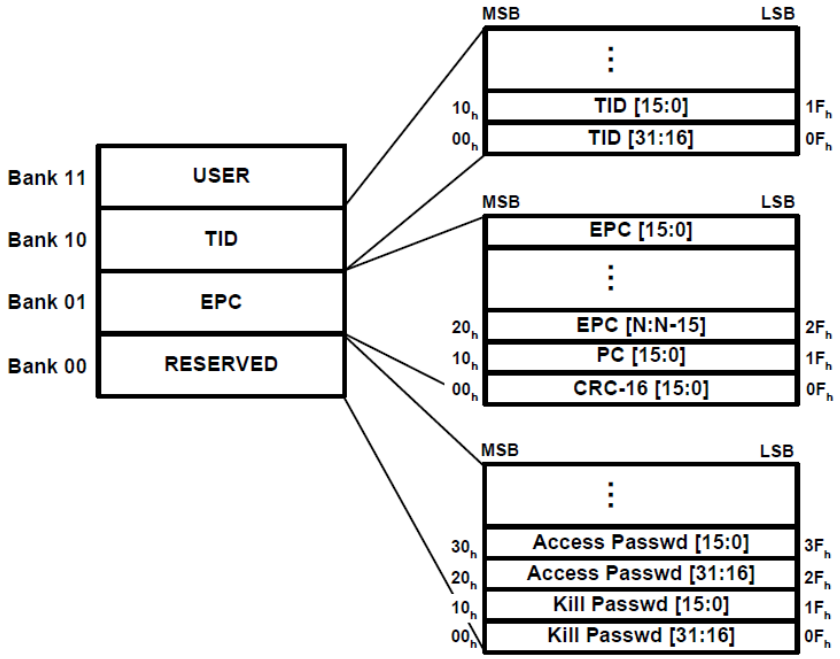


Figure 6.17 – Logical memory map

Figure 6.17 depicts a logical memory map. Ex. 1010, § 6.3.2.1. The memory banks are "Reserved memory," "EPC memory," "TID memory," and "User memory." *Id.* The EPC memory contains "a code (such as an EPC, and hereafter referred to as an EPC) that identifies the object to which the tag is or will be attached." *Id.* The TID memory contains "sufficient

identifying information . . . for an Interrogator to uniquely identify the custom commands and/or optional features that a Tag supports." *Id.*

Figure E.1 is reproduced below.

E.1 Example inventory and access of a single Tag

Figure E.1 shows the steps by which an Interrogator inventories and accesses a single Tag.

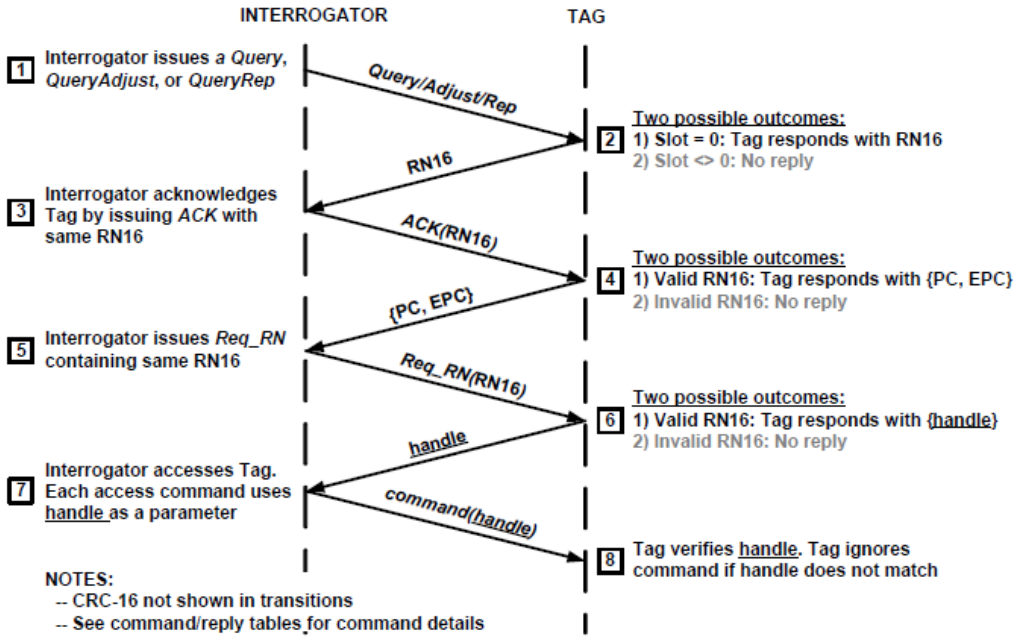


Figure E.1 – Example of Tag inventory and access

Id. at 85 (Annex E). Figure E.1 is an example and "shows the steps by which an Interrogator inventories and accesses a single Tag." *Id.*

3. The Alleged Obviousness of Proposed Substitute Claim 26 in View of Schuessler and Gen2

For reasons discussed below, Petitioner has not established the unpatentability of proposed substitute independent claim 26 as obvious over Schuessler and Gen2.

As discussed above, proposed substitute independent claim 26 covers an RFID tag having two modes, the prior art mode (each of two commands causing the backscattering of the respective one of two codes) and the Gush mode (one command causing the backscattering of a combination formed

from the concatenating of the two codes). *See* Rev'd MTA 7–8 (Patent Owner relying on Figures 7 and 11 as written description support for the two modes); *id.*, App'x A. The two codes are stored in separate memory banks and each code is retrieved from the respective memory bank in response to the respective command calling for backscattering. *See id.*, App'x A (limitations 26e, 26f, 26h–26j).

Patent Owner argues that the proposed amendments distinguish the substitute claims over Petitioner's prior art, asserting that the "[s]ubstitute claims further recite that the EPC and the code different from the EPC are stored in different memory banks of the IC, and[], and are subsequently retrieved from those memory banks *to form* a combination by concatenating the codes *in response* to receiving the first command in the Gush mode." Rev'd MTA 20. Patent Owner further argues that Petitioner has failed to show that these aspects are present in the proposed combination of Schuessler and Gen2. *See* Reply to Opp. 8–10. Specifically, Patent Owner argues that

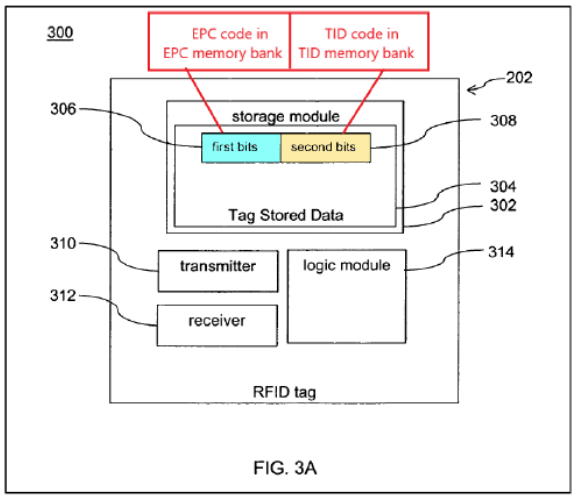
> Schuessler, Gen2, or their combination fail to teach retrieving codes from separate memory banks in response to a single command. . . . [And, t]he substitute claims require the stored EPC and the other code to be retrieved from *separate memory banks* and *concatenated to form the combination*—all *in response to receiving the first command.* Neither Schuessler nor Gen 2 teach or suggest these limitations.

Id.

Petitioner contends that Gen2 teaches an EPC memory bank and a TID memory bank, with the respective code being stored in each bank. Opp. to Rev'd MTA 11–12; *see also id.* at 12 (asserting that Schuessler discloses Gen2 tags storing an EPC and a TID). Petitioner concedes that "Gen2, however, does not specify a physical implementation for addressing these

logical memory banks." *Id.* at 13. To the extent we understand it, Petitioner's theory regarding concatenating requires that the two codes be stored immediately adjacent each other such that they may be retrieved as a contiguous combination in response to a single command. *See* Tr. 19:12–23 (Petitioner arguing that Schuessler discloses two codes "stored back to back" and that satisfies the concatenated limitation); Ex. 1032 (Mr. Fischer testifying that "[i] In Schuessler's normal mode, the ACK command (the first command) would result in two codes, which could be the EPC and a code other than the EPC, to be retrieved and their bits concatenated so that the last bit of the first code is followed by the first bit of the second code in a binary sequence."). In this respect, Petitioner argues that "it would have been obvious to a [person of ordinary skill in the art] to construct the four Gen2 logical memory banks as one continuous address space, as was known in prior art RFID tags." Opp. to Rev'd MTA 13 (citing Ex. 1010 § 6.3.2.1; Ex. 1003 ¶ 198; Ex. 1014 ¶ 6). Petitioner continues, "[t]hus, in implementing a tag that complied with Gen2, it would have been obvious that a TID code would be stored in a physical memory location adjacent to an EPC code because Gen2 specifies that TID is stored in a TID memory bank location that is logically adjacent to an EPC stored in an EPC memory bank." *Id.* (citing Ex. 1010, Fig. 6.17; Ex. 1003 ¶ 198). Petitioner then carries over to the Schuessler reference that purportedly obvious configuration of two of the four memory banks of Gen2, arguing that "it would have been obvious to store another Gen2 specified code different from the EPC, such as a Tag identifier ('TID') as the second plurality of bits 308 in adjacent tag memory identified as a Gen2 TID memory bank." *Id.* at 14 (citing Ex. 1003 ¶ 134; Ex. 1009 ¶ 52, Fig. 3A; Ex. 1010 § 6.3.2.1).

To illustrate its theory, Petitioner provides an annotated version of Schuessler's Figure 3A, reproduced below.



Id. Above is Schuessler's Figure 3A (a block diagram of an RFID tag, Ex. 1009 ¶ 28) annotated to illustrate EPC and TID codes stored in what Petitioner characterizes as the first and second memory banks. *See* Opp. to Rev'd MTA 14.

Petitioner maps Schuessler's trailing truncate mode to the claimed prior art mode and Schuessler's normal mode to the claimed Gush mode. *See* Opp. to Rev'd MTA 15–16 ("Schuessler also teaches a Gen2 tag that may operate in a normal mode in which the response includes both a first and second code, and a truncated mode in which a response includes just the first code."); *id.* at 17–18 ("It would have been obvious to a POSITA for a tag to receive a newly-defined Select command, *a Gush command*, as disclosed by Schuessler to change the tag from, for example, trailing truncate mode to 'normal mode,' *a Gush mode* of operation.").

For the disputed aspects of the claimed invention—retrieving codes from separate memory banks and concatenating the codes to form a combination while in the Gush mode—Petitioner offers only a conclusory

assertion of obviousness in the Opposition to the Revised Motion to Amend. Specifically, Petitioner argues

> It would have been obvious in view of Schuessler's teachings that, when configured in "normal mode," a Gen2 Ack command would cause the tag to retrieve the first plurality of bits 306 (*the EPC*) and the second plurality of bits 308 (*the code different from the EPC*) from its Gen2 memory banks, and *concatenate* the bits *to form a combination* to be backscattered that "will include both first plurality of bits 306" (*the EPC*) followed by the "second plurality of bits 308" (*the code different from the EPC*), *without receiving any commands while the combination is being backscattered*. Ex. 1009, [0054], [0097]; Ex. 1032, ¶¶3052-53.

Opp. to Rev'd MTA 18.

We agree with Patent Owner that Petitioner has failed to show how its proposed combination of Schuessler and Gen2 teaches the claimed Gush mode's single command to retrieve codes in two separate memory banks. *See* Reply to Opp. 7. Patent Owner argues in both the Revised Motion to Amend and in its Reply that Gen2 teaches that multiple memory banks shall *not* be accessed with one command. *See, e.g.*, Rev'd MTA 21 (quoting Ex. 1010 § 6.3.2.1 ("Operations in one logical memory bank shall not access memory locations in another bank.")); Reply to Opp. 8. Dr. Durgin notes that Petitioner maps the Gen2 "Ack" command to the claimed "first command," and persuasively testifies,

> In the Gen2 framework, responses to single commands (such as the reply to an "Ack" command, which pulls data from the EPC membank) always read from a single memory bank. For example, Gen2 teaches that the "Read" command "shall apply to a single memory bank" (Ex. 2020 [sic, 1010], § 6.3.2.10.3.2). Elsewhere, Gen2 teaches that "operations in

> one logical memory bank shall not access memory locations in another bank." *Id.* at §6.3.2.1.

Ex. 2003 ¶¶ 53–54; *see also* Opp. to Rev'd MTA 18 (Petitioner arguing that a Gen2 Ack command would cause the tag to retrieve the two codes from its Gen2 memory banks). Thus, the evidence of record cited by Patent Owner indicates that a single Gen2 Ack command shall not access more than one memory bank. Ex. 1010 § 6.3.2.1; Ex. 2003 ¶¶ 53–54. In other words, a single Gen2 Ack command cannot retrieve an EPC from a first memory bank and a code different from the EPC from a second memory bank.

Petitioner does not adequately rebut these arguments and evidence. *See* Pet. Sur-reply 6–7; Tr. 62:3–18 (Petitioner presenting attorney-argument without directing us to supporting evidence). Rather, in response to Patent Owner's arguments regarding retrieving codes from separate memory banks via a single command, Petitioner offers the undeveloped and conclusory argument that "[a] skilled artisan . . . would have been motivated to implement such a command to, for example, read an EPC and a TID from separate, but adjacent memory banks, in order to subsequently issue a Gen2 custom command." Pet. Sur-reply 7 (citing Ex. 1032 ¶¶ 3041, 3043). Petitioner does not elaborate and does not explain adequately why a skilled artisan would have been so motivated or how this scenario involving a subsequently issued custom command fits into Petitioner's originally proposed combination of references' teachings. *See id.*

Patent Owner also persuasively argues that Petitioner's and its expert's reliance on Exhibit 1014 (a different Schuessler reference) is flawed and that the cited paragraph, when read in its entirety, does not support Petitioner's proposition. Reply to Opp. 8; *see also* Tr. 64:9–26. Petitioner,

in order to support its theory regarding concatenating of the two codes by reading them contiguously from memory, argues the following:

> For example, it would have been obvious to a POSITA to construct the four Gen2 logical memory banks as one continuous address space, as was known in prior art RFID tags. Ex. 1010, §6.3.2.1; Ex. 1003, ¶198; *see, e.g., Ex. 1014, [0006] (Prior art methods "treat[ed] all of tag memory as one continuous address space."*).

Opp. to Rev'd MTA 13 (emphasis added). Petitioner's expert, Mr. Fischer, testifies similarly as to the obviousness of Gen2 memory banks being one continuous address space, but testifies with a bit more precision, acknowledging that the referenced prior art methods were under "ISO 18000-6A/B standards that predated Gen2 tags." Ex. 1003 ¶ 198.

> The cited paragraph 6 of Exhibit 1014 states the following:
>
> The existing ISO format requires modification before it can be applied to Gen 2 tags, in part because the ISO method treats all of tag memory as one continuous address space. *In contrast, Gen 2 tags segment memory into four mutually-exclusive segments*.

Ex. 1014 ¶ 6 (emphasis added). We do not find, and Petitioner does not explain adequately how, this statement—contrasting the Gen2 "mutually-exclusive" implementation with the ISO continuous memory configuration—to support Petitioner's assertion that it would have been obvious to construct the four Gen2 logical memory banks as one continuous address space. Accordingly, Petitioner's theory—that the limitations directed to retrieving codes from two memory banks and concatenating the codes are satisfied because of continuous memory addresses—fails to be persuasive.

After Patent Owner pointed out a flaw in Petitioner's case, Petitioner offered a new theory of how the references' purportedly teach a single

command to read codes from separate memory banks. *See* Pet. Sur-reply 5–9; Tr. 29:25–30:11, 31:16–33:2 (Petitioner's Counsel: "But I've also added there the argument which I made in the surreply in response to patent owner that you could also use the trailing compress mode to cause the Gen2 add command to retrieve the two codes from separate memory banks."). As mentioned above, Petitioner's articulated theory utilized Schuessler's normal and trailing truncate modes, and an EPC and a TID. *See, e.g.*, Opp. to Rev'd MTA 14, 17–18. In the Sur-reply, Petitioner proposes a new "example" where "a first code would be stored in a memory bank, such as the EPC memory bank, and a second compressed code would be stored in the User Memory bank," and "[i]n Trailing Truncate Mode (TTM), the tag transmits only first bits 306, and in Trailing Compress Mode (TCM), the tag transmits first bits 306 and compressed bits 316." *Id.* at 5 (citations omitted); *see also id.* at 7 (using a different annotated depiction of an RFID block diagram to illustrate where the second code would be stored in Schuessler's device). Accordingly, Petitioner has changed theories as to which memory banks and which modes are utilized. Petitioner argues that the Trailing Compress Mode teaches using a single command to read two codes from separate memories. *Id.* at 7.

Petitioner's last minute change of theories is untimely. *See* Consolidated Trial Practice Guide 74–75. Further, even if the Trailing Compress Mode discloses that which is alleged by Petitioner, Petitioner does not explain adequately how that mode fits into an overall proposed combination that teaches or suggests the entirety of the claimed subject matter or why one of ordinary skill in the art would have had a reason to arrange the various prior art elements to arrive at the claimed subject matter.

See, e.g., Pet. Sur-reply 10 (Petitioner, in the same brief, continuing to rely on the TID from the TID memory bank as the second code rather than the compressed version of a second code from the User memory bank as used for the TCM theory). It is not enough to point to an alleged disclosure of a single limitation in isolation. A successful obviousness challenge requires a cohesive articulated theory that accounts for the claimed subject matter as a whole.

Based on the foregoing, Petitioner has not established by a preponderance of the evidence that proposed substitute independent claim 26 is unpatentable over the combination of Schuessler and Gen2.

Proposed substitute independent claim 38 recites a method similar to that performed by the apparatus of proposed substitute claim 26. For proposed substitute claim 38, Petitioner relies on its unpersuasive arguments made for proposed substitute claim 26. Opp. to Rev'd MTA 24–25. Accordingly, Petitioner has not shown that proposed substitute claim 38 is unpatentable. The remaining proposed substitute claims depend from proposed substitute independent claim 26 or claim 38. Petitioner's arguments against those dependent claims do not cure the underlying defects of the arguments against proposed substitute claim 26. *See* Opp. to Rev'd MTA 19–26. Therefore, Petitioner has not met its burden as to the proposed dependent claims.[5]

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[5] Petitioner, in its obviousness challenge, also makes the conclusory and undeveloped assertion that proposed substitute dependent claim 35 is unpatentable under 35 U.S.C. § 112(d) because "the EPC" in the combination of independent claim 26 "is no different than the 'entire EPC' recited in claim 35." Pet. Opp. to Rev'd MTA 23. Petitioner's claim construction position is unpersuasive as it fails to explain why we should

III. CONCLUSION[6]

We grant Patent Owner's request to cancel original claims 1–15, 19–20, and 22–24, we grant Patent Owner's request to add proposed substitute claims 26–29, 31–38, and 40–44, and we deny Patent Owner's request to add proposed substitute claims 30 and 39.

In summary:

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	1–15, 19–20, 22–24
Substitute Claims Proposed in the Amendment	26–44
Substitute Claims: Motion to Amend Granted	26–29, 31–38, 40–44
Substitute Claims: Motion to Amend Denied	30, 39
Substitute Claims: Not Reached	

IV. ORDER

For the foregoing reasons, it is

ORDERED that Patent Owner's Motion to Amend is *granted* as to the non-contingent request to cancel original claims 1–15, 19–20, and 22–24;

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read the word "entire" into the "EPC" of the independent claim's Gush mode combination where the drafter did not include that term there but did explicitly limit the EPC in the prior art mode response to "the EPC in its entirety." Rev'd MTA, App'x A (proposed substitute independent claim 26).

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

FURTHER ORDERED that Patent Owner's Motion to Amend is *granted* as to the request to add proposed substitute claims 26–29, 31–38, and 40–44;

FURTHER ORDERED that Patent Owner's Motion to Amend is *denied* as to the request to add proposed substitute claims 30 and 39; and

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

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