

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SMARTMATIC USA CORP.,
Petitioner,

v.

ELECTION SYSTEMS & SOFTWARE, LLC,
Patent Owner.

IPR2019-00531
Patent 8,096,471 B2

Before GEORGIANNA W. BRADEN, JEFFREY W. ABRAHAM, and
SHELDON M. McGEE, *Administrative Patent Judges*.

McGEE, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining No Claims Unpatentable

Granting-In-Part Patent Owner's Non-Contingent Motion to Amend
Denying-In-Part and Dismissing-In-Part Patent Owner's Motion to Exclude

35 U.S.C. § 318(a)

I. INTRODUCTION

Smartmatic USA Corporation (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–20 of U.S. Patent No. 8,096,471 B2 (Ex. 1001, “the ’471 patent”). Paper 2 (“Pet.”). Election Systems & Software, LLC, (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 9 (“Prelim. Resp.”). We instituted an *inter partes* review of claims 1–20 of the ’471 patent on all grounds of unpatentability alleged in the Petition. Paper 10 (“Institution Decision” or “Dec.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 16 (“PO Resp.”)), as well as a Motion to Amend (Paper 17 (“Motion to Amend” or “Mot. Amend”)). In its non-contingent Motion to Amend, Patent Owner canceled challenged claims 1–15 and 17–20, leaving only original claim 16 at issue in this proceeding, and introduced proposed substitute claims 21–39. Mot. Amend 1. Petitioner filed a Reply (Paper 19 (“Reply”)), along with an Opposition to Patent Owner’s Motion to Amend (Paper 20 (“Opp. Amend”)). Pursuant to Patent Owner’s request (Paper 17, 1), we provided Preliminary Guidance on Patent Owner’s Motion to Amend. Paper 23 (“Prelim. Guid.”). Patent Owner filed a Sur-Reply (Paper 24 (“Sur-Reply”)), as well as a Reply to Petitioner’s Opposition to its Motion to Amend (Paper 25 (“Reply Amend”)).¹ Petitioner filed a Sur-Reply to Patent Owner’s Reply in support of its Motion to Amend. Paper 33 (“Sur-Reply Amend”).

¹ Although Patent Owner deleted previously submitted substitute claims 32–39 in this filing, we treated this paper as a reply, and not as a revised motion

Patent Owner filed a Motion to Exclude certain evidence submitted by Petitioner (Paper 34 (“Mot. Excl.”)), to which Petitioner filed an Opposition (Paper 35 (“Opp. Mot. Excl.”)). Patent Owner filed a Reply to Petitioner’s Opposition to its Motion to Exclude. Paper 36 (“Reply Mot. Excl.”)).

An oral hearing was held on May 6, 2020, and a transcript of the hearing is included in the record. Paper 39 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine Petitioner has not established by a preponderance of the evidence that original claim 16 of the ’471 patent is unpatentable.

We deny-in-part and dismiss-in-part Patent Owner’s Motion to Exclude.

We grant-in-part Patent Owner’s Non-Contingent Motion to Amend.

A. Related Proceedings

The parties identify the following district court proceeding as related to the ’471 patent: Election Sys. & Software, LLC v. Smartmatic USA Corp., 1:18-cv-01259 (D. Del.). Pet. 1; Paper 4, 2 (Patent Owner’s Mandatory Notices).

B. The ’471 Patent (Ex. 1001)

The ’471 patent, titled “Ballot Marking Device Having Attached Ballot Box,” issued on January 17, 2012. Ex. 1001, codes (54), (45). The ’471 patent relates to “a ballot marking device adapted to mark a ballot

to amend. *See* Paper 11, 7 (allowing, in addition to a sur-reply to Petitioner’s reply at DUE DATE 3, either a reply to the opposition to the motion to amend or a revised motion to amend).

and either return the marked ballot to the voter or automatically deposit the marked ballot into a secure ballot box attached” thereto. *Id.* at code (57).

C. Illustrative Claim

The only original independent claim remaining in the ’471 patent after Patent Owner’s non-contingent² Motion to Amend (Paper 17), is claim 16, which is reproduced below.

16. A voter assistance terminal, comprising:

a presentation device operable to present to a voter a plurality of election choices and a plurality of ballot handling choices, wherein the ballot handling choices comprise returning a ballot to the voter and depositing the ballot into a ballot box;

an input device operable to receive from the voter at least one selection corresponding to the election choices and an instruction corresponding to the ballot handling choices;

a print mechanism operable to record the received voter selection on the ballot;

a transport mechanism operable to transport the ballot through a ballot channel in accordance with the received voter instruction, wherein the transport mechanism causes ejection of the ballot if the received voter instruction is to return the ballot to the voter, and wherein the transport mechanism causes deposit of the ballot into the ballot box if the received voter instruction is to deposit the ballot into the ballot box; and

wherein the presentation device, the input device, the print mechanism, and the transport mechanism are integrated in a single unit.

Ex. 1001, 22:48–23:3.

² Patent Owner did not specify whether the Motion to Amend is contingent on a finding in a final written decision that the challenged claims are unpatentable. Pursuant to our request (Paper 23, 4), Patent Owner clarified that its Motion to Amend is non-contingent. Paper 25, 1.

D. Instituted Challenges to Patentability

We instituted *inter partes* review of claims 1–20 of the ’471 patent on the following challenges. Dec. 2, 4.

Claims Challenged	35 U.S.C. §	References / Basis
1–6, 10–17	§ 103(a)	Johnson ³ and Cummings ⁴
7, 8, 18, 19	§ 103(a)	Johnson, Cummings, and Nakada ⁵
9, 20	§ 103(a)	Johnson, Cummings, and Peter, III ⁶

E. Patentability Challenges Post-Motion to Amend

Patent Owner canceled challenged claims 1–15 and 17–20 and introduced substitute claims 21–31 in its non-contingent Motion to Amend. Mot. Amend 1; Reply Amend 1 (deleting previously introduced proposed substitute claims 32–39). Patent Owner provides the following claim listing setting forth how the substitute claims relate to now canceled original claims 1–6 and 11–19:

³ US 7,077,314 B2, issued July 18, 2006 (“Johnson,” Ex. 1002).

⁴ US 2004/0016802 A1, published January 29, 2004 (“Cummings,” Ex. 1003).

⁵ US 2008/0079210 A1, published April 3, 2008 (“Nakada,” Ex. 1004).

⁶ US 4,333,641, issued June 8, 1982 (“Peter, III,” Ex. 1005).

<u>Substitute Claim</u> ⁷	<u>Original Patent Claim(s)</u>
21	17
22	18
23	19
24	4
25	5
26	6
27	11
28	12
29	13
30	1
31	2 & 3

Reply Amend 2. Original claim 16 was neither canceled nor amended in Patent Owner's motion. *Id.*; *see also* Mot. Amend 2 ("No replacement claim is being proposed for issued claim 16."). Thus, as a result of Patent Owner's non-contingent Motion to Amend, the challenges now presented for our review are:

Claims Challenged	35 U.S.C. §	References / Basis
16, 21, 24–29	§ 103(a)	Johnson and Cummings
22, 23	§ 103(a)	Johnson, Cummings, Nakada
30, 31	§ 103(a)	Johnson, Cummings, and Chung ⁸

⁷ The headings of the claim listing provided by Patent Owner appear to be mislabeled. The first column should read "Substitute Claim" because it includes substitute claims 21–31; the second column should read "Patent Claim" because it refers to original patent claim numbers. Paper 25, 2.

⁸ US 2006/0202031 A1, published Sept. 14, 2006 ("Chung," Ex. 1023).

See Opp. Amend 6 (asserting how substitute “claims 21–29 correspond to challenged claims 4–6, 11–13, and 17–19, except for correction of typographical errors, rewriting of claims into independent form, or updating dependencies,” and, as such, “claims 21–29 remain obvious for the same reasons already identified for claims 4–6, 11–13, and 17–19 in the Petition and in the Petitioner’s Reply”); *see also id.* at 7–19, 24–25 (asserting how claims 30 and 31 are unpatentable as obvious over Johnson, Cummings, and Chung (Ex. 1023)).

Petitioner relies on two Declarations from Benjamin Bederson, Ph.D., Exs. 1006, 1024. Patent Owner relies on two Declarations from Michael I. Shamos, Ph.D., J.D. Exs. 2002, 2003.

II. ANALYSIS

A. *Claim Construction*

Petitioner filed its Petition on January 7, 2019. Pet. 71. Based on that filing date, we apply the same claim construction standard that is applied in civil actions under 35 U.S.C. § 282(b), which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (applicable to *inter partes* reviews filed on or after November 13, 2018).

Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the

invention.” *Id.* at 1313. Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

To properly interpret the meaning of a given claim term, our reviewing court instructs us to “look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history” which collectively “is the most significant source of the legally operative meaning of disputed claim language.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). “[T]he specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* When such intrinsic evidence resolves any ambiguity in the meaning of a disputed claim limitation, “it is improper to rely on extrinsic evidence.” *Id.* at 1583.

Petitioner proposes a construction for the term “diverter” and the phrase “integrated in a single unit.” Pet. 11–16. Patent Owner proposes a construction for the phrases “ballot handling choices” and “returning the [marked] ballot to the voter.”⁹ PO Resp. 17–18. Petitioner disputes Patent

⁹ The phrase “returning *the* ballot to the voter” does not appear in original claim 16. Rather, this claim recites “returning *a* ballot to the voter” as one of the ballot handling choices presented to a voter. Ex. 1001, 22:48–53. We treat this as a harmless typographical error in Patent Owner’s Response. The phrase “returning the ballot to the voter” does appear, however, in proposed substitute claims 24 (item [G]) and 27 (item [G]). Mot. Amend. A-5; *see* Reply Amend. A-4–A5.

Owner's construction for the phrase "returning the [marked] ballot to the voter." Reply 4–5.

On the fully developed record, we determine that the only limitations requiring an express construction to resolve the controversy are "returning a ballot to the voter" (original claim 16), "returning the ballot to the voter" (proposed substitute claims 24 and 27), and "returning the marked ballot to the voter" (proposed substitute claim 30). Ex. 1001, 22:52; Reply Amend. A-3–A-6. Because of the significant overlap between these three limitations, we address them together.

Patent Owner asserts that these phrases "should be construed to mean 'returning the ballot to give the voter physical possession of the ballot.'" PO Resp. 18 (citing Ex. 1001, 18:20–28, 20:22–25, 20:45–9; Ex. 2002 ¶¶ 68–72). Petitioner does not offer a specific construction for these limitations, but asserts that they should not be limited to giving a voter physical possession of the ballot. Reply 4–5. For support, Petitioner states that the skilled artisan "would understand the term 'ballot' to mean a 'physical or electronic record of the choices of an individual voter.'" *Id.* (citing Ex. 1001, 1:57–61, 6:62–7:1; Ex. 1025, 24).

On the fully developed record, we agree with Patent Owner, and construe "returning a ballot to the voter" and "returning the ballot to the voter" to mean "returning the ballot to give the voter physical possession of the ballot." Similarly, we construe "returning the marked ballot to the voter" to mean "returning the marked ballot to give the voter physical possession of the ballot." We begin, as we must, with the intrinsic evidence of record, i.e., the words of the claims and the '471 patent specification. *Vitronics*, 90 F.3d at 1582.

Claim 16 is directed to a “voter assistance terminal” which comprises “a presentation device operable to present,” *inter alia*, “a plurality of ballot handling choices”—one of which is “returning a ballot to the voter” and the other “depositing the ballot into a ballot box.” Ex. 1001, 22:48–53. The voter assistance terminal of claim 16 further requires “an input device operable to receive . . . an instruction corresponding to the ballot handling choices,” and “a transport mechanism operable to transport the ballot through a ballot channel in accordance with the received voter instruction.” *Id.* at 22:54–62. The claimed “transport mechanism causes ejection of the ballot if the received voter instruction is to return the ballot to the voter,” but “causes deposit of the ballot into the ballot box if the received voter instruction is to deposit the ballot into the ballot box.” *Id.* at 22:62–67. Proposed substitute claim 24 contains similar “presentation device,” “input device,” and “transport mechanism” limitations as those recited in original claim 16. Reply Amend. A-4–A-5. Proposed substitute claim 27 is directed to “[a] method of marking a ballot using a ballot marking device having an attached ballot box,” and recites active steps of presenting a plurality of election and ballot handling choices and, after “marking the ballot,” “transporting the marked ballot through the ballot marking device.” *Id.* at A-5.

Each of the aforementioned limitations of original claim 16 and proposed substitute claims 24 and 27 connotes how a physical ballot—as opposed to an “electronic record”—is to be handled by a physical device. For example, the transport mechanism of original claim 16 is required to be “operable to transport the ballot through a ballot channel” and to “cause[] ejection of the ballot” or “cause[] deposit of the ballot into the ballot box”

depending on what voter instructions are received. Ex. 1001, 22:60–67. Notably, the ’471 patent repeatedly refers to the “ballot” as “paper” that may be issued by election personnel and/or handled by the voting apparatus consistent with a voter’s instructions. *Id.* at 2:39–44, 2:58–60, 4:4–6, 4:11–14, 4:28–33; 4:42–44, 6:22–52, 8:25–30, 10:40–43, 12:20–25, 14:23–33. Furthermore, the claimed “ballot channel” and “ballot box” are physical objects. *See id.* at Figs. 1, 7 (ballot box 25), Fig. 31 (ballot box 624), 18:35–42 (explaining how, in Figure 26, “ballot channel 614 is defined between a pair of closely spaced plates 616, 618, with feed rollers 612a, 612b operable to transport a ballot through the ballot channel 614”). Petitioner does not explain, nor do we perceive, how an “electronic record”—consistent with Petitioner’s seeming construction of the term “ballot”—could travel through a ballot channel, or be “eject[ed]” from or “deposit[ed]” into a physical object.

Petitioner’s assertions in its Reply do not persuade us that the proper construction of these limitations includes “electronic records” associated with a given vote. Reply 4–5. First, we note that Petitioner merely focuses on the meaning of the term “ballot.” *Id.* Such an emphasis on one word within a phrase does not fully inform the proper construction of these limitations as a whole. Additionally, the two unexplained citations to intrinsic evidence that Petitioner provides (Reply 5) do not appear to support Petitioner’s position. The disclosure at column 1, lines 57–61 of the ’471 patent discusses drawbacks of certain prior art systems and does not address the ballot “return” language at issue here. Column 6, line 62 through column 7, line 1 also does not appear relevant to the proper construction of the limitations because it, too, does not discuss ballot return. Finally, we do

not consider Petitioner's citation to extrinsic evidence for purposes of our claim construction. Reply 5 (citing Ex. 1025). On the complete record, we determine that the intrinsic evidence before us resolves any ambiguity in the meaning of the disputed claim limitations. Thus, it would be improper to consider Petitioner's extrinsic evidence to determine the proper construction. *Vitronics*, 90 F.3d at 1583.

Furthermore, the claim language must be interpreted according to how it would have been understood by those skilled in the art at the time the application was filed. *See Schering Corp. v. Amgen Inc.*, 222 F.3d 1347, 1353 (Fed. Cir. 2000). Notably, Patent Owner's declarant, Dr. Shamos, explains how the skilled artisan would have understood these limitations to be providing the voter with physical possession of the ballot. Ex. 2002 ¶¶ 68–72 (citing Ex. 1001, 2:27–35, 20:35–40, 20:45–49, Fig. 33). We have reviewed the evidence and credit Dr. Shamos's testimony regarding it. Specifically, we are persuaded by Dr. Shamos's explanation how the '471 patent specification supports a construction of "returning the ballot to the voter" as physical return of the ballot to the voter. Ex. 2002 ¶ 71 (citing Ex. 1001, 20:45–49: "If the voter chooses to have the ballot returned to him (at path 828), he then has the option (at block 830) of either *manually depositing* the ballot into a *ballot box* (block 820), or of *re-inserting the ballot* into the *marking device* for verification" (emphases added)).

Petitioner's declarant, Dr. Bederson, does not provide a substantive opinion for us to consider regarding how the skilled artisan would have understood this limitation as a whole. Rather, Dr. Bederson merely disagrees with Patent Owner's construction and, without explanation,

focuses on the term “ballot,” citing the same evidence unpersuasively relied on by Petitioner. Ex. 1024 ¶ 13; Reply 4–5.

In sum, based on the arguments and evidence presented on this complete record, we construe “returning a ballot to the voter” and “return the ballot to the voter” to mean “returning the ballot to give the voter physical possession of the ballot.” Similarly, we construe “returning the marked ballot to the voter” to mean “returning the marked ballot to give the voter physical possession of the ballot.”

We determine that it is not necessary to provide an express construction for any other claim term for purposes of resolving the controversy. *See, e.g., Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs.*, 200 F.3d at 803).

B. Level of Ordinary Skill in the Art

Petitioner asserts that one of ordinary skill in the art would have had at least a Bachelor’s degree in electrical engineering or computer science, at least two years’ experience with user interface design and voting systems, and familiarity with the internal mechanical mechanisms of electronic voting machines. Pet. 9–10 (citing Ex. 1006 ¶ 48).

Patent Owner disputes Petitioner’s definition of one of ordinary skill in the art as it pertains to the requirement of “at least two years’ experience with user interface design.” PO Resp. 17. According to Patent Owner, “[i]nstead, the POSITA would have at least a Bachelor’s degree in electrical engineering or computer science and at least two years’ experience with user

interfaces, electronic voting systems, and ballot transport mechanisms of voting machines.” *Id.* (citing Ex. 2002 ¶¶ 33–35; Ex. 2003 ¶¶ 20–21).

In response, Petitioner asserts that Patent Owner’s Declarant, Dr. Shamos testified he does not agree with Patent Owner’s proffered level of ordinary skill in the art as it applies to “ballot transport mechanisms.” Reply 2 (citing Ex. 1022, 40:23–41:9).

The parties’ proffered definitions do not differ significantly, with the main difference being whether the skilled artisan would have had two years’ experience with user interface *design*. Compare Pet. 9–10, with PO Resp. 17. Moreover, neither party argues that the outcome of this case would differ based on our adoption of any particular definition of one of ordinary skill in the art. In light of the complete record now before us, we adopt Petitioner’s definition of one of ordinary skill in the art.

The level of ordinary skill in the art is also reflected by the references themselves. See *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“[T]he absence of specific findings on the level of skill in the art does not give rise to reversible error ‘where the prior art itself reflects an appropriate level and a need for testimony is not shown.’”); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (finding that the Board of Patent Appeals and Interferences did not err in concluding that the level of ordinary skill in the art was best determined by the references of record).

C. Asserted Obviousness of Original Claim 16

Petitioner asserts that claim 16 would have been unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Johnson and Cummings. Pet. 53–58; see also *id.* at 26–27 (setting forth the obviousness rationale and expectation of successfully modifying the teachings of Johnson

with those of Cummings with respect to claim 1 in Section VII.A.3.a., which is relied on for independent original claim 16); Reply 7–24 (addressing as a group Patent Owner’s arguments regarding original claim 16 and substitute claims 21 and 24–29, the subject matter of which was recited in original claims 4–6, 11–13, and 17). For support, Petitioner relies on declaration testimony from Dr. Bederson (Exs. 1006, 1024).

1. Overview of Johnson

Johnson discloses

an electronic voting machine that includes a user interface configured to enable a voter to enter voting choices; a display for displaying the user interface and the voting choices; a print mechanism configured to print the voting choices on a paper ballot, and a scanner assembly attached to the print mechanism to scan the printed voting choices on the paper ballot immediately after the print mechanism prints the voting choices on the paper ballot so as to generate an electronic version of the voting choices that are printed on the paper ballot.

Ex. 1002, 2:38–47.

Johnson also discloses “a computer-implemented method of recording voter choices using an electronic voting machine,” where “the method may include steps of presenting the voter with a plurality of voting choices via an electronic user interface; accepting the voter’s choices and storing the voter’s choices; printing a paper ballot that reflects the user’s choices,” and may optionally include “scanning the just printed indicia to generate an electronic version of the voter’s choices that are printed on the paper ballot, and storing the generated electronic version of the voting choices printed on the paper ballot.” *Id.* at 3:8–20. “The method may also include steps of showing [the] printed ballot to the voter[,], obtaining a confirmation from the

voter that the printed ballot is accurate, and validating the voter's choices only upon obtaining the voter's confirmation that the printed ballot is accurate." *Id.* at 3:37–42.

Johnson provides details regarding the vote confirmation process. *Id.* at 5:27–6:60. Specifically, after the voter indicates that voting is complete, “the voter's choices are recorded in a secure data store,” the paper ballot is printed, and “separate data paths are created”—namely, one “stemming from electronic data obtained through the user's interaction with the user interface and recording the voter's choices, and the other expressed solely by the generated paper ballot.” *Id.* at 5:27–39. To enable the voter to confirm the accuracy of the vote registered on the paper ballot, the paper ballot is presented to the voter for examination, but not handling. *Id.* at 5:39–51; *see also* 6:45–49 (explaining how the ballot “may then be presented through a transparent window [] for the voter's inspection and approval,” but that “the voter can only see the just-printed ballot[] but cannot in any way touch or alter it.”). The voter then determines and “indicates whether the paper ballot presented . . . accurately reflects the voter's intent.” *Id.* at 5:54–56. “If the paper ballot is inaccurate,” it is “physically voided in some irrevocable manner and the electronic vote is erased,” and the voter may try to vote again. *Id.* at 5:56–60. Johnson discloses that “[p]rovisions may be made” in the voting machine “to segregate paper ballots [] that have not been approved by the voter and to allow the voter to start the voting process over again.” *Id.* at 6:56–60. “After the voter indicates that the paper ballot conforms to the voter's choices,” the electronic vote is validated, and the paper ballot “is automatically and without human intervention conveyed to the lockbox.” *Id.* at 5:60–65, 6:52–55.

2. *Overview of Cummings*

Cummings discloses “[a] ballot marking system and apparatus for marking a paper ballot listing a plurality of candidates which includes a marking space . . . which can either be hand-marked by a voter, or machine-marked by the marking apparatus.” Ex. 1003, Abstract. Cummings describes a method where a voter receives a physical ballot from the election judge after the voter’s identity is confirmed, and the voter can either manually mark the ballot in a conventional booth or insert the ballot into a marking device. *Id.* ¶ 38. If the voter elects to use the marking device, “voting choices appropriate to the ballot are presented to the voter on successive viewing screens on [the] voting terminal” upon entry of the ballot into the marking device. *Id.* The voting choices may be presented to the voter “one slate of candidates for an office at a time, under control of processors contained within” the marking device. *Id.* “With each office voted, a check is automatically made to determine if the voter has under-voted (failed to vote for a candidate in that office) or over-voted (voted for two or more candidates for that office).” *Id.* If there is an under- or over-vote, the voter is presented with an opportunity to correct the voting error. *Id.* If the error goes uncorrected or if the voter fails to vote “within a predetermined period of time, the voting process is terminated and the ballot held in [the] marking device [] is rejected and returned to the voter.” *Id.*

After a selection has been made for each candidate, “the voter indicates his satisfaction with his choices by actuating a vote option on [a] touch-screen,” which causes the marking device to mark the ballot in a manner that may be consistent with manual marking in a voting booth. *Id.* ¶ 39. As the ballot is marked by the marking device, it is discharged and

returned to the voter, who removes the ballot, visually checks the ballot for accuracy, and then carries the ballot to a scanner. *Id.* ¶ 40. The scanner checks the ballot for under- or over-votes. *Id.* If none are detected by the scanner, “the ballot is automatically deposited in [the] ballot box.” *Id.*

3. *The Parties’ Contentions — Original Independent Claim 16*

Petitioner asserts that the elements recited in original independent claim 16¹⁰ are disclosed by Johnson and Cummings. Pet. 53–58.

Furthermore, Petitioner asserts that a person of ordinary skill in the art would have been motivated to modify the teachings of Johnson with those of Cummings at the time of the invention to provide options for either depositing the paper ballot or returning it to the voter, and to include a transport mechanism for performing the requested operation. Pet. 57 (citing, *inter alia*, Section VII.A.3.a.); *see also id.* at 26–27 (the portion of Section VII.A.3.a. referenced by Petitioner). Petitioner contends the skilled artisan

would have recognized that, while election officials may wish to prevent voters from accessing printed ballots, a voter may wish to receive his or her printed ballot if it were incorrectly marked in order to gain assurance that the ballot will not be mistakenly counted during a recount or audit of the paper ballots.

Id. at 26. Petitioner asserts that such modification would have had a reasonable expectation of success because it “would merely involve providing an exit chute for returning paper ballots to the voter and elements

¹⁰ Original claim 16 was not amended in Patent Owner’s non-contingent Motion to Amend. Mot. Amend. 2; Reply Amend. 2. Thus, for claim 16, the operative pleadings are Petitioner’s Petition and Reply, and Patent Owner’s Response and Sur-Reply. Therefore, in our analysis of claim 16, we need not address the parties’ contentions set forth in the briefing germane to proposed substitute claims 21–31, i.e., Paper 17 (Mot. Amend), Paper 25 (Reply Amend), Paper 20 (Opp. Amend), and Paper 33 (Sur-Reply Amend).

for transporting the paper ballot to the exit chute” upon the voter’s indication that the ballot is inaccurate. *Id.* at 26–27.

Patent Owner contests Petitioner’s position that the skilled artisan would have been motivated to combine Johnson with Cummings. PO Resp. 2–3, 19–35. Patent Owner also asserts there would have been no reasonable expectation of success in making such a modification (*id.* at 34–36), and that several limitations of claim 16 are not taught by these references (*id.* at 36–42).

Regarding motivation to combine, Patent Owner avers that Johnson and Cummings disclose different types of voting machines that “function drastically differently” such that the skilled artisan would have no motivation to combine the teachings of these references. *Id.* at 2. Specifically, Patent Owner states that Johnson discloses a “direct-recording electronic (‘DRE’) voting machine with voter-verified paper trail audit (‘VVPAT[’]) that submits an electronic vote and never returns the voting receipt to the voter,” while “Cummings [] is a ballot-marking device (‘BMD’) that marks a paper ballot before always returning the ballot to the voter to be manually deposited in a separate ballot-scanning device (‘BSD’) with an attached ballot box so the paper ballot can be cast in the election.” *Id.* Patent Owner details the purported differences between Johnson’s DRE voting machine with VVPAT (*id.* at 6–10) and the BMD voting machine disclosed by Cummings (*id.* at 10–16). One such purported difference is that Johnson’s printed ballot “remains at all times inaccessible to the voter.” *Id.* at 9.

Based on the purported differences of Johnson’s DRE voting machine with VVPAT, and Cummings’ BMD voting machine, Patent Owner argues

Petitioner’s proffered modification—i.e., adding Cummings’ “ballot return” feature to Johnson’s device—would change the basic principles under which Johnson was designed to operate and would render Johnson inoperable for its intended purpose. *Id.* at 19–23. Patent Owner argues that Petitioner’s proffered combination “is actually detrimental to Johnson’s operation as it would render Johnson’s recount and/or audit based on the paper receipts unreliable.” *Id.* at 26.

Patent Owner argues further that Johnson teaches away from returning a ballot to the voter, thus contradicting the only articulated basis for why the skilled artisan would have been motivated to combine Johnson and Cummings. *Id.* at 27–28. Patent Owner avers that Johnson’s voting machine “has no need to return a ballot to the voter, nor is such an ‘advantage’ relevant to Johnson’s [] voting machine.” *Id.* at 28. Patent Owner stresses how Johnson’s voting machine operates in a fundamentally different way than that of Cummings. *Id.* at 29–30. Specifically, Patent Owner argues that—unlike when using Cummings’ BMD voting machine—a voter does not obtain a paper ballot from a voting official when using Johnson’s DRE voting machine with VVPAT, “so there is no need for returning a spoiled ballot so that a voter can obtain a new unmarked paper ballot from a voting official as in Cummings.” *Id.* Rather, Patent Owner argues, Johnson’s machine erases the electronic vote and automatically creates a new paper ballot. *Id.* at 30.

Patent Owner argues further that Petitioner’s proffered motivation of “[r]eturning a voided ballot to permit a voter to leave a polling place with a ballot or to discard it is contrary to all state voting laws in the U.S.” and “would undermine the voting process because the voting officials would not

be able to account for all of the ballots provided to a polling location.” *Id.* Patent Owner argues that “auditability requires a complete accounting for all ballots delivered to a polling place, including unvoted (blank) ballots, voted ballots and spoiled ballots,” and “[i]f the total of voted ballots, unvoted ballots and spoiled ballots does not equal the number of ballots provided to the polling place, then the election is suspect because some errant ballots have not been accounted for.” *Id.* As such, Patent Owner argues, voters are not permitted to leave the polling place with any ballots. *Id.* Patent Owner contends that “[i]t is important to preserve voided ballots so they can be inspected during an election audit or a recount” because an election tamperer may “void ballots that have been voted for a disfavored candidate” thus making it “critical to be able to inspect the voided ballots to determine that they were properly voided by the voting machine, and not by a tamperer.” *Id.* at 33.

Petitioner replies that Patent Owner’s arguments are “[b]ased on the incorrect premise that *Johnson* teaches against ever returning a ballot to a voter.” Reply 7. Petitioner asserts that Johnson “suggests that voided ballots are not deposited into the lockbox” because Johnson indicates that approved ballots are conveyed to the lockbox, and is silent whether the lockbox contains non-validated printed ballots. *Id.* at 9–10. Petitioner states that Johnson “does not exclude the possibility of returning” voided ballots to the voter, and “is consistent with other voting machines that, for some period of time prevent the voter from accessing the ballot, only to later return the ballot to the voter.” *Id.* at 11 (citing Ex. 1023 ¶ 99).

Petitioner disputes Patent Owner’s position “that the spoiled ballots must be kept in the lockbox attached to the voting machine to conduct a full

audit of the election.” Reply 18. To support its position, Petitioner states Johnson never discloses that spoiled ballots are used in a recount, alleges that Dr. Shamos “provides no evidence to support his suggestions that election audits must be carried out in a particular fashion,” and points to a voting law in Massachusetts which purports to “expressly require not including spoiled ballots in an audit.” *Id.* at 18–19 (citing Exs. 1026, 1027). Petitioner also asserts that “even if all elections were required to keep spoiled ballots to conduct a full audit of an election, there are ways of doing so without capturing them within the machine in which they are spoiled,” which would have “many advantages” such as voter assurance, space savings within the ballot box, enabling a voter to prove the ballot was spoiled thus prompting the official to reset the voting machine, and the reduction of cost and complication of voting machine transport mechanisms. *Id.* at 19–20. Petitioner also challenges Dr. Shamos’s position regarding whether a voter is allowed to leave a polling place with a receipt showing how the voter cast its vote. *Id.* at 20. For support, Petitioner identifies nine issued patents or published patent applications that disclose voting machines where purportedly a voter is allowed to obtain such a receipt. *Id.* at 20–21 (citing Exs. 1028–1036).

Patent Owner, in response, stresses again how, in Johnson’s system, “[n]either the poll workers nor the voter ever touches a paper ballot.” Sur-Reply 4. Patent Owner also discusses how Johnson’s system and method are configured to have “parallel and identical” voting procedures for absentee and non-absentee voters. *Id.* at 4–5. Patent Owner states that “[b]ecause the absentee voter is not at an official polling place, the absentee voter cannot be given a spoiled or unapproved ballot because there is a high likelihood of the

absentee voter leaving the location with the spoiled ballot, destroying the auditability of the election.” *Id.* at 5. Thus, according to Patent Owner, “[t]he spoiled ballot of the absentee voter must remain secure in the lock box of Johnson.” *Id.*

Patent Owner also contests Dr. Bederson’s testimony regarding the Massachusetts voting law “expressly requir[ing]” the exclusion of spoiled ballots from an audit and their destruction without examination. *Id.* at 8. At deposition, Patent Owner discussed the Massachusetts statute Dr. Bederson relied on (Ex. 1027), and presented additional Massachusetts statutes¹¹ to Dr. Bederson. Ex. 2005, 100:16–122:4. According to Patent Owner,

when confronted with other voting statutes from Massachusetts that plainly require the election officials to retain all spoiled ballots in a special envelope until the time period for all recounts and challenges to the election and audits of the election have passed, [Dr.] Bederson had no answer and could not defend his prior testimony.”

Sur-Reply 9. Patent Owner then points to the purported expertise of its declarant, stating “Dr. Shamos is an attorney with intimate knowledge of the election laws as applied to voting machines,” and that his testimony regarding the illegality of allowing a voter to leave a polling place with a spoiled ballot “stands unrebutted and must be accepted by the Board.” *Id.*; *see also id.* at 20 (asserting that Dr. Bederson’s testimony on another issue “is reckless and, as with his false testimony about the Massachusetts voting laws, eviscerates his credibility on all issues”).

¹¹ These additional Massachusetts statutes are now of record in this proceeding as Exhibits 2006–2009. Paper 32.

4. *Obviousness Analysis of Claim 16*

Independent claim 16 requires a presentation device operable to present to a voter a plurality of ballot handling choices including “returning a ballot to the voter” and “depositing the ballot into a ballot box.” Ex. 1001, 22:48–53. Consistent with our claim construction of “returning a ballot to the voter” discussed *supra*, this limitation requires “returning the ballot to give the voter physical possession of the ballot.”

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). Obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). Petitioner must demonstrate obviousness by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d); *see also Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). A party that petitions the Board for a

determination of obviousness must show that “a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *Procter & Gamble Co. v. Teva Pharm. USA, Inc.*, 566 F.3d 989, 994 (Fed. Cir. 2009) (quoting *Pfizer, Inc. v. Apotex, Inc.*, 408 F.3d 1348, 1361 (Fed. Cir. 2007)).

We have analyzed both parties’ arguments and evidence consistent with these legal principles and, on the complete record, find Petitioner has not shown the skilled artisan would have been motivated to make the proffered modification to the teachings of Johnson. In particular, Petitioner has not shown the skilled artisan, considering Johnson’s teachings as a whole, would have modified Johnson to provide a voter with options for either depositing a physical ballot to a ballot box or returning the ballot to the voter. Additionally, Petitioner has neither explained adequately, nor provided sufficient evidence to support, how returning a physical ballot to a voter would have rendered Johnson’s election results capable of being recounted and/or audited successfully.

Johnson expressly teaches how the voter has no physical access to the printed ballot while casting a vote. *See* Ex. 1002, 5:32–41 (explaining how a paper ballot is generated and presented to the voter “[a]fter the voter has made his or her voting choices,” “but is not given to the voter.”); *id.* at 5:41–52 (disclosing how, after the ballot is printed, “[t]he voter may then look at and examine the printed ballot (*but has no physical access thereto*) to ensure that the printed ballot accurately memorializes the choices the voter has just made through the touch screen or other input means,” and how the printed ballot may be displayed behind a transparent window of the voting machine

to ensure “the printed ballot is visible but *otherwise inaccessible* to the voter” (emphases added)); *id.* at 6:47–55 (explaining how “the voter can only see the just-printed ballot 212” at this stage, “but *cannot in any way touch or alter it*,” and, if “the voter agrees that the paper ballot is accurate, [it] is automatically and *without human intervention* conveyed to the lockbox 208” (emphases added)).

According to Petitioner, “Johnson does not teach never providing the voter with a ballot.” Reply 15. Petitioner thus appears to argue that Johnson’s lack of physical access to the printed ballot does not apply to every step in Johnson’s voting process. *See id.* (“At most, Johnson discloses preventing user access to the paper ballot at one point in the voting process, when asking the voter whether or not the paper ballot is accurate.”); Reply 11 (asserting “Johnson’s disclosure is consistent with other voting machines that, for some period of time prevent the voter from accessing the ballot, only to later return the ballot to the voter.” (citing Ex. 1023)); *see also* Tr. 17:20–21 (Petitioner’s counsel representing that Johnson “doesn’t affirmatively say that the voter can never access the ballot. It doesn’t shut the door.”). Such purported silence, however, does not negate our obligation to consider the teachings of the Johnson reference as a whole. *See In re Gorman*, 933 F.2d 982, 986 (Fed. Cir. 1991) (explaining how “the test is whether the teachings of the prior art, taken as a whole, would have made obvious the claimed invention.”).

Considering Johnson as a whole, we do not agree that allowing the voter to access Johnson’s printed ballot at any stage in the voting process would have been an obvious modification. As set forth, *supra*, Johnson repeatedly stresses the voter’s inaccessibility to the physical ballot, and

when the printed ballot accurately reflects the voter's intention, Johnson expressly teaches that the printed ballot "is automatically and without human intervention conveyed to the lockbox," thereby ending the voting process from the voter's perspective. Ex. 1002, 6:1–9, 52–55. In other words, Johnson teaches that when the physical ballot is accurate, the voter never has access to it before it is transferred to a locked box. And while Johnson lacks precise details regarding what happens to a printed ballot if not "approved by the voter," the reference—when considered as a whole—does not suggest that a voter should be given physical possession of the inaccurate or disapproved ballot after it is segregated. *Id.* at 6:56–60. Thus, in view of Johnson's express teaching to make the "accurate" ballots physically inaccessible to the voter, Johnson's lack of specificity regarding how inaccurate ballots are treated is not enough to demonstrate to us that the skilled artisan would have been motivated to make the proffered modification.

On this point, Petitioner's citation to other evidence, i.e., Chung (Ex. 1023), to establish how a voter may be prevented from accessing the printed ballot for a period of time, but is later provided with the printed ballot, is unavailing. Reply 11.¹² Specifically, Petitioner fails to explain sufficiently how Chung's voting machine is similar to Johnson's. Moreover,

¹² To the extent Petitioner's citation of prior art "voting validation receipts" is intended to establish that it was well known to prevent voter access to a physical ballot for a period of time, only to provide access to the physical ballot later in the voting process, we find such reliance misplaced. Reply 20–22 (citing Exs. 1028–1037). Petitioner does not explain sufficiently how, much less establish that, voter validation receipts are sufficiently similar to Johnson's actual physical ballot which is used in an election recount and/or audit. Ex. 1002, 6:10–11; 8:20–26; 10:41–53.

the evidence supports Patent Owner’s argument (Sur-Reply 7) that Chung’s process begins with a voter being “given a paper ballot by a poll worker.” *See* Ex. 1023, Fig. 4, ¶ 86 (“Process 300 starts 305 with a voter signing in 310 at a polling place and being issued 310 an optically-readable paper mark sense ballot form.”). Thus, absent sufficient explanation from Petitioner, we perceive no similarity between Johnson’s system, where the paper ballot remains inaccessible to the voter, and Chung’s system where the paper ballot is given to a voter in the first instance. *Compare* Ex. 1002, 5:39–51, 6:45–55, *with* Ex. 1023, Fig. 4, ¶ 86.

Furthermore, Johnson’s disclosure and record evidence regarding election auditability and recounts underscores why the skilled artisan would not have been motivated to modify Johnson’s teachings to return the ballot to the voter should the voter disapprove of it. Johnson repeatedly stresses the importance of election auditability and recounts, and specifically teaches that “the paper ballots may form the basis for a later recount or audit.” Ex. 1002, 6:10–11; *see also id.* at 8:10–26 (discussing how a voter’s choices creates “independent data paths” and “read-after-print information” which, when combined, “provides a reliable record of the voter’s intent,” and how “[w]hen combined with the tangible and persistent nature of the voter-verified printed ballot 212 . . . , embodiments of the present invention provide a secure, fully auditable record of the vote,” thus providing an “independent basis for carrying out meaningful hand or machine recounts and audits of voting processes and administration.”).

Johnson’s Figure 7, reproduced below, is illustrative.

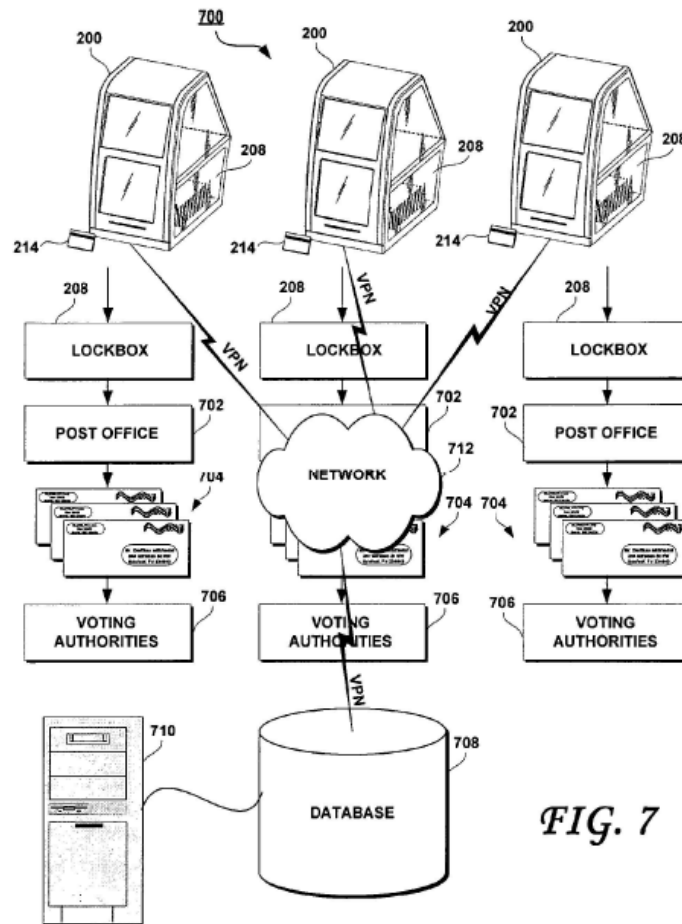


FIG. 7

Johnson's Figure 7 depicts, *inter alia*, a plurality of voting machines 200 transmitting acquired votes to one or more database 708 over computer network 712 for later access by one or more computers 710 to tally the results and conduct audits and/or recounts. Ex. 1002, 10:1–15.

Significantly, Figure 7 also illustrates how *physical* printed ballots 212, collected in lockboxes 208, are handled. As explained by Johnson, printed ballots 212, or lockbox 208 containing such ballots, are removed from voting machine 200, and then “physically transferred” to the U.S. Post Office or other authorized agency for further handling. *Id.* at 10:15–21. Johnson then details how the printed ballots are carefully handled so that envelopes 704 containing printed ballots 212 are not destroyed, and how

envelopes 704 are sufficiently lined “such that the printed ballot cannot be read from outside the envelope,” e.g., by x-ray scanning. *Id.* at 10:22–33. Johnson states that “[t]he purpose of the envelope security is to prevent reading and selective disposition (e.g., destruction) of specific ballots.” *Id.* at 10:33–35.

We disagree here with Petitioner’s argument that Johnson suggests that only “approved,” i.e., not “voided” or “spoiled,” ballots enter lockbox 208. Reply 9–10. Johnson—when discussing voting machine 200 illustrated in Figure 3—uses numerical identifier “212” to refer to both approved *and* disapproved ballots. *See* Ex. 1002, 6:52–60 (stating how “[o]nce the voter agrees that the paper ballot is accurate, the paper ballot 212 is automatically and without human intervention conveyed to the lockbox 208” and how “[p]rovisions may be made within . . . electronic voting machine 200 to segregate paper ballots 212 that have not been approved by the voter”). Johnson does not specify what such segregation “provisions” are included in his discussion of voting machine 200 depicted in Figure 3. Johnson’s discussion of multiple voting machines 200 depicted in Figure 7, however, specifies that “*each* printed ballot 212 may be securely held and made available for automated or manual recounting at the discretion of the local authorities and according to the laws of each state and the federal government.” *Id.* at 10:41–45 (emphasis added); *see also id.* at 10:51–53 (anticipating “that the mailed printed ballots 212 will arrive in time for *any recount* that may be ordered”). Therefore, while Johnson offers few details on specifically how any disapproved (i.e., “voided” or “spoiled”) paper ballots 212 would be segregated by voting machine 200, Johnson’s disclosure, considered as a whole, strongly suggests that both approved *and*

disapproved paper ballots 212 are transferred to lockbox 208 to be kept in the event of a later audit or recount.

Moreover, Dr. Shamos explains why maintaining both approved and disapproved ballots are necessary to conduct a successful audit or recount of election results generated with Johnson's DRE voting machine. Ex. 2002 ¶¶ 93–98. According to Dr. Shamos, if Johnson's physical ballot is returned to a voter, the voter could leave the voting location with the ballot. *Id.* ¶ 94. Under that circumstance, "the number of ballots cast will not equal the number of voters who checked in, and election officials will be unable to account for all the ballots." *Id.*; *see also* Ex. 2003 ¶ 59 ("Returning a ballot to the voter in Johnson would render the election unauditable. There would be no way to account for the ballots that had been returned to the voters and discarded"); *id.* ¶ 75 ("if N ballots are given out to voters, at the close of polls those N ballots must be accounted for. Otherwise a voter would obtain a new ballot without giving up a spoiled ballot, possibly resulting in the voter being able to vote twice"); *id.* ¶ 80 (explaining how "[i]t is important to preserve voided ballots so they can be inspected during an election audit or a recount" because a tamperer may void ballots cast for a disfavored candidate, and how "[i]t is critical to be able to inspect the voided ballots to determine that they were properly voided by the voting machine, and not by a tamperer"). We credit Dr. Shamos's testimony because it is consistent with Johnson's disclosure considered as a whole.¹³

¹³ We also credit Dr. Shamos's testimony in view of his extensive experience and expertise in the election field. Dr. Shamos testifies that he is an attorney who has "worked in the election field since 1980 and [has] performed certification examinations on at least 60 different voting

Petitioner’s counter-argument that an election audit does not necessarily require physical possession of disapproved ballots is unpersuasive because it is not supported by evidence. Reply 18–19; Ex. 1024 ¶¶ 39–40. Here, Petitioner and Dr. Bederson rely on a Massachusetts voting law to support this argument, stating “the voting laws of Massachusetts expressly require not including spoiled ballots in an audit, and that these ballots instead be destroyed without examination.” Reply 19 citing Ex. 1027. Petitioner’s argument is contradicted, however, by the additional Massachusetts voting laws cited by Patent Owner. *See, e.g.*, Ex. 2007, 1 (requiring the clerk to “record the total number of ballots received, the number registered on the ballot box, *and the total number of spoiled ballots*” (emphasis added)), Ex. 2009, 2 (explaining the process of transmitting a petition for recount to the registrars of voters, including “sealed envelopes containing the ballots casts, the original tally sheets, [and] the envelopes containing the *spoiled and unused ballots*” (emphasis added)). Furthermore, when asked about these additional Massachusetts voting laws under oath, Dr. Bederson acknowledged how these additional Massachusetts voting laws are inconsistent with his understanding that disapproved, i.e., “spoiled” physical ballots are not necessary for an audit. Ex. 2005, 122:1–4.

This brings us to the issue of what weight we ascribe to Dr. Bederson’s testimonial evidence, including how audits are carried out in jurisdictions such as Massachusetts. Ex. 1024 ¶¶ 39–40; *see Velandier v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003) (stating that it is “within the discretion of the trier of fact to give each item of evidence such weight as it

machines in 120 examinations in various states.” Ex. 2002 ¶ 3; Ex. 2003 ¶ 59; *see also* Ex. 2002 ¶¶ 1, 2, 4–17 (detailing Dr. Shamos’s qualifications).

feels appropriate”). Dr. Bederson acknowledges he is neither an attorney, nor “a particular expert in Massachusetts law.” Ex. 1006 ¶ 16; Ex. 2005, 101:14–16. Dr. Bederson testifies that he uncovered the Massachusetts statute submitted as Exhibit 1027 after conducting “some Web searching to see . . . if audits and spoiled ballots are run in different fashions to see if there was any clear, straightforward evidence” to support his understanding that spoiled ballots were not needed for an election audit. Ex. 2005, 104:24–106:4. Dr. Bederson also testifies he is unsure of what a “voting list” is in the context of the Massachusetts law submitted as Exhibit 1027. *Id.* at 108:14–23. This apparent lack of familiarity with a specific voting law supporting his understanding, as well as what a “voting list” includes, underscores Dr. Bederson’s lack of expertise on the Massachusetts voting laws that he stated “expressly require not including spoiled ballots in an audit.” Ex. 1024 ¶ 40. Furthermore, Dr. Bederson acknowledges he has not worked on an election audit or recount. Ex. 2005, 8:1–4, 9:23–10:2. In view of this, we accord little weight to his testimony that “election audits do not have to be carried out in any particular fashion,” and “[t]he way in which election audits are handled varies from jurisdiction-to-jurisdiction.” Ex. 1024 ¶ 40. Similarly, we give little weight to Dr. Bederson’s assertion, devoid of explanation, that “some prior art voting systems expressly disclose providing for the destruction of invalid ballots.” *Id.* ¶ 39 (citing Ex. 1026, 5:39–46).¹⁴ We stress here that no documentary evidence has been presented in this proceeding to establish sufficiently that disapproved, i.e., “spoiled,” ballots are unnecessary to conduct an election audit or recount.

¹⁴ Neither Petitioner nor Dr. Bederson explain how this passage relates to election audit procedures or recounts.

See Tr. 15:18–16:7 (Petitioner’s counsel stating “I’m not aware of any documentary evidence we have that goes to that point.”). In the absence of such evidence, Petitioner’s argument is unsupported. Indeed, Petitioner acknowledges (albeit without explanation) that “election officials may wish to prevent voters from accessing their printed ballot.” Pet. 26; Reply 1; Ex. 1006 ¶ 82. Based on the evidence of record in this proceeding, we are persuaded that at least one reason election officials would have wanted to prevent voters from accessing their printed ballots is to preserve the integrity of a potential election audit and/or recount. Ex. 1002, 1:47–49, 5:66–6:7, 6:10–11, 6:52–60, 8:10–26, 10:15–53; Ex. 2002 ¶¶ 94–99, 122, 128, 135, 153, 155–156; Ex. 2003 ¶¶ 59, 62–68, 74–80; *see also* Tr. 12:21–13:6 (Petitioner’s counsel stating that “one of the reasons that an official may not want the voter to access the ballot is if they wanted to do an audit after the election they would want to have all of the ballots present.”).

In sum, Petitioner fails to demonstrate by a preponderance of the evidence that the skilled artisan would have been motivated to modify Johnson’s disclosure with that of Cummings, so as to return a physical, i.e., paper, ballot to the voter. It follows that Petitioner has not shown by a preponderance of the evidence that claim 16 is unpatentable.

III. PATENT OWNER’S NON-CONTINGENT MOTION TO AMEND

A. *Introduction*

Patent Owner filed a Motion to Amend, maintaining only original claim 16, withdrawing claims 1–15 and 17–20, and proposing substitute claims 21–39. Mot. Amend 2–3. Specifically, Patent Owner introduced three additional independent claims as proposed

substitute claims—i.e., claims 24, 27, and 30. Mot. Amend A-4–A-7; Reply Amend. A-4–A-7.

Each of these proposed substitute claims recites limitations similar to those present in claim 16, namely a “ballot return” feature. For example, proposed substitute claim 24 is directed to “[a] ballot marking device adapted to mark a ballot in accordance with selections made by a voter and to either directly deposit the marked ballot into an attached ballot box or return the marked ballot to the voter,” where “a plurality of ballot handling choices” are provided to the voter, one of which comprises “returning the ballot to the voter.” Reply Amend. A-4–A-5. Proposed substitute claim 27 is a method that comprises, *inter alia*, “presenting to the voter a plurality of ballot handling choices,” one of which comprises “returning the ballot to the voter.” *Id.* at 5. Proposed substitute claim 30 is directed to “[a] ballot marking device” comprising “a presentation device operable to visually or aurally present to the voter a plurality of election choices and a plurality of ballot handling choices.” *Id.* at 6. The “ballot handling choices” of substitute claim 30 include “returning the marked ballot to the voter and depositing the marked ballot into a ballot box” if the marked ballot is accurate, and “returning the marked ballot to the voter” if it is not accurate. *Id.*

Pursuant to Patent Owner’s request (Mot. Amend 1), we provided Preliminary Guidance on Patent Owner’s motion. Prelim. Guid. After receiving our Preliminary Guidance, Patent Owner filed a “Reply in Support of its Motion to Amend,” clarifying that its original motion was intended to be non-contingent on a finding of unpatentability of claims 1–15 and 17–20.

Reply Amend 1. Furthermore, Patent Owner deleted previously submitted proposed substitute claims 32–39. *Id.*¹⁵

B. Principles of Law

In an *inter partes* review, amended claims are not added to a patent as of right, but rather must be proposed as a part of a motion to amend.

35 U.S.C. § 316(d). “Before considering the patentability of any substitute claims, . . . the Board first must determine whether the motion to amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121.” *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 4 (PTAB Feb. 25, 2019) (precedential). We must, therefore, consider whether: (a) the amendment proposes a reasonable number of substitute claims; (b) the proposed claims are supported in the original disclosure; (c) the amendment responds to a ground of unpatentability involved in the trial; and (d) 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.

The Board must assess the patentability of 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 Lectrosonics*, Paper 15 at 3–4. After the issuance of *Aqua Products*, the Federal Circuit issued a decision in *Bosch Automotive Service Solutions*,

¹⁵ Although Patent Owner deleted previously submitted substitute claims 32–39 in this filing, we treated this paper as a reply, and not as a revised motion to amend. *See* Paper 11, 7 (allowing, in addition to a sur-reply to Petitioner’s reply at DUE DATE 3, either a reply to the opposition to the motion to amend or a revised motion to amend).

LLC v. Matal, 878 F.3d 1027 (Fed. Cir. 2017) (“*Bosch*”), as well as a follow-up Order amending that decision on rehearing. *See Bosch Auto. Serv. Sols., LLC v. Iancu*, Order on Petition for Panel Rehearing, No. 2015-1928 (Fed. Cir. Mar. 15, 2018).

In accordance with *Aqua Products*, *Bosch*, and *Lectrosonics*, 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, “the petitioner bears the burden of proving that the proposed amended claims are unpatentable by a preponderance of the evidence.” *Bosch*, 878 F.3d at 1040 (as amended on rehearing). *See Lectrosonics*, Paper 15 at 3–4. In determining whether a petitioner has proven unpatentability of the substitute claims, the Board focuses 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). Thus, the Board determines whether substitute claims are unpatentable by a preponderance of the evidence based on the entirety of the record, including any opposition made by the Petitioner.

C. *Analysis*

Because the Preliminary Guidance issued in this proceeding is not binding on the Board, we consider anew Patent Owner’s Motion to Amend and Petitioner’s Opposition, along with the subsequently filed Reply and Sur-Reply. We begin our analysis by addressing the statutory and regulatory requirements for a motion to amend, followed by addressing Petitioner’s assertions of unpatentability of proposed substitute claims 21–31.

1. Proposed substitute claims 21–29

a. Reasonable Number of Substitute Claims

By statute, in a motion to amend, a patent owner may propose a reasonable number of substitute claims for each challenged claim. 35 U.S.C. § 316(d)(1)(B). There is a rebuttable presumption that a reasonable number of substitute claims per challenged claim is one substitute claim. 37 C.F.R. § 42.121(a)(3).

Patent Owner proposes substitute claims 21–29 to replace original claims 4–6, 11–13, 17–19, which is a one-for-one substitution. We therefore find that Patent Owner proposes a reasonable number of substitute claims for claims 4–6, 11–13, and 17–19.

b. Support in the Original Disclosure

A motion to amend may not present substitute claims that introduce new subject matter. 35 U.S.C. § 316(d); 37 C.F.R. § 41.121(a)(2)(ii). New matter is any addition to the claims without support in the 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.”); *see also Lectrosonics*, Paper 15 at 7 (“the Board requires that a motion to amend set forth written description support in the originally filed disclosure of the subject patent for each proposed substitute claim”).

Patent Owner has identified purported written description support in the originally filed disclosure of the subject patent for the new limitations added to proposed substitute claims 21–29. Mot. Amend 3–6, 11, 12. Patent Owner states that proposed substitute claims 21–23 are substantially the same as original claims 17–19 and correct a typographical error. *Id.* at 2.

Patent Owner states proposed substitute claim 24 is original claim 4 written in independent form, proposed substitute claim 27 is original claim 11 written in independent form, and proposed substitute claims 25, 26, 28, and 29 “updat[e] the claim dependencies from claim 4 to 24 and from claim 11 to 27.” *Id.* Petitioner does not challenge the existence of written description support for these proposed substitute claims 21–29. *See* Opp. Amend 3–4 (asserting certain limitations recited in proposed substitute claims 30 and 31 lack support, but making no such assertions regarding proposed substitute claims 21–29).

We have reviewed Patent Owner’s assertions of support in the original disclosure for proposed substitute claims 21–29 and determine that sufficient support exists.

c. Responsive to a Ground of Unpatentability Involved in the Trial

37 C.F.R. § 42.121(a)(2)(i) states that “[a] motion to amend may be denied where . . . [t]he amendment does not respond to a ground of unpatentability involved in the trial.” While this rule does not require “every word added to or removed from a claim in a motion to amend be solely for the purpose of overcoming an instituted ground,” some of the proposed amendments should be directed to addressing a prior art ground in the trial. *See Lectrosonics*, Paper 15 at 5–6 (stating “once a proposed claim includes amendments to address a prior art ground in the trial, a patent owner may also include additional limitations to address potential § 101 or § 112 issues, if necessary.”).

Such is precisely the case here. Proposed substitute claim 30, discussed *infra*, adds “a new ‘ballot receiving slot’ limitation and four new wherein clauses.” Mot. Amend 3. Patent Owner argues that the “ballot

receiving slot” limitation is not taught by a prior art reference involved in the trial, i.e., Johnson. Ex. 2003 ¶ 50. Thus, proposed substitute claim 30 includes an amendment that attempts to address a prior art ground. On the other hand, proposed substitute claims 21–29 do not include any such amendments, instead correcting typographical errors in original claims 11 and 17–19, rewriting previously dependent claims into independent form, and updating claim dependencies to reflect new claim numbers.

Mot. Amend 2.

Therefore, while proposed substitute claims 21–29 discussed here do not themselves “respond to a ground of unpatentability involved in the trial” as set forth in 37 C.F.R. § 42.121(a)(2)(i), at least one other proposed claim, i.e., claim 30, does. Accordingly, we determine that this requirement is met.

d. Does Not Enlarge Claim Scope

Patent Owner asserts that proposed substitute claims 21–29 do not enlarge the scope of the claims they replace. Mot. 2. We agree because these claims appear to be substantially the same as original claims 4–6, 11–13, and 17–19, which they replace. We, thus, determine that this requirement is met.

e. Patentability Analysis of Proposed Substitute Claims 21–29

Having now established that Patent Owner has satisfied the statutory and regulatory requirements associated with its motion to amend, we turn to the patentability analysis. It is Petitioner that bears the burden of establishing, by a preponderance of the evidence, that the proposed amended claims are unpatentable. *Bosch*, 878 F.3d at 1040 (as amended on rehearing); see *Lectrosonics*, Paper 15 at 4 (“[T]he burden of persuasion

ordinarily will lie with the petitioner to show that any proposed substitute claims are unpatentable by a preponderance of the evidence.”).

Here, Petitioner asserts that proposed substitute claims 21–29 “remain obvious for the same reasons already identified for claims 4–6, 11–13, and 17–19 in the Petition and in the Petitioner’s Reply.” Opp. 6. Thus, the only patentability challenge Petitioner raises with respect to proposed substitute claims 21–29 is under 35 U.S.C. § 103(a) as set forth in its Petition and its Reply.

Proposed substitute claims 21–23 depend directly or indirectly from original claim 16. Reply Amend A-3–A-4. By virtue of this dependency, claims 21–23 require a “ballot handling choice” that includes “returning a ballot to the voter,” i.e., “returning the ballot to give the voter physical possession of the ballot” as discussed *supra*. Proposed independent substitute claims 24 and 27 each recite “wherein the ballot handling choices comprise returning the ballot to the voter and depositing the ballot into the attached ballot box.” *Id.* at A-5. Proposed substitute claims 25 and 26 depend from proposed substitute claim 24, and proposed substitute claims 28 and 29 depend from proposed substitute claim 27. *Id.* at A5–A6. Based on our claim construction, *supra*, each of claims 24–29 thus require “returning the ballot to give the voter physical possession of the ballot.”

Petitioner’s obviousness arguments for these limitations in claims 21–29 are the same deficient arguments as those relied on for original claim 16 discussed *supra*. See Opp. Amend 6 (relying on arguments presented for claims 4–6, 11–13, and 17–19¹⁶ in its Petition at pages 40–43, 49–51, and

¹⁶ Proposed substitute claims 21–29 correspond to original claims 4–6, 11–13, and 17–19. Reply Amend A-2.

58–64, and its Reply at pages 7–24 which argues claims 4–6, 11–13, and 16–19). Thus, for the reasons already provided with respect to claim 16, *supra*, we determine that Petitioner’s obviousness challenge of proposed substitute claims 21–29 fails.

Petitioner, therefore, has not established by a preponderance of the evidence that proposed substitute claims 21–29 are unpatentable.

2. Proposed Substitute Claims 30 and 31

Proposed substitute claim 30 was presented as a replacement for original claim 1 as follows:

30. A ballot marking device adapted to mark a ballot in accordance with selections made by a voter ~~and to either directly deposit the marked ballot into an attached ballot box or return the marked ballot to the voter~~, the device comprising:

[A] a presentation device operable to visually or aurally present to the voter a plurality of election choices and a plurality of ballot handling choices, wherein the ballot handling choices presented to the voter if a marked ballot is accurate comprise returning the marked ballot to the voter and depositing the marked ballot into a ballot box, and the ballot handling choices presented to the voter if the marked ballot is not accurate comprise returning the marked ballot to the voter;

[B] an input device operable to receive from the voter at least one selection corresponding to the election choices and at least one instruction corresponding to the ballot handling choices;

[C] a marking mechanism operable to record the received voter selection on the ballot to create the marked ballot;

[D] a transport mechanism operable to transport the marked ballot through a ballot channel of the device;

[E] a diverter operable to direct the marked ballot from the transport mechanism into the attached ballot box; and

[F] a ballot receiving slot configured to physically receive an unmarked ballot;

[G] wherein the presentation device, the input device, the marking mechanism, the transport mechanism, and the diverter and the ballot receiving slot are integrated in a single unit;

[H] wherein the transport mechanism is operable to eject the marked ballot at a different location than the location of the ballot receiving slot to deposit the marked ballot in the attached ballot box;

[I] wherein the transport mechanism is operable to return the marked ballot to the voter through the ballot receiving slot; and

[J] wherein the received voter selection is not counted or tabulated in the election by the ballot marking device if the marked ballot is deposited into the attached ballot box.

Reply Amend. A-6–A-7. Proposed substitute claim 31 depends from claim 30. *Id.* at A-7.

For the reasons below, whether or not the requirements under 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121 are met, Petitioner persuades us that proposed substitute claims 30 and 31 are unpatentable.

Petitioner asserts, *inter alia*, that certain limitations recited in proposed substitute claim 30 lack antecedent basis and, therefore, are indefinite under 35 U.S.C. § 112, second paragraph. Opp. Amend 5–6. Of these, we were preliminarily persuaded that three of these limitations—“the attached ballot box,” “the device,” and “the election”—lack antecedent basis in claim 30. Prelim. Guid. 14. Patent Owner offered no response to our preliminary finding. *See generally* Reply Amend. Petitioner maintains that these three limitations lack antecedent basis, rendering proposed substitute claims 30 and 31 indefinite. Sur-Reply Amend 11–12.

We agree. Here, it is manifestly unclear to which of “the device[s]” proposed substitute claim 30 is referring in limitation [D]—the “ballot marking device” as a whole, the “presentation device” of limitation [A], or the “input device” of limitation [B]. With no reply from Patent Owner on

this point, and no further amendments presented in a revised motion to amend, we find that the antecedent basis issues with claim 30—and by extension claim 31—remain.

Thus, Petitioner has demonstrated by a preponderance of the evidence that claims 30 and 31 are unpatentable as indefinite under 35 U.S.C. § 112, second paragraph.¹⁷

3. Conclusion

Patent Owner's Motion to Amend is granted with respect to proposed substitute claims 21–29, and denied with respect to proposed substitute claims 30 and 31.

IV. MOTION TO EXCLUDE

Patent Owner moves to exclude (1) Exhibits 1023, 1026, 1028–1036, and 1038 on the ground of untimely submission; (2) Exhibit 1037 on the grounds of being untimely submitted, undated, irrelevant, and unauthenticated in violation of Federal Rules of Evidence 401, 402, and 901; and (3) paragraphs 22, 39, 41–44, and 47 of Dr. Bederson's Second Declaration (Ex. 1024) citing Exhibits 1023, 1026, and 1028–1038. Mot. Excl. 2, 5–6. Petitioner filed an Opposition ("Opp. Mot. Excl.") and Patent Owner filed a Reply ("Reply Mot. Excl.")

Exhibit 1023

Having considered the arguments presented by both parties, we agree with Petitioner that Exhibit 1023 is a reference relied on in an obviousness

¹⁷ We need not reach whether these proposed substitute claims are also unpatentable as obvious. Opp. Amend 7–19, 24.

challenge to Patent Owner's proposed substitute claims 30 and 31. Opp. Mot. Excl. 4; Opp. Amend 7. Furthermore, Petitioner appears correct that its citation of Exhibit 1023 was relied on as evidence responsive to Patent Owner's argument that Johnson's paper ballot is not returned to the voter. Opp. Mot. Exc. 4–5; Reply 11.

Thus, Exhibit 1023 is deemed properly responsive to Patent Owner's argument and may be considered as part of our evaluation of the record, and we deny Patent Owner's Motion to Exclude Exhibit 1023.

Exhibits 1026 and 1028–1038

We do not consider the merits of Patent Owner's Motion to Exclude with respect to these exhibits because, as explained *supra*, even if the disputed evidence is considered, it is accorded minimal weight and fails to persuade us that Petitioner has met its burden of establishing the unpatentability of any claim in this proceeding. Thus, Patent Owner's Motion to Exclude Exhibits 1026 and 1028–1038 is dismissed as moot.

V. CONCLUSION

We conclude Petitioner has not satisfied its burden of demonstrating, by a preponderance of the evidence, that the subject matter of original claim 16 of the '471 patent is unpatentable.

Also, Petitioner has not shown, by a preponderance of the evidence, that the subject matter of proposed substitute claims 21–29 of Patent Owner's Non-Contingent Motion to Amend are unpatentable.

Petitioner has shown, by a preponderance of the evidence, that the subject matter of proposed substitute claims 30 and 31 of Patent Owner's Non-Contingent Motion to Amend is unpatentable.

In summary:

Claim	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
16	103	Johnson, Cummings		16

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	1–15, 17–20
Substitute Claims Proposed in the Amendment	21–31
Substitute Claims: Motion to Amend Granted	21–29
Substitute Claims: Motion to Amend Denied	30, 31
Substitute Claims: Not Reached	

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claim 16 of U.S. Patent No. 8,096,471 B2 has not been shown to be unpatentable; and

FURTHER ORDERED that Patent Owner's Non-Contingent Motion to Amend is granted with respect to the cancellation of original claims 1–15 and 17–20 and the addition of proposed substitute claims 21–29;

FURTHER ORDERED that Patent Owner's Non-Contingent Motion to Amend is denied with respect to proposed substitute claims 30 and 31;

FURTHER ORDERED that Patent Owner's Motion to Exclude Exhibit 1023 is denied;

FURTHER ORDERED that Patent Owner's Motion to Exclude Exhibits 1026 and 1028–1038 is dismissed;

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.

IPR2019-00531
Patent 8,096,471 B2

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